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CATALOGUE

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# SWEET'S ARCHITECTURAL CATALOGUE

Indexed by Firms Represented, by Products  
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## PREFACE

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Owing to the exigencies of the war it has been impossible to meet the demand for copies of the catalogue, which is being used extensively by all departments of the United States Government, and at no time has the co-operative nature of the publication played a more important part in maintaining the relations between the manufacturer and those who specify or purchase his product.

It is the purpose of the publishers to develop the practical value of the information contained in SWEET'S, by describing, in detail, the peculiarity and use of individual products through specifications and drawings which show approved methods of using the materials in standard and special forms of construction. Valuable information of this character will be found in many of the catalogues contained in this volume.

The contents are made accessible for quick reference through a comprehensive system of indexing.

EDITOR.



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Architects, contractors and others identified with building operations are invited to address the publishers of SWEET'S CATALOGUE for information concerning any special class of building material or equipment.

Detailed information is on file pertaining to the products of the principal manufacturers in the building field.

Users of "SWEET'S" who notice the omission of the catalogues of firms in whose products they are interested, or who find any of the catalogues herein contained lacking in the specific data required, are requested to advise the publishers of the deficiency. Such co-operation will be an aid to efforts to make subsequent editions increasingly comprehensive.

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# GENERAL INDEX

The General Index is divided into three parts:

**Part I—Firms**

**Part II—Products**

**Part III—Geographical**

## Part I—Firms

An index of the Firms catalogued in this volume

### A

A. B. See Electric Elevator Co., 1262-63.  
 Acme Cement Plaster Co., 140-41.  
 Adams-Rogers Co., see "Bilt-Well" Service Bureau, 574-75.  
 Adams & Kelly Co., see "Bilt-Well" Service Bureau, 574-75.  
 African Ceramic and Tile Co. of Tunis, Inc., 290.  
 Alberene Stone Co., 890-91.  
 Alberger Heater Co., 901.  
 Alhambra Tile Co., see Associated Tile Manufacturers, 284-87.  
 Alignum Fireproof Products Co., Inc., 646-47.  
 Allen Mfg. Co., W. D., 1131-33.  
 Allen Pressure System Co., Inc., 1474-75.  
 Alliance Brick Co., 71-72.  
 Allith Mfg. Co., see Allith-Prouty Co., 614-15.  
 Allith-Prouty Co., 614-15.  
 Allright Mfg. Co., 848-49.  
 Alpha Portland Cement Co., 119.  
 Alsen's American Portland Cement Works, 120.  
 American Abrasive Metals Co., 346.  
 American Bitumastic Enamels Co., 1373.  
 American Blower Co., 996-99.  
 American Brass Co. (Metal Mouldings), 492-93; (Pipe and Tubing), 1071.  
 American Cement Tile Mfg. Co., 432-33.  
 American Chain Co., Inc., 754.  
 American Chemical Paint Co., 1372.  
 American Clothes Dryer Co., see Domestic Laundry Equipment Corporation, 1042-43.  
 American District Steam Co., 912.  
 American Drafting Furniture Co., 1.  
 American Elevator & Machine Co., 1261.  
 American Enameled Brick & Tile Co., 74-77.  
 American Encaustic Tiling Co., Ltd., see Associated Tile Manufacturers, 284-87.  
 American Fence Construction Co., 534-36.  
 American Gypsum Co., 142-44.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co., 344-45.  
 American Materials Co., Inc., 133.  
 American Metal Weather Strip Co., 779.  
 American Pressweld Radiator Corporation, 952-53.  
 American Pulley Co., 757.  
 American Rolling Mill Co., see Associated Metal Lath Manufacturers, 196-201.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel Window Co., 694-97.

American Steel & Wire Co. (Concrete Reinforcement), 232-33; (Electrical Wires and Cables), 1182-87; (Wire Rope), 30-33.  
 American Telephone and Telegraph Co., 1237.  
 American 3-Way Prism Co., 821.  
 American Water Heater Co., Inc., 1018-19.  
 Anchor Post Iron Works, 537-43.  
 Angle Window and Door Co., 709.  
 Ankyra Mfg. Co., 244-45.  
 Antakwa Co., 37.  
 Anti-Hydro Waterproofing Co., 38.  
 Arco Co., 1316-17.  
 Arex Co., 457.  
 Arkansas Soft Pine Bureau, 560.  
 Armstrong Cork Co., 1390-92.  
 Armstrong Cork & Insulation Co. (Cold Storage Insulation), 349-51; (Flooring), 323.  
 Arrow Conductor & Mfg. Co., 94.  
 Artesian Well and Supply Co., 1092.  
 Asbestos Protected Metal Co., see Aspromet Co., 414-16.  
 Asphalt Ready Roofing Co., 388.  
 Aspromet Co., 414-16.  
 Associated Metal Lath Manufacturers, 196-201.  
 Associated Tile Manufacturers, 284-87.  
 Atchison Revolving Door Co., 586-87.  
 Aten Sewage Disposal Co., 879.  
 Athey Co., 780.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Atlantic Terra Cotta Co., 112-13.  
 Atlantic Tile Mfg. Co., see Associated Tile Manufacturers, 284-87.  
 Atlas Portland Cement Co., 121-26.  
 Atlas Valve Co., 940-41.  
 Auld & Conger Co., 359.  
 Austral Window Co., 736.  
 Auto Utilities Mfg. Co., 458.  
 Automatic Electric Co., 1238-39.  
 Automatic Refrigerating Co., 1048-49.  
 Ayer & Lord Tie Co., 310.

### B

Badger Wire & Iron Works, 494-95.  
 Badger & Sons Co., E. B., 892-93.  
 Bailey Co., C. C., 1393.  
 Banner Rock Products Co., 352.  
 Bannon Pipe Co., P., 110.  
 Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.

Barnum, E. T., 496-97.  
 Barnum Iron Works, E. T., 1487.  
 Barrell Co., William L., 410.  
 Barrett Co. (Roof Vent Connections), 442; (Roofing and Sheathing), 394-97.  
 Barton Spider-Web System, 20-21.  
 Bayley Co., William., 698-99.  
 Beach Garage Equipment Co., Inc., T. C., 1483.  
 Beardslee Chandelier Mfg. Co., 1226.  
 Beaton & Corbin Mfg. Co., 935.  
 Beaver Board Companies, 170-71.  
 Beaver Falls Art Tile Co., see Associated Tile Manufacturers, 284-87.  
 Beaver Tile & Specialty Co., Inc., 324.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Benedict & Burnham Branch, American Brass Co., 1071.  
 Benjamin Electric Mfg. Co. (Panelboards), 1177; (Wiring Devices), 1206.  
 Berger Mfg. Co. (Concrete Reinforcement), 202-05; (Metal Ceilings), 417; (Metal Furniture), 1406-08; (Metal Lumber), 176-82; see also Associated Metal Lath Manufacturers, 196-201.  
 Berlin Mills Co., see Brown Co., 573.  
 Berry Brothers, 1346.  
 Bessler Movable Stairway Co., 257.  
 Best Bros. Keene's Cement Co., 146-47.  
 Best Register Co., 988-89.  
 Bicalky Fan Co., 1000.  
 Biegler Mfg. Co., E. N., 39.  
 Bigelow Wire Works, Cheney, 491.  
 Billings-Chapin Co., 1318.  
 "Bilt-Well" Service Bureau, 574-75.  
 Bird & Son, 390-91.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bishopric Mfg. Co., 169.  
 Bitu-Mortar Waterproofing Co., Inc., 40.  
 Blackburn-Smith Corporation, 880.  
 Bodwell Granite Co., see National Building Granite Quarries Association, 58-59.  
 Bommer Brothers, 600-01.  
 Booraem, J. Francis, 288.  
 Booth Bros. & Hurricane Isle Granite Co., see National Building Granite Quarries Association, 58-59.  
 Boston Insulated Wire & Cable Co., 1192.  
 Boston Varnish Co., 1340-41.  
 Bostwick Steel Lath Co., see Associated Metal Lath Manufacturers, 196-201.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Boyle & Co., Inc., John, 411.  
 Bradford Pressed Brick Co., 78-79.



Bramhall, Deane Co., 1010-11.  
 Brasco Mfg. Co., 481.  
 Brecht Co., 1050-52.  
 Bridgeport Wood Finishing Works, 1369.  
 Brook Iron Works, A. T., 544-45.  
 Brooklyn Vault Light Co., 822-23.  
 Brooklyn Vitrified Tile Works, see Associated Tile Manufacturers, 284-87.  
 Brown Co., 573.  
 Brown Hoisting Machinery Co., 184-85.  
 Bruner Granitoid Co., P. M. (Cement Floor Hardeners), 337; (Vault Lights), 824-26.  
 Brunt Tile and Porcelain Co., see Associated Tile Manufacturers, 284-87.  
 Bryant Electric Co., 1207.  
 Building Directories, Bulletin & Sign Co., 1434.  
 Burchartz Fireproofing Co., Inc., 26.  
 Bureau Brothers, 498.  
 Burgess Sulphite Fibre Co., see Brown Co., 573.  
 Burlington Venetian Blind Co., 802-03.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Burt Mfg. Co., 459-61.  
 Butcher Polish Co., 1368.

## C

Cabot, Inc., Samuel, 1382-85.  
 Caldwell Co., Inc., W. E., 1093.  
 Caldwell Mfg. Co., 758-59.  
 Cambridge Tile Mfg. Co., see Associated Tile Manufacturers, 284-87.  
 Campfield Raggle Block Co., 108-09.  
 Canton Foundry & Machine Co. (Automobile Turntables), 1486; (Building Specialties), 270.  
 Carbolineum Wood Preserving Co., 1386.  
 Carbondale Machine Co., 1053.  
 Carey Co., Philip (Roofing), 398; (Sheathing Materials), 172; see also Magnesia Association of America, 1078-79.  
 Carnahan Mfg. Co., 576-77.  
 Carney's Cement Co., 129.  
 Carpenter Mfg. Co., R. F., 868-69.  
 Carpenter & Co., Inc., Davis, 827.  
 Carr-Cullen Co., see "Bilt-Well" Service Bureau, 574-75.  
 Carr-Trombley Mfg. Co., see "Bilt-Well" Service Bureau, 574-75.  
 Carr, Ryder & Adams Co., see "Bilt-Well" Service Bureau, 574-75.  
 Carr & Beal Co., see "Bilt-Well" Service Bureau, 574-75.  
 Carr & Johnston Co., see "Bilt-Well" Service Bureau, 574-75.  
 Carter Lumber Co., C. J., 314.  
 Carter White Lead Co., 1315.  
 Casement Hardware Co., 737.  
 Central Architectural Iron Works, 261.  
 Central Brass Mfg. Co., 852-55.  
 Central Creosoting Co., 311.  
 Central Metallic Door Co., 648.  
 Ceresit Waterproofing Co., 41.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Chapman Slate Co., 360-61.  
 Chapman Valve Mfg. Co., 1080-81.  
 Chattanooga Boiler & Tank Co., 1094.  
 Chattanooga Roofing & Foundry Co. (Fireplace Fixtures), 278; (Ornamental Metal Work), 499.  
 Chelsea Elevator Co., 1265-67.  
 Cheney & Co., Inc., 329.  
 Cheney & Son, S., 297.  
 Chesley Co., Inc., A. C., 710-11.  
 Chicago Bridge & Iron Works, 1095.  
 Chicago Clothes Dryer Works of New York, see Domestic Laundry Equipment Corporation, 1042-43.  
 Chicago Dryer Co., 1038-41.  
 Chicago Pump Co., 1097.  
 Chicago Spring Butt Co., 602-03.  
 Chicago Steel Tank Co., 1482.  
 Chicago Varnish Co., 1342-43.  
 Church, Stephen B., 1100.  
 Clark Co., W. J., 252.  
 Clason Architectural Metal Works, 358.  
 Cleveland Builders Supply Co., 145.

Clinton Metallic Paint Co., 1380.  
 Clinton Wire Cloth Co. (Concrete Reinforcement), 227-31; (Grilles), 990-91.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Coe Brass Branch, American Brass Co., 492-93.  
 Cohoes Iron Foundry and Machine Co., 1264.  
 Cold Light Mfg. Co., 1210.  
 Collier-Adams Mfg. Co., see "Bilt-Well" Service Bureau, 574-75.  
 Collier-Barnett Co., see "Bilt-Well" Service Bureau, 574-75.  
 Colonial Fireplace Co., 279.  
 Columbia Iron & Wire Works Co., 268-69.  
 Columbian Hardware Co., 762.  
 Commonwealth Brass Corporation, 1082.  
 Composite Metal Lath Co., 236-38.  
 Compound Injector & Specialty Co., 872-73.  
 Concrete Engineering Co., 24-25.  
 Concrete Hardening Co., Inc., 338.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Concrete Specialties Mfg. Co., 828.  
 Concrete Steel Co., 188-89.  
 Conkling-Armstrong Terra Cotta Co., 114.  
 Connecticut Telephone & Electric Co., Inc., 1240-41.  
 Connelly Co., Thomas, 130-31.  
 Connorsville Blower Co., 1102-03.  
 Consolidated Engineering Co., see Massachusetts Blower Co., 1005.  
 Consolidated Expanded Metal Companies, 206-08; see also Associated Metal Lath Manufacturers, 196-201.  
 Consolidated Sheet Metal Works, 712-13.  
 Cornell Iron Works, 666.  
 Cornell Wood Products Co., 173.  
 Corrugated Bar Co. (Concrete Floor System), 22; (Concrete Reinforcement), 190-92.  
 Coulson & Co., J. W., 482-83.  
 Covert Co., H. W., 280.  
 Cox Stove Co., Abram, 960-64.  
 Crampton-Farley Brass Co., 874.  
 Crane Co., 1084-85.  
 Crane Co., William M., 1012-13.  
 Creo-Dipt Co., Inc., 382-83.  
 Creswell Iron Works, Samuel J., 258-59.  
 Crittall Casement Window Co., 714-15.  
 Crouse-Hinds Co., 1178.  
 Curtis Bros. & Co., see Curtis Service Bureau, 578-79.  
 Curtis Door & Sash Co., see Curtis Service Bureau, 578-79.  
 Curtis Sash & Door Co., see Curtis Service Bureau, 578-79.  
 Curtis Service Bureau, 578-79.  
 Curtis-Yale-Howard Co., see Curtis Service Bureau, 578-79.  
 Curtis, Booth & Bentley Co., see Curtis Service Bureau, 578-79.  
 Curtis, Towle & Paine Co., see Curtis Service Bureau, 578-79.  
 Curtis & Yale Co., see Curtis Service Bureau, 578-79.  
 Custodis Chimney Construction Co., Al-  
 phones, 89.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Cutler Mail Chute Co., 1440-41.  
 Cyclone Fence Co., 546-48.

## D

Dahlstrom Metallic Door Co., 649-51.  
 Dail Steel Products Co., 850.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Davis Marble Co., 283.  
 Dayton Malleable Iron Co., 246.  
 Deming Co., 1104-07.  
 Denison Fireproofing Co., 95.  
 Denison Interlocking Tile Corporation, 96-97.  
 De Smet Quartz Tile Co., 291.  
 De Soto Paint Mfg. Co., 1319.  
 Detroit Mausoleum Equipment Works, 500.  
 Detroit Show Case Co., 477-80.  
 Detroit Steel Products Co., 700-01.  
 Dexter Brothers Co., 1381.  
 Diamond Door Hanger Co., Inc., 616-17.  
 Diamond Metal Weather Strip Co., 784.  
 Dodge & Co., H. B., 768.

Domestic Laundry Equipment Corporation  
 1042-43.  
 Donley Brothers Co., 247.  
 Draper Shade Co., Luther O., 807.  
 Dreadnought Flooring Co., 325.  
 Drouvé Co., G., 444-45.  
 Dudfield Mfg. Co., 380.  
 Dunham Co., C. A., 916-21.  
 Duplex Hanger Co., 253.  
 Du Pont de Nemours & Co., E. I., see Bridge-  
 port Wood Finishing Co., 1369; Harrison  
 Works, 1322-25.  
 Duvinage, Pierre, 260.

## E

Eagle-Picher Lead Co., 875.  
 Eastern Bridge & Structural Co., 18-19.  
 Eastern Machinery Co., 1268-69.  
 Eco Clock Co., 1442.  
 Economy Drawing Table Co., 2-4.  
 Economy Fuse & Mfg. Co., 1223.  
 Economy Heater Co., 1015-17.  
 Economy Pumping Machinery Co., 1101.  
 Eddy Engineering Co., 922-23.  
 Edison Electric Appliance Co., Inc., 1204.  
 Edison Lamp Works, 1224.  
 Edwards Mfg. Co. (Rolling Doors), 664-65;  
 (Sheet Metal Work), 418-19; (Steel Fac-  
 tory and Office Equipment), 1410-11.  
 Ehret Magnesia Mfg. Co., see Magnesia Asso-  
 ciation of America, 1078-79.  
 Electric Cable Co., 1190-91.  
 Electrical Information and Data, see Society  
 for Electrical Development, Inc., 1145-52.  
 Elevator Locks Co., 1292.  
 Empire Gypsum Co., 152.  
 Energy Elevator Co., 1270-73.  
 Ernst Specialty Co., C. K., 1294-97.  
 Ernst's Sons, C. F., 1484-85.  
 Erwin Mfg. Co., 1140.  
 Estate Stove Co., 1205.  
 Eustis Mfg. Co., J. P., 885.

## F

Fearless Dishwasher Co., Inc., 1034.  
 Federal Cement Tile Co., 429-31.  
 Federal Steel Fixture Co., 1412-13.  
 Federal Terra Cotta Co., 115.  
 Ferdinand & Co., L. W., 1394.  
 Fischer & Jirouch Co. (Decorative Orna-  
 ments), 1405; (Garden Furniture), 1404.  
 Fiske Iron Works, J. W., 552-53.  
 Fletcher Co., H. E., see National Building  
 Granite Quarries Association, 58-59.  
 Flexner-Taylor Co., 320.  
 Folding Partition Co., 769.  
 Ford Mfg. Co., 239.  
 Foundation Co., 14.  
 Fountain Faucet Co., 862.  
 Fowler & Pay, 132.  
 Franklin Mfg. Co., see Magnesia Association  
 of America, 1078-79.  
 Friction Pivot Co., Inc., 738.  
 Friedley-Voshardt Co., 501.  
 Fritts-Gilbert Refrigerator Co., 1059.  
 Fulton Co., 937-38.

## G

Garden City Sand Co., 134-37.  
 Garrett & Son Corp., C. S., 392.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co. (Fire Pre-  
 vention Systems), 1136-39; (Gas Heating  
 Systems), 1028.  
 General Fireproofing Co. (Metal Furniture),  
 1414; (Metal Lath), 210-13; (Waterproof-  
 ing), 42; see also Associated Metal Lath  
 Manufacturers, 196-201.  
 General Gas Light Co., 1029.  
 General Kompolite Co., 330.  
 General Roofing Mfg. Co., see Certain-teed  
 Products Corporation, 399-401.  
 General Slate Co., 362-64.  
 Georgia Marble Co., 68-69.  
 Gerdes, Theodore R. N., 462.



Gifford-Wood Co., 1298.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Gillette-Vibber Co., 1211.  
 Gillis & Geoghegan, 1299-1305.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co., 1344-45.  
 Globe Ventilator Co., 463.  
 Gorham Co Architectural Bronze, 502-03.  
 Gorton & Lidgerwood Co., 1083.  
 Goss Corporation, John L., see National Building Granite Quarries Association, 58-59.  
 Goulds Mfg. Co., 1108-09.  
 Graf Mfg. Co., Frank H., 886.  
 Grand Crossing Boiler Works, 907.  
 Grand Rapids Plaster Co., 148-49.  
 Grant Pulley and Hardware Co. (Revolving Window Fixtures), 739; (Rolling Partitions), 770; (Window Hardware), 760-61.  
 Grauer & Co., Albert (Cement Floor Hardeners), 337; (Vault Lights), 824-26.  
 Gregg Varnish Co., see Certain-teed Products Corporation, 399-401.  
 Grueby Faience & Tile Co., 292; see also Associated Tile Manufacturers, 284-87.  
 Guaranty Iron & Wire Co., 667.  
 Guardian Refrigerator Co., 1056.  
 Guastavino Co., R., 34-35.

## H

Habirshaw Electric Cable Co., Inc., 1193-1201.  
 Hackney Ventilating Co., 1001.  
 Haines & Co., William S., 924-25.  
 Hall's Safe Co., 1431.  
 Hamilton Mfg. Co., 5.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Harsch & Sons Co., John, 504.  
 Hart Mfg. Co., 1212-13.  
 Hart & Crouse Co., 965-67.  
 Hart & Hegeman Mfg. Co., 1214-15.  
 Hart & Hutchinson Co., 1416-17.  
 Hartmann-Sanders Co., 298-99.  
 Hasbrouck Flooring Co., 315.  
 Haslett Spiral Chute Co., 1306.  
 Hastings Pavement Co., 308.  
 Hauserman Co., E. F., 1415.  
 Heinicke, Inc., H. R., 90-91.  
 Herrick Refrigerator Co., 1060-61.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Hess Warming & Ventilating Co., 887.  
 Hetzel, Estate of J. G., 443.  
 Higgin Mfg. Co. (Metal Weatherstrips), 782-83; (Window Screens), 794-95.  
 Highland Glass Co., 808-09.  
 Highton & Sons Co., Wm., 992-93.  
 Hill Clothes Dryer Co., 1037.  
 Hitchings & Co., 1454-55.  
 Hodgson Co., E. F., 1453.  
 Hoffman Heater Co., 1020-22.  
 Hoffman Specialty Co., 926-29.  
 Hoffmann & Billings Mfg. Co., 863.  
 Holland Furnace Co., 956-57.  
 Hollister-Whitney Co., 1274.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hope & Sons, Henry, 716-17.  
 Horn Co., A. C., 43.  
 Howard Clock Co., E., 1444-45.  
 Howell, Field & Goddard, Inc., 652-53.  
 Hubbell, Inc., Harvey, 1216-17.  
 Hughes-Keenan Co., 262-65.  
 Hugo Mfg. Co., 1030.  
 Humirad Co., Inc., 936.  
 Humphrey Brick & Tile Co., 106.  
 Hunt, Helm, Ferris & Co., 644.  
 Hunt & Co., Robert W., 8.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co., 82-83.  
 Hydrex Felt & Engineering Co., 44.  
 Hydrolithic Waterproofing Co., Inc., 45.

## I

Ideal Hanger Co., 256.  
 Ilg Electric Ventilating Co., 1002-03.  
 Improved Office Partition Co., 771.  
 Indiana Lumber & Mfg. Co., 580-81.

Interior Metal Mfg. Co., 654-55.  
 International Casement Co., Inc., 718.  
 International Filter Co., 1124.  
 International Heater Co., 968-73.  
 International Insulation Co., 174.  
 Invincible Vacuum Cleaner Mfg. Co., 1260.  
 Irving Forge, W., 505.  
 Irving Iron Works Co., 348.  
 Isko, Inc., 1057.  
 Ivanhoe-Regent Works, 1228-29.

## J

Jackson Co., Wm. H. (Metal Windows), 512; (Tile), 289.  
 James Mfg. Co., 1466-70.  
 Jamison Cold Storage Door Co., 1064-65.  
 Jeanette Glass Co., 829.  
 Jenkins Bros., 1086-87.  
 Jennison-Wright Co., 312-13.  
 Jeter & Co., Inc., A. H., 446-47.  
 Johns-Manville Co., H. W. (Acoustics and Waterproofing Materials), 36; (Mastic Flooring), 331; (Pipe and Boiler Insulation), 1076-77; (Roofing Materials), 402-05; (Shingles), 386-87; (Steam Traps), 930; (Underground Pipe Insulation), 910.  
 Johnson, Inc., E. J., 366-67.  
 Johnson Mfg. Co., Geo. W., 668.  
 Johnson Service Co., 942-46.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Jones Cold Store Door Co., see Jamison Cold Storage Door Co., 1064-65.  
 Jordan & Co., Paul R., 464-65.  
 Josam Mfg. Co., 876-78.

## K

Kaestner & Hecht Co., 1276-77.  
 Kalman Co., Paul J., 193.  
 Kanawha Mfg. Co., 974.  
 Kane Blind & Screen Co., see Kane Mfg. Co., 793.  
 Kane Mfg. Co., 793.  
 Kaustine Co., Inc., 851.  
 Kawneer Mfg. Co., 488-90.  
 Keasbey & Mattison Co., see Magnesia Association of America, 1078-79.  
 Kees Mfg. Co., F. D. (Metal Building Corners), 240; (Screen Hardware), 799.  
 Kelley Island Lime & Transport Co., 150-51.  
 Kellogg Co., M. W., 92-93.  
 Kelsey Heating Co., 958-59.  
 Kennedy, Inc., David E. (Cork Composition Floors), 327; (Cork Floors), 326.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Kenney Mfg. Co., 834.  
 Kenwood Bridge Co., 17.  
 Keppler Glass Constructions, Inc., 831-33.  
 Kernchen Company, 466.  
 Kerner Incinerator Co., 908.  
 Kerr Machinery & Supply Co., 1110-11.  
 Ketcham, O. W., 118.  
 Kewanee Boiler Co., 975-77.  
 Kewanee Private Utilities Co., 1112-13.  
 Kewanee Water Supply Co., see Kewanee Private Utilities Co., 1112-13.  
 Keystone Varnish Co., 1347-48.  
 Kimball Brothers Co., 1275.  
 King Construction Co., 1456-57.  
 King Ventilating Co., 468-69.  
 King & Co., J. B., 153.  
 Kinnear Mfg. Co., 670-79.  
 Kinney Co., C. M., see United States Changeable Sign Co., 1435.  
 Knappe Machine Co., John, 1399.  
 Knowles Mushroom Ventilator Co., 1004.  
 Kohler Die & Specialty Co., 248.  
 Koken Barbers' Supply Co., 1395.  
 Kuhls, H. B. Fred, 1376.  
 Kushequa Brick Co., 84-85.  
 Kushequa Ceramic Co., 436-37.

## L

L. P. T. Specialty Co., 763.  
 Lamson Co., 1307.  
 Lasar Mfg. Co., 506-07.  
 Lavigne Mfg. Co., see Commonwealth Brass Corporation, 1082.

Lawson Mfg. Co., 604-05.  
 Lee, Thomas (Fireproof Doors and Windows), 719; (Ventilators), 467.  
 Lehigh Portland Cement Co., 127.  
 Lemmerman & Hoffman Granite Co., see National Building Granite Quarries Association, 58-59.  
 Library Bureau, 1418-19.  
 Link-Belt Co., 1310.  
 Litterer Bros. Mfg. Co., 894-95.  
 Loomis-Manning Filter Distributing Co., 1125.  
 Lord & Burnham Co. (Greenhouses), 1458-61; (Hot Water Boilers), 978-79; (Sash Operators), 747.  
 Loudon Machinery Co., 1471-73.  
 Louisville Varnish Co., Inc., 1349.  
 Lovejoy Granite Co., see National Building Granite Quarries Association, 58-59.  
 Lowe Brothers Co., 1328-29.  
 Lowerator Co., Inc., 1308-09.  
 Luminous Unit Co., 1227.  
 Lupton's Sons Co., David, 704-08.  
 Lutton Co., William H., 1462-63.  
 Lyon Metallic Mfg. Co., 1420-21.

## M

MacArthur Concrete Pile & Foundation Co., 10-11.  
 McCabe Hanger Mfg. Co., 618-20.  
 McCain Co., W. W., 1044.  
 McCray Refrigerator Co., 1062.  
 McFarland-Hyde Co., 720-21.  
 McFarland & Co., J. C., see McFarland-Hyde Co., 720-21.  
 McGann & Sons Co., T. F., 508-09.  
 McShane Bell Foundry Co., 1451.  
 Mack Iron and Wire Works Co., 510-11.  
 Maddock's Sons Co., Thomas, 835-42.  
 Magnesia Association of America, 1078-79.  
 Maine Slate Co. of Monson, see General Slate Co., 362-64.  
 Maine & New Hampshire Granite Corporation, see National Building Granite Quarries Association, 58-59.  
 Majestic Co., 271-73.  
 Mallory Mfg. Co., 741.  
 Manhattan Brass Co., 513.  
 Mannen Co., John E. (Garage Heaters), 1031; (Laundry Equipment), 1045.  
 Manufacturing Equipment & Engineering Co., (Metal Furniture), 1422; (Plumbing Fixtures), 847.  
 Maple Flooring Manufacturers' Ass'n, 316-18.  
 Marble & Shattuck Chair Co., 1400-01.  
 Marbleloid Co., 332-33.  
 Marietta Paint & Color Co., 1330.  
 Mas-Oleum Floor Mfg. Co., 334.  
 Massa, George, 1278.  
 Massachusetts Blower Co., 1005.  
 Massachusetts Fan Co., see Massachusetts Blower Co., 1005.  
 Master Builders Co., 339.  
 Matawan Tile Co., see Associated Tile Manufacturers, 284-87.  
 Mathews Mfg. Co., 1402-03.  
 Matthews Brothers Co., 66.  
 Matthews Bros. Mfg. Co., 582-83.  
 Matthews & Brother, Inc., W. N., 864-65.  
 Maurer & Son, Henry, 98-99.  
 Medart Mfg. Co., Fred., 1423.  
 Mende, Paul, 321.  
 Meneely Bell Co., 1452.  
 Mensch, L. J., 302.  
 Merchant & Evans Co. (Fire Doors and Shutters), 680; (Metal Roofing), 420; (Ventilators), 470.  
 Mesker Brothers Iron Co., 722-25.  
 Messenger & Parks Mfg. Co., 681.  
 Metallic Sash-Operator Co., 748-49.  
 Meurer Bros. Co., Inc., 422-23.  
 Meyers Mfg. Co., Fred. J., 516.  
 Michigan Engine Valve Co., 740.  
 Milford Iron Foundry, 300-01.  
 Miller Lock Co., 598-99.  
 Miller & Co., Edward, 1230.  
 Milwaukee Air Power Pump Co., 1114-15.



Milwaukee Artistic Metal Ceiling Co., see Milwaukee Corrugating Co., 421.  
 Milwaukee Corrugating Co. (Metal Ceilings), 421; (Metal Lath), 209; (Ventilators), 471; see also Associated Metal Lath Manufacturers, 196-201.  
 Minneapolis Heat Regulator Co., 948-49.  
 Minnesota Manufacturers' Association, 1311.  
 Minwax Co., Inc., 342.  
 Mississippi Glass Co., 810-11.  
 Mississippi Wire Glass Co., 812-15.  
 Moline Heat, 939.  
 Monarch Metal Weather Strip Co., 786-87.  
 Monroe Screen, Blind & Partition Co., 772.  
 Monson Lustre Slate Co., see General Slate Co., 362-64.  
 Montgomery Elevator Co., 1279.  
 Monument Pottery Co., 843-46.  
 Morgan Co., 584-85.  
 Mosaic Tile Co., see Associated Tile Manufacturers, 284-87.  
 Mott Iron Works, J. L., 514-15.  
 Mound City Paint & Color Co., see Certain-teed Products Corporation, 399-401.  
 Mount Airy Granite Cutting Co., see National Building Granite Quarries Association, 58-59.  
 Mueller Mosaic Co., 293.  
 Muller & Co., Franklin R., 335.  
 Murdock Mfg. & Supply Co., 866-67.  
 Murphy Varnish Co., 1350-51.  
 Murphy Wall Bed Co., 1396-97.  
 Mutual Electric & Machine Co., 1179.

## N

National Asbestos Mfg. Co., 385.  
 National Automatic Door Co., 660.  
 National Building Granite Quarries Association, 58-59.  
 National Commercial Gas Association, 1009.  
 National Fire Proofing Co., 100-05.  
 National Kellastone Co., 138-39.  
 National Mfg. Co., 621-25.  
 National Metal Weather Strip Co., 785.  
 National Paint & Varnish Co., 1331.  
 National Pipe Bending Co., 902-03.  
 National Roofing Co., 389.  
 National Skylight and Ventilator Co., 448-49.  
 National Tile Co., see Associated Tile Manufacturers, 284-87.  
 National Ventilating Co., 454-56.  
 National X-Ray Reflector Co., 1231.  
 Natroco Paint & Varnish Works, 1334.  
 Natural Slate Blackboard Co., 376-77.  
 New England Granite Works, see National Building Granite Quarries Association, 58-59.  
 New York Belting & Packing Co., 322.  
 New York Blue Print Paper Co., 6.  
 New York Brass Foundry Co., 1134-35.  
 New York Continental Jewell Filtration Co., 1126.  
 New York Sewage Disposal Co., 881.  
 New York Silicate Book Slate Co., 378.  
 Newark Cornice and Skylight Works, 726-27.  
 Newman Clock Co., 1443.  
 Niagara Gypsum Co., 156.  
 Niagara Metal Weather Strip Co., 788.  
 Nonpareil Skylight Co., 450-51.  
 North Carolina Granite Corporation, see National Building Granite Quarries Association, 58-59.  
 North Carolina Pine Association, 562-63.  
 Northeastern Co., 1387.  
 Northern Hemlock and Hardwood Manufacturers' Association, 564-65.  
 North Western Expanded Metal Co., 214-15; see also Associated Metal Lath Manufacturers, 196-201.  
 Northwestern Terra Cotta Co., 116-17.  
 Norwood Engineering Co., 1127.

## O

Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
 Oak Flooring Manufacturers Association, 319.

Obelisk Waterproofing Co., 46.  
 Ogden Co., J. Edward, 682-83.  
 Ohio Blower Co., 472-74.  
 Old Bridge Enamel Brick and Tile Co., see Associated Tile Manufacturers, 284-87.  
 Olson & Co., Samuel, 1312-13.  
 Otis Elevator Co., 1280-84.

## P

Page Steel and Wire Co., 549-51.  
 Pardee Works, C., see Associated Tile Manufacturers, 284-87.  
 Parker Rust-Proof Company of America, 1370-71.  
 Parrott Heater Co., 1023.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co., 1332-33.  
 Pauly Jail Building Co., 1488.  
 Payne Co., F. S., 1290-91.  
 Payson Mfg. Co., 750-53.  
 Pecora Paint Co., 1378-79.  
 Peelle Co., 684-87.  
 Peerless Ice Machine Co., 1054.  
 Peerless Mfg. Co., Inc., 281.  
 Penb. rthy Injector Co., 882-83.  
 Penn Brass & Bronze Works, 517.  
 Penn Metal Co. (Metal Lath), 216; (Metal Windows), 734; see also Associated Metal Lath Manufacturers, 196-201.  
 Pennsylvania Fireproofing Co., 107.  
 Pennsylvania Wire Glass Co., 816-17.  
 Penrhyn Slate Co., 365.  
 Permanent Ironite Waterproofing Co., 47.  
 Permutit Co., 1130.  
 Perth Amboy Tile Works, see Associated Tile Manufacturers, 284-87.  
 Pfauder Co., 1035.  
 Phenix Mfg. Co., 800-01.  
 Pierson U-Bar Co., 1464-65.  
 Pitcairn Varnish Co., 1352-53.  
 Pitt Composite Iron Works, William R., 558-59.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Plymouth Gypsum Co., 154-55.  
 Polachek Bronze & Iron Co., John, 522.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Powell Steel Kitchen Co., 1032-33.  
 Powers Regulator Co. (Temperature Controlling Systems), 947; (Temperature Regulating Devices), 950-51.  
 Pratt & Cady Co., Inc., 1090-91.  
 Pratt & Lambert, Inc., 1354-55.  
 Presbrey-Coykendall Co., 62.  
 Pressed Prism Plate Glass Co., 820.  
 Price-Evans Foundry Co., 518-19.  
 Prouty Co., Ltd., T. C., see Allith-Prouty Co., 614-15.  
 Prox Co., Frank, 980-81.  
 Pullman Mfg. Co., 764-65.

## R

Raymond Concrete Pile Co., 12-13.  
 Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.  
 Reeb Corporation, M. A., 157.  
 Reed & Barton, 520-21.  
 Reese Mfg. Co., 796-97.  
 Reflectolyte Co., 1232-34.  
 Reliance Fireproof Door Co., 656-57.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Revolving Door & Fixture Co., 590.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Richards & Kelly Mfg. Co., 830.  
 Richmond Screw Anchor Co., 249.  
 Ridgway & Son, B., 296.  
 Riester & Thesmacher Co., 658-59.  
 Rising & Nelson Slate Co., 368-69.  
 Riverside Boiler Works, Inc., 896-99.  
 Roberts Filter Mfg. Co., 1128-29.  
 Rock Island Register Co., 994-95.  
 Rock Plaster Mfg. Co., 160.  
 Rockport Granite Co., 60-61; see also National Building Granite Quarries Association, 58-59.

Rookwood Pottery Co., 294-95.  
 Royal Safety Anchor Co., 766-67.  
 Royal Ventilator Co., 475.

## S

S-M-I Engineering Co., 23.  
 Safe-Cabinet Co., 1430.  
 Safety Detachable Window Corporation, 730-31.  
 Safety Fire Extinguisher Co., 1141.  
 Saino Fire Door & Shutter Co., 669.  
 St. Louis Wire & Iron Co., 523.  
 Samson Cordage Works, 755.  
 Sandusky Cement Co. (Portland Cement), 128; (Waterproofing), 56.  
 Sarco Co., Inc., 931.  
 Sargent Granite Co., Inc., J. D., see National Building Granite Quarries Association, 58-59.  
 Sayre & Fisher Co., 73.  
 Schouler Cement Construction Co., 789.  
 Scientific Heater Co., 1046-47.  
 Searls Mfg. Co., 888-89.  
 Security Insert Co., 250.  
 Sedgwick Machine Works, 1285-89.  
 Seeger Refrigerator Co., 1063.  
 Sengbusch Self-Closing Inkstand Co., 7.  
 Sewer Pipe Manufacturers Association, 111.  
 Sexauer & Lemke, Inc., 262-65.  
 Shannon Mfg. Co., see Domestic Laundry Equipment Corporation, 1042-43.  
 Sharp Rotary Ash Receiver Co., Inc., 954-55.  
 Shea & Donnelly Co., 67.  
 Shelby Spring Hinge Co., 606-07.  
 Sheldon Slate Co., F. C., 370-72.  
 Sherman Slate Co., D. C., see General Slate Co., 362-64.  
 Shone Co., 884.  
 Silver Lake Co., 756.  
 Simmons Co., John, 1142-43.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Smyser-Royer Co., 528.  
 Sneed & Co. Iron Works, Inc., 1424-25.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Society for Electrical Development, Inc., 1145-52.  
 Soellner, Herman, 1070.  
 Solar Metal Products Co., Inc., 645.  
 Sonneborn Sons, Inc., L., 340-41.  
 Sorlien Ceiling Bed Co., 1398.  
 Southern Cypress Manufacturers' Association, 570-71.  
 Southern Gypsum Co., Inc., 158-59.  
 Southern Pine Association, 561.  
 Spalt & Sons, Inc., Geo., 1058.  
 Special Service Flooring Corporation, 336.  
 Spencer Turbine Cleaner Co., 1256-57.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Fire Escape Co., 266.  
 Standard Paint Co. (Roofing), 393; (Waterproofing), 48-49.  
 Standard Stained Shingle Co., see Creo-Dipt Co., Inc., 382-83.  
 Standard Store Service, Inc., 1314.  
 Standard Varnish Works, 1356-63.  
 Stanley Works, 608-13.  
 Stanley & Patterson, Inc., 1246-55.  
 Stark Brick Co., 88.  
 Stark Rolling Mill Co., 424-25.  
 Stearns & Co., E. C., 909.  
 Steel City Electric Co., 1222.  
 Steelite Co., 1293.  
 Stephenson, C. H., 277.  
 Sterling Foundry Co., 274.  
 Stevens Partition & Floor Deadener Co., 354-55.  
 Stevenson Cold Storage Door Co., 1066-69.  
 Stewart Iron Works Co., 556-57.  
 Stone, Junius H., 353.  
 Stover Mfg. & Engine Co., 282.  
 Stowell Co., 636-37.  
 Sturtevant Co., B. F. (Fans and Blowers), 1006-07; (Ventilators), 476.  
 Swedish Venetian Blind Co. (Blinds), 806; (Rolling Partitions), 773.



Swenson Granite Co., John, 63. see also National Building Granite Quarries Association, 58-59.  
 Sykes Metal Lath and Roofing Co., 220-21; see also Associated Metal Lath Manufacturers, 196-201.  
 Symons Clamp Co., 183.

## T

Tailet & Ticket Co., 1436-37.  
 Tabor Sash Fixture Co., see Grant Pulley and Hardware Co., 739.  
 Taylor Co., N. & G., 426-28.  
 Terrell's Equipment Co., 1426-27.  
 Texas Cement Plaster Co., 161.  
 Thatcher Furnace Co., 982-84.  
 Thermograde Valve Co., 913.  
 Thomas Clock Co., Seth, 1446-47.  
 Thomas, Roberts, Stevenson Co., 1014.  
 Thomson Wood Finishing Co., 1364.  
 Thorp Fire Proof Door Co., 661-63.  
 Tiffany Studios, 526-27.  
 Time-Systems Co., 1448-49.  
 Toch Brothers, 50-51.  
 Tompkins-Kiel Marble Co., 70.  
 Trageser Steam Copper Works, John, 900.  
 Transfer Stained Shingle Co., Inc., 384.  
 Tropical Paint & Oil Co., 1335.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co. (Reinforcing Steel), 217-19; (Steel Windows), 702-03; see also Associated Metal Lath Manufacturers, 196-201.  
 Trussed Concrete Steel Co., see Truscon Steel Co., 217-19; 702-03.  
 Trusswall Mfg. Co., 303.  
 Tucker Co., Edward A., 194.  
 Turner Construction Co., 15.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Twin City Varnish Co., 1365.  
 Tyler Co., W. S., 529.  
 Tyler Underground Heating System, 911.

## U

Uni-Form Co., 27-29.  
 Union Blind & Ladder Co., Inc., 778.  
 Union Metal Corner Co., 222-23.  
 Union Metal Mfg. Co., 304.  
 United Cork Companies, 356.  
 United Cork Flooring Co., 328.

United Electric Co., 1258-59.  
 United Lined Tube & Valve Co., 1072-73.  
 United Pump & Power Co., 1116-19.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 United States Changeable Sign Co., 1435.  
 U. S. Encaustic Tile Works, see Associated Tile Manufacturers, 284-87.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 United States Gypsum Co. (Plasters), 162-68; (Roof Tile), 438-39; (Wall Board), 175.  
 United States Mineral Wool Co., 357.  
 United States Roofing Tile Co., 440-41.  
 Universal Balance Door, Inc., 591.  
 Universal Electric Stage Lighting Co., 1235.  
 Universal Safety Tread Co., 347.

## V

Vaile-Kimes Co., 1120-21.  
 Valentine & Co., 1366-67.  
 Van Dorn Iron Works Co. (Jail Construction), 1489; (Office Furniture and Equipment), 1428; (Structural Hardware), 254-55.  
 Van Kannel Revolving Door Co. (Bulletin Boards), 1438; (Revolving Doors), 588-89.  
 Van Noorden & Co., E., 452-53.  
 Variety Mfg. Co., 688-91.  
 Vendor Slate Co., 374-75.  
 Vermont Structural Slate Co., 373.  
 Vitri-fy Co., 343.  
 Vitrolite Co., 870-71.  
 Vonnegut Hardware Co., 593-97.  
 Vortex Mfg. Co., 1374.

## W

Wadsworth, Howland & Co., Inc., 1338-39.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wagner Mfg. Co., 638-39.  
 Wagner's Sons Co., J. F., 732-33.  
 Walsh & Weidner Boiler Co., 1096.  
 Walworth Mfg. Co., 1144.  
 Warren Chemical & Mfg. Division (Flooring), 309; (Roofing), 408-09.  
 Waterproofing Co., 54-55.  
 Watertite Drain & Scupper Co., Inc., 275.  
 Watson Mfg. Co., Inc. (Metal Furniture), 1429; (Screens), 798.  
 Wayne Oil Tank & Pump Co., 1480-81.  
 Weatherproof Calking Co., 1377.

Webb Pink Granite Co., 64; see also National Building Granite Quarries Association, 58-59.  
 Weber Costello Co., 379.  
 Webster & Co., Warren, 932-34.  
 Western Brick Co., 86-87.  
 Western Conduit Co., see Youngstown Sheet & Tube Co., 1180-81.  
 Western Electric Co., 1202-03.  
 Western Glass Co., 818-19.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Wheeling Tile Co., see Associated Tile Manufacturers, 284-87.  
 Whitaker-Glessner Co., 241.  
 White Fireproof Construction Co., 16.  
 White Pine Bureau, 572.  
 Whitlock Coil Pipe Co., 904-06.  
 Wiggin's Sons Co., H. B., 1388-89.  
 Wilkins, George Lester, 746.  
 Williams, Inc., Jno., 532.  
 Williams Pivot Sash Co., 742-45.  
 Wilson Corporation, J. G. (Rolling Doors), 692-93; (Rolling Partitions), 774-77; (Venetian Blinds), 804-05.  
 Windshield Scupper Co., 276.  
 Wing Mfg. Co., L. J., 1008.  
 Winkler-Reichmann Co., 1236.  
 Winslow Bros. Co., 735.  
 Wisconsin Iron & Wire Works (Fire Escapes), 267; (Ornamental Metal Work), 533.  
 Witherow Steel Co., 195.  
 Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.  
 Wright Wire Co., 234-35.  
 Wright & Alexander Co., 251.

## Y

Yeomans Brothers Co., 1122-23.  
 York Mfg. Co., 1055.  
 York Safe and Lock Co., 1433.  
 Youngstown Pressed Steel Co., 224-26.  
 Youngstown Sheet & Tube Co. (Electrical Conduits), 1180-81; (Pipe), 1074-75.

## Z

Zibell Damp Resisting Paint Co., 57.  
 Zouri Drawn Metals Co., 486-87.





## Part II—Products

The Products catalogued are indexed usually under the noun, such as "Elevators, Electric"; "Doors, Fire." Qualifying words, like "Building," "Elevating," "Heating," are used only as leading words in a few cases when necessary to conform with accepted trade usage.

Trade names are printed in italics.

The index relates to the contents of this book, and does not include items which might be inferred.

### A

- Abattoir Doors**, see Doors, Refrigerator and Cold Storage.
- Abattoir Equipment**, see Packing House Equipment; Slaughter House Equipment.
- Abattoir Lifts**, see Elevators; Hoists; Dumbwaiters.
- Absorption Refrigerating Machines**, see Ice Making and Refrigerating Machinery.
- Accumulators**.  
Thermograde Valve Co., 913.
- Acid Linings**, see Linings, Acid Resisting.
- Acoustical Materials and Treatment**.  
Guastavino Co., R., 34-35.  
International Insulation Co., 174.  
Johns-Manville Co., H. W., 36.  
Rumford, 34-35.  
Universal Insulite, 174.
- Adjusters, Casement**, see Fasteners and Adjusters, Casement or Sash.
- Adjusters, Sash**, see Fasteners and Adjusters, Awning, Blind, Screen or Shutter.
- Adjusters, Screen**, see Fasteners and Adjusters, Awning, Blind, Screen or Shutter.
- Agitators**.  
Brecht Co., 1050-52.  
Caldwell Co., Inc., W. E., 1093.
- Air Compressors**, see Compressors, Air.
- Air Conditioning Apparatus**.  
American Blower Co., 996-99.  
Bicalky Fan Co., 1000.  
Bishop-Babcock-Becker Co., 914-15.  
Gerdes, Theodore R. N., 462.  
Hackney Ventilating Co., 1001.  
Humirad Co., Inc., 936.  
Ilg Electric Ventilating Co., 1002-03.  
Johnson Service Co., 942-46.  
Kelsey Heating Co., 958-59.  
Massachusetts Blower Co., 1005.  
Moline Heat, 939.  
Sturtevant Co., B. F., 1006-07.  
ABC, 996-99.  
Bicalky, 1000.  
Gerdes, 462.  
Hackney, 1001.  
Humirad, 936.  
Ilg, 1002-03.  
Johnson, 942-46.  
Kelsey, 958-59.  
Sirocco, 996-99.  
Sturtevant, 1006-07.
- Air Controlling Heads**, see Heads, Air Controlling.
- Air Deflectors**.  
Gerdes, Theodore R. N., 462.  
Knowles Mushroom Ventilator Co., 1004.
- Air Deflectors—Continued**.  
Gerdes, 462.  
Knowles, 1004.
- Air Diffusers**, see Heads, Air Controlling.
- Air Eliminators**, see Traps, Steam, Radiator.
- Air Engineers**, see Engineers, Heating and Ventilating.
- Air Locks**.  
Penberthy Injector Co., 882-83.  
Penberthy, 882-83.
- Air Moisteners**, see Air Conditioning Apparatus.
- Air Purifiers**, see Air Conditioning Apparatus.
- Air Receivers**, see Receivers, Air.
- Air Washers**, see Washers, Air.
- Alarms, Burglar or Fire**.  
General Fire Extinguisher Co., 1136-39.  
Holtzer-Cabot Electric Co., 1242-45.  
New York Brass Foundry Co., 1134-35.  
Stanley & Patterson, Inc., 1246-55.  
Faraday, 1246-55.  
Grinnell, 1136-39.  
Reacto, 1242-45.  
Stillbech, 1134-35.
- Alcohol Slating**, see Slating, Liquid.
- Altar Crosses**, see Furnishings, Church.
- Altar Rails**, see Rails, Altar; Ornamental Metal Work.
- Altars**.  
(See also Furnishings, Church; Marble, Structural or Ornamental; Ornamental Metal Work.)  
Tiffany Studios, 526-27.
- Alum, Filtering**.  
Loomis-Manning Filter Distributing Co., 1125.
- Aluminum Work**.  
Commonwealth Brass Corporation, 1082.  
Highton & Sons Co., Wm., 992-93.  
Highton, 992-93.
- Ammeters**.  
Crouse-Hinds Co., 1178.  
General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
G-E, 1153-67.
- Ammonia Condensers**, see Condensers, Ammonia.
- Ammonia Economizers**, see Economizers, Ammonia.
- Ammonia Fittings**, see Fittings, Pipe, Ammonia.
- Anchors, Building: Ashlar, Terra Cotta, Wall Plate**.  
American 3-Way Prism Co., 821.  
Ankya Mfg. Co., 244-45.  
Chattanooga Boiler & Tank Co., 1094.  
Donley Brothers Co., 247.  
Duvillage, Pierre, 260.  
Ideal Hanger Co., 256.
- Anchors, Building: Ashlar, Terra Cotta, Wall Plate—Continued**.  
Irving Iron Works Co., 348.  
Price-Evans Foundry Co., 518-19.  
Richmond Screw Anchor Co., 249.  
Van Dorn Iron Works Co., 254-55.  
Wagner Architectural Iron Works, A. F., 530-31.  
Ankya Ankor, 244-45.
- Anchors, Concrete**.  
(See also Inserts, Concrete.)  
Barton Spider-Web System, 20-21.  
Richmond Screw Anchor Co., 249.  
Security Insert Co., 250.  
Wright & Alexander Co., 251.  
Security, 250.  
Wrialco, 251.
- Anchors, Joist**, see Anchors, Building, etc.
- Anchors, Pipe**.  
Tyler Underground Heating System, 911.  
Tyler, 911.
- Anchors, Screw**.  
Ankya Mfg. Co., 244-45.  
Richmond Screw Anchor Co., 249.  
Ankya Ankor, 244-45.  
Richmond, 249.
- Anchors, Stanchion**, see Stanchions.
- Anchors, Wall or Joist**, see Anchors, Building, etc.
- Anchors, Wall or Window**.  
Royal Safety Anchor Co., 766-67.  
Royal, 766-67.
- Anchors, Window Cleaners Belt**.  
Royal Safety Anchor Co., 766-67.  
Royal, 766-67.  
Specifications, 766-67.
- Andirons**.  
(See also Fireplace Trimmings.)  
Chattanooga Roofing & Foundry Co., 278.  
Colonial Fireplace Co., 279.  
Fiske Iron Works, J. W., 552-53.  
Irving Forge, W., 505.  
Jackson Co., Wm. H., 512.  
Tiffany Studios, 526-27.  
W. Irving, 505.
- Angle Caps**, see Caps, Angle.
- Angle Iron Specialties**, see Angles, Beams, Channels and Tees.
- Angles, Beams, Channels and Tees**.  
(See also Structural Steel; Lumber, Metal.)  
American Brass Co., 1071.  
Berger Mfg. Co., 176-82.  
Concrete Engineering Co., 24-25.  
General Fireproofing Co., 210-13.  
Messenger & Parks Mfg. Co., 681.  
National Mfg. Co., 621-25.  
Ohio Blower Co., 472-74.  
Truscon Steel Co., 217-19.  
Witherow Steel Co., 195.  
Youngstown Pressed Steel Co., 224-26.  
Ceco, 24-25.  
Benedict Nickel, 1071.  
GF, 210-13.

**Angles, Beams, Channels and Tees—Continued.***Metal Lumber*, 176-82.*Sharon*, 224-26.*Swartwout*, 472-74.*Truscon*, 217-19.**Angles, Brass, Bronze, Copper, Nickel and German Silver.***American Brass Co.*, 1071.*Benedict Nickel*, 1071.**Animal Pens**, see Pens, Live Stock.**Announcement Boards**, see Boards, Bulletin; Boards, Directory.**Announcers, Act.***Universal Electric Stage Lighting Co.*, 1235.**Annunciators, Electric.***Connecticut Telephone & Electric Co., Inc.*, 1240-41.*General Electric Co.*, 1153-67.*Holtzer-Cabot Electric Co.*, 1242-45.*Stanley & Patterson, Inc.*, 1246-55.*Western Electric Co.*, 1202-03.*Winkler-Reichman Co.*, 1236.*Connecticut*, 1240-41.*De Veau*, 1246-55.*Electrical Page Boy*, 1236.*G-E*, 1153-67.*Still Small Voice*, 1236.*Western Electric*, 1202-03.**Annunciators, Lamp.***Holtzer-Cabot Electric Co.*, 1242-45.*Stanley & Patterson, Inc.*, 1246-55.**Annunciators, Temperature.***New York Brass Foundry Co.*, 1134-35.*Monitor*, 1134-35.*Stillbech*, 1134-35.**Anti-Slip Treads**, see Treads, Safety.**Aquaria.***Fiske Iron Works, J. W.*, 552-53.**Arbors**, see Ornamental Metal Work;

Wire Work; Woodwork, Exterior;

Fencing; Trellises; Pergolas.

**Arc Lamp Cord**, see Cord, Trolley, Bell and Arc Lamp.**Arc Lamps**, see Lamps, Arc.**Arches, Brick**, see Brick, Special.**Arches, Flat or Segmental**, see Blocks, Building, Hollow, Fireproof.**Arches, Floor**, see Floor Construction, Fireproof.**Arches, Iron and Wire.***American Fence Construction Co.*, 534-36.*Anchor Post Iron Works*, 537-43.*Brook Iron Works, A. T.*, 544-45.*Fiske Iron Works, J. W.*, 552-53.**Architects and Engineers Supplies.***American Drafting Furniture Co.*, 1.*Economy Drawing Table Co.*, 2-4.*Hamilton Mfg. Co.*, 5.*New York Blue Print Paper Co.*, 6.*American*, 1.*Economy*, 2-4.*NYB*, 6.**Architectural Metal Work**, see Ornamental Metal Work.**Architectural Terra Cotta**, see Terra Cotta, Architectural.**Archways, Bronze**, see Ornamental Metal Work.**Area Gratings**, see Gratings, Sidewalk, Area, etc.**Arresters, Dust.**

(See also Collectors, Dust.)

*Bicalky Fan Co.*, 1000.*Bishop-Babcock-Becker Co.*, 914-15.*Gerdes, Theodore R. N.*, 462.*Ohio Blower Co.*, 472-74.*Bicalky*, 1000.*Swartwout*, 472-74.**Art Metal Work**, see Ornamental Metal Work.**Artesian Well Drilling**, see Artesian Wells.**Artesian Wells.***Artesian Well and Supply Co.*, 1092.*Church, Stephen B.*, 1100.**Asbestos Roofing**, see Roofing, Asbestos.**Ash Cans**, see Receivers, Ash.**Ash Chutes**, see Dumps, Ash.**Ash Dumps, Fireplace**, see Dumps, Ash.**Ash Hoists**, see Hoists, Cellar and Ash.**Ash Pit Doors**, see Doors, Ash Pit.**Ash Receivers**, see Receivers, Ash.**Ash Traps**, see Dumps, Ash.**Ash and Refuse Handling Machinery.**  
(See also Elevating and Conveying Machinery.)*Ernst Specialty Co., C. K.*, 1294-97.*Gifford-Wood Co.*, 1298.*Gillis & Geoghegan*, 1299-1305.*Link-Belt Co.*, 1310.*Olson & Co., Samuel*, 1312-13.*Sedgwick Machine Works*, 1285-89.*Ernst*, 1294-97.*G & G*, 1299-1305.*G-W*, 1298.*Peck*, 1310.*Sedgwick*, 1285-89.**Ashlar.**

(See also Marble; Granite; Limestone.)

*Swenson Granite Co., John*, 63.*Woodbury Granite Co.*, 65.**Asphalt.***Ford Mfg. Co.*, 239.*Warren Chemical & Mfg. Division*, 309.**Asphalt Felt**, see Felt, Asphalt or Tarred.**Asphalt Roofing**, see Roofing, Asphalt.**Athletic Field Enclosures**, see Fencing, Wire or Woven Wire.**Automobile Equipment, Electric.***Connecticut Telephone & Electric Co., Inc.*, 1240-41.*Westinghouse Electric & Mfg. Co.*, 1169-76.*Connecticut*, 1240-41.**Automobile Pockets**, see Pockets, Stage, Electric.**Automobile Specialties.***Commonwealth Brass Corporation*, 1082.**Automobile Turntables**, see Turntables, Automobile.**Automobile Washers**, see Washers, Vehicle.**Awning Blinds**, see Blinds, Awning.**Awning Covers**, see Covers, Awning.**Awning Lines**, see Lines, Awning.**Awnings, Canvas and Duck.***Boyle & Co., Inc., John*, 411.*Phenix Mfg. Co.*, 800-01.*Boyle's*, 411.*Phenix*, 800-01.**Awnings, Disappearing.***Pittsburgh Plate Glass Co.*, 484-85.**Awnings, Metal.***Price-Evans Foundry Co.*, 518-19.**Awnings, Venetian.***Dodge & Co., H. B.*, 768.*Swedish Venetian Blind Co.*, 806.*Wilson Corporation, J. G.*, 804-05.*Swedish*, 806.*Wilson*, 804-05.**Axes, Fire.***Allen Mfg. Co., W. D.*, 1131-33.*Safety Fire Extinguisher Co.*, 1141.*Simmons Co., John*, 1142-43.**B****Babbitt Metal.***Eagle-Picher Lead Co.*, 875.**Backing, Stone.**

(See also Paint: Brick, Cement, Concrete, Plaster, Stone.)

*Anti-Hydro Waterproofing Co.*, 38.*Arco Co.*, 1316-17.*Barrett Co.*, 394-97.**Backing, Stone—Continued.***Biegler Mfg. Co., E. N.*, 39.*Ceresit Waterproofing Co.*, 41.*General Fireproofing Co.*, 42.*Horn Co., A. C.*, 43.*Hydrex Felt & Engineering Co.*, 44.*Johns-Manville Co., H. W.*, 36.*Minwax Co., Inc.*, 342.*Standard Paint Co.*, 393.*Toch Brothers*, 50-51.*Anti-Hydro Primer*, 38.*Arco*, 1316-17.*Biegler's*, 39.*C. W. Co.*, 41.*GF No. 220*, 42.*Hornstone*, 43.*Hydrex*, 44.*Johns-Manville*, 36.*Minwax*, 342.*R. I. W.*, 50-51.*SPC*, 393.

Specifications, 39.

**Bacteriologists.***New York Sewage Disposal Co.*, 881.**Bagging Machinery.***Gifford-Wood Co.*, 1298.*G-W*, 1298.**Balances, Sash.***Caldwell Mfg. Co.*, 758-59.*L. P. T. Specialty Co.*, 763.*Pullman Mfg. Co.*, 764-65.*Caldwell*, 758-59.*L. P. T.*, 763.*Pullman*, 764-65.**Balances, Sash, Spring.***Pullman Mfg. Co.*, 764-65.*Pullman*, 764-65.**Balconies, Metal.**

(See also Railings, Balcony.)

*Chattanooga Roofing & Foundry Co.*, 499.*Duvinage, Pierre*, 260.*Meyers Mfg. Co., Fred J.*, 516.*Penn Brass & Bronze Works*, 517.*Snow Iron Works, Inc., W. A.*, 554-55.**Balcony Brackets**, see Ornamental Metal Work.**Balcony Panel Pockets**, see Pockets, Stage, Electric.**Balcony Railings**, see Railings, Balcony.**Balls, Metal.***Fiske Iron Works, J. W.*, 552-53.**Balusters**, see Balustrades.**Balustrades, Cement.***Trusswall Mfg. Co.*, 303.**Balustrades, Metal.**

(See also Ornamental Metal Work.)

*McGann & Sons Co., T. F.*, 508-09.*Meyers Mfg. Co., Fred J.*, 516.*Penn Brass & Bronze Works*, 517.*Polachek Bronze & Iron Co., John*, 522.*Price-Evans Foundry Co.*, 518-19.*Smith Wire and Iron Works, F. P.*, 524-25.*Wagner Architectural Iron Works, A. F.*, 530-31.*Williams, Inc., Jno.*, 532.**Balustrades, Wood.**

(See also Trim, Wood; Cabinet Work.)

*Curtis Service Bureau*, 578-79.*North Carolina Pine Association*, 562-63.*Curtis*, 578-79.**Bank Counter Fronts**, see Screens, Bank and Counter; Grilles.**Bank Enclosures**, see Ornamental Metal Work; Wire Work; Screens, Bank and Counter.**Bank Furniture**, see Furniture, Office, Bank and Library.**Bank Screens**, see Screens, Bank and Counter; Grilles.**Bank Vaults**, see Vaults, Safe Deposit and Bank.**Bank and Office Fixtures.***Berger Mfg Co.*, 1406-08.



**Bank and Office Fixtures—Continued.**

"Bilt-Well" Service Bureau, 574-75.  
 Dahlstrom Metallic Door Co., 649-51.  
 Edwards Mfg. Co., 1410-11.  
 Federal Steel Fixture Co., 1412-13.  
 Fiske Iron Works, J. W., 552-53.  
 General Fireproofing Co., 1414.  
 Gorham Co Architectural Bronze, 502-03.  
 Indiana Lumber & Mfg. Co., 580-81.  
 Lasar Mfg. Co., 506-07.  
 Library Bureau, 1418-19.  
 McGann & Sons Co., T. F., 508-09.  
 Matthews Bros. Mfg. Co., 582-83.  
 Polachek Bronze & Iron Co., John, 522.  
 Reed & Barton, 520-21.  
 Smyser-Royer Co., 528.  
 Van Dorn Iron Works, 1428.  
 Watson Mfg. Co., Inc., 1429.  
 Williams, Inc., Jno., 532.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
 Bilt-Well, 574-75.  
 Federal, 1412-13.  
 Library Bureau, 1418-19.  
 Van Dorn, 1428.

**Bar Fixtures, Nickel.**

American Brass Co., 1071.  
 Benedict Nickel, 1071.

**Bar Locks, see Locks, Bar.****Bar-tie Supports, see Supports, Bar-tie.****Bar Ties, see Ties, Bar, Concrete Reinforcing.****Barbed Wire, see Wire, Barbed.****Barber Shop Fixtures.**

Koken Barbers' Supply Co., 1395.  
 Koken, 1395.

**Barber Shop Sterilizers, see Sterilizers.****Barbers' Chairs, see Furniture, Barber, Chiropody and Manicure.****Barn Equipment.**

(See also Stable Fittings and Fixtures.)  
 Badger Wire & Iron Works, 494-95.  
 Fiske Iron Works, J. W., 552-53.  
 Hunt, Helm, Ferris & Co., 644.  
 James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
 Mack Iron and Wire Works Co., 510-11.  
 Meyers Mfg. Co., Fred J., 516.  
 Mott Iron Works, J. L., 514-15.  
 Price-Evans Foundry Co., 518-19.  
 Schouler Cement Construction Co., 789.  
 Smith Wire and Iron Works, F. P., 524-25.  
 James, 1466-70.  
 Star, 644.

**Barracks.**

Truscon Steel Co., 217-19.  
 Kahn, 217-19.  
 Truscon, 217-19.

**Barrel Drainers, see Drainers, Skid and Barrel.****Barrels, Ash, see Receivers, Ash.****Barrels, Metal, Fireproof.**

Lyon Metallic Mfg. Co., 1420-21.  
 Stephenson, C. H., 277.  
 Lyon, 1420-21.  
 The Stephenson, 277.

**Bars, Corner, Sash, Transom or Division, see Store Fronts, Metal.****Bars, Corrugated, see Bars, Reinforcing, Concrete.****Bars, Curb, Concrete.**

Concrete Steel Co., 188-89.  
 Truscon Steel Co., 217-19.  
 Havemeyer, 188-89.  
 Kahn, 217-19.  
 Truscon, 217-19.

**Bars, Deformed, see Bars, Reinforcing, Concrete.****Bars, Muck, Puddled Iron.**

Youngstown Sheet & Tube Co., 1074-75.

**Bars, Post, Corner.**

Smith Wire and Iron Works, F. P., 524-25.

**Bars, Reinforcing, Concrete.**

(See also Concrete Reinforcement, Flat Slab.)

Concrete Engineering Co., 24-25.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Concrete Steel Co., 188-89.  
 Corrugated Bar Co., 190-92.  
 Kalman Co., Paul J., 193.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Truscon Steel Co., 217-19.  
 Tucker Co., Edward A., 194.  
 Witherow Steel Co., 195.  
 Corr-Bar, 190-92.  
 Havemeyer, 188-89.  
 Kahn, 217-19.  
 Monotype, 194.  
 Rib Bars, 217-19.  
 Rivet Grip, 186-87.  
 Truscon, 217-19.  
 Witherow, 195.  
 Specifications, 190-92.

**Bars, Soda Fountain, Nickel.**

American Brass Co., 1071.  
 Benedict Nickel, 1071.

**Bars, Truss.**

Truscon Steel Co., 217-19.  
 Van Noorden & Co., E., 452-53.  
 Anchor, 452-53.  
 Kahn, 217-19.  
 Truscon, 217-19.

**Bars and Shapes, Brass or Bronze.**

American Brass Co., 492-93.  
 Manhattan Brass Co., 513.

**Bars and Shapes, Merchant.**

Youngstown Sheet & Tube Co., 1074-75.

**Base Beads, see Beads, Ground.****Base Corners, see Corners, Base.****Base Grounds, see Beads, Ground.****Baseboards, Slate, see Slate, Structural.****Baseboards, Wood, see Trim, Wood.****Basement Hoists, see Hoists, Cellar and Ash.****Basement Windows, see Windows, Basement, Burglarproof.****Bases, Column, see Caps and Bases, Column.****Bases, Flagpole.**

Fiske Iron Works, J. W., 552-53.

**Bases, Floor, see Cove Base.****Bases, Hood.**

Alberene Stone Co., 890-91.  
 Alberene Stone, 890-91.

**Bases, Post, see Caps and Bases, Post.****Bases, Slate, see Slate, Structural.****Bases, Soda Fountain.**

Herrick Refrigerator Co., 1060-61.

**Bases, Ventilator, see Ventilators; Sheet Metal Work.****Bases, Wood, see Trim, Wood.****Basins, Blow-off.**

Compound Injector & Specialty Co., 872-73.  
 Dehn's, 872-73.

**Basins, Gravel.**

(See also Basins and Covers, Catch.)  
 Compound Injector & Specialty Co., 872-73.  
 Dehn's, 872-73.

**Basins and Covers, Catch.**

Canton Foundry & Machine Co., 270.  
 Compound Injector & Specialty Co., 872-73.  
 Dehn's, 872-73.

**Baskets, Fireplace.**

(See also Fireplace Trimmings.)

Chattanooga Roofing & Foundry Co., 278.

**Baskets, Towel.**

Searls Mfg. Co., 888-89.

**Baskets, Waste.**

(See also Furniture.)

Darby & Sons Co., Inc., Edward, 1409.  
 General Fireproofing Co., 1414.

**Baskets, Waste—Continued.**

North Western Expanded Metal Co., 214-15.  
 GF Allsteel, 1414.  
 Nemco, 214-15.

**Bas-reliefs.**

Harsch & Sons Co., John, 504.  
 McGann & Sons Co., T. F., 508-09.

**Bath Fixtures and Fittings, see Bathroom Accessories; Cocks and Bibbs; Plumbing Fixtures.****Bathroom Accessories.**

(See also Cabinets, Medicine; Plumbing Fixtures; Baths, Shower or Needle.)

"Bilt-Well" Service Bureau, 574-75.  
 Carpenter Mfg. Co., R. F., 868-69.  
 Central Brass Mfg. Co., 852-55.  
 Crane Co., 1084-85.  
 Eustis Mfg. Co., J. P., 885.  
 Glauber Brass Mfg. Co., 856-61.  
 Graf Mfg. Co., Frank H., 886.  
 Hess Warming & Ventilating Co., 887.  
 Hoffmann & Billings Mfg. Co., 863.  
 Maddock's Sons Co., Thomas, 835-42.  
 Monument Pottery Co., 843-46.  
 Searls Mfg. Co., 888-89.  
 Bilt-Well, 574-75.  
 Brasscrafters White, 885.  
 Crane, 1084-85.  
 Glauber, 856-61.  
 Maddock's, 835-42.  
 Sanymetal, 868-69.  
 Searloid, 888-89.

**Baths, Shower or Needle.**

Central Brass Mfg. Co., 852-55.  
 Crane Co., 1084-85.  
 Glauber Brass Mfg. Co., 856-61.  
 Hoffmann & Billings Mfg. Co., 863.  
 Matthews & Brother, Inc., W. N., 864-65.  
 Crane, 1084-85.  
 Glauber, 856-61.  
 Niedecken, 863.  
 Nu-Rapid, 856-61.

**Baths, Steam.**

Alberene Stone Co., 890-91.  
 Alberene Stone, 890-91.

**Bathtubs.**

Crane Co., 1084-85.  
 Maddock's Sons Co., Thomas, 835-42.  
 Monument Pottery Co., 843-46.  
 Crane, 1084-85.  
 Maddock's, 835-42.  
 Monument, 843-46.  
 Porner, 835-42.  
 Stuyvesant, 843-46.  
 Traycove, 843-46.  
 Traymore, 843-46.  
 Specifications, 835-42.

**Batteries, Dry.**

Western Electric Co., 1202-03.  
 Western Electric, 1202-03.

**Batteries, Telephone.**

Automatic Electric Co., 1238-39.  
 Connecticut Telephone & Electric Co., Inc., 1240-41.  
 Stanley & Patterson, Inc., 1246-55.  
 Connecticut, 1240-41.  
 De Veau, 1246-55.

**Battery Charging Outfits.**

Cutler-Hammer Mfg. Co., 1208-09.  
 General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 C-H, 1208-09.  
 G-E, 1153-67.  
 Westinghouse-Cooper-Hewitt, 1169-76.

**Battery Sets.**

General Electric Co., 1153-67.  
 Stanley & Patterson, Inc., 1246-55.  
 G-E, 1153-67.  
 Patterson, 1246-55.  
 Specifications, 1246-55.

**Battery Switches, see Switches, Electric Battery.****Beads, Bullnose, see Beads, Corner.****Beads, Corner.**

Berger Mfg. Co., 202-05.



**Beads, Corner—Continued.**

Clinton Wire Cloth Co., 227-31.  
Concrete Engineering Co., 24-25.  
Consolidated Expanded Metal Companies, 206-08.  
General Fireproofing Co., 210-13.  
Milwaukee Corrugating Co., 209.  
Morgan Co., 584-85.  
National Mfg. Co., 621-25.  
North Western Expanded Metal Co., 214-15.  
Penn Metal Co., 216.  
Sykes Metal Lath and Roofing Co., 220-21.  
Truscon Steel Co., 217-19.  
Union Metal Corner Co., 222-23.  
Wheeling Corrugating Department, 242-43.  
Youngstown Pressed Steel Co., 224-26.  
*American*, 224-26.  
*Berger's* 202-05.  
*Ceco*, 24-25.  
*Corco*, 242-43.  
*GF*, 210-13.  
*Hannon*, 222-23.  
*Hunt*, 227-31.  
*Keystone*, 206-08.  
*Kno-Equal*, 214-15.  
*Parker*, 224-26.  
*Penco*, 216.  
*Steelcrete*, 206-08.  
*Superior*, 209.  
*Sykes*, 220-21.  
*T-Rail*, 206-08.  
*Truscon*, 217-19.  
*Union*, 222-23.  
*Universal*, 206-08.  
Specifications, 209.

**Beads, Ground.**

Berger Mfg. Co., 202-05.  
Concrete Engineering Co., 24-25.  
Penn Metal Co., 216.  
Truscon Steel Co., 217-19.  
Union Metal Corner Co., 222-23.  
United States Gypsum Co., 162-68.  
*Ceco*, 24-25.  
*Hannon*, 222-23.  
*Penco*, 216.  
*Simplex*, 162-68.  
*Truscon*, 217-19.  
Specifications, 162-68.

**Beads, Rail, see Beads, Corner.****Beam Wrappings, see Wrappings, Beam.****Bedford Stone, see Limestone.****Beds, Built-in.**

Murphy Wall Bed Co., 1396-97.  
Sorlien Ceiling Bed Co., 1398.  
*Murphy*, 1396-97.  
*Sorlien*, 1398.

**Beds, Ceiling, Invisible.**

Sorlien Ceiling Bed Co., 1398.  
*Sorlien*, 1398.  
Specifications, 1398.

**Beds, Concealed.**

Murphy Wall Bed Co., 1396-97.  
Sorlien Ceiling Bed Co., 1398.  
*Murphy*, 1396-97.  
*Sorlien*, 1398.

**Beds, Disappearing, see Beds, Concealed.****Beds, Jail, see Jail Construction and Equipment.****Beds, Wall.**

Murphy Wall Bed Co., 1396-97.  
*Murphy*, 1396-97.

**Beef Killing Equipment, see Slaughter House Equipment.****Bell Cord, see Cord: Trolley, Bell and Arc Lamp.****Bells: Angelus, Chime, Westminster, etc.**

McShane Bell Foundry Co., 1451.  
Meneely Bell Co., 1452.

**Bells, Call, see Bells, Electric.****Bells, Chapel, see Bells: Angelus, Chime, Westminster, etc.****Bells, Chime, see Bells: Angelus, Chime, Westminster, etc.****Bells: Church, Fire Alarm, Fog Signal, School, etc.**

Holtzer-Cabot Electric Co., 1242-45.  
McShane Bell Foundry Co., 1451.  
Meneely Bell Co., 1452.  
Stanley & Patterson, Inc., 1246-55.  
*Faraday*, 1246-55.

**Bells, Court House, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Electric.**

General Electric Co., 1153-67.  
Holtzer-Cabot Electric Co., 1242-45.  
Stanley & Patterson, Inc., 1246-55.  
*Faraday*, 1246-55.  
*G-E*, 1153-67.  
*Marlo*, 1246-55.  
*P R*, 1246-55.

**Bells, Farm, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Fire Alarm, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Fog Signal, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Peal, see Bells: Angelus, Chime, Westminster, etc.****Bells, School, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Ship, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Tower Clock, see Bells: Church, Fire Alarm, Fog Signal, School, etc.****Bells, Westminster, see Bells: Angelus, Chime, Westminster, etc.****Belt Conveyors, see Conveyors, Belt, Chain and Woven Wire.****Belting, Conveyor.**

Link-Belt Co., 1310.

**Belts, Safety, Window Cleaners.**

Royal Safety Anchor Co., 766-67.  
*Royal*, 766-67.  
Specifications, 766-67.

**Beltways, Data on.**

Associated Metal Lath Manufacturers, 196-201.

**Bench Drawers and Legs, see Benches, Metal.**

Manufacturing Equipment & Engineering Co., 847.

**Benches, Garden, see Furniture, Garden and Park.****Benches, Greenhouse.**

Hitchings & Co., 1454-55.  
Lord & Burnham Co., 1458-61.  
Lutton Co., William H., 1462-63.  
Pierson U-Bar Co., 1464-65.

**Benches, Metal.**

Edwards Mfg. Co., 1410-11.  
Federal Steel Fixture Co., 1412-13.  
Hauserman Co., E. F., 1415.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 847.  
*Hauserman*, 1415.  
*Lyon*, 1420-21.

**Benders, Bar.**

Concrete Steel Co., 188-89.  
*Havemeyer*, 188-89.

**Bending Machines.**

Concrete Steel Co., 188-89.

**Bends, Pipe, see Coils and Bends, Pipe.****Bends and Extensions, Closet.**

Compound Injector & Specialty Co., 872-73.  
*Acme*, 872-73.  
*Dehn's*, 872-73.

**Bibbs, see Cocks and Bibbs.****Bidet Pans, see Pans, Bidet.****Billets, Steel.**

Youngstown Sheet & Tube Co., 1074-75.

**Binders, Floor.**

Consolidated Expanded Metal Companies, 206-08.  
*Steelcrete*, 206-08.

**Binders, Road.**

Barrett Co., 394-97.  
Warren Chemical & Mfg. Division, 309.  
*Tarvia*, 394-97.

**Bins, Coal, see Bunkers, Coal and Ore.****Bins, Concrete.**

Brown Hoisting Machinery Co., 184-85.  
*Ferroinclave*, 184-85.

**Bins, Ore, see Bunkers, Coal and Ore.****Bins, Receiving, Merchandise, see Bins, Storage, Metal.****Bins, Storage, Metal.**

Berger Mfg. Co., 1406-08.  
Chattanooga Boiler & Tank Co., 1094.  
Edwards Mfg. Co., 1410-11.  
Federal Steel Fixture Co., 1412-13.  
General Fireproofing Co., 1414.  
Hauserman Co., E. F., 1415.  
Lamson Co., 1307.  
Library Bureau, 1418-19.  
Lupton's Sons Co., David., 704-08.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
Medart Mfg. Co., Fred, 1423.  
Terrell's Equipment Co., 1426-27.  
*GF Allsteel*, 1414.  
*Berger's*, 1406-08.  
*Hauserman*, 1415.  
*Library Bureau*, 1418-19.  
*Lupton*, 704-08.  
*Lyon*, 1420-21.  
*Medart*, 1423.

**Bins, Wine.**

Soellner, Herman, 1070.

**Birch, see Lumber, Birch.****Bird Baths, see Furniture, Garden and Park.****Bird Cages, see Cages, Animal.****Bitumen Compounds.**

Hydrex Felt & Engineering Co., 44.  
Warren Chemical & Mfg. Division, 309.  
*Hydrex*, 44.  
*Warren's*, 309.

**Black Printing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Black Sheets.**

New York Silicate Book Slate Co., 378.

**Blackboard Cloth, see Cloth, Blackboard.****Blackboards, Revolving.**

New York Silicate Book Slate Co., 378.

**Blackboards, Rolling or Coiling.**

Union Blind & Ladder Co., Inc., 778.  
Wilson Corporation, J. G., 774-77.

**Blackboards, Slate.**

Auld & Conger Co., 359.  
Johnson, Inc., E. J., 366-67.  
Natural Slate Blackboard Co., 376-77.  
New York Silicate Book Slate Co., 378.  
Sheldon Slate Co., F. C., 370-72.  
*Sheldon's*, 370-72.  
Specifications, 376-77.

**Blackboards, Slate, Veneer.**

New York Silicate Book Slate Co., 378.

**Blackboards, Wood or Wood Fiber.**

Beaver Board Companies, 170-71.  
Union Blind & Ladder Co., Inc., 778.  
Weber Costello Co., 379.  
Wilson Corporation, J. G., 774-77.  
*Beaver*, 170-71.  
*Hyloplate*, 379.

**Blanks, Hinge, see Hinges.****Blenders, Flour.**

Olson & Co., Samuel, 1312-13.

**Blinds, Awning.**

Burlington Venetian Blind Co., 802-03.  
Dodge & Co., H. B., 768.



**Blinds, Awning—Continued.**

Swedish Venetian Blind Co., 773; 806.  
Wilson Corporation, J. G., 804-05.  
*Swedish*, 806.  
*Wilson*, 804-05.

**Blinds, Folding, Rolling and Sliding.**

Burlington Venetian Blind Co., 802-03.  
Curtis Service Bureau, 578-79.  
Monroe Screen, Blind & Partition Co., 772.  
Swedish Venetian Blind Co., 773; 806.  
Wilson Corporation, J. G., 804-05.  
*Burlington*, 802-03.  
*Monroe*, 772.  
*Swedish*, 806.  
*Wilson*, 804-05.

**Blinds, Venetian.**

Burlington Venetian Blind Co., 802-03.  
Dodge & Co., H. B., 768.  
Monroe Screen, Blind & Partition Co., 772.  
Swedish Venetian Blind Co., 806.  
Wilson Corporation, J. C., 804-05.  
*Burlington*, 802-03.  
*Monroe*, 772.  
*Swedish*, 806.  
*Wilson*, 804-05.

**Blocks, Building, Hollow, Fireproof.**

(See also Brick, Hollow; Blocks, Gypsum; Terra Cotta, Hollow, Fireproof.)  
Alliance Brick Co., 71-72.  
Bannon Pipe Co., P., 110.  
Bradford Pressed Brick Co., 78-79.  
Burchartz Fireproofing Co., Inc., 26.  
Campfield Raggle Block Co., 108-09.  
Denison Fireproofing Co., 95.  
Denison Interlocking Tile Corporation, 96-97.  
Humphrey Brick & Tile Co., 106.  
Ketcham, O. W., 118.  
Maurer & Son, Henry, 98-99.  
National Fire Proofing Co., 100-05.  
Pennsylvania Fireproofing Co., 107.  
United States Gypsum Co., 162-68.  
Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Burchartz Two-way*, 26.  
*Denison*, 95.  
*Elco*, 107.  
*Haverstraw*, 100-05.  
*Humphrey*, 106.  
*Interlocking Tile*, 96-97.  
*Natco*, 100-05.  
*Natco Backup*, 100-05.  
*Natco XXX*, 100-05.  
*Pyrobar*, 162-68.  
*Tex-Tile*, 100-05.

**Blocks, Butchers, see Market Fixtures.****Blocks, Flooring, see Blocks, Wood, Flooring and Paving, Creosoted or Treated.****Blocks, Gypsum.**

Acme Cement Plaster Co., 140-41.  
American Gypsum Co., 142-44.  
Empire Gypsum Co., 152.  
Grand Rapids Plaster Co., 148-49.  
King & Co., J. B., 153.  
Niagara Gypsum Co., 156.  
Plymouth Gypsum Co., 154-55.  
Reeb Corporation, M. A., 157.  
Rock Plaster Mfg. Co., 160.  
Southern Gypsum Co., Inc., 158-59.  
United States Gypsum Co., 162-68.  
*Acme*, 140-41.  
*Anchor*, 142-44.  
*King's Windsor*, 153.  
*Niagara*, 156.  
*Peerless*, 157.  
*Plymouth*, 154-55.  
*Pyrobar*, 162-68.  
Specifications, 140-41; 162-68.

**Blocks, Insulating.**

Johns-Manville Co., H. W., 1076-77.  
Magnesia Association of America, 1078-79.  
*Asbestocel*, 1076-77.  
*Asbesto-Sponge Felted*, 1076-77.  
*85% Magnesia*, 1076-77.

**Blocks, Insulating—Continued.**

*Thermo*, 1076-77.  
*Vitribestos*, 1076-77.  
*Vitro*, 1076-77.

**Blocks, Partition, Gypsum, see Blocks, Gypsum.****Blocks, Paving, Asphalt.**

Hastings Pavement Co., 308.

**Blocks, Paving, Brick.**

Bannon Pipe Co., P., 110.  
Bradford Pressed Brick Co., 78-79.  
Kushequa Brick Co., 84-85.

**Blocks, Paving, Granite.**

Rockport Granite Co., 60-61.  
Woodbury Granite Co., 65.

**Blocks, Plaster, see Blocks, Gypsum.****Blocks, Raggle.**

Campfield Raggle Block Co., 108-09.  
*Campfield*, 108-09.

**Blocks, Sewer.**

Campfield Raggle Block Co., 108-09.  
*Campfield*, 108-09.

**Blocks, Wire Rope.**

American Steel & Wire Co., 30-33.

**Blocks, Wood.**

(See also Flooring, Wood; Flooring, Wood Block.)  
Kennedy, Inc., David E., 326.

**Blocks, Wood, Flooring and Paving.**

**Creosoted or Treated.**  
Ayer & Lord Tile Co., 310.  
Central Creosoting Co., 311.  
Jennison-Wright Co., 312-13.  
Southern Pine Association, 561.

**Blowers, Forced Draft, see Blowers, Pressure.****Blowers, Pressure.**

(See also Fans, Ventilating or Exhaust.)  
American Blower Co., 996-99.  
Connorsville Blower Co., 1102-03.  
Gerdes, Theodore R. N., 462.  
Ilg Electric Ventilating Co., 1002-03.  
Massachusetts Blower Co., 1005.  
Sturtevant Co., B. F., 1006-07.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Wing Mfg. Co., L. J., 1008.  
*ABC*, 996-99.  
*Ilg Universal*, 1002-03.  
*Sturtevant*, 1006-07.  
*Westinghouse-Sirocco*, 1169-76.

**Blowers, Rotary, see Blowers, Pressure; Blowers and Exhausters.****Blowers, Turbo.**

Sturtevant Co., B. F., 1006-07.  
Wing Mfg. Co., L. J., 1008.  
*Sturtevant*, 1006-07.

**Blowers and Exhausters.**

(See also Fans, Ventilating or Exhaust.)  
American Blower Co., 996-99.  
Bicalky Fan Co., 1000.  
Gerdes, Theodore R. N., 462.  
Ilg Electric Ventilating Co., 1002-03.  
Massachusetts Blower Co., 1005.  
Spencer Turbine Cleaner Co., 1256-57.  
Sturtevant Co., B. F., 1006-07.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Wing Mfg. Co., L. J., 1008.  
*ABC*, 996-99.  
*Bicalky*, 1000.  
*Bi-multi*, 1000.  
*Ilg*, 1002-03.  
*Sturtevant*, 1006-07.  
*Westinghouse-Sirocco*, 1169-76.  
*Wing*, 1008.

**Blue Lead.**

Eagle-Picher Lead Co., 875.

**Blue Line Printing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Blue Print Dryers, see Dryers, Blue Print.****Blue Printing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Blue Printing Apparatus.**

American Drafting Furniture Co., 1.  
*American*, 1.  
*Paragon*, 1.

**Boards, Asbestos.**

Alignum Fireproof Products Co., Inc., 646-47.  
*Alignum*, 646-47.

**Boards, Bulletin.**

(See also Boards, Directory.)  
Building Directories, Bulletin & Sign Co., 1434.  
Kennedy, Inc., David E., 327.  
United Cork Flooring Co., 328.  
United States Changeable Sign Co., 1435.  
Van Kannel Revolving Door Co., 1438.  
Wisconsin Iron & Wire Works, 533.  
*Crescent*, 328.  
*Greeley*, 1434.  
*Kencor*, 327.  
*Van Kannel*, 1438.

**Boards, Ceiling, see Boards, Wall or Ceiling.****Boards, Chart.**

Kennedy, Inc., David E., 327.  
*Kencor*, 327.

**Boards, Directory.**

(See also Boards, Bulletin.)  
Building Directories, Bulletin & Sign Co., 1434.  
Gorham Co Architectural Bronze, 502-03.  
McGann & Sons Co., T. F., 508-09.  
Reed & Barton, 520-21.  
Tablet & Ticket Co., 1436-37.  
United States Changeable Sign Co., 1435.  
Van Kannel Revolving Door Co., 1438.  
*Greeley*, 1434.  
*Van Kannel*, 1438.  
*Willson's* 1436-37.

**Boards, Drawing.**

American Drafting Furniture Co., 1.  
Economy Drawing Table Co., 2-4.  
Hamilton Mfg. Co., 5.  
*American*, 1.  
*Economy*, 2-4.

**Boards, Ironing.**

Chicago Dryer Co., 1038-41.  
*Chicago*, 1038-41.

**Boards, Pastry.**

Penrhyn Slate Co., 365.

**Boards, Plaster.**

(See also Boards, Wall or Ceiling.)  
American Gypsum Co., 142-44.  
Bishopric Mfg. Co., 169.  
Concrete Engineering Co., 24-25.  
Ford Mfg. Co., 239.  
Grand Rapids Plaster Co., 148-49.  
International Insulation Co., 174.  
King & Co., J. B., 153.  
Niagara Gypsum Co., 156.  
Plymouth Gypsum Co., 154-55.  
Reeb Corporation, M. A., 157.  
Rock Plaster Mfg. Co., 160.  
Southern Gypsum Co., Inc., 158-59.  
United States Gypsum Co., 162-68.  
*Adamant*, 162-68.  
*Bishopric*, 169.  
*Ceco*, 24-25.  
*Economy*, 158-59.  
*King's Diamond*, 153.  
*Monarch*, 142-44.  
*Niagara*, 156.  
*Peerless*, 157.  
*Rock*, 160.  
*Sackett*, 148-49; 162-68.  
*Universal Insulite*, 174.  
Specifications, 158-59; 162-68.

**Boards, Sheathing.**

Banner Rock Products Co., 352.  
Bishopric Mfg. Co., 169.  
International Insulation Co., 174.  
King & Co., J. B., 153.  
*Bishopric*, 169.  
*King's*, 153.  
*Rock Cork*, 352.

**Boards, Stucco.**

(See also Boards, Wall or Ceiling.)  
Bishopric Mfg. Co., 169.  
*Bishopric*, 169.



**Boards, Wall or Ceiling.**

American Gypsum Co., 142-44.  
 Beaver Board Companies, 170-71.  
 Bird & Son, 390-91.  
 Bishopric Mfg. Co., 169.  
 Carey Co., Philip, 172.  
 Concrete Engineering Co., 24-25.  
 Cornell Wood Products Co., 173.  
 Ford Mfg. Co., 239.  
 Grand Rapids Plaster Co., 148-49.  
 International Insulation Co., 174.  
 Niagara Gypsum Co., 156.  
 Rock Plaster Mfg. Co., 160.  
 Southern Gypsum Co., Inc., 158-59.  
 United States Gypsum Co., 175.  
*Beaver Board*, 170-71.  
*Ceco*, 24-25.  
*Ceil-Board*, 172.  
*Cornell*, 173.  
*Economy*, 158-59.  
*Monarch*, 142-44.  
*Neposet*, 390-91.  
*Niagara*, 156.  
*Rock*, 160.  
*Sheetrock*, 175.  
*Universal Insulite*, 174.

**Boiler Feeders**, see Feeders, Boiler, Low Pressure.

**Boiler Settings**, see Settings, Boiler.

**Boiler Stands**, see Stands, Boiler.

**Boilers, Barber.**

Riverside Boiler Works, Inc., 896-99.  
*Riverside*, 896-99.

**Boilers, Cast Iron**, see Boilers, Heating, Steam and Hot Water.

**Boilers, Clothes**, see Wash Boilers.

**Boilers, Copper**, see Boilers, Range, Copper.

**Boilers, Down-draft**, see Boilers, Smokeless.

**Boilers, Heating, Greenhouse and Conservatory**, see Heating Systems, Greenhouse and Conservatory; Boilers, Heating, Steam and Hot Water.

**Boilers, Heating, Hot Water**, see Boilers, Heating, Steam and Hot Water.

**Boilers, Heating, Hot Water or Steam and Hot Air, Combination.**

Holland Furnace Co., 956-57.  
 International Heater Co., 968-73.  
 Kelsey Heating Co., 958-59.  
*Climax*, 958-59.  
*Economy*, 968-73.  
*Holland*, 956-57.  
*International*, 968-73.  
*Kelsey*, 958-59.

**Boilers, Heating, Steam and Hot Water.**  
 (See also Boilers, Power.)

Cox Stove Co., Abram, 960-64.  
 Hart & Crouse Co., 965-67.  
 International Heater Co., 968-73.  
 Kanawha Mfg. Co., 974.  
 Kelsey Heating Co., 958-59.  
 Kewanee Boiler Co., 975-77.  
 Lord & Burnham Co., 978-79.  
 Pittsburg Water Heater Co., 1024-27.  
 Prox Co., Frank, 980-81.  
 Thatcher Furnace Co., 982-84.  
*Bernard*, 974.  
*Burnham*, 978-79.  
*Climax*, 958-59.  
*Economic*, 980-81.  
*Empress*, 968-73.  
*Hart & Crouse*, 965-67.  
*Hartun*, 975-77.  
*International*, 968-73.  
*Kewanee*, 975-77.  
*Novelty*, 960-64.  
*Pittsburgh*, 1024-27.  
*Prince*, 968-73.  
*Progress*, 982-84.  
*Radium*, 980-81.  
*Sultan*, 968-73.  
*Thatcher*, 982-84.

**Boilers, Heating, Steam and Hot Water, Gas.**

International Heater Co., 968-73.  
*International*, 968-73.

**Boilers, Hot Water, Storage, Copper.**  
 see Boilers, Range, Copper.

**Boilers, Hot Water Supply**, see Boilers, Heating, Steam and Hot Water; Heaters, Water, Storage, Steam; Boilers, Range.

**Boilers, Hot Water Tank**, see Boilers, Heating, Steam and Hot Water.

**Boilers, Internally Fired and Locomotive.**

Kewanee Boiler Co., 975-77.  
 Walsh & Weidner Boiler Co., 1096.  
*Kewanee*, 975-77.

**Boilers, Kitchen**, see Boilers, Range.

**Boilers, Laundry**, see Boilers, Heating, Steam and Hot Water.

**Boilers, Portable.**

Kewanee Boiler Co., 975-77.  
 Walsh & Weidner Boiler Co., 1096.  
*Kewanee*, 975-77.

**Boilers, Power.**

Chattanooga Boiler & Tank Co., 1094.  
 Kewanee Boiler Co., 975-77.  
 Walsh & Weidner Boiler Co., 1096.  
*Kewanee*, 975-77.

**Boilers, Range, Copper.**

Badger & Sons Co., E. B., 892-93.  
 Bramhall, Deane Co., 1010-11.  
 Riverside Boiler Works, Inc., 896-99.  
 Trageser Steam Copper Works, John, 900.  
*Badger*, 892-93.  
*Graves*, 900.  
*Kop-steel*, 896-99.  
*Riverside*, 896-99.  
 Specifications, 892-93; 896-99.

**Boilers, Range, Galvanized.**

Riverside Boiler Works, Inc., 896-99.  
 Trageser Steam Copper Works, John, 900.  
*Graves*, 900.  
*Riverside*, 896-99.

**Boilers, Range, Gas Heating, Combination.**

Economy Heater Co., 1015-17.  
*Economy*, 1015-17.  
*Peerless*, 1015-17.

**Boilers, Return Tubular**, see Boilers, Power.

**Boilers, Smokeless.**

Hart & Crouse Co., 965-67.  
 Kanawha Mfg. Co., 974.  
 Kewanee Boiler Co., 975-77.  
 Prox Co., Frank, 980-81.  
*Bernard*, 974.  
*Economic*, 980-81.  
*Hart & Crouse*, 965-67.  
*Kewanee*, 975-77.

**Boilers, Smokeless, Portable.**

Kewanee Boiler Co., 975-77.  
*Kewanee*, 975-77.

**Boilers, Water Tube.**

Hart & Crouse Co., 965-67.  
 Kanawha Mfg. Co., 974.  
 Walsh & Weidner Boiler Co., 1096.  
*Bernhard*, 974.  
*Hart & Crouse*, 965-67.

**Bolts, Anchor**, see Anchors, Building, etc.

**Bolts, Centering.**

Richmond Screw Anchor Co., 249.

**Bolts, Cremone.**

Stanley Works, 608-13.  
*Stanley*, 608-13.

**Bolts, Door.**

Bommer Brothers, 600-01.  
 Columbia Iron & Wire Works Co., 268-69.  
 Lawson Mfg. Co., 604-05.  
 National Mfg. Co., 621-25.  
 Reliance-Grant Elevator Equipment Corp., 626-29.

**Bolts, Door—Continued.**

Shelby Spring Hinge Co., 606-07.  
 Stanley Works, 608-13.  
*Bommer*, 600-01.  
*Stanley*, 608-13.

**Bolts, Door, Chain.**

National Mfg. Co., 621-25.  
 Stanley Works, 608-13.  
*Stanley*, 608-13.

**Bolts, Door, Indicator.**

Lawson Mfg. Co., 604-05.

**Bolts, Door, Lavatory.**

Bommer Brothers, 600-01.  
 Chicago Spring Butt Co., 602-03.  
*Bommer*, 600-01.

**Bolts, Expansion.**

Ankyra Mfg. Co., 244-45.  
 McCabe Hanger Mfg. Co., 618-20.  
 Richmond Screw Anchor Co., 249.  
*Ankyra Ankor*, 244-45.

**Bolts, Form.**

Richmond Screw Anchor Co., 249.

**Bolts, Panic**, see Locks, Emergency Exit.

**Bolts, Rail.**

Irving Forge, W., 505.  
*W. Irving*, 505.

**Bolts, Slide, Mausoleum.**

Detroit Mausoleum Equipment Works, 500.

**Bolts, Window.**

Royal Safety Anchor Co., 766-67.  
*Royal*, 766-67.

**Bond Boxes**, see Boxes, Safe Deposit.

**Bonds, Plaster**, see Plaster Bonds.

**Bonechar, Filtering.**

Loomis-Manning Filter Distributing Co., 1125.

**Book Shelving**, see Shelving.

**Book Slates**, see Slates, Book.

**Book Tile**, see Blocks, Building, Hollow, Fireproof; Terra Cotta, Hollow, Fireproof.

**Book Trucks**, see Omnibuses, Vault and Office.

**Bookcase Fronts.**

Monroe Screen, Blind & Partition Co., 772.

**Bookcases, Metal.**

Berger Mfg. Co., 1406-08.  
 Library Bureau, 1418-19.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Watson Mfg. Co., Inc., 1429.  
*Library Bureau*, 1418-19.

**Bookcases, Wood.**

(See also Furniture.)  
 "Bilt-Well" Service Bureau, 574-75.  
*Bilt-Well*, 574-75.

**Bookstacks**, see Stacks, Book.

**Booster Pumps**, see Pumps, Booster.

**Boosters, Live Steam.**

National Pipe Bending Co., 902-03.  
*National*, 902-03.

**Booths, Consultation, Jail.**

Pauly Jail Building Co., 1488.

**Boots and Connections, Conductor Pipe**, see Pipe, Conductor.

**Border Lights**, see Lights, Border, Stage.

**Borders, Floor, Metal**, see Registers, Heating and Ventilating; Grilles; Gratings.

**Borings, Test, Foundation.**

(See also Shoring and Underpinning.)  
 Artesian Well and Supply Co., 1092.

**Bottle Racks**, see Racks, Bottle.

**Bottle Shelving**, see Shelving, Bottle.

**Bowl Reflectors**, see Reflectors, Lighting; Glassware, Illuminating.

**Bowling Alley Sound Deadening**, see Foundations, Bowling Alley and Machinery.

**Bowls, Lighting**, see Glassware, Illuminating; Lighting Fixtures.



- Bowls, Toilet, Vitreous China.**  
Dail Steel Products Co., 850.  
Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
*Maddock's*, 835-42.
- Bowls, Water Closet,** see Bowls, Toilet, Vitreous China.
- Bowls, Watering, Automatic.**  
Louden Machinery Co., 1471-73.
- Bows, Elevator.**  
Carpenter & Co., Inc., Davis, 827.
- Box Stalls,** see Stalls, Box, Sanitary Steel.
- Boxes, Coupling, Cast Iron.**  
General Electric Co., 1153-67.  
*G-E*, 1153-67.
- Boxes, Feed,** see Stable Fittings and Fixtures; Barn Equipment.
- Boxes, Filler.**  
Wayne Oil Tank & Pump Co., 1480-81.
- Boxes, Fire Alarm.**  
Stanley & Patterson, Inc., 1246-55.
- Boxes, Floor, Concrete.**  
Chicago Spring Butt Co., 602-603.  
Steel City Electric Co., 1222.
- Boxes, Floor, Outlet,** see Boxes, Junction or Outlet.
- Boxes, Flour, Metal.**  
Mannen Co., John E., 1031.  
*Manest*, 1031.
- Boxes, Flower.**  
Fischer & Jirouch Co., 1404.  
Majestic Co., 271-73.
- Boxes, Flower, Terra Cotta.**  
Hood Brick Co., B. Mifflin, 80-81.  
*Pottry*, 80-81.
- Boxes, Fuse,** see Boxes, Junction or Outlet.
- Boxes, Gutter.**  
Canton Foundry & Machine Co., 270.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co., 241.  
*Portsmouth Iron*, 241.
- Boxes, Hose.**  
Murdock Mfg. & Supply Co., 866-67.
- Boxes, Junction or Outlet.**  
Bryant Electric Co., 1207.  
Crouse-Hinds Co., 1178.  
General Electric Co., 1153-67.  
Gillette-Vibber Co., 1211.  
Sprague Electric Works, 1168.  
Stanley & Patterson, Inc., 1246-55.  
Steel City Electric Co., 1222.  
Western Electric Co., 1202-03.  
*Bryant*, 1207.  
*Condulets*, 1178.  
*Fullman*, 1222.  
*G-E*, 1153-67.  
*Gee-Vee*, 1211.  
*Patterson*, 1246-55.  
*Steel City*, 1222.  
*Western Electric*, 1202-03.  
Specification, 1153-67.
- Boxes, Mail.**  
American Mailing Device Corporation, 1439.  
Cutler Mail Chute Co., 1440-41.  
Manhattan Brass Co., 513.  
Miller Lock Co., 598-99.  
*Cutler*, 1440-41.
- Boxes, Messenger, Steel.**  
Hall's Safe Co., 1431.  
Herring-Hall-Marvin Safe Co., 1432.
- Boxes, Metal.**  
Best Register Co., 988-89.  
Berger Mfg. Co., 1406-08.  
Darby & Sons Co., Inc., Edward, 1409.  
Federal Steel Fixture Co., 1412-13.  
General Fireproofing Co., 1414.  
Hauserman Co., E. F., 1415.  
Lyon Metallic Mfg. Co., 1420-21.  
Majestic Co., 271-73.  
Mannen Co., John E., 1031.
- Boxes, Metal—Continued.**  
Manufacturing Equipment & Engineering Co., 1422.  
Medart Mfg. Co., Fred, 1423.  
Penn Metal Co., 216.  
Steel City Electric Co., 1222.  
Terrell's Equipment Co., 1426-27.  
Van Dorn Iron Works Co., 254-55.  
*Best*, 988-89.  
*GF Allsteel*, 1414.  
*Hauserman*, 1415.  
*Lyon*, 1420-21.  
*Manest*, 1031.  
*Penco*, 216.
- Boxes, Panelboard,** see Cabinets and Boxes, Panelboard.
- Boxes, Plant.**  
Mathews Mfg. Co., 1402-03.
- Boxes, Register.**  
Rock Island Register Co., 994-95.  
*No Streak*, 994-95.  
*Rock Island*, 994-95.
- Boxes, Roof.**  
Whitaker-Glessner Co., 241.  
*Portsmouth Iron*, 241.
- Boxes, Safe Deposit.**  
General Fireproofing Co., 1414.  
Hall's Safe Co., 1431.  
Herring-Hall-Marvin Safe Co., 1432.  
York Safe and Lock Co., 1433.  
*GF Allsteel*, 1414.
- Boxes, Steel,** see Boxes, Metal.
- Boxes, Switch, Electric.**  
Sprague Electric Works, 1168.  
Steel City Electric Co., 1222.  
*Steel City*, 1222.
- Boxes, Tool, Metal,** see Boxes, Metal.
- Boxes, Tote,** see Boxes, Metal.
- Boxes, Tree,** see Boxes, Plant.
- Boxes, Valve.**  
Pratt & Cady Co., Inc., 1090-91.
- Boxes, Wall.**  
Clark Co., W. J., 252.  
Duplex Hanger Co., 253.  
Ideal Hanger Co., 256.  
Jordan & Co., Paul R., 464-65.  
Van Dorn Iron Works Co., 254-55.  
*Duplex*, 253.
- Braces, Rail.**  
National Mfg. Co., 621-25.
- Brackets, Balcony,** see Ornamental Metal Work.
- Brackets, Faience.**  
Mueller Mosaic Co., 293.  
Rookwood Pottery Co., 294-95.
- Brackets, Harness,** see Stable Fittings and Fixtures.
- Brackets, Lamp,** see Standards and Brackets, Lamp; Lighting Fixtures.
- Brackets, Ornamental Metal,** see Ornamental Metal Work; Standards and Brackets, Lamp.
- Brackets, Pier,** see Plates and Brackets, Pier.
- Brackets, Shelf.**  
Stanley Works, 608-13.  
*Stanley*, 608-13.
- Brackets, Wall, Pipe.**  
Tyler Underground Heating System, 911.  
*Tyler*, 911.
- Brackets, Wall, Radiator.**  
American Pressweld Radiator Corporation, 952-53.
- Brackets, Wood.**  
"Bilt-Well" Service Bureau, 574-75.  
*Bilt-Well*, 574-75.
- Braided Cable,** see Cables, Braided.
- Braided Cord,** see Cord, Braided.
- Brass.**  
Merchant & Evans Co., 420.  
Smith Wire and Iron Works, F. P., 524-25.  
*M & E Co.*, 420.
- Brass Goods, Plumbing,** see Plumbing Brass Goods.
- Brass Mouldings,** see Mouldings, Metal or Metal Covered.
- Brass Work, Ornamental,** see Ornamental Metal Work.
- Brasses, Ecclesiastical.**  
(See also Furnishings, Church.)  
McGann & Sons Co., T. F., 508-09.
- Breechings, Smoke.**  
(See also Sheet Metal Work.)  
Chattanooga Boiler & Tank Co., 1094.  
Kewanee Boiler Co., 975-77.  
Walsh & Weidner Boiler Co., 1096.
- Brick, Bonding.**  
Ketcham, O. W., 118.
- Brick, Chimney.**  
Western Brick Co., 86-87.
- Brick, Clinker.**  
Sayre & Fisher Co., 73.  
*S. & F.*, 73.
- Brick, Common,** see Brick, Face or Front.
- Brick, Cork.**  
Armstrong Cork & Insulation Co., 323.  
Fiske Iron Works, J. W., 552-53.  
James Mfg. Co., 1466-70.  
Louden Machinery Co., 1471-73.  
United Cork Companies, 356.  
United Cork Flooring Co., 328.  
*James*, 1466-70.  
*Linotile*, 323.  
*Star*, 328; 356.
- Brick, Enameled or Porcelain.**  
American Enameled Brick & Tile Co., 74-77.  
Hydraulic-Press Brick Co., 82-83.  
Ketcham, O. W., 118.  
Sayre & Fisher Co., 73.  
*Hy-namel*, 82-83.  
*Hy-tex*, 82-83.  
*Superior*, 73.
- Brick, Face or Front: Pressed, Clear-glaze, Salt-glaze, Matt.**  
Alliance Brick Co., 71-72.  
American Enameled Brick & Tile Co., 74-77.  
Atlantic Terra Cotta Co., 112-13.  
Bannon Pipe Co., P., 110.  
Bradford Pressed Brick Co., 78-79.  
Campfield Raggle Block Co., 108-09.  
Hood Brick Co., B. Mifflin, 80-81.  
Hydraulic-Press Brick Co., 82-83.  
Ketcham, O. W., 118.  
Kushequa Brick Co., 84-85.  
National Fire Proofing Co., 100-05.  
Pennsylvania Fireproofing Co., 107.  
Sayre & Fisher Co., 73.  
Stark Brick Co., 88.  
Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Black Headers*, 84-85.  
*Bradford Pressed Brick*, 78-79.  
*Bradford Reds*, 78-79.  
*Bradford Ruffs*, 78-79.  
*Campfield*, 108-09.  
*Cloister*, 86-87.  
*Devonshire*, 84-85.  
*Doric*, 86-87.  
*Empire*, 86-87.  
*Gothic*, 86-87.  
*Hy-tex*, 82-83.  
*Kq Paver*, 84-85.  
*Kushequa*, 84-85.  
*Natco*, 100-05.  
*Old English*, 73.  
*Ox-Blood*, 84-85.  
*Pentex*, 107.  
*Pentex Splits*, 107.  
*Persians*, 86-87.  
*Pottry*, 80-81.  
*Rain-washed*, 73.  
*S. & F.*, 73.  
*Saruk*, 84-85.  
*Velours*, 84-85.  
*Western Rugs*, 86-87.
- Brick, Faience,** see Brick, Fancy or Ornamental.



**Brick, Fancy or Ornamental: Flash, Speckled, Mottled, Iron-spot.**

American Enameled Brick & Tile Co., 74-77.  
 Bradford Pressed Brick Co., 78-79.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Pennsylvania Fireproofing Co., 107.  
 Sayre & Fisher Co., 73.  
 Western Brick Co., 86-87.  
*Doric*, 86-87.  
*Gothic*, 86-87.  
*Hy-tex*, 82-83.  
*Pentex*, 107.  
*Pentex Splits*, 107.

**Brick, Fire.**

Alliance Brick Co., 71-72.  
 American Enameled Brick & Tile Co., 74-77.  
 Atlantic Terra Cotta Co., 112-13.  
 Bannon Pipe Co., P., 110.  
 Bradford Pressed Brick Co., 78-79.  
 Federal Terra Cotta Co., 115.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Maurer & Son, Henry, 98-99.  
 National Fire Proofing Co., 100-05.  
 Sayre & Fisher Co., 73.  
*Alliance*, 71-72.  
*Hy-tex*, 82-83.  
*Natco*, 100-05.  
*Phenix*, 73.  
*Pottry*, 80-81.  
*Sayre & Fisher*, 73.

**Brick, Fireplace and Mantel.**

Alliance Brick Co., 71-72.  
 American Enameled Brick & Tile Co., 74-77.  
 Atlantic Terra Cotta Co., 112-13.  
 Bradford Pressed Brick Co., 78-79.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Kushequa Brick Co., 84-85.  
 Stark Brick Co., 88.  
 Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Hy-tex*, 82-83.  
*Pottry*, 80-81.  
*Saruk*, 84-85.

**Brick, Flooring, see Flooring, Brick.****Brick, Glazed, see Brick, Face or Front.****Brick, Hollow.**

Bannon Pipe Co., P., 110.  
 Bradford Pressed Brick Co., 78-79.  
 Humphrey Brick & Tile Co., 106.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 National Fire Proofing Co., 100-05.  
 Pennsylvania Fireproofing Co., 107.  
 Sayre & Fisher Co., 73.  
 Western Brick Co., 86-87.  
*Haverstraw*, 100-05.  
*Humphrey*, 106.  
*Hy-tex*, 82-83.  
*Natco Backup*, 100-05.  
*Pentex*, 107.  
*Pentex Splits*, 107.  
*Tex-Tile*, 100-05.

**Brick, Imitation, Sheet Metal.**

(See also Siding, Iron or Steel, Galvanized or Painted.)

American Sheet and Tin Plate Co., 412-13.  
 Edwards Mfg. Co., 418-19.  
 Stark Rolling Mill Co., 424-25.  
*Toncan Metal*, 424-25.

**Brick, Insulating.**

Armstrong Cork & Insulation Co., 349-51.  
*Nonpareil*, 349-51.

**Brick, Mantel, see Brick, Fireplace and Mantel.****Brick, Nailing, Composition, see Nailing Base or Grounds, Composition.****Brick, Ornamental, see Brick, Fancy or Ornamental.****Brick, Paving.**

Alliance Brick Co., 71-72.  
 Bannon Pipe Co., P., 110.  
 Bradford Pressed Brick Co., 78-79.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Kushequa Brick Co., 84-85.  
 Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Brickette*, 84-85.  
*Hy-tex*, 82-83.  
*Kq Paver*, 84-85.  
*Pottry*, 80-81.  
*Western Commons*, 86-87.

**Brick, Porcelain, see Brick, Enameled or Porcelain.****Brick, Pressed, see Brick, Face or Front.****Brick, Radial.**

(See also Brick, Special.)

Bradford Pressed Brick Co., 78-79.  
 Custodis Chimney Construction Co., Alphons, 89.  
 Heinicke, Inc., H. R., 90-91.  
 Hydraulic-Press Brick Co., 82-83.  
 Kellogg Co., M. W., 92-93.  
*Heinicke*, 90-91.  
*Hy-tex*, 82-83.

**Brick, Repressed.**

Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Kushequa Brick Co., 84-85.  
 Sayre & Fisher Co., 73.  
*Hy-tex*, 82-83.  
*Old English*, 73.  
*Rain-washed*, 73.

**Brick, Rough Texture.**

Alliance Brick Co., 71-72.  
 Bannon Pipe Co., P., 110.  
 Bradford Pressed Brick Co., 78-79.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Kushequa Brick Co., 84-85.  
 National Fire Proofing Co., 100-05.  
 Pennsylvania Fireproofing Co., 107.  
 Sayre & Fisher Co., 73.  
 Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Black Headers*, 84-85.  
*Bradford Ruffs*, 78-79.  
*Empire*, 86-87.  
*Hy-tex*, 82-83.  
*Natco*, 100-05.  
*Ox-blood Devonshire*, 84-85.  
*Pentex*, 107.  
*Pentex Split*, 107.  
*Pottry*, 80-81.  
*Rugs*, 86-87.  
*Saruk*, 84-85.  
*Western Rugs*, 86-87.

**Brick, Smooth Texture.**

Alliance Brick Co., 71-72.  
 Bradford Pressed Brick Co., 78-79.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Kushequa Brick Co., 84-85.  
 Sayre & Fisher Co., 73.  
 Stark Brick Co., 88.  
 Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Cloister*, 86-87.  
*Hy-tex*, 82-83.  
*Pottry*, 80-81.

**Brick, Special.**

Heinicke, Inc., H. R., 90-91.

**Brick, Special: Impervious, Moulded, Arch.**

Alliance Brick Co., 71-72.  
 American Enameled Brick & Tile Co., 74-77.  
 Atlantic Terra Cotta Co., 112-13.  
 Bradford Pressed Brick Co., 78-79.  
 Federal Terra Cotta Co., 115.  
 Hood Brick Co., B. Mifflin, 80-81.

**Brick, Special: Impervious, Moulded, Arch—Continued.**

Hydraulic-Press Brick Co., 82-83.  
 Ketcham, O. W., 118.  
 Stark Brick Co., 88.  
 Western Brick Co., 86-87.  
*Alliance*, 71-72.  
*Cloister*, 86-87.  
*Hy-tex*, 82-83.  
*Pottry*, 80-81.

**Brick, Vitrified, see Brick, Paving.****Brick, Wire-cut.**

Hood Brick Co., B. Mifflin, 80-81.  
 Hydraulic-Press Brick Co., 82-83.  
 Kushequa Brick Co., 84-85.  
*Pottry*, 80-81.

**Brickwork Designers.**

Ketcham, O. W., 118.

**Bridge Substructures.**

Foundation Co., 14.

**Bridges, Steel, see Structural Steel or Iron Work.****Bridging, Cross, Adjustable.**

Van Dorn Iron Works Co., 254-55.

**Bridging, Metal.**

Wheeling Corrugating Department, 242-43.  
*Corco*, 242-43.

**Bridle Wire, see Wire and Cables, Electric.****Brine Coolers, see Coolers, Brine.****Broilers, see Heating and Cooking Appliances.****Bronze, see Bronzsmiths.****Bronze, Sheet.**

Friedley-Voshardt Co., 501.

**Bronze Work, Ornamental, see Ornamental Metal Work.****Bronzsmiths.**

Friedley-Voshardt Co., 501.  
 Gorham Co Architectural Bronze, 502-03.  
 Harsch & Sons Co., John, 504.  
 Merchant & Evans Co., 420.  
 Tiffany Studios, 526-27.  
 Tyler Co., W. S., 529.

**Bronzing Liquid.**

Harrison Works, 1322-25.  
*Harrisons*, 1322-25.

**Brown Printing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Brushes, Floor.**

Butcher Polish Co., 1368.  
*Butcher's*, 1368.

**Brushes, Paint.**

Carbolineum Wood Preserving Co., 1386.

**Brushes, Wire.**

Darby & Sons Co., Inc., Edward, 1409.

**Bubblers, Drinking, Sanitary, see Fountains, Drinking, Sanitary.****Bubbling Drinking Fountains, see Fountains, Drinking, Sanitary.****Bucket Carriers, see Elevating and Conveying Machinery; Conveyors, Bucket.****Buckets, Conveying.**

Link-Belt Co., 1310.  
 Olson & Co., Samuel, 1312-13.

**Buckets, Elevator.**

Clark Co., W. J., 252.  
 Link-Belt Co., 1310.  
 Olson & Co., Samuel, 1312-13.

**Buckets, Fire.**

Wheeling Corrugating Department, 242-43.

**Buckets, Watering.**

James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
*James*, 1466-70.

**Bucks, Door, see Trim.****Buffers, Elevator.**

Otis Elevator Co., 1280-84.  
*Otis*, 1280-84.



**Buffet Kitchens**, see Kitchens, Buffet; Cabinets, Kitchen.

### Buffets.

(See also Furniture.)

"Bilt-Well" Service Bureau, 574-75.  
Curtis Service Bureau, 578-79.  
*Bilt-Well*, 574-75.  
Curtis, 578-79.

**Building Anchors**, see Anchors, Building, Ashlar, Terra Cotta, Wall Plate.

**Building Corners**, see Corners, Building, Metal.

**Building Directories**, see Directories, Building; Boards, Bulletin; Boards, Directory.

### Building Fronts, Metal.

(See also Store Fronts, Metal; Ornamental Metal Work.)

Smith Wire and Iron Works, F. P., 524-25.

### Building Inspection.

Hunt & Co., Robert, W., 8.

### Building Papers.

Aspromet Co., 414-16.  
Bird & Son, 390-91.  
Brown Co., 573.  
Carey Co., Philip, 172.  
Certain-teed Products Corporation, 399-401.  
Ford Mfg. Co., 239.  
Garrett & Son Corp., C. S., 392.  
Hydrex Felt & Engineering Co., 44.  
Johns-Manville Co., H. W., 36.  
Patent Vulcanite Roofing Co., 406-07.  
Standard Paint Co., 393.  
Warren Chemical & Mfg. Division, 408-09.

*Acme*, 36.  
*APM*, 414-16.  
*Bermico*, 573.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*Fibreweave*, 172.  
*Giant*, 393.  
*Hercules*, 393.  
*Hydrex-Bikota*, 44.  
*Hydrex-Novento*, 44.  
*Johns-Manville*, 36.  
*Neponset*, 390-91.  
*Neponset Black*, 390-91.  
*Neponset Red Rope*, 390-91.  
*Neptune*, 36.  
*P & B*, 393.  
*Peerless*, 36.  
*Pyramid*, 239.  
*Raw Hide*, 392.  
*Universal*, 393.

### Building Papers, Asbestos.

Aspromet Co., 414-16.  
Johns-Manville Co., H. W., 36.  
*APM*, 414-16.  
*Johns-Manville*, 36.  
*Phoenix*, 36.  
*Salamander*, 36.

**Building Papers, Waterproof**, see Building Papers.

**Building Specialties, Metal**, see Specific Headings.

**Buildings, Portable**, see Houses, Portable.

**Buildings, Steel**, see Structural Steel or Iron Work.

### Bulkheads.

Foundation Co., 14.  
Raymond Concrete Pile Co., 12-13.

**Bull Pens**, see Pens, Live Stock.

**Bulletin Boards**, see Boards, Bulletin.

**Bullnose Beads**, see Beads, Corner.

### Bumpers, Door.

National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.

### Bunkers, Coal and Ore.

Brown Hoisting Machinery Co., 184-85.  
Chattanooga Boiler & Tank Co., 1094.  
Kenwood Bridge Co., 17.  
Link-Belt Co., 1310.  
Raymond Concrete Pile Co., 12-13.  
*Ferrocilave*, 184-85.

### Bunks, Jail.

Barnum Iron Works, E. T., 1487.  
Pauly Jail Building Co., 1488.

**Burglarproof Materials**, see Jail Construction and Equipment.

### Burlaps, Asphalt.

Carey Co., Philip, 398.  
*Fabricseal*, 398.

### Burlaps, Kalsomining.

Wiggin's Sons Co., H. B., 1388-89.  
*Shel-Ko-Na*, 1388-89.

### Burlaps, Lining.

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.

### Burlaps, Metallic Effect.

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.

### Burlaps, Painting.

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.  
*Shel-Ko-Na*, 1388-89.

### Burlaps, Prepared.

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.

### Burlaps, Sized.

Wiggin's Sons Co., H. B., 1388-89.

### Burlaps, Tapestry, Dyed.

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.

**Burlaps, Waterproof**, see Waterproofing and Dampproofing Felt, Cloth and Fabric.

### Burners, Acetylene.

Crane Co., William M., 1012-13.  
*Vulcan*, 1012-13.

**Burners, Garbage and Refuse**, see Incinerators.

### Burners, Gas, Illuminating.

Crane Co., William M., 1012-13.  
*Vulcan*, 1012-13.

### Burners, Gas, Industrial.

Crane Co., William M., 1012-13.  
General Fire Extinguisher Co., 1028.  
Ohio Blower Co., 472-74.  
*Grinnell Ready-heat*, 1028.  
*Swartwout*, 472-74.  
*Vulcan*, 1012-13.

### Burners, Gas and Oil, Combination.

Gilbert & Barker Mfg. Co., 1478-79.  
Ohio Blower Co., 472-74.  
*G & B*, 1478-79.  
*Swartwout*, 472-74.

### Burners, Oil.

Gilbert & Barker Mfg. Co., 1478-79.  
Ohio Blower Co., 472-74.  
*G & B*, 1478-79.  
*Swartwout*, 472-74.

### Burnishing Machines, Silver.

American Laundry Machinery Co., 1036.  
*Tahara*, 1036.

### Bushings, Conduit.

Steel City Electric Co., 1222.  
*Fullman Star*, 1222.

**Busts, Bronze**, see Statuary, Metal.

### Buttons, Push, Luminous.

Cold Light Mfg. Co., 1210.  
*Marvelite*, 1210.

### Buttons, Roofing.

Wheeling Corrugating Department, 242-43.

**Butts**, see Hinges.

**Buzzers, Electric**, see Bells, Electric.

## C

### Cabinet Work.

(See also Trim.)

"Bilt-Well" Service Bureau, 574-75.  
Curtis Service Bureau, 578-79.  
Fischer & Jirouch Co., 1405.  
Indiana Lumber & Mfg. Co., 580-81.  
Matthews Bros. Mfg. Co., 582-83.  
Morgan Co., 584-85.  
North Carolina Pine Association, 562-63.

### Cabinet Work—Continued.

Northern Hemlock and Hardwood Manufacturers' Association, 564-65.  
Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.  
Tiffany Studios, 526-27.  
*Bilt-Well*, 574-75.  
Curtis, 578-79.

### Cabinets, Battery.

Stanley & Patterson, Inc., 1246-55.

### Cabinets, Blue Print.

American Drafting Furniture Co., 1.  
Economy Drawing Table Co., 2-4.  
Hamilton Mfg. Co., 5.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
Van Dorn Iron Works Co., 1428.  
*American*, 1.  
*Economy*, 2-4.  
*Lyon*, 1420-21.  
*Van Dorn*, 1428.

**Cabinets, Clothes Drying**, see Dryers, Clothes.

**Cabinets, Electrical**, see Cabinets and Boxes, Panelboard.

**Cabinets, Filing**, see Filing Equipment.

### Cabinets, Hose.

(See also Racks and Reels, Hose.)  
Allen Mfg. Co., W. D., 1131-33.  
New York Brass Foundry Co., 1134-35.  
Simmons Co., John, 1142-43.  
*Duplex*, 1134-35.  
*Stillbech*, 1134-35.  
*20th Century*, 1142-43.  
Specifications, 1131-33.

**Cabinets, Ice Cream**, see Refrigerators and Coolers.

### Cabinets, Kitchen.

"Bilt-Well" Service Bureau, 574-75.  
Morgan Co., 584-85.  
Powell Steel Kitchen Co., 1032-33.  
*Bilt-Well*, 574-75.  
*Powell's* 1032-33.

### Cabinets, Kitchen, Built-in.

Powell Steel Kitchen Co., 1032-33.  
*Powell's* 1032-33.

**Cabinets, Laundry Supply**, see Cabinets, Linen.

### Cabinets, Linen.

Domestic Laundry Equipment Corporation, 1042-43.

### Cabinets, Medicine.

"Bilt-Well" Service Bureau, 574-75.  
Crane Co., 1084-85.  
Curtis Service Bureau, 578-79.  
Eustis Mfg. Co., J. P., 885.  
Graf Mfg. Co., Frank H., 886.  
Hess Warming & Ventilating Co., 887.  
Morgan Co., 584-85.  
Searls Mfg. Co., 888-89.  
*Bilt-Well*, 574-75.  
*Brasscrafters White*, 885.  
*Crane*, 1084-85.  
Curtis, 578-79.

### Cabinets, Metal.

(See also Furniture.)  
Allen Mfg. Co., W. D., 1131-33.  
Berger Mfg. Co., 1406-08.  
Economy Drawing Table Co., 2-4.  
Eustis Mfg. Co., 885.  
Federal Steel Fixture Co., 1412-13.  
Graf Mfg. Co., Frank H., 886.  
Hamilton Mfg. Co., 5.  
Hart & Hegeman Mfg. Co., 1214-15.  
Hess Warming & Ventilating Co., 887.  
Koken Barbers' Supply Co., 1395.  
Library Bureau, 1418-19.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
Safe-Cabinet Co., 1430.  
Searls Mfg. Co., 888-89.  
Terrell's Equipment Co., 1426-27.

**Cabinets, Metal**—Continued.

- Van Dorn Iron Works Co., 1428.  
 Watson Mfg. Co., Inc., 1429.  
*Brasscrafters White*, 885.  
*Economy*, 2-4.  
*H & H*, 1214-15.  
*Hess*, 887.  
*Koken*, 1395.  
*Library Bureau*, 1418-19.  
*Lyon*, 1420-21.  
*Safe-Cabinet*, 1430.  
*Van Dorn*, 1428.

**Cabinets, Metal, Stationery**, see Filing Equipment.**Cabinets, Oil**, see Oil Storage and Distributing Systems.**Cabinets, Panelboard**, see Cabinets and Boxes, Panelboard.**Cabinets, Plan Drawer**.

- (See also Cabinets, Blue Print.)  
 American Drafting Furniture Co., 1.  
*Economy Drawing Table Co.*, 2-4.  
 Watson Mfg. Co., Inc., 1429.  
*American*, 1.  
*Economy*, 2-4.

**Cabinets, Steel**, see Cabinets, Metal.**Cabinets, Towel**, see Bathroom Accessories.**Cabinets, Wood**.

- (See also Furniture.)  
 Curtis Service Bureau, 578-79.  
 Hamilton Mfg. Co., 5.  
 Indiana Lumber & Mfg. Co., 580-81.  
*Library Bureau*, 1418-19.  
*Curtis*, 578-79.  
*Library Bureau*, 1418-19.

**Cabinets and Boxes, Panelboard**.

- Benjamin Electric Mfg. Co., 1177.  
 Crouse-Hinds Co., 1178.  
 General Electric Co., 1153-67.  
 Hart & Hegeman Mfg. Co., 1214-15.  
 Mutual Electric & Machine Co., 1179.  
 Stanley & Patterson, Inc., 1246-55.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Western Electric Co., 1202-03.  
*Benjamin*, 1177.  
*Bull Dog*, 1179.  
*G-E*, 1153-67.  
*H & H*, 1214-15.  
*Safety Service*, 1218-21.  
*Western Electric*, 1202-03.

**Cable Connectors, Copper**.

- General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Cables, Aerial, Electric**, see Wire and Cables, Electric.**Cables, Automobile, Electric**, see Wire, Electric, Ignition.**Cables, Basket Weave**.

- Electric Cable Co., 1190-91.  
*Ecco*, 1190-91.

**Cables, Border Light**.

- American Steel & Wire Co., 1182-87.

**Cables, Braided**.

- Connecticut Telephone & Electric Co., Inc., 1240-41.  
*Connecticut*, 1240-41.

**Cables, Dredger, Electric**.

- (See also Wire and Cables, Electric.)  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Electric Cable Co., 1190-91.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Atlantic*, 1188-89.  
*Ecco*, 1190-91.  
*Habirshaw*, 1193-1201.

**Cables, Electric**, see Wire and Cables, Electric.**Cables, Intercommunicating**.

- Connecticut Telephone & Electric Co., Inc., 1240-41.  
*Connecticut*, 1240-41.

**Cables, Lead Incased**.

- (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.

**Cables, Lead Incased**—Continued.

- Atlantic Insulated Wire & Cable Co., 1188-89.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Americore*, 1182-87.  
*Atlantic*, 1188-89.  
*Dolphin*, 1188-89.  
*Habirshaw*, 1193-1201.  
*Neptune*, 1188-89.  
*Triton*, 1188-89.

**Cables, Mine and Torpedo, Electric**.

- (See also Wire and Cables, Electric.)  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Atlantic*, 1188-89.  
*Habirshaw*, 1193-1201.

**Cables, Mining Machinery, Electric**.

- (See also Wire and Cables, Electric.)  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Electric Cable Co., 1190-91.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Atlantic*, 1188-89.  
*Ecco*, 1190-91.  
*Habirshaw*, 1193-1201.

**Cables, Paper and Cambric**, see Wire, Electric, Insulated.**Cables, Park and Suburban**.

- Habirshaw Electric Cable Co., Inc., 1193-1201.

**Cables, Submarine, Electric**.

- (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Electric Cable Co., 1190-91.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
 Sprague Electric Works, 1168.  
*Atlantic*, 1188-89.  
*BM*, 1168.  
*Dolphin*, 1188-89.  
*Ecco*, 1190-91.  
*Habirshaw*, 1193-1201.  
*Neptune*, 1188-89.  
*Triton*, 1188-89.

**Cables, Switchboard**.

- American Steel & Wire Co., 1182-87.  
*Americore*, 1182-87.  
 Specifications, 1182-87.

**Cables, Theater and Stage, Electric**, see Wire and Cables, Electric.**Cables, Underground, Electric**, see Wire and Cables, Electric.**Cabs, Elevator**, see Cars, Elevator.**Caen Stone**.

- Tompkins-Kiel Marble Co., 70.  
*Dunnville*, 70.

**Caen Stone Finish**, see Paint, Interior.**Cages**.

- Badger Wire & Iron Works, 494-95.

**Cages, Animal**.

- American Fence Construction Co., 534-36.  
 Cyclone Fence Co., 546-48.  
*Cyclone*, 546-48.

**Cages, Bank**.

- (See also Screens, Bank and Counter.)  
 Badger Wire & Iron Works, 494-95.  
 Watson Mfg. Co., Inc., 1429.

**Cages, Dumbwaiter**.

- (See also Wire Work.)  
 Massa, George, 1278.  
 Sedgwick Machine Works, 1285-89.  
*Sedgwick*, 1285-89.

**Cages, Flying**, see Cages, Animal.**Cages, Prison**, see Jail Construction and Equipment.**Caisson Construction**.

- (See also Shoring and Underpinning.)  
 Foundation Co., 14.

**Calcined Magnesite**, see Magnesite.**Calf Pens**, see Pens, Live Stock.**Calking Compounds and Materials**.

- Horn Co., A. C., 43.  
 Kuhls, H. B. Fred, 1376.  
 Pecora Paint Co., 1378-79.  
 Weatherproof Calking Co., 1377.  
*Elastic*, 1376.  
*Hennen's*, 1377.  
*Pecora*, 1378-79.  
 Specifications, 1378-79.

**Calls, Carriage, Electric**.

- Universal Electric Stage Lighting Co., 1235.

**Candelabra**, see Lighting Fixtures.**Canning Machinery**.

- Brecht Co., 1050-52.

**Canopies, Metal**, see Marquises; Ornamental Metal Work.**Canopies, Prism Glass**, see Glass, Prism.**Cans, Ash**, see Receivers, Ash.**Cans, Garbage**, see Receivers, Garbage.**Cans, Ice**.

- York Mfg. Co., 1055.

**Cans, Janitors**, see Cans, Waste.**Cans, Refuse**, see Receivers, Refuse.**Cans, Waste**.

- Safety Fire Extinguisher Co., 1141.  
 Wheeling Corrugating Department, 242-43.

**Canvas**.

- Barrell Co., William L., 410.  
 Wiggin's Sons Co., H. B., 1388-89.  
*Con-Ser-Tex*, 410.  
*Ko-Na*, 1388-89.

**Canvas, Decorators**, see Canvas, Prepared, Ceiling and Wall.**Canvas, Prepared, Ceiling or Wall**.

- Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.

**Canvas, Roofing**, see Roofing, Canvas.**Canvas, Sheeting**.

- Wiggin's Sons Co., H. B., 1388-89.  
*Ko-Na*, 1388-89.

**Canvas, Waterproof**, see Waterproofing and Dampproofing Felt, Cloth and Fabric.**Canvas Floor Coverings**, see Coverings, Floor, Canvas.**Canvas and Cotton Duck**.

- Barrell Co., William L., 410.  
 Boyle & Co., Inc., John, 411.

**Capitals, Column, Ornamental**, see Ornaments: Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.**Capitals, Composition**, see Caps and Bases, Column.**Cappings, Ridge**, see Roof Trimmings.**Caps, Angle**.

- Truscon Steel Co., 217-19.  
 Wheeling Corrugating Department, 242-43.  
*Truscon*, 217-19.

**Caps, Chimney**, see Caps and Tops, Chimney.**Caps, Column**, see Caps and Bases, Column.**Caps, Moulding, Faience**.

- Mueller Mosaic Co., 293.

**Caps, Post**, see Caps and Bases, Column.**Caps, Roofing**, see Roof Trimmings, Metal.**Caps, Wainscot, Tile**, see Tile, Floor and Wall.**Caps and Bases, Column**.

- Chattanooga Roofing & Foundry Co., 499.  
 Cheney & Son, S., 297.  
 Clark Co., W. J., 252.  
 Creswell Iron Works, Samuel J., 258-59.  
 Duplex Hanger Co., 253.  
 Duvinage, Pierre, 260.  
 Hartmann-Sanders Co., 298-99.



**Caps and Bases, Column**—Continued.

Ideal Hanger Co., 256.  
 Majestic Co., 271-73.  
 Milford Iron Foundry, 300-01.  
 Price-Evans Foundry Co., 518-19.  
 Rookwood Pottery Co., 294-95.  
 St. Louis Wire & Iron Co., 523.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Union Metal Mfg. Co., 304.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Van Dorn Iron Works Co., 254-55.  
 Wagner Architectural Iron Works, A. F., 530-31.  
*Duplex*, 253.  
*Duvillage*, 260.  
*Ideal*, 256.  
*Keystone*, 305-07.  
*Lane*, 523.  
*Union*, 304.  
*Zimmerman*, 297.

**Caps and Bases, Post**, see Caps and Bases, Column.**Caps and Tops, Chimney.**

Bannon Pipe Co., P., 110.  
 Gerdes, Theodore R. N., 462.  
 Globe Ventilator Co., 463.  
 Hood Brick Co., B. Mifflin, 80-81.  
 Ketcham, O. W., 118.  
 National Mfg. Co., 621-25.  
 Royal Ventilator Co., 475.  
 Sterling Foundry Co., 274.  
*Best*, 274.  
*Globe*, 463.  
*Pottery*, 80-81.  
*Royal*, 475.

**Car Lead**, see White Lead.**Carburetors.**

Penberthy Injector Co., 882-83.  
*Penberthy*, 882-83.

**Carpet, Cork.**

Armstrong Cork Co., 1390-92.  
*Armstrong's*, 1390-92.  
 Specifications, 1390-92.

**Carpet, Wood**, see Flooring, Wood Carpet; Flooring, Parquet.**Carriage Calls**, see Calls, Carriage, Electric.**Carriers, Bucket**, see Conveyors, Bucket.**Carriers, Cable.**

Standard Store Service, Inc., 1314.

**Carriers, Cash or Merchandise.**

Allith-Prouty Co., 614-15.  
 Gifford-Wood Co., 1298.  
 Lamson Co., 1307.  
 Loudon Machinery Co., 1471-73.  
 Minnesota Manufacturers' Association, 1311.  
 Olson & Co., Samuel, 1312-13.  
 Standard Store Service, Inc., 1314.  
*Allith-Prouty*, 614-15.  
*G-W*, 1298.

**Carriers, Clothing**, see Carriers, Garment, Extension.**Carriers, Feed and Litter.**

Hunt, Helm, Ferris & Co., 644.  
 James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
*James*, 1466-70.  
*James Big Boy*, 1466-70.  
*Star*, 644.

**Carriers, Garment, Extension.**

Knappe Machine Co., John, 1399.  
*Columbia*, 1399.  
*Twentieth Century*, 1399.

**Carriers, Harness.**

James Mfg. Co., 1466-70.  
*James*, 1466-70.

**Carriers, Hay**, see Carriers, Feed and Litter.**Carriers, Manure.**

James Mfg. Co., 1466-70.  
*James*, 1466-70.

**Carriers, Merchandise**, see Carriers, Cash or Merchandise.**Carriers, Milk Can.**

James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
*James*, 1466-70.

**Carriers, Pneumatic Tube**, see Conveyors, Pneumatic Tube.**Carriers, Sweep-off and Pick-up**, see Carriers, Cash or Merchandise.**Cars, Dumbwaiter**, see Dumbwaiters.**Cars, Elevator.**

Badger Wire & Iron Works, 494-95.  
 Bigelow Wire Works, Cheney, 491.  
 Eastern Machinery Co., 1268-69.  
 Guaranty Iron & Wire Co., 667.  
 Lasar Mfg. Co., 506-07.  
 Meyers Mfg. Co., Fred J., 516.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Smyser-Royer Co., 528.  
 Steelite Co., 1293.  
 Tiffany Studios, 526-27.  
 Tyler Co., W. S., 529.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
*Steelite*, 1293.

**Carts, Hose.**

Safety Fire Extinguisher Co., 1141.

**Carved Woodwork**, see Cabinet Work.**Casement Adjusters**, see Fasteners and Adjusters, Casement or Sash.**Casement Screens**, see Screens, Door and Window.**Casements**, see Windows, Casement.**Cases, Card, Metal**, see Filing Equipment.**Cases, Museum**, see Museum Equipment.**Cases, Show**, see Showcases.**Cases, Upright**, see Filing Equipment.**Cases, Wall**, see Cabinets, Metal.**Casing, Boiler.**

Walsh & Weidner Boiler Co., 1096.

**Casing, Door, Metal**, see Doors, Fire, Metal or Metal Covered.**Casing, Pipe.**

Youngstown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

**Casing, Pipe, Underground.**

Bannon Pipe Co., P., 110.  
 Johns-Manville Co., H. W., 910.  
 Tyler Underground Heating System, 911.  
*Johns-Manville*, 910.  
*Tyler*, 911.

**Casing, Wood**, see Trim, Wood.**Castings, Aluminum.**

Harsch & Sons Co., John, 504.

**Castings, Brass, Bronze and Copper.**

Bureau Brothers, 498.  
 Harsch & Sons Co., John, 504.  
 McGann & Sons Co., T. F., 508-09.  
 Manhattan Brass Co., 513.  
 New York Brass Foundry Co., 1134-35.  
 Polachek Bronze & Iron Co., John, 522.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Williams, Inc., Jno., 532.  
*Stillbech*, 1134-35.

**Castings, German Silver.**

Polachek Bronze & Iron Co., John, 522.

**Castings, Iron.**

American 3-Way Prism Co., 821.  
 Canton Foundry & Machine Co., 270.  
 Creswell Iron Works, Samuel J., 258-59.  
 Dayton Malleable Iron Co., 246.  
 Duvillage, Pierre, 260.  
 Fiske Iron Works, J. W., 552-53.  
 McGann & Sons Co., T. F., 508-09.  
 Smith Wire and Iron Works, F. P., 524-25.

**Castings, Iron**—Continued.

Snead & Co. Iron Works, Inc., 1424-25.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Wagner Architectural Iron Works, A. F., 530-31.

**Castings, Manganese.**

Harsch & Sons Co., John, 504.

**Castings, Municipal**, see Castings, Iron.**Castings, Phosphor Bronze**, see Castings, Brass, Bronze and Copper.**Castings, Sewer**, see Castings, Iron.**Catacomb Handles**, see Handles, Catacomb.**Catchbasins**, see Basins and Covers, Catch.**Catches, Door**, see Latches and Locks.**Ceiling Beds**, see Beds, Ceiling, Invisible.**Ceiling Disks, Lighting**, see Lighting Fixtures.**Ceiling Plates**, see Plates, Floor and Ceiling.**Ceiling Sockets**, see Sockets, Ceiling.**Ceilings, Glass.**

(See also Skylights.)

American 3-Way Prism Co., 821.  
 Bruner Granitoid Co., P. M., 824-26.  
 Grauer & Co., Albert, 824-26.  
 Keppler Glass Constructors, Inc., 831-33.  
 Vitrolite Co., 870-71.  
*Bruner*, 824-26.  
*Keppler*, 831-33.  
*Vitrolite*, 870-71.

**Ceilings, Metal.**

American Sheet and Tin Plate Co., 412-13.

Berger Mfg. Co., 417.  
 Edwards Mfg. Co., 418-19.  
 Friedley-Voshardt Co., 501.  
 Mannen Co., John E., 1045.  
 Merchant & Evans Co., 420.  
 Messenger & Parks Mfg. Co., 681.  
 Milwaukee Corrugating Co., 421.  
 Penn Metal Co., 216.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
*Berger's Classic*, 417.  
*Corco*, 242-43.  
*Invisible Joint*, 421.  
*M & E Co.*, 420.  
*Penco*, 216.  
*Portsmouth Iron*, 241.  
*The Edwards*, 418-19.

**Ceilings, Reinforced Concrete**, see Concrete Construction; Concrete Reinforcement.**Ceilings, Soffit, Plaster Board**, see Boards, Plaster.**Ceilings, Suspended, Metal Lath, Data on.**

Associated Metal Lath Manufacturers, 196-201.

**Ceilings, Suspended, Plaster Board**, see Boards, Plaster.**Ceilings, Vaulted.**

Guastavino Co., R., 34-35.

**Cell Appurtenances**, see Jail Construction and Equipment.**Cellar Drainers**, see Drainers, Cellar.**Cellar Gratings**, see Gratings, Sidewalk, Area, etc.**Cells, Padded**, see Cells, Prison.**Cells, Prison.**

(See also Jail Construction and Equipment.)  
 Barnum Iron Works, E. T., 1487.  
 Mack Iron and Wire Works Co., 510-11.  
 Pauly Jail Building Co., 1488.  
 Van Dorn Iron Works Co., 1489.  
*Van Dorn*, 1489.

**Cement, Acidproof.**

Certain-teed Products Corporation, 399-401.

**Cement, Acidproof—Continued.**

Vitrifyx Co., 343.  
*Certain-teed*, 399-401.  
*Vitrifyx*, 343.

**Cement, Asbestos.**

Biegler Mfg. Co., E. N., 39.  
 Johns-Manville Co., H. W., 1076-77.  
 King & Co., J. B., 153.  
*Biegler's*, 39.  
 85% *Magnesia*, 1076-77.  
*Ever-Tite*, 39.  
*King's Windsor*, 153.  
 Nos. 302, 400 and 85% *Magnesia*, 1076-77.

**Cement, Asphalt.**

Asphalt Ready Roofing Co., 388.  
 Biegler Mfg. Co., E. N., 39.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Garrett & Son Corp., C. S., 392.  
 Johns-Manville Co., H. W., 36; 402-05.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Warren Chemical & Mfg. Division, 408-09.  
*Anchor*, 408-09.  
*Biegler's*, 39.  
*C.S.G.*, 392.  
*Certain-teed*, 399-401.  
*Eclipse*, 408-09.  
*Fixit*, 389.  
*Hudson*, 388.  
*Johns-Manville*, 36.  
*Johns-Manville Ajax*, 402-05.  
*Manco*, 398.  
*National*, 389.  
*Warren's*, 408-09.

**Cement, Bricklayers, see Mortar, Cement, Portland.****Cement, Bridge.**

Toch Brothers, 50-51.  
*R.I.W.*, 50-51.

**Cement, Caen Stone.**

Best Bros. Keene's Cement Co., 146-47.  
 Cleveland Builders Supply Co., 145.  
 Garden City Sand Co., 134-37.  
*American*, 134-37.  
*Best Bros. Fine*, 146-47.  
*Excelsior*, 145.  
 Specifications, 145.

**Cement, Elastic.**

Belknap-Moran-Allen Co., Inc., 1375.  
 Certain-teed Products Corporation, 399-401.  
 Hetzel, Estate of H. G., 443.  
 Kuhls, H. B. Fred, 1376.  
 Pecora Paint Co., 1378-79.  
*Certain-teed*, 399-401.  
*Elastic*, 1376.  
*Elastico*, 1375.  
*Hetzel's*, 443.  
*Pecora*, 1378-79.

**Cement, Expansion Joint.**

Carey Co., Philip, 398.  
 Hydrex Felt & Engineering Co., 44.  
*Elastite*, 398.  
*Hydrex*, 44.

**Cement, Finishing.**

Acme Cement Plaster Co., 140-41.  
 Vitrifyx Co., 343.  
*Acme*, 140-41.  
*Vitrifyx*, 343.

**Cement, Fire Brick.**

Clinton Metallic Paint Co., 1380.  
*Clinton*, 1380.

**Cement, Gypsum.**

King & Co., J. B., 153.  
 United States Gypsum Co., 162-68.  
*King's*, 153.  
*U. S. G.*, 162-68.

**Cement, Hydraulic.**

Connelly Co., Thomas, 130-31.  
*Utica*, 130-31.  
 Specifications, 130-31.

**Cement, Insulating.**

Armstrong Cork & Insulation Co., 349-51.

**Cement, Insulating—Continued.**

Johns-Manville Co., H. W., 1076-77.  
 85% *Magnesia*, 1076-77.  
*Nonpareil*, 349-51.

**Cement, Keene's.**

Acme Cement Plaster Co., 140-41.  
 American Gypsum Co., 142-44.  
 Best Bros. Keene's Cement Co., 146-47.  
 King & Co., J. B., 153.  
 Plymouth Gypsum Co., 154-55.  
 United States Gypsum Co., 162-68.  
*Acme*, 140-41.  
*Best Bros. Fine*, 146-47.  
*Best Bros. Quickset*, 146-47.  
*Best Bros. Regular*, 146-47.  
*Best Bros. Superfine*, 146-47.  
*J. B. White & Bros.*, 153.  
*Stucco*, 154-55.  
*U. S. G.*, 162-68.  
 Specifications, 140-41; 146-47; 162-68.

**Cement, Keene's Gypsum.**

United States Gypsum Co., 162-68.

**Cement, Linoleum.**

Armstrong Cork Co., 1390-92.  
 Bailey Co., C. C., 1393.  
 Ferdinand & Co., L. W., 1394.  
*Dreadnought*, 1393.  
*20th Century*, 1394.  
*Nonpareil*, 1390-92.  
 Specifications, 1393-94.

**Cement, Magnesite.**

American Materials Co., Inc., 133.

**Cement, Marble Finish.**

Best Bros. Keene's Cement Co., 146-47.  
*Best Bros. Superfine*, 146-47.

**Cement, Mortar.**

(See also Mortar, Cement, Portland.)  
 Carney's Cement Co., 129.  
*Carney's*, 129.  
 Specifications, 129.

**Cement, Pipe.**

Standard Paint Co., 393.  
*SPC*, 393.

**Cement, Portland.**

Alpha Portland Cement Co., 119.  
 Alsen's American Portland Cement Works, 120.  
 Atlas Portland Cement Co., 121-26.  
 De Smet Quartz Tile Co., 291.  
 Garden City Sand Co., 134-37.  
 Lehigh Portland Cement Co., 127.  
 Sandusky Cement Co., 128.  
 Vitrifyx Co., 343.  
*Alpha*, 119.  
*Alsen's*, 120.  
*Atlas*, 121-26.  
*Atlas-White*, 121-26.  
*De Smet*, 291.  
*Lehigh*, 127.  
*Medusa*, 128.  
*Stonekote*, 134-37.  
 Specifications, 121-26.

**Cement, Portland, Colored.**

De Smet Quartz Tile Co., 291.  
 Garden City Sand Co., 134-37.  
 Vitrifyx Co., 343.  
*De Smet*, 291.  
*Stonekote*, 134-37.  
 Specifications, 134-37; 291.

**Cement, Portland, Waterproof, see Cement, Waterproof.****Cement, Putty.**

Clinton Metallic Paint Co., 1380.  
*Clinton*, 1380.

**Cement, Raggle.**

Campfield Raggle Block Co., 108-09.  
*Campfield*, 108-09.

**Cement, Roofing.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Clinton Metallic Paint Co., 1380.

**Cement, Roofing—Continued.**

Garrett & Son Corp., C. S., 392.  
 General Fireproofing Co., 42.  
 Hetzel, Estate of J. G., 443.  
 Horn Co., A. C., 43.  
 Johns-Manville Co., H. W., 402-05.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Pecora Paint Co., 1378-79.  
 Standard Paint Co., 393.  
 Vortex Mfg. Co., 1374.  
 Warren Chemical & Mfg. Division, 408-09.  
 Wheeling Corrugating Department, 242-43.  
*Anchor*, 408-09.  
*Brush-on*, 1374.  
*Certain-teed*, 399-401.  
*Clinton*, 1380.  
*Elastico*, 1375.  
*Everlastic*, 43.  
*Fixit*, 389.  
*GF, No. 250R*, 42.  
*Hetzel's*, 443.  
*Hudson*, 388.  
*Imp Asbestogum*, 393.  
*Johns-Manville*, 402-05.  
*Manco*, 398.  
*National*, 389.  
*Neponset*, 390-91.  
*Pecora*, 1378-79.  
*Pyramid*, 392.  
*Union*, 389.  
*Vorco*, 1374.  
*Warren's No. 239*, 408-09.  
 Specifications, 443.

**Cement, Slate and Tile.**

Horn Co., A. C., 43.  
*Dehydratene*, 43.

**Cement, Slaters, see Cement, Roofing.****Cement, Trowel, see Cement, Mortar.****Cement, Waterproof.**

Alsen's American Portland Cement Works, 120.  
 Antakwa Co., 37.  
 Armstrong Cork Co., 1390-92.  
 Asphalt Ready Roofing Co., 388.  
 Bailey Co., C. C., 1393.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Biegler Mfg. Co., E. N., 39.  
 Certain-teed Products Corporation, 399-401.  
 Connelly Co., Thomas, 130-31.  
 De Smet Quartz Tile Co., 291.  
 Ferdinand & Co., L. W., 1394.  
 Garden City Sand Co., 134-37.  
 Garrett & Son Corp., C. S., 392.  
 General Fireproofing Co., 42.  
 Hydrolithic Waterproofing Co., Inc., 45.  
 Johns-Manville Co., H. W., 36.  
 Sandusky Cement Co., 128.  
 Standard Paint Co., 48-49.  
 Toch Brothers, 50-51.  
 Vitrifyx Co., 343.  
 Warren Chemical & Mfg. Division, 408-09.  
 Waterproofing Co., 54-55.  
*Alsen's*, 120.  
*Antakwa Heavy*, 37.  
*Biegler's*, 39.  
*Certain-teed*, 399-401.  
*Cow Bay*, 54-55.  
*De Smet*, 291.  
*Dreadnought*, 1393.  
*Eclipse*, 408-09.  
*Elastico*, 1375.  
*Ever-Tite*, 39.  
*GF No. 250*, 42.  
*Hudson*, 388.  
*Hydro-Crete*, 45.  
*Jeffery's*, 1394.  
*Johns-Manville*, 36.  
*Medusa*, 128.  
*Nonpareil*, 1390-92.  
*R. I. W.*, 50-51.  
*Stonekote*, 134-37.  
*Trimbok*, 50-51.  
*20th Century*, 1394.



**Cement, Waterproof—Continued.***Utica*, 130-31.*Vitrifyx*, 343.

Specifications, 54-55.

**Cement Coatings**, see Paint: Brick, Cement, Concrete, Plaster, Stone.**Cement Colors**, see Colors, Cement and Mortar.**Cement Floor Fillers**, see Hardeners and Densifiers, Cement and Concrete.**Cement Ornaments**, see Ornaments: Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.**Cement Plasters**, see Plasters, Cement.**Cement Waterproofing**, see Waterproofing and Dampproofing.**Cemetery Vault Doors**, see Doors, Mausoleum.**Centerings, Steel.***Uni-Form Co.*, 27-29.**Centers, Sash and Transom.**

(See also Sash Pivots.)

*Friction Pivot Co., Inc.*, 738.*Friedley-Voshardt Co.*, 501.*Grant Pulley and Hardware Co.*, 739; 760-61.*Mesker Brothers Iron Co.*, 722-25.*Michigan Engine Valve Co.*, 740.*Williams Pivot Sash Co.*, 742-45.*C. D. T.*, 738.*Grant*, 760-61.*Howarth*, 740; 760-61.*Tabor*, 739.*Williams*, 742-45.**Centers, Ventilator**, see Centers, Sash and Transom.**Cesspool Covers**, see Frames and Covers, Cesspool.**Cesspools.**

(See also Frames and Covers, Cesspool.)

*Josam Mfg. Co.*, 876-78.*Smith Wire and Iron Works, F. P.*, 524-25.**Chafing Dishes**, see Heating and Cooking Appliances.**Chain, Brass or Bronze.***American Chain Co., Inc.*, 754.**Chain, Flat Steel and Steel Wire.***American Chain Co., Inc.*, 754.*American*, 754.*Eureka*, 754.*Lock Link*, 754.*Niagara*, 754.*Tenso*, 754.**Chain, Furnace**, see Chain, Plumbers and Furnace.**Chain, Hammock.***American Chain Co., Inc.*, 754.*American*, 754.*S.R.P.*, 754.**Chain, Lamp and Lighting Fixture.***American Chain Co., Inc.*, 754.*American*, 754.**Chain, Pipe Hanging.***American Chain Co., Inc.*, 754.*Niagara*, 754.**Chain, Plumbers and Furnace.***American Chain Co., Inc.*, 754.*American*, 754.**Chain, Porch Swing**, see Chain, Hammock.**Chain, Roller.***Link-Belt Co.*, 1310.**Chain, Safety.***American Chain Co., Inc.*, 754.**Chain, Sash.***American Chain Co., Inc.*, 754.*Grant Pulley and Hardware Co.*, 760-61.*American*, 754.*Grant*, 760-61.*Hercules*, 754.**Chain, Sprocket.***American Chain Co., Inc.*, 754.**Chain, Sprocket—Continued.***Link-Belt Co.*, 1310.*Lock Link*, 754.**Chain Drives**, see Drives, Chain.**Chain Link Fences**, see Fencing, Wire or Woven Wire.**Chair Rails**, see Rails, Chair; Trim.**Chairs.***Koken Barbers' Supply Co.*, 1395.*Manufacturing Equipment & Engineering Co.*, 1422.*Marble & Shattuck Chair Co.*, 1400-01.*Mathews Mfg. Co.*, 1402-03.*Van Dorn Iron Works Co.*, 1428.*Koken*, 1395.*M & S*, 1400-01.*Van Dorn*, 1428.

Specifications, 1400-01.

**Chairs, Bar, Concrete Reinforcing.***Concrete Engineering Co.*, 24-25.*Concrete Reinforcing and Engineering Co.*, 186-87.*Symons Clamp Co.*, 183.*Tucker Co., Edward A.*, 194.*Ceco*, 24-25.*Symons*, 183.**Chairs, Barbers**, see Furniture, Barber, Chiropody and Manicure.**Chairs, Beauty Parlor**, see Furniture, Barber, Chiropody and Manicure.**Chairs, Easel, Concrete Reinforcing.***Concrete Steel Co.*, 188-89.*Havemeyer*, 188-89.**Chairs, Garden**, see Furniture, Garden and Park.**Chairs, Hair Dressers**, see Furniture, Barber, Chiropody and Manicure.**Chairs, High, Concrete Reinforcing.***Concrete Steel Co.*, 188-89.*Havemeyer*, 188-89.**Chairs, Manicurists**, see Furniture, Barber, Chiropody and Manicure.**Chairs, Metal**, see Furniture, Garden and Park; Furniture, Metal.**Chairs, Tie, Concrete Reinforcing.***Concrete Steel Co.*, 188-89.*Havemeyer*, 188-89.**Chairs, Wood**, see Furniture.**Chalk Lines.***Samson Cordage Works*, 755.*Silver Lake Co.*, 756.*Samson*, 755.**Chalk Rails**, see Rails, Chalk.**Chalk Troughs**, see Rails, Chalk.**Chandeliers**, see Lighting Fixtures.**Channels, Metal**, see Angles, Beams, Channels and Tees; Structural Steel; Lumber, Metal.**Check Desks**, see Desks, Check.**Checks and Springs, Door.***Allith-Prouty Co.*, 614-15.*Bommer Brothers*, 600-01.*Chicago Spring Butt Co.*, 602-03.*Hunt, Helm, Ferris & Co.*, 644.*McFarland-Hyde Co.*, 720-21.*Richards-Wilcox Mfg. Co.*, 630-35.*Shelby Spring Hinge Co.*, 606-07.*Allith-Prouty*, 614-15.*Bommer*, 600-01.*R-W*, 630-35.*Shelby Chief*, 606-07.**Chemical Analyses**, see Engineers, Chemical.**Chemical Engineers**, see Engineers, Chemical.**Chemical Engines**, see Engines, Fire, Chemical.**Chemical Plants.**

(See also Engineers or Contractors, Building.)

*Foundation Co.*, 14.*Schouler Cement Construction Co.*, 789.**Chemical Toilets**, see Closets, Waterless, Chemical.**Chemicals.***Brown Co.*, 573.**Chemicals, Cement.***Vitrifyx Co.*, 343.*Vitrifyx*, 343.**Chemicals, Fire Extinguishing.***Allen Mfg. Co., W. D.*, 1131-33.*Erwin Mfg. Co.*, 1140.*Firefoam*, 1140.**Chemicals, Metal Preparing and Rust-proofing.**

(See also Paint, Metal Protective.)

*American Chemical Paint Co.*, 1372.*Clinton Metallic Paint Co.*, 1380.*Deoxidine*, 1372.*Deoxylyte*, 1372.*Lithoform*, 1372.**Chemists**, see Engineers, Chemical.**Chests, Steel**, see Safes; Boxes, Safe Deposit.**Chimes.**

(See also Bells.)

*McShane Bell Foundry Co.*, 1451.*Meneely Bell Co.*, 1452.**Chimney Accessories.***Custodis Chimney Construction Co.*,*Alphons*, 89.*Heinicke, Inc., H. R.*, 90-91.**Chimney Caps**, see Caps and Tops, Chimney.**Chimney Foundations**, see Foundations, Chimney.**Chimney Linings**, see Linings, Chimney and Flue.**Chimney Repairing and Remodeling.***Custodis Chimney Construction Co.*,*Alphons*, 89.**Chimney Tops**, see Caps and Tops, Chimney.**Chimneys, Acidproof.***Custodis Chimney Construction Co.*,*Alphons*, 89.*Heinicke, Inc., H. R.*, 90-91.**Chimneys, Brick, Radial, Perforated.**

(See also Smokestacks, Steel.)

*Custodis Chimney Construction Co.*,*Alphons*, 89.*Heinicke, Inc., H. R.*, 90-91.*Kellogg Co., M. W.*, 92-93.

Specifications, 90-91; 92-93.

**Chimneys, Incinerator**, see Chimneys.**Chiropody Furniture**, see Furniture, Barber, Chiropody and Manicure.**Christmas Tree Lamps**, see Lighting, Ornamental.**Chronometers, Marine.***Thomas Clock Co., Seth*, 1446-47.**Church Bells**, see Bells: Church, Fire Alarm, Fog Signal, School, etc.**Church Fixtures.***"Bilt-Well" Service Bureau*, 574-75.*Bilt-Well*, 574-75.**Church Furnishing**, see Furnishings, Church.**Church Paneling**, see Trim, Wood.**Churches, Portable**, see Houses, Portable.**Chutes, Coal.***Canton Foundry & Machine Co.*, 270.*Chattanooga Boiler & Tank Co.*, 1094.*Chattanooga Roofing & Foundry Co.*, 499.*Columbia Iron & Wire Works Co.*, 268-69.*Covert Co., H. W.*, 280.*Donley Brothers Co.*, 247.*Holland Furnace Co.*, 956-57.*Majestic Co.*, 271-73.*National Mfg. Co.*, 621-25.*Olson & Co., Samuel*, 1312-13.*Sterling Foundry Co.*, 274.*Wagner Mfg. Co.*, 638-39.*Best*, 274.*Canton*, 270.

**Chutes, Coal**—Continued.

*Columbia*, 268-69.  
*D-B*, 247.  
*Holland*, 956-57.  
*Majestic*, 271-73.  
 Specifications, 268-69.

**Chutes, Gravity, Straight or Spiral, Merchandise.**

Haslett Spiral Chute Co., 1306.  
 Lamson Co., 1307.  
 Lowerator Co., Inc., 1308-09.  
 Minnesota Manufacturers' Association, 1311.  
 Olson & Co., Samuel, 1312-13.  
 Otis Elevator Co., 1280-84.  
 Standard Store Service, Inc., 1314.  
*Haslett*, 1306.  
*Lowerator*, 1308-09.  
*Otis*, 1280-84.

**Chutes, Ice Recording.**

Jamison Cold Storage Door Co., 1064-65.  
 Stevenson Cold Storage Door Co., 1066-69.  
*Stevenson's*, 1066-69.

**Chutes, Laundry, Glass Enameled.**

Pfaudler Co., 1035.  
 Specifications, 1035.

**Chutes, Mail.**

American Mailing Device Corporation, 1439.  
 Cutler Mail Chute Co., 1440-41.  
 Olson & Co., Samuel, 1312-13.  
*Cutler*, 1440-41.

**Chutes, Spiral**, see Chutes, Gravity, Straight or Spiral, Merchandise.**Chutes, Window**, see Chutes, Coal.**Circuit Breakers.**

General Electric Co., 1153-67.  
 Trumbull Electric Mfg. Co., 1218-21.  
*G-E*, 1153-67.

**Cistern Covers and Rings**, see Covers, Frames and Plate, Trench, Sump and Pit.**Cisterns, Lead.**

Hope & Sons, Henry, 716-17.

**Civil Engineers**, see Engineers, Civil.**Clamps, Column.**

Symons Clamp Co., 183.  
*Symons*, 183.  
 Specifications, 183.

**Clamps, Ground.**

Gillette-Vibber Co., 1211.  
*Gee-Vee*, 1211.

**Clamps, Wire Rope.**

American Steel & Wire Co., 30-33.

**Clapboards, Wood.**

Brown Co., 573.

**Clay, Fireproofing.**

Maurer & Son, Henry, 98-99.  
 National Fire Proofing Co., 100-05.  
*Natco*, 100-05.

**Clay Pipe**, see Pipe, Clay.**Clay Tile**, see Tile, Clay, Decorative or Sanitary.**Cleaners, Eraser.**

Dudfield Mfg. Co., 380.  
*Dudfield's Dustless*, 380.

**Cleaners, Flue, Vacuum.**

Spencer Turbine Cleaner Co., 1256-57.  
*Spencer*, 1256-57.

**Cleaners, Iron or Steel.**

American Chemical Paint Co., 1372.

**Cleaners, Tube, Boiler.**

Spencer Turbine Cleaner Co., 1256-57.  
*Spencer*, 1256-57.

**Cleaners, Vacuum**, see Vacuum Cleaners, Portable or Sanitary.**Cleaning and Renovating, Building Exteriors.**

Obelisk Waterproofing Co., 46.

**Clean-out Doors**, see Doors, Clean-out.**Clean-out Tees**, see Tees, Clean-out.**Clean-outs.**

Crampton-Farley Brass Co., 874.  
*Noxall*, 874.

**Clips.**

Tucker Co., Edward A., 194.

**Clips, Corner Bead**, see Beads, Corner.**Clips, Hose, Fire.**

Allen Mfg. Co., W. D., 1131-33.

**Clips, Plaster Board.**

Concrete Engineering Co., 24-25.  
 United States Gypsum Co., 162-68.  
*Ceco*, 24-25.  
*Jester Sackett*, 162-68.

**Clips, Purlin.**

Berger Mfg. Co., 202-05.

**Clips, Siding.**

Kees, Mfg. Co., F. D., 240.  
*Kees*, 240.

**Clips, Soffit.**

Berger Mfg. Co., 202-05.  
 United States Gypsum Co., 162-68.  
*Sackett*, 162-68.

**Clips, Wire Rope.**

American Steel & Wire Co., 30-33.

**Clock Systems.**

Eco Clock Co., 1442.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Howard Clock Co., E., 1444-45.  
 Newman Clock Co., 1443.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
 Time-Systems Co., 1448-49.  
*Boston*, 1442.  
*Eco*, 1442.  
*Hahl*, 1448-49.  
*Standard*, 1450.  
 Specifications, 1450.

**Clocks.**

Eco Clock Co., 1442.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Howard Clock Co., E., 1444-45.  
 Jackson Co., Wm. H., 512.  
 Newman Clock Co., 1443.  
 Safety Fire Extinguisher Co., 1141.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
 Tiffany Studios, 526-27.  
 Time-Systems Co., 1448-49.  
*Boston*, 1442.  
*Eco*, 1442.  
*Grille*, 1443.  
*Hahl*, 1448-49.  
*Standard*, 1450.

**Clocks, Astronomical**, see Clocks, Marine, Astronomical and Locomotive.**Clocks, Balcony and Screen.**

Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
 Time-Systems Co., 1448-49.  
*Hahl*, 1448-49.  
*Standard*, 1450.

**Clocks, Bracket**, see Clocks, Partition and Post.**Clocks, Calendar.**

Howard Clock Co., E., 1444-45.  
 Thomas Clock Co., Seth, 1446-47.

**Clocks, Chiming.**

Howard Clock Co., E., 1444-45.  
 Thomas Clock Co., Seth, 1446-47.

**Clocks, Electric.**

Eco Clock Co., 1442.  
 Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Eco*, 1442.  
*Boston*, 1442.  
*Standard*, 1450.

**Clocks, Hall.**

Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Standard*, 1450.

**Clocks, Marine, Astronomical and Locomotive.**

Howard Clock Co., E., 1444-45.  
 Thomas Clock Co., Seth, 1446-47.

**Clocks, Master or Secondary**, see Clock Systems.**Clocks, Partition and Post.**

Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Standard*, 1450.

**Clocks, Precision**, see Clocks, Marine, Astronomical and Locomotive.**Clocks, Program.**

(See also Clock Systems.)  
 Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
 Time-Systems Co., 1448-49.  
*Hahl*, 1448-49.  
*Standard*, 1450.

**Clocks, Regulator.**

Eco Clock Co., 1442.  
 Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Boston*, 1442.  
*Eco*, 1442.  
*Standard*, 1450.

**Clocks, Secondary**, see Clock Systems.**Clocks, Self-winding.**

Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Standard*, 1450.

**Clocks, Ships Bell**, see Clocks, Marine, Astronomical and Locomotive.**Clocks, Street or Tower.**

Howard Clock Co., E., 1444-45.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
 Time-Systems Co., 1448-49.  
*Hahl*, 1448-49.  
*Standard*, 1450.

**Clocks, Time**, see Clock Systems; Clocks, Watchmans.**Clocks, Tower**, see Clocks, Street or Tower.**Clocks, Watchmans.**

Eco Clock Co., 1442.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Howard Clock Co., E., 1444-45.  
 Newman Clock Co., 1443.  
 Safety Fire Extinguisher Co., 1141.  
 Standard Electric Time Co., 1450.  
 Thomas Clock Co., Seth, 1446-47.  
*Boston*, 1442.  
*Eco*, 1442.  
*Grille*, 1443.  
*Standard*, 1450.  
 Specifications, 1443.

**Closers, Door, Automatic.**

Dahlstrom Metallic Door Co., 649-51.  
 Edwards Mfg. Co., 664-65.  
 Hunt, Helm, Ferris & Co., 644.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinneer Mfg. Co., 670-79.  
 McFarland-Hyde Co., 720-21.  
 Ogden Co., J. Edward, 682-83.  
 Peelle Co., 684-87.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Stowell Co., 636-37.  
*Kinneer*, 670-79.  
*Ogden*, 682-83.  
*Peelle*, 684-87.  
*R-W*, 630-35.  
*Wilbern*, 636-37.

**Closers, Door, Electric.**

Richards-Wilcox Mfg. Co., 630-35.  
*R-W*, 630-35.

**Closers, Door, Elevator.**

Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
*R-W*, 630-35.



**Closet Seats.**

Allright Mfg. Co., 848-49.  
Kenney Mfg. Co., 834.  
*Allright*, 848-49.  
*Ionia*, 834.

**Closets, Chemical, see Closets, Waterless, Chemical.****Closets, Earth, Portable.**

Stephenson, C. H., 277.  
*The Stephenson*, 277.

**Closets, Earth, Underground.**

Stephenson, C. H., 277.  
*The Stephenson*, 277.

**Closets, Flush Valve.**

Kenney Mfg. Co., 834.  
Maddock's Sons Co., Thomas, 835-42.  
*Ariston*, 835-42.  
*Flushometer*, 834.  
*Ionia*, 834.  
*Maddock's*, 835-42.

**Closets, Warming, Gas, see Heating and Cooking Appliances, Gas.****Closets, Water.**

Crane Co., 1084-85.  
Dail Steel Products Co., 850.  
Kaustine Co., Inc., 851.  
Kenney Mfg. Co., 834.  
Maddock's Sons Co., Thomas, 835-42.  
Manufacturing Equipment & Engineering Co., 847.  
Monument Pottery Co., 843-46.  
Stephenson, C. H., 277.  
*Ariston*, 835-42.  
*Crane*, 1084-85.  
*Ionia*, 834.  
*Madera*, 835-42.  
*Maderno*, 835-42.  
*Madison*, 835-42.  
*The Stephenson*, 277.  
Specifications, 835-42.

**Closets, Waterless, Chemical.**

Dail Steel Products Co., 850.  
Kaustine Co., Inc., 851.  
*Wolverine*, 850.  
Specifications, 851.

**Cloth, Blackboard.**

New York Silicate Book Slate Co., 378.

**Cloth, Deck and Roof, see Roofing, Canvas.****Cloth, Slated.**

New York Silicate Book Slate Co., 378.  
*Lapilinum*, 378.

**Cloth, Tracing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Cloth, Wall Covering.**

Wiggin's Sons Co., H. B., 1388-89.  
*Ko-Na*, 1388-89.  
*Kraft Ko-Na*, 1388-89.

**Cloth, Waterproofing, see Waterproofing and Dampproofing Felt, Cloth and Fabric.****Cloth, Wire.**

Burlington Venetian Blind Co., 802-03.  
Burrowes Co., E. T., 790-92.  
Clinton Wire Cloth Co., 227-31.  
Concrete Engineering Co., 24-25.  
Darby & Sons Co., Inc., Edward, 1409.  
Higgin Mfg. Co., 794-95.  
Kane Mfg. Co., 793.  
Page Steel and Wire Co., 549-51.  
Phenix Mfg. Co., 800-01.  
Reese Mfg. Co., 796-97.  
St. Louis Wire & Iron Co., 523.  
Smith Wire and Iron Works, F. P., 524-25.  
Watson Mfg. Co., Inc., 798.  
Wright Wire Co., 234-35.  
*Ceco*, 24-25.  
*Clinton*, 227-31.  
*Copbronze*, 790-92.  
*Enameled Galvanite*, 790-92.  
*Higgin*, 794-95.  
*Phenix*, 800-01.

**Clothes Dryers, see Dryers, Clothes.****Clothes Lines.**

Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Wright Wire Co., 234-35.  
*Samson*, 755.  
*Silver Lake*, 756.

**Clothing Carriers, see Carriers, Garment, Extension.****Club Houses, Portable, see Houses, Portable.****Clutches, Friction.**

Eastern Machinery Co., 1268-69.

**Coach Lead, see White Lead.****Coal Bunkers, see Bunkers, Coal and Ore.****Coal Chutes, see Chutes, Coal.****Coal Crushers, see Crushers, Coal and Stone.****Coal Storage Systems, see Coal and Ore Handling Machinery.****Coal Tar, Refined.**

Certain-teed Products Corporation, 399-401.  
Ford Mfg. Co., 239.  
*Certain-teed*, 399-401.

**Coal Windows, see Chutes, Coal.****Coal and Ore Handling Machinery.**

(See also Elevating and Conveying Machinery.)  
Chicago Bridge & Iron Works, 1095.  
Gifford-Wood Co., 1298.  
Kenwood Bridge Co., 17.  
Link-Belt Co., 1310.  
Olson & Co., Samuel, 1312-13.  
*G-W*, 1298.  
*Peck*, 1310.

**Coalhole Covers and Rings, see Covers and Rings, Coalhole.****Coaling Stations, see Coal and Ore Handling Machinery.****Coat Racks, see Racks, Garment.****Coatings, see Paint.****Cocks, Asbestos Packed.**

Pratt & Cady Co., Inc., 1090-91.

**Cocks, Ball, see Cocks and Bibbs.****Cocks, Basin, see Cocks and Bibbs.****Cocks, Bath, see Cocks and Bibbs.****Cocks, Gage.**

Jenkins Bros, 1086-87.

**Cocks, Gas.**

Crane Co., 1084-85.  
*CC*, 1084-85.

**Cocks, Ice Water.**

Glauber Brass Mfg. Co., 856-61.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.

**Cocks, Kitchen and Pantry, see Cocks and Bibbs.****Cocks, Shower Bath, see Baths, Shower or Needle.****Cocks, Stop and Waste.**

Central Brass Mfg. Co., 852-55.  
Glauber Brass Mfg. Co., 856-61.  
*Central*, 852-55.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.  
*Quick-pressure*, 852-55.

**Cocks and Bibbs, Compression and Ground Key.**

Central Brass Mfg. Co., 852-55.  
Glauber Brass Mfg. Co., 856-61.  
Hoffmann & Billings Mfg. Co., 863.  
*Central*, 852-55.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.  
*Quick-pressure*, 852-55.

**Cocks and Bibbs, Fuller.**

Central Brass Mfg. Co., 852-55.  
Fountain Faucet Co., 862.  
Glauber Brass Mfg. Co., 856-61.  
Hoffmann & Billings Mfg. Co., 863.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.  
*Quick-pressure*, 852-55.

**Cocks and Bibbs, Quick Opening.**

Central Brass Mfg. Co., 852-55.  
Fountain Faucet Co., 862.  
Glauber Brass Mfg. Co., 856-61.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.  
*Quick-pressure*, 852-55.

**Cocks and Bibbs, Self-closing.**

Central Brass Mfg. Co., 852-55.  
Fountain Faucet Co., 862.  
Glauber Brass Mfg. Co., 856-61.  
Hoffmann & Billings Mfg. Co., 863.  
*Glauber*, 856-61.  
*Nu-rapid*, 856-61.  
*Quick-pressure*, 852-55.

**Coffee Pots and Urns, see Heating and Cooking Appliances.****Cofferdam Construction.**

Foundation Co., 14.

**Coils and Bends, Pipe.**

Automatic Refrigerating Co., 1048-49.  
National Pipe Bending Co., 902-03.  
United Lined Tube & Valve Co., 1072-73.  
Whitlock Coil Pipe Co., 904-06.

**Cold Storage Doors, see Doors, Refrigerator and Cold Storage.****Cold Storage Systems, see Ice Making and Refrigerating Machinery; Refrigerators and Coolers.****Collapsible Spirals, see Spirals, Column.****Collectors, Dust.**

(See also Arresters, Dust.)  
Gerdes, Theodore R. N., 462.

**Colonnades, see Columns, Wood.****Colors, Cement and Mortar.**

Biegler Mfg. Co., E. N., 39.  
Cabot, Inc., Samuel, 1382-85.  
Clinton Metallic Paint Co., 1380.  
De Soto Paint Mfg. Co., 1319.  
Harrison Works, 1322-25.  
Horn Co., A. C., 43.  
Pecora Paint Co., 1378-79.  
Toch Brothers, 50-51.  
*Biegler's*, 39.  
*Clinton*, 1380.  
*Horn's Watertite*, 43.  
*Memphi*, 1319.  
*Pecora*, 1378-79.  
*R. I. W.*, 50-51.  
Specifications, 1378-79; 1380.

**Colors, Fresco, see Paint, Interior.****Colors, Oil, see Paint; Varnish.****Column Brackets and Beam Supports, see Caps and Bases, Column.****Column Caps, see Caps and Bases, Column.****Column Clamps, see Clamps, Column.****Column Coverings, see Blocks, Building, Hollow, Fireproof.****Column Guards, see Guards, Column, Plate Steel.****Column Spirals, see Concrete Reinforcement, Spiral Column.****Columns, Cast Iron, see Columns, Metal.****Columns: Cement, Composition, Plaster, Staff, etc.**

Hartmann-Sanders Co., 298-99.

**Columns, Concrete, Hooped.**

Mensch, L. J., 302.  
*Emperger's*, 302.

**Columns, Concrete, Reinforced.**

Mensch, L. J., 302.  
Trusswall Mfg. Co., 303.  
*Emperger's*, 302.  
*Trusswall*, 303.

**Columns, Hardwood, Staved, see Columns, Wood.****Columns, Lock Joint, see Columns, Wood.****Columns, Marble.**

Georgia Marble Co., 68-69.

**Columns, Metal.**

Canton Foundry & Machine Co., 270.  
Chattanooga Boiler & Tank Co., 1094.

**Columns, Metal—Continued.**

Chattanooga Roofing & Foundry Co., 499.  
 Creswell Iron Works, Samuel J., 258-59.  
 Duvinage, Pierre, 260.  
 Kenwood Bridge Co., 17.  
 Milford Iron Foundry, 300-01.  
 Price-Evans Foundry Co., 518-19.  
 Union Metal Mfg. Co., 304.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Keystone, 305-07.  
 Milford, 300-01.  
 Union, 304.

**Columns, Metal, Concrete Filled.**

Milford Iron Foundry, 300-01.  
 Milford, 300-01.

**Columns, Porch, see Columns, Metal; Columns, Wood.****Columns, Spiral, Wire.**

Smith Wire and Iron Works, F. P., 524-25.

**Columns, Steel, see Columns, Metal.****Columns, Supporting, Composition.**

James Mfg. Co., 1466-70.  
 James, 1466-70.

**Columns, Veneered, see Columns, Wood.****Columns, Wood.**

"Bilt-Well" Service Bureau, 574-75.  
 Brown Co., 573.  
 Curtis Service Bureau, 578-79. ■  
 Hartmann-Sanders Co., 298-99.  
 Morgan Co., 584-85.  
 North Carolina Pine Association, 562-63.  
 Southern Pine Association, 561.  
 Bilt-Well, 574-75.  
 Curtis, 578-79.  
 Koll's, 298-99.  
 Lock-Joint, 298-99.

**Compensarcs.**

General Electric Co., 1153-67.  
 G-E, 1153-67.

**Composition Flooring, see Flooring, Composition.****Composition Ornaments, see Ornaments: Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.****Compression Work, see Cocks and Bibbs, Compression and Ground Key.****Compressors, Air.**

Beach Garage Equipment Co., Inc., T. C., 1483.  
 Bishop-Babcock-Becker Co., 914-15.  
 Goulds Mfg. Co., 1108-09.  
 Johnson Service Co., 942-46.  
 Kerr Machinery & Supply Co., 1110-11.  
 Powers Regulator Co., 947.  
 United Pump & Power Co., 1116-19.  
 American, 914-15.  
 Ideal, 1483.  
 Johnson, 942-46.  
 Kerr, 1110-11.  
 Specifications, 942-46.

**Compressors, Ammonia.**

Automatic Refrigerating Co., 1048-49.

**Compressors, Turbine.**

Spencer Turbine Cleaner Co., 1256-57.

**Computers, see Oil Storage and Distributing Systems.****Concealed Beds, see Beds, Concealed.****Concrete, Nailing, see Nailing Base or Grounds, Composition.****Concrete Anchors, see Anchors, Concrete.****Concrete Bonds.**

Horn Co., A. C., 43.  
 Standard Paint Co., 48-49.  
 Vitri-fyx Co., 343.  
 Bondsit, 43.  
 Impervite, 48-49.  
 Vitri-fyx, 343.

**Concrete Construction.**

(See also Engineers or Contractors, Concrete Construction; Concrete Reinforcement.)

Aspromet Co., 414-16.  
 Barton Spider-Web System, 20-21.  
 Brown Hoisting Machinery Co., 184-85.  
 Clinton Wire Cloth Co., 227-31.  
 Concrete Engineering Co., 24-25.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Corrugated Bar Co., 22; 190-92.  
 Kalman Co., Paul J., 193.  
 Mensch, L. J., 302.  
 National Fire Proofing Co., 100-05.  
 Raymond Concrete Pile Co., 12-13.  
 S-M-I Engineering Co., 23.  
 Schouler Cement Construction Co., 789.  
 Turner Construction Co., 15.  
 Uni-Form Co., 27-29.  
 White Fireproof Construction Co., 16.  
 APM, 414-16.  
 Clinton, 227-31.  
 Corr-Mesh, 190-92.  
 Corr-Plate, 22.  
 Ferroinclave, 184-85.  
 Krect, 186-87.  
 Natco, 100-05.  
 S-M-I, 23.  
 Specifications, 24-25; 190-92.

**Concrete Forms, see Forms, Concrete, Metal.****Concrete Hardeners, see Hardeners and Densifiers, Cement and Concrete.****Concrete Inserts, see Inserts, Concrete.****Concrete Inspection.**

Hunt & Co., Robert W., 8.

**Concrete Piles, see Piles, Concrete.****Concrete Reinforcement, Corrugated Iron or Steel Plate.**

(See also Concrete Reinforcement, Expanded Metal or Sheet Metal Mesh.)  
 Brown Hoisting Machinery Co., 184-85.  
 Concrete Engineering Co., 24-25.  
 Corrugated Bar Co., 190-92.  
 General Fireproofing Co., 210-13.  
 Stark Rolling Mill Co., 424-25.  
 Truscon Steel Co., 217-19.  
 Ferroinclave, 184-85.  
 GF, 210-13.  
 Hy-Rib, 217-19.  
 Toncan Metal, 424-25.  
 Truscon, 217-19.

**Concrete Reinforcement, Expanded Metal or Sheet Metal Mesh.**

Berger Mfg. Co., 202-05.  
 Concrete Engineering Co., 24-25.  
 Consolidated Expanded Metal Companies, 206-08.  
 Corrugated Bar Co., 190-92.  
 Edwards Mfg. Co., 418-19.  
 General Fireproofing Co., 210-13.  
 North Western Expanded Metal Co., 214-15.  
 Stark Rolling Mill Co., 424-25.  
 Truscon Steel Co., 217-19.  
 Youngstown Pressed Steel Co., 224-26.  
 Ceco, 24-25.  
 Corr-Mesh, 190-92.  
 Econo, 214-15.  
 Ferro-lithic, 202-05.  
 GF, 210-13.  
 Hy-Rib, 217-19.  
 Kahn, 217-19.  
 Keyridge, 418-19.  
 Meyer Steelform, 24-25.  
 Multiplex, 202-05.  
 Ribplex, 202-05.  
 Self-Sentering, 210-13.  
 Steelcrete, 206-08.  
 Toncan Metal, 424-25.  
 Truscon, 217-19.  
 Trussit, 210-13.  
 Specifications, 206-08.

**Concrete Reinforcement, Flat Slab.**

(See also Bars, Reinforcing, Concrete.)  
 American Steel & Wire Co., 232-33.  
 Aspromet Co., 414-16.  
 Barton Spider-Web System, 20-21.

**Concrete Reinforcement, Flat Slab—Continued.**

Clinton Wire Cloth Co., 227-31.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Consolidated Expanded Metal Companies, 206-08.  
 Corrugated Bar Co., 190-92.  
 S-M-I Engineering Co., 23.  
 Truscon Steel Co., 217-19.  
 Uni-Form Co., 27-29.  
 APM, 414-16.  
 Clinton, 227-31.  
 Krect, 186-87.  
 S-M-I, 23.  
 Steelcrete, 206-08.  
 Triangle Mesh, 232-33.  
 Truscon, 217-19.

**Concrete Reinforcement, Spiral Column.**

Concrete Engineering Co., 24-25.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Concrete Steel Co., 188-89.  
 Corrugated Bar Co., 190-92.  
 Mensch, L. J., 302.  
 Truscon Steel Co., 217-19.  
 Tucker Co., Edward A., 194.  
 Witherow Steel Co., 195.  
 Corr-Bar, 190-92.  
 Truscon, 217-19.  
 Specifications, 190-92.

**Concrete Reinforcement, Unit Frame.**

Concrete Engineering Co., 24-25.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Concrete Steel Co., 188-89.  
 Corrugated Bar Co., 190-92.  
 Truscon Steel Co., 217-19.  
 Corr-Bar, 190-92.  
 Rib-Metal, 217-19.  
 Rivet Grip, 186-87.  
 Truscon, 217-19.

**Concrete Reinforcement, Wire Mesh.**

American Steel & Wire Co., 232-33.  
 Clinton Wire Cloth Co., 227-31.  
 Concrete Engineering Co., 24-25.  
 Corrugated Bar Co., 190-92.  
 Kalman Co., Paul J., 193.  
 Truscon Steel Co., 217-19.  
 Ceco, 24-25.  
 Clinton, 227-31.  
 Triangle Mesh, 232-33.  
 Truscon, 217-19.

**Concrete Testing, see Testing, Cement, Concrete, Sand, etc.****Concrete Waterproofing, see Waterproofing and Dampproofing.****Condensers, Ammonia.**

Automatic Refrigerating Co., 1048-49.  
 York Mfg. Co., 1055.

**Condensers, Jet.**

Brecht Co., 1050-52.

**Condensers, Surface.**

Alberger Heater Co., 901.  
 Automatic Refrigerating Co., 1048-49.  
 York Mfg. Co., 1055.

**Conductor Pipe, see Pipe, Conductor.****Conductor Pipe Boots, see Pipe, Conductor.****Conductors, Armored, see Wire and Cables, Electric.****Conductors, Insulated, Rubber.**

American Steel & Wire Co., 1182-87.  
 General Electric Co., 1153-67.  
 G-E, 1153-67.

**Conductors, Lightning.**

Arrow Conductor & Mfg. Co., 94.  
 Fiske Iron Works, J. W., 552-53.  
 King Ventilating Co., 468-69.  
 Specifications, 94.

**Conduit Bushings, see Bushings, Conduit.****Conduit Fittings.**

Hart & Hegeman Mfg. Co., 1214-15.  
 Youngstown Sheet & Tube Co., 1180-81.  
 H & H, 1214-15.  
 Paiste, 1214-15.



**Conduit Locknuts**, see Locknuts, Conduit.

**Conduit Outlets**, see Boxes, Junction or Outlet.

**Conduits, Electric, Data on.**  
General Electric Co., 1153-67.  
Society for Electrical Development, Inc., 1145-52.

**Conduits, Electric, Flexible and Rigid.**  
General Electric Co., 1153-67.  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Sprague Electric Works, 1168.  
Western Electric Co., 1202-03.  
Youngstown Sheet & Tube Co., 1180-81.  
*Buckeye*, 1180-81.  
*G-E*, 1153-67.  
*Greenfielduct*, 1168.  
*Habirshaw*, 1193-1201.  
*Spragueduct*, 1168.  
*Western Electric*, 1202-03.  
Specifications, 1180-81.

**Conduits, Electric, Underground.**  
Bannon Pipe Co., P., 110.  
Youngstown Sheet & Tube Co., 1180-81.

**Conduits, Underground, Steam and Hot Water Pipe.**  
Bannon Pipe Co., P., 110.  
Campfield Raggle Block Co., 108-09.  
Johns-Manville Co., H. W., 910.  
Tyler Underground Heating System, 911.  
*Campfield*, 108-09.  
*Johns-Manville*, 910.  
*Tyler*, 911.

**Conduits, Wood, Creosoted.**  
Central Creosoting Co., 311.

**Connectors, Electric Stage.**  
Universal Electric Stage Lighting Co., 1235.

**Connectors, Outlet Box.**  
Gillette-Vibber Co., 1211.  
*Gee-Vee*, 1211.

**Connectors, Soil Pipe.**  
Josam Mfg. Co., 876-78.

**Conservatories**, see Greenhouses and Conservatories.

**Consulting Engineers**, see Engineers, Consulting.

**Contractors, Brick Construction.**  
Ketcham, O. W., 118.

**Contractors, Building Construction**, see Engineers or Contractors, Building.

**Contractors, Calking.**  
Weatherproof Calking Co., 1377.

**Contractors, Cold Storage Insulation.**  
Armstrong Cork & Insulation Co., 349-51.  
Banner Rock Products Co., 352.  
Johns-Manville Co., H. W., 1076-77.  
*Johns-Manville*, 1076-77.

**Contractors, Concrete Construction**, see Concrete Construction; Engineers or Contractors, Concrete Construction.

**Contractors, Cut Stone.**  
Georgia Marble Co., 68-69.  
Matthew Brothers Co., 66.  
Ridgway & Son, B., 296.  
Rockport Granite Co., 60-61.  
Webb Pink Granite Co., 64.  
Woodbury Granite Co., 65.

**Contractors, Electrical.**  
General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.

**Contractors, Fireproof Construction.**  
(See also Engineers or Contractors, Concrete Construction.)  
Barton Spider-Web System, 20-21.  
National Fire Proofing Co., 100-05.  
Turner Construction Co., 15.  
United States Gypsum Co., 162-68.

**Contractors, Flooring, Composition.**  
General Kompolite Co., 330.  
Marbleloid Co., 332-33.  
Mas-Oleum Floor Mfg. Co., 334.  
Muller & Co., Franklyn R., 335.

**Contractors, Flooring, Composition—Continued.**  
National Kellastone Co., 138-39.  
Special Service Flooring Corporation, 336.

**Contractors, Flooring, Cork.**  
Kennedy, Inc., David E., 326.

**Contractors, Flooring, Wood.**  
(See also Flooring, Wood.)  
Carter Lumber Co., C. J., 314.  
Jennison-Wright Co., 312-13.  
Kennedy, Inc., David E., 326.

**Contractors, General**, see Engineers or Contractors, Building.

**Contractors, Granite**, see Contractors, Cut Stone.

**Contractors, Greenhouses and Conservatories**, see Greenhouses and Conservatories.

**Contractors, Insulation, Cold Storage.**  
(See also Insulation, Cold Storage and Refrigerating.)  
Armstrong Cork & Insulation Co., 349-51.

**Contractors, Kitchen Equipment.**  
Bramhall, Deane Co., 1010-11.

**Contractors, Lightning Conductor.**  
Arrow Conductor & Mfg. Co., 94.

**Contractors, Marble, Interior.**  
Davis Marble Co., 283.

**Contractors, Piling.**  
MacArthur Concrete Pile & Foundation Co., 10-11.  
Raymond Concrete Pile Co., 12-13.

**Contractors, Roofing.**  
(See also Roofing.)  
American Cement Tile Mfg. Co., 432-33.  
Carey Co., Philip, 398.  
Clason Architectural Metal Works, 358.  
United States Gypsum Co., 438-39.

**Contractors, Sewage Disposal.**  
Aten Sewage Disposal Co., 879.  
New York Sewage Disposal Co., 881.

**Contractors, Sheet Metal.**  
(See also Sheet Metal Work.)  
Clason Architectural Metal Works, 358.  
Consolidated Sheet Metal Works, 712-13.  
Mannen Co., John E., 1045.  
Riester & Thesmacher Co., 658-59.  
Wagner's Sons Co., Inc., J. F., 732-33.

**Contractors, Shipyard Installation.**  
Foundation Co., 14.

**Contractors, Structural Steel**, see Structural Steel or Iron Work.

**Contractors, Swimming Pool**, see Engineers or Contractors, Swimming Pool.

**Contractors, Waterproofing and Damp-proofing**, see Engineers or Contractors, Waterproofing and Dampproofing.

**Controllers, Conveyor.**  
Cutler-Hammer Mfg. Co., 1208-09.  
*C-H*, 1208-09.

**Controllers, Elevator.**  
A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Cutler-Hammer Mfg. Co., 1208-09.  
Eastern Machinery Co., 1268-69.  
Kaestner & Hecht Co., 1276-77.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Payne Co., F. S., 1290-91.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*C-H*, 1208-09.  
*K. & H.*, 1276-77.  
*Otis*, 1280-84.  
*Payne*, 1290-91.

**Controllers, Elevator Door**, see Operators, Door or Gate, Elevator.

**Controllers, Motor.**  
Cutler-Hammer Mfg. Co., 1208-09.  
Sprague Electric Works, 1168.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*C-H*, 1208-09.

**Controllers, Shower Bath**, see Mixers, Shower Bath.

**Controllers, Temperature**, see Regulators, Temperature.

**Controllers, Vacuum and Cut-off, Automatic.**  
Bishop-Babcock-Becker Co., 914-15.

**Controllers, Vacuum and Electric Switch, Automatic.**  
Bishop-Babcock-Becker Co., 914-15.

**Controlling Devices, Refrigerating, Automatic**, see Safety Devices, Refrigerating, Automatic.

**Converters, Rotary.**  
General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.

**Conveying Machinery**, see Elevating and Conveying Machinery.

**Conveying Systems**, see Conveyors; Elevating and Conveying Machinery.

**Conveyors, Apron, Steel or Wood.**  
Olson & Co., Samuel, 1312-13.

**Conveyors, Automatic**, see Elevating and Conveying Machinery.

**Conveyors, Bakery.**  
Haslett Spiral Chute Co., 1306.  
Olson & Co., Samuel, 1312-13.

**Conveyors, Belt, Chain and Woven Wire.**  
Cyclone Fence Co., 546-48.  
Gifford-Wood Co., 1298.  
Haslett Spiral Chute Co., 1306.  
Lamson Co., 1307.  
Link-Belt Co., 1310.  
Minnesota Manufacturers' Association, 1311.  
Olson & Co., Samuel, 1312-13.  
Standard Store Service, Inc., 1314.  
*Cyclone*, 546-48.  
*G-W*, 1298.

**Conveyors, Bucket.**  
Brecht Co., 1050-52.  
Gifford-Wood Co., 1298.  
Link-Belt Co., 1310.  
Olson & Co., Samuel, 1312-13.  
*G-W*, 1298.  
*Peck*, 1310.

**Conveyors, Coal and Ash**, see Elevating and Conveying Machinery.

**Conveyors, Film.**  
Chelsea Elevator Co., 1265-67.  
*Chelsea*, 1265-67.

**Conveyors, Gravity.**  
(See also Chutes, Gravity, Straight or Spiral, Merchandise.)  
Gifford-Wood Co., 1298.  
Haslett Spiral Chute Co., 1306.  
Lamson Co., 1307.  
Lowerator Co., Inc., 1308-09.  
Minnesota Manufacturers' Association, 1311.  
Olson & Co., Samuel, 1312-13.  
Otis Elevator Co., 1280-84.  
Standard Store Service, Inc., 1314.  
*G-W*, 1298.  
*Haslett*, 1306.  
*Lowerator*, 1308-09.  
*Otis*, 1280-84.

**Conveyors, Merchandise**, see Carriers, Cash or Merchandise.

**Conveyors, Office and Store Service**, see Carriers, Cash or Merchandise.

**Conveyors, Overhead**, see Telferage Systems; Elevating and Conveying Machinery.

**Conveyors, Package**, see Carriers, Cash or Merchandise.

**Conveyors, Packing House**, see Packing House Equipment.

**Conveyors, Pneumatic Tube.**  
Lamson Co., 1307.  
Standard Store Service, Inc., 1314.

**Conveyors, Spiral**, see Conveyors, Gravity; Chutes, Gravity, Straight or Spiral, Merchandise.

**Conveyors, Tray.**

Lamson Co., 1307.  
Lowerator Co., Inc., 1308-09.  
Olson & Co., Samuel, 1312-13.  
Standard Store Service, Inc., 1314.  
Lowerator, 1308-09.

**Cookers, Starch.**

Domestic Laundry Equipment Corporation, 1042-43.

**Cooking Appliances**, see Heating and Cooking Appliances.

**Coolers, Air.**

(See also Air Conditioning Apparatus.)  
Alberger Heater Co., 901.

**Coolers, Brine.**

Carbondale Machine Co., 1053.  
York Mfg. Co., 1055.

**Coolers, Oil.**

Alberger Heater Co., 901.

**Coolers, Refrigerators**, see Refrigerators and Coolers.

**Coolers, Water**, see Refrigerators and Coolers.

**Coolers, Wort.**

Alberger Heater Co., 901.

**Coolers and Cooling Rooms**, see Refrigerators and Coolers; Ice Making and Refrigerating Machinery.

**Cooling Air Apparatus**, see Air Conditioning Apparatus.

**Coping, Chimney**, see Caps and Tops, Chimney.

**Coping, Wall.**

Bannon Pipe Co., P., 110.  
Campfield Raggle Block Co., 108-09.  
Kushequa Ceramic Co., 436-37.  
Sewer Pipe Manufacturers Association, 111.  
Sterling Foundry Co., 274.  
Wheeling Corrugating Department, 242-43.  
Campfield, 108-09.

**Coppersmiths.**

Badger & Sons Co., E. B., 892-93.  
Merchant & Evans Co., 420.  
Smith Wire and Iron Works, F. P., 524-25.

**Cord, Arc Lamp**, see Cord, Trolley, Bell and Arc Lamp.

**Cord, Braided.**

Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.

**Cord, Curtain and Shade.**

American Steel & Wire Co., 30-33.  
Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.

**Cord, Electric.**

American Steel & Wire Co., 1182-87.  
Atlantic Insulated Wire & Cable Co., 1188-89.  
Boston Insulated Wire & Cable Co., 1192.  
Electric Cable Co., 1190-91.  
Habitshaw Electric Cable Co., Inc., 1193-1201.  
Sprague Electric Works, 1168.  
Americore, 1182-87.  
Atlantic, 1188-89.  
Canvasite, 1182-87.  
Ecco, 1190-91.  
Habitshaw, 1193-1201.  
Specifications, 1182-87.

**Cord, Electric, Reinforced, Portable.**

American Steel & Wire Co., 1182-87.

**Cord, Electric, Special.**

Boston Insulated Wire & Cable Co., 1192.

**Cord, Electric, Telephone and Switchboard.**

Sprague Electric Works, 1168.

**Cord, Picture, Wire.**

Wright Wire Co., 234-35.

**Cord, Sash.**

American Steel & Wire Co., 30-33.  
Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.  
Spot Cord, 755.  
Specifications, 755.

**Cord, Shade**, see Cord, Curtain and Shade.

**Cord, Trolley, Bell and Arc Lamp.**

Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.

**Cord, Ventilator and Signal.**

Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.

**Core Ovens**, see Ovens, Core.

**Cores, Steel, Concrete.**

Berger Mfg. Co., 202-05.  
General Fireproofing Co., 210-13.  
Mensch, L. J., 302.  
Berger's, 202-05.  
GF, 210-13.

**Cork, Granulated and Regranulated.**

Armstrong Cork & Insulation Co., 349-51.  
Banner Rock Products Co., 352.  
United Cork Companies, 356.  
Crescent, 356.  
Nonpareil, 349-51.  
Rock Cork, 352.  
Star, 356.

**Cork Brick**, see Brick, Cork.

**Cork Carpet**, see Carpet, Cork.

**Cork Flooring Tile**, see Tile, Floor and Wall, Cork.

**Cork Tile**, see Tile, Floor and Wall, Cork.

**Corkboard.**

Armstrong Cork & Insulation Co., 349-51.  
Stone, Junius H., 353.  
United Cork Companies, 356.  
Acme, 349-51.  
Crescent, 356.  
Eureka, 349-51.  
Nonpareil, 349-51.  
Non-Plus Ultra, 353.  
Star, 356.

**Corkboard, Compressed or Waterproof**, see Corkboard.

**Corkboard, Waterproof.**

**Corner Beads**, see Beads, Corner.

**Corner Post Bars**, see Bars, Post, Corner.

**Corners, Base.**

Morgan Co., 584-85.

**Corners, Building, Metal.**

Kees Mfg. Co., F. D., 240.  
Milwaukee Corrugating Co., 209.  
Wheeling Corrugating Department, 242-43.  
Kees, 240.

**Cornices, Metal.**

American Brass Co., 492-93.  
Chattanooga Roofing & Foundry Co., 499.  
Consolidated Sheet Metal Works, 712-13.  
Edwards Mfg. Co., 418-19.  
Friedley-Voshardt Co., 501.  
Mannen Co., John E., 1045.  
Messenger & Parks Mfg. Co., 681.  
Newark Cornice and Skylight Works, 726-27.  
Riester & Thesmacher Co., 658-59.  
Stark Rolling Mill Co., 424-25.  
Whitaker-Glessner Co., 241.  
Portsmouth Iron, 241.  
Toncan Metal, 424-25.

**Cornices, Wood.**

North Carolina Pine Association, 562-63.

**Corrodors, Lead.**

Wadsworth, Howland & Co., Inc., 1338-39.  
Bay State, 1338-39.

**Cottages, Portable**, see Houses, Portable.

**Cotter Pins, Self-spreading.**

American Chain Co., Inc. 754.  
Campbell Hammerlock, 754.

**Cotton Duck**, see Canvas and Cotton Duck.

**Counter Cases**, see Showcases.

**Counter Railings**, see Railings, Bank and Office.

**Counter Screens**, see Screens, Bank and Counter.

**Counter Tops, Cork**, see Table Tops, Cork.

**Counters, Bank.**

Rookwood Pottery Co., 294-95.  
Watson Mfg. Co., Inc., 1429.

**Counters, Glass.**

Vitrolite Co., 870-71.  
Vitrolite, 870-71.

**Counters, Metal.**

Van Dorn Iron Works Co., 1428.  
Van Dorn, 1428.

**Couplings, Hose.**

Allen Mfg. Co., W. D., 1131-33.  
Clark Co., W. J., 252.

**Couplings, Lavatory**, see Plumbing Brass Goods.

**Couplings, Pipe.**

United Lined Tube & Valve Co., 1072-73.  
United, 1072-73.

**Cove Base.**

Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.  
Cheney & Co., Inc., 329.  
De Smet Quartz Tile Co., 291.  
Kennedy, Inc., David E., 326; 327.  
Kushequa Ceramic Co., 436-37.  
Marbleloid Co., 332-33.  
Muller & Co., Franklyn R., 335.  
New York Belting & Packing Co., 322.  
Rookwood Pottery Co., 294-95.  
Special Service Flooring Corporation, 336.  
United Cork Flooring Co., 328.  
Be-ver, 324.  
Crescent, 328.  
De Smet, 291.  
Everlastic, 327.  
Linotile, 323.  
Marbleloid, 332-33.  
Nonpareil, 326.  
Troegerlith, 329.  
Unico, 328.

**Cove Base, Rubber.**

New York Belting & Packing Co., 322.

**Cove Base, Sanitary.**

(See also Tile, Floor and Wall.)  
Armstrong Cork & Insulation Co., 323.  
Associated Tile Manufacturers, 284-87.  
Beaver Tile & Specialty Co., Inc., 324.  
Cheney & Co., Inc., 329.  
De Smet Quartz Tile Co., 291.  
Kennedy, Inc., David E., 326; 327.  
Kushequa Ceramic Co., 436-37.  
Marbleloid Co., 332-33.  
Muller & Co., Franklyn R., 335.  
New York Belting & Packing Co., 322.  
Rookwood Pottery Co., 294-95.  
Special Service Flooring Corporation, 336.  
United Cork Flooring Co., 328.  
United States Roofing Tile Co., 440-41.  
Be-ver, 324.  
Crescent, 328.  
De Smet, 291.  
Everlastic, 327.  
Linotile, 323.  
Marbleloid, 332-33.  
Nonpareil, 326.  
Special Service, 336.



**Cove Base, Sanitary**—Continued.

*Troegerlith*, 329.  
*Unico*, 328.

**Cove Base, Slate.**

Vermont Structural Slate Co., 373.  
Specifications, 373.

**Cove Base, Tile**, see **Tile, Floor and Wall.****Covering Compounds**, see **Waterproofing and Dampproofing Paint and Compounds.****Coverings, Beam and Girder, Hollow Tile**, see **Blocks, Building, Hollow, Fireproof.****Coverings, Column, Hollow Tile**, see **Blocks, Building, Hollow, Fireproof.****Coverings, Cork.**

Armstrong Cork Co., 1390-92.  
Armstrong Cork & Insulation Co., 349-51.  
Beaver Tile & Specialty Co., Inc., 324.  
*Be-ver*, 324.

**Coverings, Floor, Canvas.**

Barrell Co., William L., 410.  
Boyle & Co., Inc., John, 411.  
Hydrex Felt & Engineering Co., 44.  
*Bayonne*, 411.  
*Con-Ser-Tex*, 410.  
*Hydrex*, 44.

**Coverings, Floor, Fiber Mastic**, see **Linoleum, Mastic.****Coverings, Pipe, Cold Water**, see **Coverings, Pipe and Boiler, Steam or Hot Water.****Coverings, Pipe, Underground.**

Armstrong Cork & Insulation Co., 349-51.  
*Nonpareil*, 349-51.

**Coverings, Pipe and Boiler, Steam or Hot Water.**

Armstrong Cork & Insulation Co., 349-51.  
Carey Co., Philip, 398.  
Johns-Manville Co., H. W., 1076-77.  
Magnesia Association of America, 1078-79.  
*Anti-Sweat*, 1076-77.  
*Asbestocel*, 1076-77.  
*Asbesto-Sponge*, 1076-77.  
*Asbesto-Sponge Felted*, 1076-77.  
*Carey*, 398.  
*85% Magnesia*, 1076-77.  
*Johns-Manville*, 1076-77.  
*Nonpareil*, 349-51.  
*Thermo*, 1076-77.  
*Vitribestos*, 1076-77.  
*Vitro*, 1076-77.  
*Zero*, 1076-77.  
Specifications, 1078-79.

**Coverings, Pipe and Tank, Refrigerating.**

Armstrong Cork & Insulation Co., 349-51.  
*Nonpareil*, 349-51.

**Coverings, Wall.**

Edwards Mfg. Co., 418-19.  
Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.  
*Ko-Na*, 1388-89.  
Specifications, 1388-89.

**Covers, Ash Lift**, see **Covers and Rings, Coalhole.****Covers, Awning.**

Pittsburgh Plate Glass Co., 484-85.

**Covers, Coalhole**, see **Covers and Rings, Coalhole.****Covers, Frames and Plates, Trench, Sump and Pit.**

American Abrasive Metals Co., 346.  
Carpenter & Co., Inc., Davis, 827.  
Creswell Iron Works, Samuel J., 258-59.  
Duvinaige, Pierre, 260.  
Fiske Iron Works, J. W., 552-53.  
Majestic Co., 271-73.  
Mott Iron Works, J. L., 514-15.  
Snead & Co. Iron Works, Inc., 1424-25.

**Covers, Frames and Plates, Trench, Sump and Pit**—Continued.

Sterling Foundry Co., 274.  
*Feralun*, 346.

**Covers, Manhole**, see **Covers and Rings, Manhole.****Covers, Meter, Water.**

Canton Foundry & Machine Co., 270.

**Covers, Valve.**

Canton Foundry & Machine Co., 270.

**Covers and Rings, Cistern**, see **Covers, Frames and Plates, Trench, Sump and Pit.****Covers and Rings, Coalhole.**

American Abrasive Metals Co., 346.  
American Mason Safety Tread Co., 344-45.  
American 3-Way Prism Co., 821.  
Brooklyn Vault Light Co., 822-23.  
Bruner Granitoid Co., P. M., 824-26.  
Canton Foundry & Machine Co., 270.  
Carpenter & Co., Inc., Davis, 827.  
Columbia Iron & Wire Works Co., 268-69.  
Creswell Iron Works, Samuel J., 258-59.  
Grauer & Co., Albert, 824-26.  
Keppler Glass Constructions, Inc., 831-33.  
Richards & Kelly Mfg. Co., 830.  
Smith Wire and Iron Works, F. P., 524-25.  
Wagner Architectural Iron Works, A. F., 530-31.  
*Bruner*, 824-26.  
*Columbia*, 268-69.  
*Duplex*, 822-23.  
*Feralun*, 346.  
*Keppler*, 831-33.  
*Mason*, 344-45.

**Covers and Rings, Manhole.**

Aten Sewage Disposal Co., 879.  
Canton Foundry & Machine Co., 270.  
Creswell Iron Works, Samuel J., 258-59.  
Fiske Iron Works, J. W., 552-53.  
Mott Iron Works, J. L., 514-15.

**Cow Pens**, see **Pens, Live Stock.****Cow Stalls**, see **Stalls, Horse and Cattle.****Cowls**, see **Ventilators, Roof.****Crabs, Elevator**, see **Elevators, Freight or Passenger, Power.****Cranes, Locomotive.**

Link-Belt Co., 1310.

**Cranes, Monorail.**

Richards-Wilcox Mfg. Co., 630-35.  
Sprague Electric Works, 1168.  
*R-W*, 630-35.

**Cranes, Swinging, Barn or Stable.**

James Mfg. Co., 1466-70.  
*James*, 1466-70.

**Crematory Retorts.**

Wisconsin Iron & Wire Works, 533.

**Crematory Urns**, see **Urns, Cinerary, Bronze or Metal.****Crestings, Metal**, see **Roof Trimmings, Metal.****Crosses, Altar**, see **Furnishings, Church.****Crowbars.**

Simmons Co., John, 1142-43.

**Crucibles.**

Grueby Faience & Tile Co., 292.  
*Grueby*, 292.

**Crushers, Coal and Stone.**

Link-Belt Co., 1310.

**Crystal Ceilings**, see **Ceilings, Glass.****Crystal Domes**, see **Domes, Crystal.****Crystallizers, Sugar.**

Walsh & Weidner Boiler Co., 1096.

**Culinary Utensils**, see **Kitchen Equipment.****Culverts, Concrete.**

Brown Hoisting Machinery Co., 184-85.  
*Ferroinclave*, 184-85.

**Culverts, Metal.**

Edwards Mfg. Co., 418-19.

**Culverts, Metal**—Continued.

Penn Metal Co., 216.  
Stark Rolling Mill Co., 424-25.  
*Penco*, 216.  
*Toncan Metal*, 424-25.

**Cupboards, Metal.**

(See also **Furniture, Metal**.)

Berger Mfg. Co., 1406-08.  
Federal Steel Fixture Co., 1412-13.  
Terrell's Equipment Co., 1426-27.  
Van Dorn Iron Works Co., 1428.  
Watson Mfg. Co., Inc., 1429.  
*Terrell's* 1426-27.  
*Van Dorn*, 1428.

**Cupboards, Wood.**

(See also **Furniture**.)

"Bilt-Well" Service Bureau, 574-75.  
Curtis Service Bureau, 578-79.  
*Bilt-Well*, 574-75.  
*Curtis*, 578-79.

**Cupolas**, see **Ventilators.****Cups, Grease and Oil.**

Penberthy Injector Co., 882-83.  
*Penberthy*, 882-83.

**Cups, Unbreakable, Porcelain, Vault Light.**

Concrete Specialties Mfg. Co., 828.

**Cups, Watering.**

James Mfg. Co., 1466-70.  
*James*, 1466-70.

**Current Taps.**

Hart & Hegeman Mfg. Co., 1214-15.  
*H & H*, 1214-15.  
*Paiste*, 1214-15.

**Cushions, Vault Light.**

Flexner-Taylor Co., 320.  
*F & T*, 320.

**Cuspidors.**

Manhattan Brass Co., 513.

**Cut-offs, Rain Water.**

(See also **Pipe, Conductor**.)  
Milwaukee Corrugating Co., 209.  
Wheeling Corrugating Department, 242-43.  
*Kuehn's Korrekt Kutoffs*, 209.

**Cut-outs, Electric.**

Bryant Electric Co., 1207.  
Crouse-Hinds Co., 1178.  
Hart & Hegeman Mfg. Co., 1214-15.  
Trumbull Electric Mfg. Co., 1218-21.  
*Bryant*, 1207.  
*H & H*, 1214-15.  
*Paiste*, 1214-15.

**Cutters, Bar.**

Concrete Steel Co., 188-89.  
*Havemeyer*, 188-89.

**Cylinders, Pump, Deep Well**, see **Pumps, Deep Well.**

## D

**Dairy Equipment**, see **Barn Equipment.****Dampcourse.**

Barrett Co., 394-97.  
Biegler Mfg. Co., E. N., 39.  
Hydrex Felt & Engineering Co., 44.  
Patent Vulcanite Roofing Co., 406-07.  
*Biegler's*, 39.  
*Hydrex*, 44.

**Dampers, Dome**, see **Dampers, Fireplace.****Dampers, Fireplace.**

Colonial Fireplace Co., 279.  
Covert Co., H. W., 280.  
Donley Brothers Co., 247.  
Peerless Mfg. Co., Inc., 281.  
Stoer Mfg. & Engine Co., 282.  
*Colonial*, 279.  
*Covert*, 280.  
*D-B*, 247.  
*Peerless*, 281.  
Specifications, 280.

**Dampers, Fuse Link**, see **Ventilators, Roof.****Dampers, Heating and Ventilating.**

Best Register Co., 988-89.  
Edwards Mfg. Co., 664-65.

**Dampers, Heating and Ventilating—**

Continued.

Powers Regulator Co., 947.

*Best*, 988-89.**Dampers, Mixing**, see Dampers, Heating and Ventilating.**Dampers, Pipe.**

Cox Stove Co., Abram, 960-64.

*Novelty*, 960-64.**Dampers, Ratchet**, see Dampers, Fireplace.**Dampers, Slide, Double**, see Dampers, Heating and Ventilating.**Dampproofing**, see Engineers or Contractors, Waterproofing and Dampproofing; Waterproofing and Dampproofing.**Dampproofing Cork.**

United Cork Companies, 356.

**Dams.**

Foundation Co., 14.

**Data, Beltways.**

Associated Metal Lath Manufacturers, 196-201.

**Data, Ceilings, Suspended, Metal Lath.**

Associated Metal Lath Manufacturers, 196-201.

**Data, Conduits.**

Society for Electrical Development, Inc., 1145-52.

**Data, Metal Lath.**

Associated Metal Lath Manufacturers, 196-201.

**Data, Telephone Layouts.**

American Telephone and Telegraph Co., 1237.

**Deck Cables**, see Wire and Cables, Electric.**Deck Cloth**, see Roofing, Canvas.**Decking**, see Flooring.**Decoration, Interior.**

Tiffany Studios, 526-27.

**Deep Well Heads**, see Pumps, Deep Well.**Deformed Bars**, see Bars, Reinforcing Concrete.**Dehumidifying Apparatus**, see Air Conditioning Apparatus.**Desk Tops, Cork.**

Kennedy, Inc., David E., 326.

United Cork Flooring Co., 328.

*Crescent*, 328.*Nonpareil*, 326.*Unico*, 328.**Desks, Charging.**

Library Bureau, 1418-19.

*Library Bureau*, 1418-19.**Desks, Check.**

(See also Bank and Office Fixtures; Furniture.)

Gorham Co Architectural Bronze, 502-03.

Dahlstrom Metallic Door Co., 649-51.

Jackson Co., Wm. H., 512.

McGann &amp; Sons Co., T. F., 508-09.

Manhattan Brass Co., 513.

Penn Brass &amp; Bronze Works, 517.

Polachek Bronze &amp; Iron Co., John, 522.

Reed &amp; Barton, 520-21.

Tiffany Studios, 526-27.

**Desks, Metal.**

(See also Furniture.)

Federal Steel Fixture Co., 1412-13.

General Fireproofing Co., 1414.

Gorham Co Architectural Bronze, 502-03.

Jackson Co., Wm. H., 512.

Library Bureau, 1418-19.

Lyon Metallic Mfg. Co., 1420-21.

McGann &amp; Sons Co., T. F., 508-09.

Polachek Bronze &amp; Iron Co., John, 522.

Reed &amp; Barton, 520-21.

Van Dorn Iron Works Co., 1428.

Watson Mfg. Co., Inc., 1429.

Wisconsin Iron &amp; Wire Works, 533.

*GF Allsteel*, 1414.*Library Bureau*, 1418-19.*Lyon*, 1420-21.*Van Dorn*, 1428.**Detectors, Fire.**

General Fire Extinguisher Co., 1136-39.

New York Brass Foundry Co., 1134-35.

*Grinnell*, 1136-39.*Monitor*, 1134-35.*Stillbeck*, 1134-35.**Detectors, Ground, Electric.**

General Electric Co., 1153-67.

*G-E*, 1153-67.**Dials, Sun**, see Sundials; Furniture, Garden and Park.**Diffusers, Light**, see Lighting Fixtures.**Directories, Building.**

(See also Boards, Bulletin; Boards, Directory.)

Building Directories, Bulletin &amp; Sign Co., 1434.

Tablet &amp; Ticket Co., 1436-37.

United States Changeable Sign Co., 1435.

Van Kannel Revolving Door Co., 1438.

*Greeley*, 1434.*Van Kannel*, 1438.*Willson's* 1436-37.**Directories, Changeable Letter**, see Directories, Building.**Directory Boards**, see Boards, Directory.**Disappearing Beds**, see Beds, Concealed.**Dishwashers**, see Washers, Dish.**Disinfecting Plants.**

American Laundry Machinery Co., 1036.

*American*, 1036.**Disintegrators.**

Brecht Co., 1050-52.

**Disk Filters**, see Filters, Water, Gravity or Pressure.**Disks, Ceiling, Lighting**, see Lighting Fixtures.**Display Case Refrigerators**, see Refrigerators and Coolers.**Distillate Chilling Machines**, see Ice Making and Refrigerating Machinery.**Distributing Boards**, see Panelboards; Switchboards.**Docks, Concrete**, see Concrete Construction.**Dome Dampers**, see Dampers, Fireplace.**Domes.**

Duvinage, Pierre, 260.

Guastavino Co., R., 34-35.

Tiffany Studios, 526-27.

**Domes, Crystal.**

Keppler Glass Constructions, Inc., 831-33.

*Keppler*, 831-33.**Domes, Lighting**, see Glassware, Illuminating; Lighting Fixtures.**Domes, Revolving, Astronomical.**

Duvinage, Pierre, 260.

**Door Bolts**, see Bolts, Door.**Door Bumpers**, see Bumpers, Door.**Door Casing**, see Casing, Door, Metal.**Door Catches**, see Latches and Locks.**Door Checks**, see Checks and Springs, Door.**Door Closers**, see Closers, Door, Automatic.**Door Frames**, see Doors; Trim; Windows.**Door Guides**, see Guides, Door and Floor.**Door Hangers**, see Hangers, Door.**Door Hinges**, see Hinges.**Door Holders**, see Holders, Door; Checks and Springs, Door.**Door Knockers**, see Knockers, Door.**Door Openers, Electric.**

Richards-Wilcox Mfg. Co., 630-35.

*R-W*, 630-35.**Door Plates**, see Plates, Door, Kick or Push.**Door Pulls**, see Pulls, Door.**Door Push Bars**, see Push Bars, Door.**Door Sills**, see Sills, Door and Window.**Door Stiles and Rails**, see Cabinet Work; Trim.**Door Stops**, see Strikes, Door and Gate.**Door Strikes**, see Strikes, Door and Gate.**Door Tracks**, see Track, Door; Hangers, Door.**Doors, Art, Metal**, see Doors, Fire, Metal or Metal Covered; Doors, Entrance, Bronze or Iron.**Doors, Ash Pit.**

Canton Foundry &amp; Machine Co., 270.

Creswell Iron Works, Samuel J., 258-59.

*Majestic Co.*, 271-73.

Smith Wire and Iron Works, F. P., 524-25.

Wagner Architectural Iron Works, A. F., 530-31.

**Doors, Balance.**

Universal Balance Door, Inc., 591.

*Universal*, 591.**Doors, Bi-fold**, see Doors, Folding and Rolling.**Doors, Boiler Plate**, see Doors, Fire.**Doors, Bronze**, see Doors, Entrance, Bronze or Iron; Ornamental Metal Work.**Doors, Canopy**, see Doors, Warehouse.**Doors, Cell, Automatic Sliding.**

Pauly Jail Building Co., 1488.

Van Dorn Iron Works Co., 1489.

*Van Dorn*, 1489.**Doors, Cellar**, see Doors, Sidewalk.**Doors, Clean-out.**

Covert Co., H. W., 280.

Duvinage, Pierre, 260.

Fiske Iron Works, J. W., 552-53.

*Majestic Co.*, 271-73.

Sterling Foundry Co., 274.

Stover Mfg. &amp; Engine Co., 282.

**Doors, Coiling**, see Doors, Folding and Rolling.**Doors, Cold Storage**, see Doors, Refrigerator and Cold Storage.**Doors, Counterbalanced.**

(See also Doors and Gates, Elevator, Counterbalanced.)

Ernst Specialty Co., C. K., 1294-97.

Guaranty Iron &amp; Wire Co., 667.

Jamison Cold Storage Door Co., 1064-65.

Johnson Mfg. Co., Geo. W., 668.

Kinnear Mfg. Co., 670-79.

Ogden Co., J. Edward, 682-83.

Peelle Co., 684-87.

Pitt Composite Iron Works, William R., 558-59.

Saino Fire Door &amp; Shutter Co., 669.

Stevenson Cold Storage Door Co., 1066-69.

*Variety Mfg. Co.*, 688-91.

Wilson Corporation, J. G., 692-93.

*Ernst*, 1294-97.*Kinnear*, 670-79.*Ogden*, 682-83.*Peelle*, 684-87.*Pitt*, 558-59.*Saino*, 669.*Stevenson's*, 1066-69.*Tel-Co-Dor*, 684-87.*Varclad*, 688-91.*Vermanco*, 688-91.*Wilson*, 692-93.

Specifications. 684-87.

**Doors, Crane Runway.**

Cornell Iron Works, 666.

Edwards Mfg. Co., 664-65.

Kinnear Mfg. Co., 670-79.

Lupton's Sons Co., David, 704-08.

Wilson Corporation, J. G., 692-93.

*Kinnear*, 670-79.*Lupton*, 704-08.*Wilson*, 692-93.



**Doors, Dumbwaiter, Fireproof, Automatic.**

Peelle Co., 684-87.  
*Peelle*, 684-87.

**Doors, Electrically Operated, see Doors, Motor Operated.****Doors, Elevator, see Doors and Gates, Elevator.****Doors, Entrance, Bronze or Iron.**

(See also Ornamental Metal Work.)

Angle Window and Door Co., 709.  
 Barnum Iron Works, E. T., 1487.  
 Bayley Co., William, 698-99.  
 Bureau Brothers, 498.  
 Chesley Co., Inc., A. C., 710-11.  
 Consolidated Sheet Metal Works, 712-13.  
 Dahlstrom Metallic Door Co., 649-51.  
 Fiske Iron Works, J. W., 552-53.  
 Gorham Co Architectural Bronze, 502-03.  
 Harsch & Sons Co., John, 504.  
 Hughes-Keenan Co., 262-65.  
 Interior Metal Mfg. Co., 654-55.  
 Jackson Co., Wm. H., 512.  
 Lasar Mfg. Co., 506-07.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 McGann & Sons Co., T. F., 508-09.  
 Mack Iron and Wire Works Co., 510-11.  
 Manhattan Brass Co., 513.  
 Page Steel and Wire Co., 549-51.  
 Penn Brass & Bronze Works, 517.  
 Penn Metal Co., 734.  
 Polachek Bronze & Iron Co., 522.  
 Reed & Barton, 520-21.  
 Reliance Fireproof Door Co., 656-57.  
 Riester & Thesmacher Co., 658-59.  
 Sexauer & Lemke, Inc., 262-65.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Smyser-Royer Co., 528.  
 Thorp Fire Proof Door Co., 661-63.  
 Tiffany Studios, 526-27.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wagner's Sons Co., J. F., 732-33.  
 Watson Mfg. Co., Inc., 1429.  
 Williams, Inc., Jno., 532.  
 Wilson Corporation, J. G., 692-93.  
 Wisconsin Iron & Wire Works, 533.  
 Chesley, 710-11.  
 Lee, 719.  
 Penco, 734.  
 R. & T., 658-59.  
 Thorp-Richardson, 661-63.  
 Wilson, 692-93.

**Doors, Factory, see Doors, Fire, Metal or Metal Covered; Doors, Warehouse.****Doors, Fire, Accessories for.**

(See also Doors, Fire; Hardware, Door.)

Allith-Prouty Co., 614-15.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Edwards Mfg. Co., 664-65.  
 Kinnear Mfg. Co., 670-79.  
 Ogden Co., J. Edward, 682-83.  
 Peelle Co., 684-87.  
 Saino Fire Door & Shutter Co., 669.  
 Stowell Co., 636-37.  
 Variety Mfg. Co., 688-91.  
 Wagner's Sons Co., J. F., 732-33.  
 Wilson Corporation, J. G., 692-93.  
 Allith-Prouty, 614-15.  
 Kinnear, 670-79.  
 National, 640-43.  
 Ogden, 682-83.  
 Peelle, 684-87.  
 Saino, 669.  
 Wilbern, 636-37.  
 Wilson, 692-93.

**Doors, Fire, Metal or Metal Covered.**

Alignum Fireproof Products Co., Inc., 646-47.  
 American Steel Window Co., 694-97.  
 Anchor Post Iron Works, 537-43.  
 Angle Window and Door Co., 709.  
 Barnum, E. T., 496-97.  
 Bayley Co., William, 698-99.  
 Brasco Mfg. Co., 481.

**Doors, Fire, Metal or Metal Covered—Continued.**

Carpenter Mfg. Co., R. F., 868-69.  
 Central Metallic Door Co., 648.  
 Chesley Co., Inc., A. C., 710-11.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Consolidated Sheet Metal Works, 712-13.  
 Cornell Iron Works, 666.  
 Coulson & Co., J. W., 482-83.  
 Dahlstrom Metallic Door Co., 649-51.  
 Detroit Steel Products Co., 700-01.  
 Duvinage, Pierre, 260.  
 Edwards Mfg. Co., 664-65.  
 Fiske Iron Works, J. W., 552-53.  
 Guaranty Iron and Wire Co., 667.  
 Haslett Spiral Chute Co., 1306.  
 Hauserman Co., E. F., 1415.  
 Howell, Field & Goddard, Inc., 652-53.  
 Hughes-Keenan Co., 262-65.  
 Interior Metal Mfg. Co., 654-55.  
 Jamison Cold Storage Door Co., 1064-65.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Lasar Mfg. Co., 506-07.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Mack Iron and Wire Works Co., 510-11.  
 Merchant & Evans Co., 680.  
 Mesker Brothers Iron Co., 722-25.  
 Messenger & Parks Mfg. Co., 681.  
 National Automatic Door Co., 660.  
 National Skylight and Ventilator Co., 448-49.  
 Newark Cornice and Skylight Works, 726-27.  
 Ogden Co., J. Edward, 682-83.  
 Page Steel and Wire Co., 549-51.  
 Peelle Co., 684-87.  
 Penn Metal Co., 734.  
 Pitt Composite Iron Works, William R., 558-59.  
 Price-Evans Foundry Co., 518-19.  
 Reliance Fireproof Door Co., 656-57.  
 Revolving Door & Fixture Co., 590.  
 Riester & Thesmacher Co., 658-59.  
 Saino Fire Door & Shutter Co., 669.  
 Sexauer & Lemke, Inc., 262-65.  
 Solar Metal Products Co., Inc., 645.  
 Stark Rolling Mill Co., 424-25.  
 Stowell Co., 636-37.  
 Thorp Fire Proof Door Co., 661-63.  
 Truscon Steel Co., 702-03.  
 Van Kannel Revolving Door Co., 588-89.  
 Van Noorden & Co., E., 452-53.  
 Variety Mfg. Co., 688-91.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wagner's Sons Co., J. F., 732-33.  
 Watson Mfg. Co., Inc., 1429.  
 Whitaker-Glessner Co., 241.  
 Wilson Corporation, J. G., 692-93.  
 Acme, 670-79.  
 Ajax, 670-79.  
 Akbar, 670-79.  
 Alignum, 646-47.  
 American, 694-97.  
 Atlas, 670-79.  
 Bayley-Springfield, 698-99.  
 Carpenter's, 868-69.  
 Chesley, 710-11.  
 Consol, 712-13.  
 Consol All Mil, 712-13.  
 Dahlstrom, 649-51.  
 Evans Almetl, 680.  
 Fenestra, 700-01.  
 Hauserman, 1415.  
 Interior, 654-55.  
 Kal-O-Mine, 688-91.  
 Kinnear, 670-79.  
 Lee, 719.  
 Lupton, 704-08.  
 National, 448-49; 640-43.  
 Ogden, 682-83.  
 Panik-Prufe, 660.  
 Peelle, 684-87.  
 Penco, 734.  
 Pitt, 558-59.  
 Portsmouth Iron, 241.

**Doors, Fire, Metal or Metal Covered—Continued.**

R & T, 658-59.  
 Saino, 669.  
 Sanymetal, 868-69.  
 Semiart, 688-91.  
 Standwell, 652-53.  
 Superior, 670-79.  
 Tel-Co-Dor, 684-87.  
 Thorp-Richardson, 661-63.  
 Toncan Metal, 424-25.  
 Truscon, 702-03.  
 Van Kannel, 588-89.  
 Wilbern, 636-37.  
 Wilson, 692-93.  
 Specifications, 681; 692-93.  
**Doors, Fire Wall, see Doors, Fire.**  
**Doors, Fireproof, see Doors, Fire, Metal or Metal Covered.**  
**Doors, Flush, Sanitary, Wood.**  
 "Bilt-Well" Service Bureau, 574-75.  
 Carnahan Mfg. Co., 576-77.  
 Morgan Co., 584-85.  
 Bilt-Well, 574-75.  
 Evans Process, 576-77.  
 Morgan, 584-85.  
**Doors, Folding and Rolling, Steel.**  
 Cornell Iron Works, 666.  
 Detroit Steel Products Co., 700-01.  
 Edwards Mfg. Co., 664-65.  
 Guaranty Iron & Wire Co., 667.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Peelle Co., 684-87.  
 Pitt Composite Iron Works, William R., 558-59.  
 Revolving Door & Fixture Co., 590.  
 Saino Fire Door & Shutter Co., 669.  
 Solar Metal Products Co., Inc., 645.  
 Swedish Venetian Blind Co., 773.  
 Variety Mfg. Co., 688-91.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wilson Corporation, J. G., 692-93.  
 Cornell, 666.  
 Fenestra, 700-01.  
 Johnson Dufold, 668.  
 Kinnear, 670-79.  
 Peelle, 684-87.  
 Pitt, 558-59.  
 Saino, 669.  
 Wilson, 692-93.  
 Specifications, 664-65; 692-93.  
**Doors, Folding and Rolling, Wood.**  
 Grant Pulley and Hardware Co., 770.  
 Kinnear Mfg. Co., 670-79.  
 Ogden Co., J. Edward, 682-83.  
 Revolving Door & Fixture Co., 590.  
 Swedish Venetian Blind Co., 773.  
 Union Blind & Ladder Co., Inc., 778.  
 Wilson Corporation, J. G., 692-93.  
 Acme, 778.  
 Grant, 770.  
 Kinnear, 670-79.  
 Ogden, 682-83.  
 Wilson, 692-93.  
 Specifications, 692-93.  
**Doors, Freezer, see Doors, Refrigerator and Cold Storage.**  
**Doors, Freight House, see Doors, Warehouse.**  
**Doors, Garage, see Doors, Warehouse.**  
**Doors, Hardwood, see Doors, Wood.**  
**Doors, Hatch.**  
 (See also Doors, Fire.)  
 Brooklyn Vault Light Co., 822-23.  
 Cohoes Iron Foundry and Machine Co., 1264.  
 Eastern Machinery Co., 1268-69.  
 Energy Elevator Co., 1270-73.  
**Doors, Hollow Metal, see Doors, Fire, Metal or Metal Covered.**  
**Doors, Ice Recording, see Doors, Refrigerator and Cold Storage.**  
**Doors, Insulated, see Doors, Refrigerator and Cold Storage.**

**Doors, Jail**, see Jail Construction and Equipment.

**Doors, Kalamein**, see Doors, Fire, Metal or Metal Covered.

**Doors, Mausoleum.**

(See also Ornamental Metal Work.)

Barnum, E. T., 496-97.

Bureau Brothers, 498.

Detroit Mausoleum Equipment Works, 500.

Gorham Co Architectural Bronze, 502-03.

Interior Metal Mfg. Co., 654-55.

Lasar Mfg. Co., 506-07.

McGann & Sons Co., T. F., 508-09.

Manhattan Brass Co., 513.

Mott Iron Works, J. L., 514-15.

Penn Brass & Bronze Works, 517.

Reed & Barton, 520-21.

Smith Wire and Iron Works, F. P., 524-25.

Thorp Fire Proof Door Co., 661-63.

Wagner Architectural Iron Works, A. F., 530-31.

Williams, Inc., Jno., 532.

**Doors, Metal or Metal Clad**, see Doors, Fire, Metal or Metal Covered.

**Doors, Motor Operated.**

Atchison Revolving Door Co., 586-87.

Cornell Iron Works, 666.

Edwards Mfg. Co., 664-65.

Kinnear Mfg. Co., 670-79.

Revolving Door & Fixture Co., 590.

Variety Mfg. Co., 688-91.

Wilson Corporation, J. G., 692-93.

Atchison, 586-87.

Kinnear, 670-79.

Wilson, 692-93.

**Doors, Panicproof**, see Doors, Fire; Doors, Revolving, Automatic Collapsible; Locks, Emergency Exit.

**Doors, Pier**, see Doors, Warehouse.

**Doors, Platform, Ice.**

Stevenson Cold Storage Door Co., 1066-69.

Little 1912, 1066-69.

Stevenson's, 1066-69.

**Doors, Receding**, see Doors, Folding and Rolling; Doors, Sliding.

**Doors, Refrigerator and Cold Storage.**

Brecht Co., 1050-52.

Jamison Cold Storage Door Co., 1064-65.

Stevenson Cold Storage Door Co., 1066-69.

Brecht, 1050-52.

Jones, 1064-65.

Noequal, 1064-65.

Sharp Freezer, 1064-65.

Stevenson's, 1066-69.

Specifications, 1066-69.

**Doors, Refrigerator and Cold Storage, Fireproof.**

Jamison Cold Storage Door Co., 1064-65.

Stevenson Cold Storage Door Co., 1066-69.

Stevenson's, 1066-69.

**Doors, Revolving.**

Alignum Fireproof Products Co., Inc., 646-47.

Atchison Revolving Door Co., 586-87.

Coburn Trolley Track Mfg. Co., 640-43.

Consolidated Sheet Metal Works, 712-13.

Jamison Cold Storage Door Co., 1064-65.

Revolving Door & Fixture Co., 590.

Saino Fire Door & Shutter Co., 669.

Stevenson Cold Storage Door Co., 1066-69.

Van Kannel Revolving Door Co., 588-89.

Wilson Corporation, J. G., 692-93.

Alignum, 646-47.

Atchison, 586-87.

Curved Wing, 586-87.

National, 640-43.

Saino, 669.

Stevenson's, 1066-69.

Straight Wing, 586-87.

Van Kannel, 588-89.

**Doors, Revolving—Continued.**

Wilson, 692-93.

Specifications, 586-87.

**Doors, Revolving, Automatic Collapsible.**

Revolving Door & Fixture Co., 590.

Van Kannel Revolving Door Co., 588-89.

Van Kannel, 588-89.

Specifications, 588-89.

**Doors, Revolving, Freezer.**

Jamison Cold Storage Door Co., 1064-65.

Stevenson Cold Storage Door Co., 1066-69.

Stevenson's, 1066-69.

**Doors, Revolving, Ice Cream**, see Doors, Revolving, Freezer.

**Doors, Revolving, Motor Operated**, see Doors, Motor Operated.

**Doors, Revolving, Unloading, Freezer.**

Jamison Cold Storage Door Co., 1064-65.

**Doors, Rolling**, see Doors, Folding and Rolling.

**Doors, Roundhouse.**

Cornell Iron Works, 666.

Edwards Mfg. Co., 664-65.

Johnson Mfg. Co., Geo. W., 668.

Kinnear Mfg. Co., 670-79.

Lupton's Sons Co., David, 704-08.

Ogden Co., J. Edward, 682-83.

Saino Fire Door & Shutter Co., 669.

Variety Mfg. Co., 688-91.

Wilson Corporation, J. G., 692-93.

Kinnear, 670-79.

Lupton, 704-08.

Ogden, 682-83.

Saino, 669.

Wilson, 692-93.

**Doors, Safe**, see Doors, Vault.

**Doors, Safety Exit**, see Doors, Fire; Doors, Revolving, Automatic Collapsible; Locks, Emergency Exit.

**Doors, Sanitary, Wood**, see Doors, Flush, Sanitary, Wood.

**Doors, Screen**, see Screens, Door and Window.

**Doors, Shipping Platform**, see Doors, Warehouse.

**Doors, Shop**, see Doors, Fire, Metal or Metal Covered; Doors, Warehouse.

**Doors, Showcase.**

Brasco Mfg. Co., 481.

Coulson & Co., J. W., 482-83.

**Doors, Sidewalk.**

American 3-Way Prism Co., 821.

Badger Wire & Iron Works, 494-95.

Barnum, E. T., 496-97.

Brooklyn Vault Light Co., 822-23.

Bruner Granitoid Co., P. M., 824-26.

Canton Foundry & Machine Co., 270.

Carpenter & Co., Inc., Davis, 827.

Columbia Iron & Wire Works Co., 268-69.

Creswell Iron Works, Samuel J., 258-59.

Ernst Specialty Co., C. K., 1294-97.

Gillis & Geoghegan, 1299-1305.

Grauer & Co., Albert, 824-26.

Keppler Glass Constructions, Inc., 831-33.

Mack Iron and Wire Works Co., 510-11.

Richards & Kelly Mfg. Co., 830.

Wagner Architectural Iron Works, A. F., 530-31.

Wisconsin Iron & Wire Works, 533.

Bruner, 824-26.

Columbia, 268-69.

Ernst, 1294-97.

G & G, 1299-1305.

Keppler, 831-33.

Ray-Placeable, 827.

**Doors, Sidewalk, Illuminating.**

American 3-Way Prism Co., 821.

Barnum, E. T., 496-97.

Brooklyn Vault Light Co., 822-23.

Bruner Granitoid Co., P. M., 824-26.

Carpenter & Co., Inc., Davis, 827.

Grauer & Co., Albert, 824-26.

**Doors, Sidewalk, Illuminating—Continued.**

Keppler Glass Constructions, Inc., 831-33.

Bruner, 824-26.

Keppler, 831-33.

Ray-Placeable, 827.

Specifications, 827.

**Doors, Sidewalk, Safety.**

Columbia Iron & Wire Works Co., 268-69.

Ernst Specialty Co., C. K., 1294-97.

Gillis & Geoghegan, 1299-1305.

Columbia, 268-69.

Ernst, 1294-97.

G & G, 1299-1305.

**Doors, Sliding.**

Alignum Fireproof Products Co., Inc., 646-47.

Barnum, E. T., 496-97.

Bigelow Wire Works, Cheney, 491.

Coburn Trolley Track Mfg. Co., 640-43.

Consolidated Sheet Metal Works, 712-13.

Guaranty Iron & Wire Co., 667.

Jamison Cold Storage Door Co., 1064-65.

Johnson Mfg. Co., Geo. W., 668.

Kinnear Mfg. Co., 670-79.

Lupton's Sons Co., David, 704-08.

Merchant & Evans Co., 680.

Newark Cornice and Skylight Works, 726-27.

Ogden Co., J. Edward, 682-83.

Peelle Co., 684-87.

Penn Metal Co., 734.

Pitt Composite Iron Works, William R., 558-59.

Riester & Thesmacher Co., 658-59.

Saino Fire Door & Shutter Co., 669.

Stevenson Cold Storage Door Co., 1066-69.

Wagner's Sons Co., J. F., 732-33.

Wilson Corporation, J. G., 692-93.

Ajax, 670-79.

Alignum, 646-47.

Consol, 712-13.

Evans Almetl, 680.

Kinnear, 670-79.

Lupton, 704-08.

National, 640-43.

Ogden, 682-83.

Peelle, 684-87.

Penco, 734.

Pitt, 558-59.

R & T, 658-59.

Saino, 669.

Stevenson's, 1066-69.

Tel-Co-Dor, 684-87.

Wilson, 692-93.

**Doors, Stack.**

Canton Foundry & Machine Co., 270.

**Doors, Stair**, see Doors.

**Doors, Steel**, see Doors, Fire, Metal or Metal Covered.

**Doors, Swinging**, see Doors, Revolving; Doors, Warehouse.

**Doors, Tin Clad**, see Doors, Fire, Metal or Metal Covered.

**Doors, Toilet, Shower Bath, etc.**

Carpenter Mfg. Co., R. F., 868-69.

Graf Mfg. Co., Frank H., 886.

Carpenter's, 868-69.

Sanymetal, 868-69.

**Doors, Trap**, see Doors, Sidewalk.

**Doors, Vault.**

Barnum, E. T., 496-97.

Hall's Safe Co., 1431.

Herring-Hall-Marvin Safe Co., 1432.

York Safe and Lock Co., 1433.

Specifications, 1432.

**Doors, Vault, Cemetery**, see Doors, Mausoleum.

**Doors, Veneered.**

Carnahan Mfg. Co., 576-77.

Curtis Service Bureau, 578-79.

Morgan Co., 584-85.



**Doors, Veneered—Continued.**

Northern Hemlock and Hardwood Manufacturers' Association, 564-65.  
Curtis, 578-79.  
Morgan, 584-85.

**Doors, Vent.**

American 3-Way Prism Co., 821.  
Bruner Granitoid Co., P. M., 824-26.  
Grauer & Co., Albert, 824-26.  
Bruner, 824-26.

**Doors, Warehouse.**

Alignum Fireproof Products Co., Inc., 646-47.  
Angle Window and Door Co., 709.  
Cornell Iron Works, 666.  
Edwards Mfg. Co., 664-65.  
Guaranty Iron & Wire Co., 667.  
Howell, Field & Goddard, Inc., 652-53.  
Johnson Mfg. Co., Geo. W., 668.  
Kinnear Mfg. Co., 670-79.  
Louden Machinery Co., 1471-73.  
Lupton's Sons Co., David, 704-08.  
Merchant & Evans Co., 680.  
Ogden Co., J. Edward, 682-83.  
Peelle Co., 684-87.  
Richards-Wilcox Mfg. Co., 630-35.  
Saino Fire Door & Shutter Co., 669.  
Union Blind & Ladder Co., Inc., 778.  
Variety Mfg. Co., 688-91.  
Wilson Corporation, J. G., 692-93.  
Acme, 778.  
Alignum, 646-47.  
Evans Almetl, 680.  
Kinnear, 670-79.  
Lupton, 704-08.  
Ogden, 682-83.  
Peelle, 684-87.  
R-W, 630-35.  
Saino, 669.  
Tel-Co-Dor, 684-87.  
Varclad, 688-91.  
Vermanco, 688-91.  
Wilson, 692-93.

**Doors, Warehouse, Mechanically Operated.**

Cornell Iron Works, 666.  
Edwards Mfg. Co., 664-65.  
Kinnear Mfg. Co., 670-79.  
Ogden Co., J. Edward, 682-83.  
Variety Mfg. Co., 688-91.  
Wilson Corporation, J. G., 692-93.  
Kinnear, 670-79.  
Ogden, 682-83.  
Wilson, 692-93.

**Doors, Wharf, see Doors, Warehouse.****Doors, Wood.**

Atchison Revolving Door Co., 586-87.  
"Bilt-Well" Service Bureau, 574-75.  
Brown Co., 573.  
Carnahan Mfg. Co., 576-77.  
Curtis Service Bureau, 578-79.  
Indiana Lumber & Mfg. Co., 580-81.  
Kinnear Mfg. Co., 670-79.  
Mesker Brothers Iron Co., 722-25.  
Morgan Co., 584-85.  
North Carolina Pine Association, 562-63.  
Northern Hemlock and Hardwood Manufacturers' Association, 564-65.  
Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
Ogden Co., J. Edward, 682-83.  
Southern Pine Association, 561.  
Wilson Corporation, J. G., 692-93.  
Atchison, 586-87.  
Curtis, 578-79.  
Kinnear, 670-79.  
Morgan, 584-85.  
Ogden, 682-83.  
Wilson, 692-93.

**Doors, Wood, Flush, see Doors, Flush, Sanitary, Wood.****Doors and Gates, Elevator.**

Alignum Fireproof Products Co., Inc., 646-47.  
Bigelow Wire Works, Cheney, 491.  
Central Metallic Door Co., 648.  
Chelsea Elevator Co., 1265-67.

**Doors and Gates, Elevator—Continued.**

Coburn Trolley Track Mfg. Co., 640-43.  
Cohoes Iron Foundry and Machine Co., 1264.  
Cornell Iron Works, 666.  
Dahlstrom Metallic Door Co., 649-51.  
Eastern Machinery Co., 1268-69.  
Edwards Mfg. Co., 664-65.  
Energy Elevator Co., 1270-73.  
Guaranty Iron & Wire Co., 667.  
Interior Metal Mfg. Co., 654-55.  
Johnson Mfg. Co., Geo. W., 668.  
Kimball Brothers Co., 1275.  
Kinnear Mfg. Co., 670-79.  
Manhattan Brass Co., 513.  
Ogden Co., J. Edward, 682-83.  
Payne Co., F. S., 1290-91.  
Peelle Co., 684-87.  
Pitt Composite Iron Works, William R., 558-59.  
Reliance Fireproof Door Co., 656-57.  
Saino Fire Door & Shutter Co., 669.  
Smith Wire and Iron Works, F. P., 524-25.  
Solar Metal Products Co., Inc., 645.  
Steelite Co., 1293.  
Variety Mfg. Co., 688-91.  
Wagner Architectural Iron Works, A. F., 530-31.  
Wilson Corporation, J. G., 692-93.  
Wright Wire Co., 234-35.  
Alignum, 646-47.  
Chelsea, 1265-67.  
Dahlstrom, 649-51.  
Kimball, 1275.  
Kinnear, 670-79.  
Meaker, 667.  
National, 640-43.  
Ogden, 682-83.  
Peelle, 684-87.  
Pitt Self-closing, 558-59.  
Saino, 669.  
Steelite, 1293.  
Tel-Co-Dor, 684-87.  
Varclad, 688-91.  
Vermanco, 688-91.  
Wilson, 692-93.  
Specifications, 656-57; 684-87.

**Doors and Gates, Elevator, Counterbalanced.**

Guaranty Iron & Wire Co., 667.  
Johnson Mfg. Co., Geo. W., 668.  
Peelle Co., 684-87.  
Saino Fire Door & Shutter Co., 669.  
Variety Mfg. Co., 688-91.  
Peelle, 684-87.  
Saino, 669.  
Tel-Co-Dor, 684-87.  
Varclad, 688-91.  
Vermanco, 688-91.  
Specification, 684-87.

**Doors and Gates, Elevator, Operating Devices for.**

(See also Locks, Elevator Door.)  
Elevator Locks Co., 1292.  
Peelle Co., 684-87.  
M-C-K, 1292.  
Peelle, 684-87.

**Dormers, Metal, see Roof Trimmings, Metal.****Down Spouts, see Leaders, Roof.****Draft Apparatus, Mechanical.**

(See also Blowers; Fans.)  
American Blower Co., 996-99.  
Ilg Electric Ventilating Co., 1002-03.  
Massachusetts Blower Co., 1005.  
Sturtevant Co., B. F., 1006-07.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Wing Mfg. Co., L. J., 1008.  
ABC, 996-99.  
Ilg, 1002-03.  
Sturtevant, 1006-07.  
Westinghouse-Sirocco, 1169-76.

**Draft Checks.**

(See also Regulators, Damper.)  
Cox Stove Co., Abram, 960-64.  
Novelty, 960-64.

**Drafting Room Equipment, see Furniture, Drafting Room; Architects and Engineers Supplies.****Drain Tile, see Tile, Drain.****Drainage Systems, Garage.**

(See also Drains, Floor.)  
Compound Injector & Specialty Co., 872-73.  
Dehn's, 872-73.  
Peerless, 872-73.

**Drainboards, see Sinks and Sink Fixtures; Tubs and Trays, Laundry.****Drainers, Cellar.**

Chicago Pump Co., 1097.  
Economy Pumping Machinery Co., 1101.  
Penberthy Injector Co., 882-83.  
Economy, 1101.  
Little Giant, 1097.  
Penberthy, 882-83.  
Specifications, 882-83.

**Drainers, Skid and Barrel.**

Wayne Oil Tank & Pump Co., 1480-81.

**Drains, Double Drainage.**

Josam Mfg. Co., 876-78.  
Josam, 876-78.

**Drains, Floor.**

Compound Injector & Specialty Co., 872-73.  
Crampton-Farley Brass Co., 874.  
Fiske Iron Works, J. W., 552-53.  
Josam Mfg. Co., 876-78.  
Louden Machinery Co., 1471-73.  
Mott Iron Works, J. L., 514-15.  
Watertite Drain & Scupper Co., Inc., 275.  
Windshield Scupper Co., 276.  
Acme, 872-73.  
Anticlog, 275.  
Dehn's, 872-73.  
Josam, 876-78.  
Noxall, 874.  
Peerless, 872-73.  
San-Seal-O, 874.  
Signet, 874.  
Specifications, 872-73.

**Drains, Garage, see Drains, Floor.****Drains, Gutter.**

Josam Mfg. Co., 876-78.  
Louden Machinery Co., 1471-73.

**Drains, Laundry, see Drains, Floor.****Drains, Refrigerator.**

(See also Refrigerators and Coolers.)  
Compound Injector & Specialty Co., 872-73.  
Josam Mfg. Co., 876-78.  
Dehn's, 872-73.

**Drains, Roof, see Gutters, Roof, Metal.****Drains, Stable, see Drains, Floor.****Drawer Slides, see Slides, Drawer.****Drawers, Bench, Metal, see Benches, Metal.****Drawing Boards, see Boards, Drawing.****Drawing Materials.**

Economy Drawing Table Co., 2-4.  
New York Blue Print Paper Co., 6.  
Economy, 2-4.  
NYB, 6.

**Drawing Mountings.**

New York Blue Print Paper Co., 6.  
NYB, 6.

**Drawing Paper, see Paper, Drawing.****Drawing Room Equipment, see Furniture, Drafting Room; Architects and Engineers Supplies.****Drawing Tables, see Tables, Drawing.****Drawings, Reproduced.**

New York Blue Print Paper Co., 6.  
NYB, 6.

**Drawn Work.**

Benjamin Electric Mfg. Co., 1206.  
Benjamin, 1206.

**Dressers.**

Morgan Co., 584-85.

**Dressers, Kitchen**, see Cabinets, Kitchen.  
**Drilling, Artesian Well**, see Artesian Wells.

**Drilling, Shaft, Elevator.**  
 Artesian Well and Supply Co., 1092.

**Drinking Fountains**, see Fountains, Drinking, Sanitary.

**Drinking Water Systems, Factory.**  
 Guardian Refrigerator Co., 1056.

**Drives, Chain.**  
 Link-Belt Co., 1310.

**Drop Wire**, see Wire and Cables, Electric.

**Drums, Winding.**  
 Eastern Machinery Co., 1268-69.  
 Kimball Brothers Co., 1275.  
 Sprague Electric Works, 1168.  
 Kimball, 1275.

**Dry Cleaning Apparatus.**  
 American Laundry Machinery Co., 1036.  
 Bowser & Co., Inc., S. F., 1476-77.  
 American, 1036.  
 Bowser, 1476-77.

**Dryers.**  
 (See also Specific Types.)  
 American Blower Co., 996-99.  
 Ilg Electric Ventilating Co., 1002-03.  
 Massachusetts Blower Co., 1005.  
 Sturtevant Co., B. F., 1006-07.  
 ABC, 996-99.  
 Ilg, 1002-03.  
 Sirocco, 996-99.  
 Sturtevant, 1006-07.

**Dryers, Blue Print.**  
 American Drafting Furniture Co., 1.  
 American, 1.  
 Paragon, 1.

**Dryers, Clothes.**  
 Chicago Dryer Co., 1038-41.  
 Domestic Laundry Equipment Corporation, 1042-43.  
 Hill Clothes Dryer Co., 1037.  
 McCain Co., W. W., 1044.  
 Mannen Co., John E., 1045.  
 Scientific Heater Co., 1046-47.  
 Chicago, 1038-41; 1042-43.  
 Domestic Dryerette, 1042-43.  
 Dririte, 1045.  
 Family, 1044.  
 Hill, 1037.  
 Hill-Canton, 1037.  
 Scientific, 1046-47.

**Dryers, Fertilizer.**  
 Brecht Co., 1050-52.

**Dryers, Grain.**  
 Hess Warming & Ventilating Co., 887.

**Dryers, Outdoor.**  
 Hill Clothes Dryer Co., 1037.  
 Champion, 1037.  
 Hill, 1037.

**Drying Systems**, see Air Conditioning Apparatus.

**Dumbwaiter Rope**, see Rope, Dumbwaiter.

**Dumbwaiters, Automatic Push Button.**  
 American Elevator & Machine Co., 1261.  
 Hollister-Whitney Co., 1274.  
 Montgomery Elevator Co., 1279.  
 Otis Elevator Co., 1280-84.  
 Otis, 1280-84.

**Dumbwaiters, Electric.**  
 A. B. See Electric Elevator Co., 1262-63.  
 American Elevator & Machine Co., 1261.  
 Chelsea Elevator Co., 1265-67.  
 Cohoes Iron Foundry and Machine Co., 1264.  
 Energy Elevator Co., 1270-73.  
 Hollister-Whitney Co., 1274.  
 Kimball Brothers Co., 1275.  
 Lamson Co., 1307.  
 Montgomery Elevator Co., 1279.  
 Otis Elevator Co., 1280-84.  
 Standard Store Service, Inc., 1314.  
 Chelsea, 1265-67.  
 Kimball, 1275.  
 Otis, 1280-84.

**Dumbwaiters, Hand.**

Chelsea Elevator Co., 1265-67.  
 Energy Elevator Co., 1270-73.  
 Hollister-Whitney Co., 1274.  
 Kimball Brothers Co., 1275.  
 Lamson Co., 1307.  
 Massa, George, 1278.  
 Montgomery Elevator Co., 1279.  
 Otis Elevator Co., 1280-84.  
 Sedgwick Machine Works, 1285-89.  
 Standard Store Service, Inc., 1314.  
 Chelsea, 1265-67.  
 Kimball, 1275.  
 Little Beauty, 1270-73.  
 Otis, 1280-84.  
 Sedgwick, 1285-89.  
 Specifications, 1265-67.

**Dumps, Ash.**  
 Covert Co., H. W., 280.  
 Creswell Iron Works, Samuel J., 258-59.  
 Majestic Co., 271-73.  
 Sharp Rotary Ash Receiver Co., Inc., 954-55.  
 Stover Mfg. & Engine Co., 282.  
 Sharp, 954-55.

**Dust Arresters and Collectors**, see Arresters, Dust.

**Dust Preventative, Road.**  
 Barrett Co., 394-97.  
 Tarvia, 394-97.

**Dust Separators**, see Separators, Dust.

**Dustproofing Concrete Floors**, see Hardeners and Densifiers, Cement and Concrete.

**Dyeing Equipment.**  
 American Laundry Machinery Co., 1036.  
 American, 1036.

**Dynamometers.**  
 Sprague Electric Works, 1168

**Dynamos**, see Generators.

## E

**Eaves Trough.**  
 Edwards Mfg. Co., 418-19.  
 Messenger & Parks Mfg. Co., 581.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Portsmouth Iron, 241.  
 Toncan Metal, 424-25.

**Ecclesiastical Metal Work**, see Ornamental Metal Work.

**Economizers, Ammonia.**  
 Carbondale Machine Co., 1053.

**Economizers, Fuel.**  
 Sturtevant Co., B. F., 1006-07.  
 Sturtevant, 1006-07.

**Ejectors, Sewage.**  
 Blackburn-Smith Corporation, 880.  
 Chicago Pump Co., 1097.  
 Economy Pumping Machinery Co., 1101.  
 Kerr Machinery & Supply Co., 1110-11.  
 Penberthy Injector Co., 882-83.  
 Shone Co., 884.  
 Yeomans Brothers Co., 1122-23.  
 Blackburn-Smith, 880.  
 Economy, 1101.  
 Kerr, 1110-11.  
 Penberthy, 882-83.  
 Shone, 884.  
 XL 96, 882-83.  
 Yeomans, 1122-23.  
 Specifications, 1110-11; 1122-23.

**Elbows, Conductor Pipe**, see Pipe, Conductor.

**Elbows, Pipe**, see Fittings, Pipe.

**Electric Cables**, see Wire and Cables, Electric.

**Electric Ovens**, see Ovens, Baking, Electric.

**Electric Plants, Isolated.**  
 Kewanee Private Utilities Co., 1112-13.

**Electric Plants, Isolated—Continued.**  
 Westinghouse Electric & Mfg. Co., 1169-76.

Kewanee, 1112-13.

**Electric Ranges**, see Ranges, Electric.

**Electric Receptacles**, see Receptacles, Electric.

**Electric Switches**, see Switches, Electric.

**Electric Winding Machines**, see Drums, Winding.

**Electrical Appliances**, see Specific Headings.

**Electrical Conversion Factors.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Currents, Notes on.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Engineers**, see Engineers, Electrical.

**Electrical Fittings**, see Specific Headings.

**Electrical Fittings, List of Approved.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Formula.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Grounding Appliances**, see Grounding Appliances, Electrical; Wiring Devices.

**Electrical Information.**  
 Society for Electrical Development, Inc., 1145-52.

Western Electric Co., 1202-03.

**Electrical Installation Estimating Data**, see Estimating Data, Electrical Installation.

**Electrical Installations, Test on.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Specialties**, see Specific Headings.

**Electrical Units.**  
 Society for Electrical Development, Inc., 1145-52.

**Electrical Wiring, Cost of.**  
 Society for Electrical Development, Inc., 1145-52.

**Electroliers**, see Lighting Fixtures.

**Elevating and Conveying Machinery.**  
 Allith-Prouty Co., 614-17.  
 Brown Hoisting Machinery Co., 184-85.  
 Chelsea Elevator Co., 1265-67.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Cohoes Iron Foundry and Machine Co., 1264.

Ernst Specialty Co., C. K., 1294-97.

Gifford-Wood Co., 1298.

Haslett Spiral Chute Co., 1306.

Kaestner & Hecht Co., 1276-77.

Kimball Brothers Co., 1275.

Lamson Co., 1307.

Link-Belt Co., 1310.

Louden Machinery Co., 1471-73.

Lowerator Co., Inc., 1308-09.

Minnesota Manufacturers' Association, 1311.

Olson & Co., Samuel, 1312-13.

Otis Elevator Co., 1280-84.

Richards-Wilcox Mfg. Co., 630-35.

Sedgwick Machine Works, 1285-89.

Standard Store Service, Inc., 1314.

Chelsea, 1265-67.

Ernst, 1294-97.

G-W, 1298.

K. & H., 1276-77.

Kimball, 1275.

Lowerator, 1308-09.

Otis, 1280-84.

Peck, 1310.

R-W, 630-35.

Sedgwick, 1285-89.

**Elevator Bows**, see Bows, Elevator.

**Elevator Buckets**, see Buckets, Elevator.



- Elevator Cars and Cabs**, see Cars, Elevator.
- Elevator Door Locks**, see Locks, Elevator Door.
- Elevator Doors**, see Doors and Gates, Elevator.
- Elevator Enclosures**, see Enclosures, Elevator.
- Elevator Equipment**, see Specific Headings.
- Elevator Fronts**, see Enclosures, Elevator.
- Elevator Gates**, see Doors and Gates, Elevator.
- Elevator Grain Spouts**, see Spouts, Grain, Elevator.
- Elevator Safety Devices**, see Safety Operating Devices, Elevator.
- Elevators, Ash**, see Hoists, Cellar and Ash; Ash and Refuse Handling Machinery.
- Elevators, Automatic.**  
Hollister-Whitney Co., 1274.  
Lamson Co., 1307.  
Minnesota Manufacturers' Association, 1311.  
Montgomery Elevator Co., 1279.  
Olson & Co., Samuel, 1312-13.
- Elevators, Automatic Push Button.**  
A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Hollister-Whitney Co., 1274.  
Kaestner & Hecht Co., 1276-77.  
Kimball Brothers Co., 1275.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Standard Store Service, Inc., 1314.  
*K. & H.*, 1276-77.  
*Kimball*, 1275.  
*Otis*, 1280-84.
- Elevators, Automobile or Carriage**, see Hoists, Automobile or Carriage.
- Elevators, Belt Driven.**  
(See also Elevators, Freight or Passenger, Power.)  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Eastern Machinery Co., 1268-69.  
Energy Elevator Co., 1270-73.  
Hollister-Whitney Co., 1274.  
Kimball Brothers Co., 1275.  
Lowerator Co., Inc., 1308-09.  
Otis Elevator Co., 1280-84.  
*Chelsea*, 1265-67.  
*Kimball*, 1275.  
*Lowerator*, 1308-09.  
*Otis*, 1280-84.
- Elevators, Bucket**, see Conveyors, Bucket; Elevating and Conveying Machinery.
- Elevators, Carriage and Automobile**, see Hoists, Automobile or Carriage.
- Elevators, Electric.**  
(See also Elevators, Freight or Passenger, Power.)  
A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Eastern Machinery Co., 1268-69.  
Energy Elevator Co., 1270-73.  
Hollister-Whitney Co., 1274.  
Kaestner & Hecht Co., 1276-77.  
Kimball Brothers Co., 1275.  
Lamson Co., 1307.  
Lowerator Co., Inc., 1308-09.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Payne Co., F. S., 1290-91.  
*Chelsea*, 1265-67.  
*K. & H.*, 1276-77.  
*Kimball*, 1275.  
*Lowerator*, 1308-09.  
*Otis*, 1280-84.
- Elevators, Freight or Passenger, Power.**  
A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Eastern Machinery Co., 1268-69.  
Energy Elevator Co., 1270-73.  
Gifford-Wood Co., 1298.  
Hollister-Whitney Co., 1274.  
Kaestner & Hecht Co., 1276-77.  
Kimball Brothers Co., 1275.  
Lowerator Co., Inc., 1308-09.  
Montgomery Elevator Co., 1279.  
Olson & Co., Samuel, 1312-13.  
Otis Elevator Co., 1280-84.  
Payne Co., F. S., 1290-91.  
Sedgwick Machine Works, 1285-89.  
*Chelsea*, 1265-67.  
*G-W*, 1298.  
*K. & H.*, 1276-77.  
*Kimball*, 1275.  
*Lowerator*, 1308-09.  
*New Haven*, 1268-69.  
*Otis*, 1280-84.  
*Sedgwick*, 1285-89.
- Elevators, Hand.**  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Energy Elevator Co., 1270-73.  
Ernst Specialty Co., C. K., 1294-97.  
Hollister-Whitney Co., 1274.  
Kaestner & Hecht Co., 1276-77.  
Kimball Brothers Co., 1275.  
Lamson Co., 1307.  
Lowerator Co., Inc., 1308-09.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Sedgwick Machine Works, 1285-89.  
Standard Store Service, Inc., 1314.  
*Chelsea*, 1265-67.  
*Ernst*, 1294-97.  
*K. & H.*, 1276-77.  
*Kimball*, 1275.  
*Lowerator*, 1308-09.  
*Otis*, 1280-84.  
*Sedgwick*, 1285-89.  
Specifications, 1265-67.
- Elevators, Hydraulic.**  
Hollister-Whitney Co., 1274.  
Kaestner & Hecht Co., 1276-77.  
Otis Elevator Co., 1280-84.  
Payne Co., F. S., 1290-91.  
*K. & H.*, 1276-77.  
*Otis*, 1280-84.
- Elevators, Ice**, see Elevators, Freight or Passenger, Power.
- Elevators, Inclined.**  
Haslett Spiral Chute Co., 1306.  
Otis Elevator Co., 1280-84.  
*Otis*, 1280-84.
- Elevators, Invalid.**  
A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Energy Elevator Co., 1270-73.  
Kaestner & Hecht Co., 1276-77.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Sedgwick Machine Works, 1285-89.  
*Chelsea*, 1265-67.  
*K. & H.*, 1276-77.  
*Otis*, 1280-84.  
*Sedgwick*, 1285-89.
- Elevators, Notes on.**  
Society for Electrical Development, Inc., 1145-52.
- Elevators, Passenger**, see Elevators, Freight or Passenger, Power.
- Elevators, Pivoted Tray.**  
Olson & Co., Samuel, 1312-13.
- Elevators, Platform.**  
(See also Elevators, Freight or Passenger, Power.)  
Olson & Co., Samuel, 1312-13.
- Elevators, Plunger**, see Elevators, Hydraulic.
- Elevators, Sidewalk, Hand.**  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Energy Elevator Co., 1270-73.  
Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Hollister-Whitney Co., 1274.  
Montgomery Elevator Co., 1279.  
Otis Elevator Co., 1280-84.  
Sedgwick Machine Works, 1285-89.  
*Chelsea*, 1265-67.  
*Ernst*, 1294-97.  
*G & G*, 1299-1305.  
*Otis*, 1280-84.  
*Perfection*, 1294-97.  
*Sedgwick*, 1285-89.
- Elevators, Sidewalk, Power.**  
A. B. See Electric Elevator Co., 1262-63.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Hollister-Whitney Co., 1274.  
Montgomery Elevator Co., 1279.  
Olson & Co., Samuel, 1312-13.  
Otis Elevator Co., 1280-84.  
*Chelsea*, 1265-67.  
*Ernst*, 1294-97.  
*G & G*, 1299-1305.  
*Otis*, 1280-84.
- Elevators, Single Drum**, see Elevators, Freight or Passenger, Power.
- Elevators, Steam.**  
(See also Elevators, Freight or Passenger, Power.)  
Hollister-Whitney Co., 1274.  
Otis Elevator Co., 1280-84.  
*Otis*, 1280-84.
- Elevators, Tandum, Drum**, see Elevators, Freight or Passenger, Power.
- Elevators, Traction Type**, see Elevators, Freight or Passenger, Power.
- Elevators, Tray**, see Elevators, Pivoted Tray; Elevators, Freight or Passenger, Power; Elevating and Conveying Machinery; Conveyors, Tray.
- Emergency Stairways**, see Stairways, Emergency; Fire Escapes.
- Enamel Undercoats.**  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Johnson & Co., Inc., Oliver, 1326-27.  
Keystone Varnish Co., 1347-48.  
Murphy Varnish Co., 1350-51.  
Pitcairn Varnish Co., 1352-53.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
U. S. Gutta Percha Paint Co., 1336-37.  
Valentine & Co., 1366-67.  
Wadsworth, Howland & Co., Inc., 1338-39.  
*Bay State*, 1338-39.  
*Flat-Lead*, 1342-43.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Harrisons Flowkote*, 1322-25.  
*Keystone*, 1347-48.  
*Memphi*, 1319.  
*Murphy*, 1350-51.  
*Ojaco*, 1326-27.  
*Ojaco Kon-Krete-Kote*, 1326-27.  
*Pitcairn Tector*, 1352-53.  
*Porcelite*, 1364.  
*Rice's*, 1336-37.  
*Satinette*, 1356-63.  
*Val-Enamel*, 1366-67.  
*Valentine's* 1366-67.  
*Viralite*, 1354-55.

**Enamel Undercoats—Continued.**

*Wahcolite*, 1338-39.  
Specifications, 1336-37; 1350-51.

**Enameled Brick**, see Brick, Enameled or Porcelain.

**Enamels.**

American Bitumastic Enamels Co., 1373.  
Antakwa Co., 37.  
Arco Co., 1316-17.  
Berry Brothers, 1346.  
Billings-Chapin Co., 1318.  
Boston Varnish Co., 1340-41.  
Bridgeport Wood Finishing Works, 1369.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
General Fireproofing Co., 42.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Hetzel, Estate of J. G., 443.  
Horn Co., A. C., 43.  
Johnson & Co., Inc., Oliver, 1326-27.  
Keystone Varnish Co., 1347-48.  
Louisville Varnish Co., Inc., 1349.  
Lowe Brothers Co., 1328-29.  
Marietta Paint & Color Co., 1330.  
Murphy Varnish Co., 1350-51.  
National Paint & Varnish Co., 1331.  
Natroco Paint & Varnish Works, 1334.  
Pecora Paint Co. 1378-79.  
Pitcairn Varnish Co., 1352-53.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
Toch Brothers, 50-51.  
Tropical Paint & Oil Co., 1335.  
Trus-Con Laboratories, 52-53.  
U. S. Gutta Percha Paint Co., 1336-37.  
Valentine & Co., 1366-67.  
Vortex Mfg. Co., 1374.  
Wadsworth, Howland & Co., Inc., 1338-39.  
*Alpine*, 1335.  
*Bay State*, 1338-39.  
*Certain-teed*, 399-401.  
*Chemic-Enamel*, 1336-37.  
*Chinaline*, 1336-37.  
*Coat-o-lite*, 1331.  
*Edelvice*, 1347-48.  
*Eggshel-White*, 1342-43.  
*Eggshell Vitralite*, 1354-55.  
*Elveeco*, 1349.  
*Flo-rite*, 1318.  
*Flo-White*, 1342-43.  
*Flowkote*, 1322-25.  
*GF No. 155*, 42.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*High Standard*, 1328-29.  
*Hornstone*, 43.  
*Horntile*, 43.  
*Kyanize*, 1340-41.  
*Liberty*, 37.  
*Lilly White*, 1319.  
*Linduro*, 1328-29.  
*Louvarco*, 1349.  
*Luxeberry*, 1346.  
*Marietta Endurance*, 1330.  
*Murphy*, 1350-51.  
*National*, 1331.  
*Ojaco*, 1326-27.  
*Ojaco Dado*, 1326-27.  
*Pecora*, 1378-79.  
*Phlorkote*, 1334.  
*Pitcairn Banzai*, 1352-53.  
*Porcelite*, 1364.  
*R.I.W.*, 50-51.  
*Radiolite*, 41.  
*Satinette*, 1356-63.  
*Semi-gloss*, 1350-51.  
*Spartanite*, 1330.  
*Superior*, 1344-45.  
*Supreme Yacht White*, 1342-43.  
*Toconamel*, 1335.

**Enamels—Continued.**

*Trus-Con*, 52-53.  
*Val-Enamel*, 1366-67.  
*Valentine's* 1366-67.  
*Valspar*, 1366-67.  
*Velvet*, 1344-45.  
*Vernicol*, 1328-29.  
*Vitralite*, 1354-55.  
*Vorco*, 1374.  
*Wahcolite*, 1338-39.  
*Wheeler's*, 1369.  
*White-Enamelite*, 1342-43.  
Specifications, 52-53; 1319; 1320-21; 1340-41; 1344-45; 1346; 1347-48; 1350-51; 1354-55; 1364; 1366-67; 1378-79.

**Enamels, Cement**, see Enamels; Paint: Brick, Cement, Concrete, Plaster, Stone.

**Enamels, Hospital**, see Enamels.

**Enclosures, Athletic Field**, see Fencing, Wire or Woven Wire.

**Enclosures, Bank**, see Specific Headings.

**Enclosures, Elevator.**

Badger Wire & Iron Works, 494-95.  
Bigelow Wire Works, Cheney, 491.  
Central Metallic Door Co., 648.  
Chattanooga Roofing & Foundry Co., 499.  
Creswell Iron Works, Samuel J., 258-59.  
Dahlstrom Metallic Door Co., 649-51.  
Eastern Bridge & Structural Co., 18-19.  
Guaranty Iron & Wire Co., 667.  
Hughes-Keenan Co., 262-65.  
Interior Metal Mfg. Co., 654-55.  
Jackson Co., Wm. H., 512.  
Lasar Mfg. Co., 506-07.  
McGann & Sons Co., T. F., 508-09.  
Manhattan Brass Co., 513.  
Mesker Brothers Iron Co., 722-25.  
Meyers Mfg. Co., Fred J., 516.  
North Western Expanded Metal Co., 214-15.  
Page Steel and Wire Co., 549-51.  
Penn Brass & Bronze Works, 517.  
Polachek Bronze & Iron Co., John, 522.  
Price-Evans Foundry Co., 518-19.  
Reed & Barton, 520-21.  
St. Louis Wire & Iron Co., 523.  
Sexauer & Lemke, Inc., 262-65.  
Smith Wire and Iron Works, F. P., 524-25.  
Smyser-Royer Co., 528.  
Snow Iron Works, Inc., W. A., 554-55.  
Solar Metal Products Co., Inc., 645.  
Steelite Co., 1293.  
Thorp Fire Proof Door Co., 661-63.  
Tiffany Studios, 526-27.  
Tyler Co., W. S., 529.  
Wagner Architectural Iron Works, A. F., 530-31.  
Whitaker-Glessner Co., 241.  
Williams, Inc., Jno., 532.  
Wisconsin Iron & Wire Works, 533.  
Wright Wire Co., 234-35.  
*Portsmouth Iron*, 241.  
*Steelite*, 1293.

**Enclosures, Elevator, Information on.**  
Associated Metal Lath Manufacturers, 196-201.

**Enclosures, Poultry Yard**, see Fencing, Wire or Woven Wire.

**Enclosures, Revolving Door.**

Atchison Revolving Door Co., 586-87.  
Reed & Barton, 520-21.  
Revolving Door & Fixture Co., 590.  
Van Kannel Revolving Door Co., 588-89.  
*Atchison*, 586-87.  
*Van Kannel*, 588-89.

**Enclosures, Stock and Tool Room.**

Anchor Post Iron Works, 537-43.  
Badger Wire & Iron Works, 494-95.  
Bigelow Wire Works, Cheney, 491.  
Brook Iron Works, A. T., 544-45.  
Cyclone Fence Co., 546-48.  
Lyon Metallic Mfg. Co., 1420-21.  
North Western Expanded Metal Co., 214-15.  
Page Steel and Wire Co., 549-51.

**Enclosures, Stock and Tool Room—Continued.**

Snow Iron Works, Inc., W. A., 554-55.  
Wright Wire Co., 234-35.  
*Cyclone*, 546-48.  
*Lyon*, 1420-21.

**Enclosures, Tennis Court**, see Fencing, Wire or Woven Wire.

**Enclosures, Wire**, see Fencing, Wire or Woven Wire; Wire Work.

**End Ferrules**, see Ferrules, End.

**Endpieces, Roof, Metal**, see Roof Trim-mings, Metal.

**Ends and Drops, Conductor**, see Pipe, Conductor.

**Engine Trimmings, Gas.**  
Commonwealth Brass Corporation, 1082.

**Engineers, Acoustical.**  
Johns-Manville Co., H. W., 36.

**Engineers, Chemical.**  
Carbolineum Wood Preserving Co., 1386.  
Hunt & Co., Robert W., 8.  
Pittsburgh Testing Laboratory, 9.

**Engineers, Civil.**  
Hunt & Co., Robert W., 8.

**Engineers, Concrete, Reinforced**, see Engineers or Contractors, Concrete Construction.

**Engineers, Construction**, see Engineers or Contractors, Building.

**Engineers, Consulting.**  
Anti-Hydro Waterproofing Co., 38.  
Carbolineum Wood Preserving Co., 1386.  
Hunt & Co., Robert W., 8.  
Kalman Co., Paul J., 193.  
S-M-I Engineering Co., 23.  
Wagner Architectural Iron Works, A. F., 530-31.

**Engineers, Electrical.**  
Electric Cable Co., 1190-91.  
General Electric Co., 1153-67.  
Hunt & Co., Robert W., 8.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Youngstown Sheet & Tube Co., 1180-81.

**Engineers, Flooring.**  
Special Service Flooring Corporation, 336.

**Engineers, Heat Treatment.**  
Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Engineers, Heating and Ventilating.**  
American Blower Co., 996-99.  
Bicalky Fan Co., 1000.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Gerdes, Theodore R. N., 462.  
Kernchen Company, 466.  
King Ventilating Co., 468-69.  
Moline Heat, 939.  
Ohio Blower Co., 472-74.  
Sturtevant Co., B. F., 1006-07.

**Engineers, Hydraulic.**  
Hunt & Co., Robert W., 8.

**Engineers, Illuminating.**  
Beardslee Chandelier Mfg. Co., 1226.  
Edison Lamp Works, 1224.  
General Electric Co., 1153-67.  
National X-Ray Reflector Co., 1231.  
Westinghouse Lamp Co., 1225.

**Engineers, Inspection.**  
Carbolineum Wood Preserving Co., 1386.  
Hunt & Co., Robert W., 8.  
Pittsburgh Testing Laboratory, 9.

**Engineers, Mechanical.**  
Gerdes, Theodore R. N., 462.  
Hunt & Co., Robert W., 8.

**Engineers, Sanitation.**  
Aten Sewage Disposal Co., 879.  
New York Sewage Disposal Co., 881.

**Engineers, Sewage Disposal**, see Engineers, Sanitation.



**Engineers, Testing.**

Hunt & Co., Robert W., 8.  
Pittsburgh Testing Laboratory, 9.

**Engineers or Contractors, Building.**

Eastern Bridge & Structural Co., 18-19.  
Foundation Co., 14.  
Hunt & Co., Robert W., 8.  
Price-Evans Foundry Co., 518-19.  
S-M-I Engineering Co., 23.  
Schouler Cement Construction Co., 789.  
Tucker Co., Edward A., 194.  
Turner Construction Co., 15.  
Wagner Architectural Iron Works, A. F., 530-31.  
White Fireproof Construction Co., 16.  
Goetz, 518-19.

**Engineers or Contractors, Concrete Construction.**

Barton Spider-Web System, 20-21.  
Concrete Engineering Co., 24-25.  
Concrete Reinforcing and Engineering Co., 186-87.  
Mensch, L. J., 302.  
National Fire Proofing Co., 100-05.  
Raymond Concrete Pile Co., 12-13.  
S-M-I Engineering Co., 23.  
Tucker Co., Edward A., 194.  
Turner Construction Co., 15.  
Uni-Form Co., 27-29.  
White Fireproof Construction Co., 16.  
Witherow Steel Co., 195.

**Engineers or Contractors, Foundation.**

Foundation Co., 14.  
MacArthur Concrete Pile & Foundation Co., 10-11.  
Raymond Concrete Pile Co., 12-13.

**Engineers or Contractors, Structural Steel, see Structural Steel or Iron Work.****Engineers or Contractors, Swimming Pool.**

Booraem, J. Francis, 288.

**Engineers or Contractors, Timber Treatment.**

Carbolineum Wood Preserving Co., 1386.

**Engineers or Contractors, Waterproofing and Dampproofing.**

Antakwa Co., 37.  
Anti-Hydro Waterproofing Co., 38.  
Biegler Mfg. Co., E. N., 39.  
Bitu-Mortar Waterproofing Co., Inc., 40.  
General Fireproofing Co., 42.  
Hydrex Felt & Engineering Co., 44.  
Hydrolithic Waterproofing Co., Inc., 45.  
Johns-Manville Co., H. W., 36.  
Obelisk Waterproofing Co., 46.  
Permanent Ironite Waterproofing Co., 47.  
Waterproofing Co., 54-55.  
Zibell Damp Resisting Paint Co., 57.

**Engineers or Contractors, Water Works, see Water Supply Systems.****Engines, Fire.**

Erwin Mfg. Co., 1140.  
Safety Fire Extinguisher Co., 1141.  
Simmons Co., John, 1142-43.  
Safety, 1141.

**Engines, Fire, Chemical.**

Erwin Mfg. Co., 1140.  
Safety Fire Extinguisher Co., 1141.  
Simmons Co., John, 1142-43.  
Erwin Firefoam, 1140.  
Safety, 1141.

**Engines, Fire, Portable.**

Erwin Mfg. Co., 1140.  
Firefoam, 1140.

**Engines, Gas or Oil.**

Church, Stephen B., 1100.  
Gerdes, Theodore R. N., 462.  
Kewanee Private Utilities Co., 1112-13.  
Church, 1100.  
Kewanee, 1112-13.  
New-Way, 1100.

**Engines, Gasoline, see Engines, Gas or Oil.****Engines, Steam.**

American Blower Co., 996-99.

**Engines, Steam—Continued.**

Church, Stephen B., 1100.  
Sturtevant Co., B. F., 1006-07.  
ABC, 996-99.  
Church, 1100.  
Sturtevant, 1006-07.

**Entrance Doors, see Doors, Entrance, Bronze or Iron.****Entrance Torchers, see Lighting Fixtures.****Entrances, see Gates, Iron or Bronze, Plain or Ornamental; Doors, Entrance, Bronze or Iron.****Enunciators, Electric.**

Winkler-Reichmann Co., 1236.  
Electrical Page Boy, 1236.  
Still Small Voice, 1236.

**Eraser Cleaners, see Cleaners, Eraser.****Erasers.**

New York Blue Print Paper Co., 6.  
Weber Costello Co., 379.  
Carnation, 6.  
NYB, 6.  
Shamrock, 6.

**Escalators.**

Otis Elevator Co., 1280-84.  
Otis, 1280-84.

**Espaliers.**

Anchor Post Iron Works, 537-43.

**Estimating Data, Electrical Installation.**

Society for Electrical Development, Inc., 1145-52.

**Evaporators.**

Brecht Co., 1050-52.

**Excavating, General.**

Foundation Co., 14.

**Excavating Machinery.**

Link-Belt Co., 1310.

**Exhaust Fans, see Fans, Ventilating or Exhaust.****Exhaust Heads, see Heads, Exhaust.****Exhausters, see Blowers and Exhausters.****Exhibit Equipment, see Museum Equipment.****Expanded Metal, see Metal, Expanded.****Expanded Metal Lath, see Lath, Metal.****Expansion Bolts, see Bolts, Expansion.****Exterior Woodwork, see Woodwork, Exterior.****Extinguishers, Fire.**

Allen Mfg. Co., W. D., 1131-33.  
Erwin Mfg. Co., 1140.  
New York Brass Foundry Co., 1134-35.  
Safety Fire Extinguisher Co., 1141.  
Simmons Co., John, 1142-43.  
Alenco, 1131-33.  
Firefoam, 1140.  
Safety, 1141.  
Stillbech, 1134-35.  
Specifications, 1131-33.

**Extractors, Grease.**

Blackburn-Smith Corporation, 880.  
Blackburn-Smith, 880.

**Extractors, Laundry.**

American Laundry Machinery Co., 1036.  
American, 1036.

**F****Fabrics, Decorative.**

(See also Decoration, Interior; Burlaps.)  
Tiffany Studios, 526-27.

**Fabrics, Wire, see Netting, Wire; Cloth, Wire.****Facias.**

(See also Ornamental Metal Work.)  
Tiffany Studios, 526-27.

**Facings, Mantel.**

Associated Tile Manufacturers, 284-87.  
Bradford Pressed Brick Co., 78-79.  
Grueby Faience & Tile Co., 292.  
Hood Brick Co., B. Mifflin, 80-81.

**Facings, Mantel—Continued.**

Jackson Co., Wm. H., 289.  
Ketcham, O. W., 118.  
Mueller Mosaic Co., 293.  
Rookwood Pottery Co., 294-95.  
Tiffany Studios, 526-27.  
Grueby, 292.  
Pottery, 80-81.

**Faience.**

Associated Tile Manufacturers, 284-87.  
Atlantic Terra Cotta Co., 112-13.  
Davis Marble Co., 283.  
Grueby Faience & Tile Co., 292.  
Ketcham, O. W., 118.  
Mueller Mosaic Co., 293.  
Northwestern Terra Cotta Co., 116-17.  
Rookwood Pottery Co., 294-95.  
Grueby, 292.

**Fans, Ceiling.**

General Electric Co., 1153-67.  
Sprague Electric Works, 1168.  
Westinghouse Electric & Mfg. Co., 1169-76.  
G-E, 1153-67.  
Specifications, 1153-67.

**Fans, Column.**

General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
G-E, 1153-67.

**Fans, Desk or Bracket.**

General Electric Co., 1153-67.  
Sprague Electric Works, 1168.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
G-E, 1153-67.  
Western Electric, 1202-03.  
Specifications, 1153-67.

**Fans, Disk, see Fans, Ventilating or Exhaust.****Fans, Gas.**

Sturtevant Co., B. F., 1006-07.  
Sturtevant, 1006-07.

**Fans, Gyating, see Fans, Ceiling; Fans, Column.****Fans, Induced Draft, see Draft Apparatus, Mechanical.****Fans, Oscillating, see Fans, Desk or Bracket.****Fans, Ventilating or Exhaust.**

(See also Blowers and Exhausters.)  
American Blower Co., 996-99.  
Bicalky Fan Co., 1000.  
General Electric Co., 1153-67.  
Gerdes, Theodore R. N., 462.  
Ilg Electric Ventilating Co., 1002-03.  
Massachusetts Blower Co., 1005.  
Sprague Electric Works, 1168.  
Sturtevant Co., B. F., 1006-07.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Wing Mfg. Co., L. J., 1008.  
ABC, 996-99.  
Bicalky, 1000.  
G-E, 1153-67.  
Ilg, 1002-03.  
Massachusetts-Davidson, 1005.  
Sirocco, 996-99.  
Sturtevant, 1006-07.  
Ventura, 996-99.  
Western Electric, 1202-03.  
Westinghouse, 1169-76.  
Westinghouse-Ventura, 1169-76.  
Wing, 1008.  
Specifications, 1153-67.

**Fasteners, Roofing.**

Standard Paint Co., 393.  
Wyron, 393.

**Fasteners, Sash, see Fasteners and Adjusters, Casement or Sash.****Fasteners Screen, see Fasteners and Adjusters, Awning, Blind, Screen or Shutter.**

**Fasteners and Adjusters, Awning, Blind, Screen or Shutter.**

Casement Hardware Co., 737.  
 Kees Mfg. Co., F. D., 799.  
 Mallory Mfg. Co., 741.  
 Monroe Screen, Blind & Partition Co., 772.  
 National Mfg. Co., 621-25.  
 Payson Mfg. Co., 750-53.  
 Phenix Mfg. Co., 800-01.  
 Safety Detachable Window Corporation, 730-31.  
 Stanley Works, 608-13.  
*Bull Dog*, 737.  
*C-H*, 737.  
*Hold Fast*, 737.  
*Kees Gossett*, 799.  
*Mallory*, 741.  
*Master*, 737.  
*Peerless*, 608-13.  
*Phenix*, 800-01.  
*Stanley*, 608-13.

**Fasteners and Adjusters, Casement or Sash.**

Caldwell Mfg. Co., 758-59.  
 Casement Hardware Co., 737.  
 Crittall Casement Window Co., 714-15.  
 Detroit Steel Products Co., 700-01.  
 Friction Pivot Co., 738.  
 Grant Pulley and Hardware Co., 760-61.  
 International Casement Co., Inc., 718.  
 Kees Mfg. Co., F. D., 799.  
 L. P. T. Specialty Co., 763.  
 Lord & Burnham Co., 747.  
 Mesker Brothers Iron Co., 722-25.  
 Metallic Sash-Operator Co., 748-49.  
 Michigan Engine Valve Co., 740.  
 Monarch Metal Weather Strip Co., 786-87.  
 National Mfg. Co., 621-25.  
 Payson Mfg. Co., 750-53.  
 Riester & Thesmacher Co., 658-59.  
 Shelby Spring Hinge Co., 606-07.  
 Stanley Works, 608-13.  
 Van Kannel Revolving Door Co., 588-89.  
 Vonnegut Hardware Co., 593-97.  
 Wilkins, George Lester, 746.  
 Williams Pivot Sash Co., 742-45.  
 Winslow Bros. Co., 735.  
*Bull-Dog*, 737.  
*C. D. T.*, 738.  
*C-H*, 737.  
*Crittall*, 714-15.  
*Fenestra*, 700-01.  
*Grant*, 760-61.  
*Harris*, 750-53.  
*Hold-Fast*, 737.  
*Howarth's*, 740.  
*Kees*, 799.  
*L. P. T.*, 763.  
*Master*, 737.  
*Monarch*, 786-87.  
*Peerless*, 608-13.  
*Queen*, 760-61.  
*R & T*, 658-59.  
*Security*, 746.  
*Signal*, 750-53.  
*Stanley*, 608-13.  
*Van Kannel*, 588-89.  
*Von Duprin*, 593-97.  
*Wilkins*, 746.  
*Williams*, 742-45.  
*Winslow*, 735.

**Faucet and Drinking Fountains, Combination.**

Fountain Faucet Co., 862.

**Faucets, see Cocks and Bibbs.****Feed Boxes and Racks, see Stable Fittings and Fixtures; Barn Equipment.****Feed Carriers, see Carriers, Feed and Litter.****Feed Trucks, see Carriers, Feed and Litter.****Feed Water Heaters, see Heaters, Feed Water.****Feeders, Boiler, Low Pressure.**

Ohio Blower Co., 472-74.  
*Swartwout*, 472-74.

**Felt, Asbestos.**

Carey Co., Philip, 398.  
 Johns-Manville Co., H. W., 36; 386-87; 402-05.  
*Fiberock*, 398.  
*Johns-Manville Asbestos Duck*, 36; 386-87; 402-05.  
*Johns-Manville No. 2 Ajax*, 402-05.

**Felt, Asphalt or Tarred.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Ford Mfg. Co., 239.  
 Garrett & Son Corp., C. S., 392.  
 General Fireproofing Co., 42.  
 Hydrex Felt & Engineering Co., 44.  
 Johns-Manville Co., H. W., 386-87; 402-05.  
 National Roofing Co., 389.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Anchor*, 408-09.  
*Barrett Specification*, 394-97.  
*Certain-teed*, 399-401.  
*Composite*, 408-09.  
*Feltex*, 398.  
*Fiberock*, 398.  
*GF, No. 18*, 42.  
*Hudson*, 388.  
*Hydrex*, 44.  
*Johns-Manville*, 386-87.  
*Johns-Manville No. 2 Ajax*, 402-05.  
*National*, 389.  
*Neponset*, 390-91.  
*Niagara Special*, 392.  
*Pyramid*, 239.  
*Ru-ber-oid*, 393.  
*SPC*, 393.  
*Tile-Tite*, 408-09.  
*Warren's*, 408-09.  
 Specifications, 408-09.

**Felt, Deadening, see Sound Deadening Materials.****Felt, Insulating and Sheathing.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Garrett & Son Corp., C. S., 392.  
 Johns-Manville Co., H. W., 386-87; 402-05.  
 National Roofing Co., 389.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Anchor*, 408-09.  
*Barrett's*, 394-97.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*Composite*, 408-09.  
*Hudson*, 388.  
*Johns-Manville*, 386-87; 402-05.  
*National*, 389.  
*Neponset*, 390-91.  
*Niagara Special*, 392.  
*SPC*, 393.  
*Tile-Tite*, 408-09.  
*Warren's*, 408-09.

**Felt, Roofing, see Felt, Insulating and Sheathing.****Felt, Saturated, see Felt, Asphalt or Tarred.****Felt, Sheathing, see Felt, Insulating and Sheathing.****Felt, Slaters, see Felt, Insulating and Sheathing.****Felt, Sound Deadening, see Sound Deadening Materials.****Felt, Waterproofing, see Waterproofing and Dampproofing Felt, Cloth and Fabric.****Fences, see Fencing.****Fencing, Factory or Industrial Plant, see Specific Type.****Fencing, Iron.**

American Fence Construction Co., 534-36.  
 Anchor Post Iron Works, 537-43.  
 Badger Wire and Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Brook Iron Works, A. T., 544-45.  
 Cyclone Fence Co., 546-48.  
 Fiske Iron Works, J. W., 552-53.  
 Lasar Mfg. Co., 506-07.  
 Mack Iron and Wire Works Co., 510-11.  
 Meyers Mfg. Co., Fred J., 516.  
 Page Steel and Wire Co., 549-51.  
 Penn Brass & Bronze Works, 517.  
 Polachek Bronze & Iron Co., John, 522.  
 St. Louis Wire & Iron Co., 523.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Smyser-Royer Co., 528.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Stewart Iron Works Co., 556-57.  
 Tyler Co., W. S., 529.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Williams, Inc., Jno., 532.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
*Cyclone*, 546-48.  
*Excelsior*, 234-35.

**Fencing, Jail.**

Barnum Iron Works, E. T., 1487.

**Fencing, Kennel, see Fencing, Wire or Woven Wire.****Fencing, Lattice, see Fencing, Wood.****Fencing, Non-climbable, see Fencing, Wire or Woven Wire.****Fencing, Picket.**

Page Steel and Wire Co., 549-51.

**Fencing, Steel, see Fencing, Iron.****Fencing, Wire or Woven Wire.**

American Fence Construction Co., 534-36.  
 Anchor Post Iron Works, 537-43.  
 Badger Wire & Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Brook Iron Works, A. T., 544-45.  
 Cyclone Fence Co., 546-48.  
 Duvinage, Pierre, 260.  
 Fiske Iron Works, J. W., 552-53.  
 Guaranty Iron & Wire Co., 667.  
 Meyers Mfg. Co., Fred J., 516.  
 Page Steel and Wire Co., 549-51.  
 St. Louis Wire & Iron Co., 523.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Stewart Iron Works Co., 556-57.  
 Tyler Co., W. S., 529.  
 Williams, Inc., Jno., 532.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
 Youngstown Sheet & Tube Co., 1074-75.  
*Buckeye*, 1074-75.  
*Cyclone*, 546-48.  
*Excelsior*, 234-35.  
*Youngstown*, 1074-75.  
 Specifications, 534-36; 546-48; 554-55.

**Fencing, Wood.**

Hartmann-Sanders Co., 298-99.  
 Mathews Mfg. Co., 1402-03.

**Fenders, Fireplace.**

Bigelow Wire Works, Cheney, 491.  
 Colonial Fireplace Co., 279.  
 Jackson Co., Wm. H., 512.

**Fenders, Metal, see Guards.****Ferrules, End.**

Compound Injector & Specialty Co., 872-73.  
*Dehn's*, 872-73.



**Fertilizer Machinery.**

Brecht Co., 1050-52.

**Figures, Bronze, see Statuary, Metal.****Filing Equipment, Drafting Room.**

American Drafting Furniture Co., 1.

Economy Drawing Table Co., 2-4.

*American*, 1.*Economy*, 2-4.**Filing Equipment, Metal.**

Berger Mfg. Co., 1406-08.

Darby &amp; Sons Co., Inc., Edward, 1409.

Federal Steel Fixture Co., 1412-13.

General Fireproofing Co., 1414.

Hall's Safe Co., 1431.

Hauserman Co., E. F., 1415.

Library Bureau, 1418-19.

Manufacturing Equipment and Engineering Co., 1422.

Safe-Cabinet Co., 1430.

Terrell's Equipment Co., 1426-27.

Van Dorn Iron Works Co., 1428.

Watson Mfg. Co., Inc., 1429.

*Federal*, 1412-13.*GF Allsteel*, 1414.*Hollreth*, 1415.*Library Bureau*, 1418-19.*Safe-Cabinet*, 1430.*Van Dorn*, 1428.**Filing Systems.**

Library Bureau, 1418-19.

Watson Mfg. Co., Inc., 1429.

*Library Bureau*, 1418-19.**Filler Boxes, see Boxes, Filler.****Fillers, Crack or Joint.**

Harrison Works, 1322-25.

Johns-Manville Co., 36.

Wadsworth, Howland &amp; Co., Inc., 1338-39.

*Bay State*, 1338-39.*Certain-teed*, 399-401.*Harrisons*, 1322-25.*Johns-Manville*, 36.**Fillers, Wood.**

Bridgeport Wood Finishing Works, 1369.

Certain-teed Products Corporation, 399-401.

Chicago Varnish Co., 1342-43.

De Soto Paint Mfg. Co., 1319.

Harrison Works, 1322-25.

Johnson &amp; Co., Inc., Oliver, 1326-27.

Louisville Varnish Co., Inc., 1349.

Lowe Brothers Co., 1328-29.

Marietta Paint &amp; Color Co., 1330.

Minwax Co., Inc., 342.

Murphy Varnish Co., 1350-51.

Patton Paint Co., 1332-33.

Pitcairn Varnish Co., 1352-53.

Pratt &amp; Lambert, Inc., 1354-55.

Standard Varnish Works, 1356-63.

Thomson Wood Finishing Co., 1364.

Tropical Paint &amp; Oil Co., 1335.

Valentine &amp; Co., 1366-67.

*Certain-teed*, 399-401.*Harrisons*, 1322-25.*High Standard*, 1328-29.*Kleartone*, 1356-63.*Louvarco*, 1349.*Marietta*, 1330.*Memphi*, 1319.*Minwax*, 342.*Murphy*, 1350-51.*Ojaco*, 1326-27.*Pitcairn*, 1352-53.*Premier*, 1349.*Silex*, 1342-43.*Val-Filler*, 1366-67.*Wheeler's*, 1369.*White Damar*, 1335.

Specifications, 342.

**Fillers, Wood, Paste.**

Certain-teed Products Corporation, 399-401.

Chicago Varnish Co., 1342-43.

De Soto Paint Mfg. Co., 1319.

Louisville Varnish Co., Inc., 1349.

Lowe Brothers Co., 1328-29.

**Fillers, Wood, Paste—Continued.**

Marietta Paint Co., 1330.

Murphy Varnish Co., 1350-51.

Patton Paint Co., 1332-33.

Pitcairn Varnish Co., 1352-53.

Pratt &amp; Lambert, Inc., 1354-55.

Standard Varnish Works, 1356-63.

*Certain-teed*, 399-401.*High Standard*, 1328-29.*Kleartone*, 1356-63.*Louvarco*, 1349.*Marietta*, 1330.*Memphi*, 1319.*Murphy*, 1350-51.*Pitcairn*, 1352-53.*Premier*, 1349.*Silex*, 1342-43.

Specifications, 1352-53; 1356-63.

**Filling Devices.**

Wayne Oil Tank &amp; Pump Co., 1480-81.

**Filter Accessories, see Filters, Water.****Filtering Plants.**

(See also Softeners, Water.)

International Filter Co., 1124.

Norwood Engineering Co., 1127.

*International*, 1124.**Filters, Charcoal.**

Norwood Engineering Co., 1127.

**Filters, Clarifying, see Filters, Water.****Filters, Dust, see Arresters, Dust.****Filters, Feed Water, see Filters, Water.****Filters, Gasoline.**

Allen Pressure System Co., Inc., 1474-75.

Bowser &amp; Co., Inc., S. F., 1476-77.

Gilbert &amp; Barker Mfg. Co., 1478-79.

Wayne Oil Tank &amp; Pump Co., 1480-81.

*ApSCO*, 1474-75.*Bowser*, 1476-77.*G & B*, 1478-79.**Filters, Oil.**

Allen Pressure System Co., Inc., 1474-75.

Bowser &amp; Co., Inc., S. F., 1476-77.

Burt Mfg. Co., 459-61.

Gilbert &amp; Barker Mfg. Co., 1478-79.

International Filter Co., 1124.

Wayne Oil Tank &amp; Pump Co., 1480-81.

*ApSCO*, 1474-75.*Bowser*, 1476-77.*G & B*, 1478-79.**Filters, Sand.**

International Filter Co., 1124.

Norwood Engineering Co., 1127.

**Filters, Water, Gravity or Pressure.**

Blackburn Smith Corporation, 880.

International Filter Co., 1124.

Loomis-Manning Filter Distributing Co., 1125.

New York Continental Jewell Filtration Co., 1126.

Norwood Engineering Co., 1127.

Permutit Co., 1130.

Roberts Filter Mfg. Co., 1128-29.

*Baltimore*, 1125.*Blackburn-Smith*, 880.*Continental*, 1126.*Jewell*, 1126.*Loomis-Manning*, 1125.*New York*, 1126.*Norwood*, 1127.*Permutit*, 1130.*Roberts*, 1128-29.*Wilson*, 1127.

Specifications, 1125.

**Finials, see Roof Trimmings.****Finishes, Wood, see Varnish; Paint.****Finishing Plaster, see Plasters, Finishing, Interior.****Fire Alarm Systems.**

Stanley &amp; Patterson, Inc., 1246-55.

*Faraday*, 1246-55.**Fire Alarms, see Bells: Church, Fire Alarm, Fog Signal, School, etc.;**

Alarms, Burglar or Fire.

**Fire Axes, see Axes, Fire.****Fire Detectors, see Detectors, Fire.****Fire Escapes.**

(See also Stairways, Emergency.)

Badger Wire &amp; Iron Works, 494-95.

Barnum, E. T., 496-97.

Chattanooga Boiler &amp; Tank Co., 1094.

Chattanooga Roofing &amp; Foundry Co., 499.

Columbia Iron &amp; Wire Works Co., 268-69.

Duvinae, Pierre, 260.

Eastern Bridge &amp; Structural Co., 18-19.

Fiske Iron Works, J. W., 552-53.

Guaranty Iron &amp; Wire Co., 667.

Hughes-Keenan Co., 262-65.

Johnson Mfg. Co., Geo. W., 668.

Mack Iron and Wire Works Co., 510-11.

Meyers Mfg. Co., Fred J., 516.

Minnesota Manufacturers' Association, 1311.

Mott Iron Works, J. L., 514-15.

Olson &amp; Co., Samuel, 1312-13.

Page Steel and Wire Co., 549-51.

Price-Evans Foundry Co., 518-19.

Reliance Fireproof Door Co., 656-57.

Sexauer &amp; Lemke, Inc., 262-65.

Smith Wire and Iron Works, F. P., 524-25.

Snow Iron Works, Inc., W. A., 554-55.

Standard Fire Escape Co., 266.

Wagner Architectural Iron Works, A. F., 530-31.

Wisconsin Iron &amp; Wire Works, 267.

Wright Wire Co., 234-35.

**Fire Escapes, Spiral,**

Minnesota Manufacturers' Association, 1311.

Olson &amp; Co., Samuel, 1312-13.

**Fire Exit Devices.**

National Automatic Door Co., 660.

Smith Metal Window Hardware Co., Frank F., 592.

Van Kannel Revolving Door Co., 588-89.

Vonnegut Hardware Co., 593-97.

*Panik-Prufe*, 660.*Van Kannel*, 588-89.*Von Duprin*, 593-97.

Specifications, 593-97.

**Fire Extinguishers and Equipment, see Extinguishers, Fire.****Fire Fighting Appliances, see Specific Headings.****Fire Hooks, see Hooks, Fire.****Fire Hose, see Hose, Fire.****Fire Hydrants, see Hydrants, Fire.****Fire Line Fittings, see Fittings, Pipe, Brass or Bronze.****Fire Poles, see Poles, Fire.****Fire Prevention Systems.**

Allen Mfg. Co., W. D., 1131-33.

General Fire Extinguisher Co., 1136-39.

Kewanee Private Utilities Co., 1112-13.

Milwaukee Air Power Pump Co., 1114-15.

United Pump &amp; Power Co., 1116-19.

*Grinnell*, 1136-39.**Fire Retardant, Information on.**

Associated Metal Lath Manufacturers, 196-201.

**Fire Screens, see Fireplace Trimmings.****Fire Stops.**

Associated Metal Lath Manufacturers, 196-201.

**Fireplace Dampers, see Dampers, Fireplace.****Fireplace Equipment, see Fireplace Trimmings.****Fireplace Fenders, see Fenders, Fireplace.****Fireplace Fixtures, see Fireplace Trimmings.****Fireplace Grates, see Grates, Fireplace.****Fireplace Heaters, see Heaters, Fireplace.****Fireplace Throats, see Throats, Fireplace, Iron.**

**Fireplace Trimmings.**

Chattanooga Roofing & Foundry Co., 278.  
 Colonial Fireplace Co., 279.  
 Covert Co., H. W., 280.  
 Fiske Iron Works, J. W., 552-53.  
 General Gas Light Co., 1029.  
 Graf Mfg. Co., Frank H., 886.  
 Irving Forge, W., 505.  
 Jackson Co., Wm. H., 512.  
 Manhattan Brass Co., 513.  
 Peerless Mfg. Co., Inc., 281.  
 Stover Mfg. & Engine Co., 282.  
*Peerless*, 281.  
*W. Irving*, 505.

**Fireplaces.**

(See also Brick, Fireplace and Mantel.)

Colonial Fireplace Co., 279.  
 Covert Co., H. W., 280.

**Fireplaces, Electric.**

Universal Electric Stage Lighting Co., 1235.

**Fireproof Hollow Terra Cotta, see Terra Cotta, Hollow, Fireproof.****Fireproofing, Information on.**

Associated Metal Lath Manufacturers, 196-201.

**Fittings, Colonial, Hand Forged.**

Irving Forge, W., 505.  
*W. Irving*, 505.

**Fittings, Electrical, see Specific Headings.****Fittings, Furnace, see Fittings, Pipe, Heating and Ventilating; Pipe, Heating and Ventilating.****Fittings, Pipe.**

American District Steam Co., 912.  
 Carbondale Machine Co., 1053.  
 Commonwealth Brass Corporation, 1082.  
 Crane Co., 1084-85.  
 Crane Co., William M., 1012-13.  
 Josam Mfg. Co., 876-78.  
 New York Brass Foundry Co., 1134-35.  
 Simmons Co., John, 1142-43.  
 Tyler Underground Heating System, 911.  
 United Lined Tube & Valve Co., 1072-73.  
 York Mfg. Co., 1055.  
*Adscs*, 912.  
*Crane*, 1084-85.  
*Stillbech*, 1134-35.  
*Tyler*, 911.  
*Vulcan*, 1012-13.

**Fittings, Pipe, Ammonia.**

Carbondale Machine Co., 1053.  
 York Mfg. Co., 1055.

**Fittings, Pipe, Brass or Bronze.**

Crane Co., 1084-85.  
 Crane Co., William M., 1012-13.  
 New York Brass Foundry Co., 1134-35.  
 Simmons Co., John, 1142-43.  
 United Lined Tube & Valve Co., 1072-73.  
*Crane*, 1084-85.  
*Stillbech*, 1134-35.  
*Vulcan*, 1012-13.

**Fittings, Pipe, Cast Iron, see Fittings, Pipe.****Fittings, Pipe, Drainage.**

Crane Co., 1084-85.  
 Josam Mfg. Co., 876-78.  
*Crane*, 1084-85.

**Fittings, Pipe, Flanged, see Fittings, Pipe.****Fittings, Pipe, Gas.**

(See also Fittings, Pipe.)

Crane Co., William M., 1012-13.  
 New York Brass Foundry Co., 1134-35.  
*Vulcan*, 1012-13.  
*Stillbech*, 1134-35.

**Fittings, Pipe, Heating and Ventilating.**

(See also Pipe, Heating and Ventilating.)  
 Commonwealth Brass Corporation, 1082.  
 International Heater Co., 968-73.  
*International*, 968-73.

**Fittings, Pipe, Lead or Tin Lined.**

United Lined Tube & Valve Co., 1072-73.

**Fittings, Pipe, Malleable.**

Crane Co., 1084-85.  
 Simmons Co., John, 1142-43.  
*Crane*, 1084-85.

**Fittings, Pipe, Oil.**

New York Brass Foundry Co., 1134-35.  
*Stillbech*, 1134-35.

**Fittings, Pipe, Steam or Water, see Fittings, Pipe.****Fittings, Pipe, Steel.**

Crane Co., 1084-85.  
 United Lined Tube & Valve Co., 1072-73.  
*Crane*, 1084-85.

**Fittings, Pipe, Tin Lined, see Fittings, Pipe, Lead or Tin Lined.****Fittings, Pipe, Wrought Iron, see Fittings, Pipe.****Fittings, Railing.**

(See also Fittings, Pipe.)

Crane Co., 1084-85.  
*Crane*, 1084-85.

**Fittings, Register.**

Rock Island Register Co., 994-95.  
*No Streak*, 994-95.  
*Rock Island*, 994-95.

**Fittings, Screw, see Fittings, Pipe.****Fittings, Wire Rope.**

American Steel & Wire Co., 30-33.

**Fixture Stems, Lighting.**

Beardslee Chandelier Mfg. Co., 1226.  
 Steel City Electric Co., 1222.  
 Tiffany Studios, 526-27.  
*Denzar*, 1226.  
*Star*, 1222.

**Fixture Wire, see Wire and Cables, Electric.****Flagging, Granite.**

National Building Granite Quarries Association, 58-59.

**Flagging, Slate.**

General Slate Co., 362-64.  
 Penrhyn Slate Co., 365.

**Flagpole Fittings.**

Walworth Mfg. Co., 1144.  
*Walworth*, 1144.

**Flagpoles, Metal.**

Barnum, E. T., 496-97.  
 Simmons Co., John, 1142-43.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Walworth Mfg. Co., 1144.  
 Wisconsin Iron & Wire Works, 533.  
*Simmons*, 1142-43.  
*Walworth*, 1144.

**Flanged Fittings, see Fittings, Pipe.****Flashings, Roof.**

American Brass Co., 1071.  
 Aspromet Co., 414-16.  
 Eagle-Picher Lead Co., 875.  
 Edwards Mfg. Co., 418-19.  
 Johns-Manville Co., H. W., 402-05.  
 Josam Mfg. Co., 876-78.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
*APM*, 414-16.  
*Benedict Nickel*, 1071.  
*Eagle*, 875.  
*Johns-Manville*, 402-05.  
*Toncan Metal*, 424-25.

**Fleches, Lead.**

Hope & Sons, Henry, 716-17.

**Flood Lighting, see Lights, Flood.****Floor Arches, see Floor Construction, Fireproof.****Floor Construction, Fireproof.**

Aspromet Co., 414-16.  
 Berger Mfg. Co., 176-82; 202-05.  
 Brown Hoisting Machinery Co., 184-85.  
 Burchartz Fireproofing Co., Inc., 26.  
 Clinton Wire Cloth Co., 227-31.  
 Concrete Engineering Co., 24-25.

**Floor Construction, Fireproof—Continued.**

Concrete Reinforcing and Engineering Co., 186-87.  
 Corrugated Bar Co., 22; 190-92.  
 Denison Fireproofing Co., 95.  
 Federal Cement Tile Co., 429-31.  
 Flexner-Taylor Co., 320.  
 General Fireproofing Co., 210-13.  
 Guastavino Co., R., 34-35.  
 Irving Iron Works Co., 348.  
 Ketcham, O. W., 118.  
 Marbleoid Co., 332-33.  
 Maurer & Son, Henry, 98-99.  
 Mende, Paul, 321.  
 Muller & Co., Franklyn R., 335.  
 National Fire Proofing Co., 100-05.  
 Pennsylvania Fireproofing Co., 107.  
 Schouler Cement Construction Co., 789.  
 Stevens Partition & Floor Deadener Co., 354-55.  
 Truscon Steel Co., 217-19.  
 Tucker Co., Edward A., 194.  
 Uni-Form Co., 27-29.  
 United States Gypsum Co., 162-68.  
*Akme Flat Slab*, 194.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*Aspromet*, 414-16.  
*Burchartz Two-way*, 26.  
*Clinton*, 227-31.  
*Combination*, 100-05.  
*Corr-Mesh*, 190-92.  
*Corr-Plate*, 22.  
*Denison*, 95.  
*Federal*, 429-31.  
*Ferrocinclave*, 184-85.  
*Flex-or-Crete*, 320.  
*Floredomes*, 217-19.  
*Floretiles*, 217-19.  
*GF End-Tile*, 210-13.  
*GF Steel-Tile*, 210-13.  
*Herculean*, 98-99.  
*Johnson*, 100-05.  
*Marbleoid*, 332-33.  
*Metal Lumber*, 176-82.  
*Meyer Steelforms*, 24-25.  
*Nailcode*, 321.  
*Natco*, 100-05.  
*Natco Flat Arch*, 100-05.  
*Natco Segmental Arch*, 100-05.  
*Peerless*, 98-99.  
*Pyrobar*, 162-68.  
*Simplex*, 98-99.  
*Stevens System*, 354-55.  
*Truscon*, 217-19.  
 Specifications, 100-05; 190-92; 354-55.

**Floor Construction, Fireproof, Flat Slab.**

Barton Spider-Web System, 20-21.

**Floor Construction, Gypsum, Reinforced, see Floor Construction, Fireproof.****Floor Construction, Sound Deadening Systems.**

Banner Rock Products Co., 352.  
 Stevens Partition & Floor Deadener Co., 354-55.  
*Rock Cork*, 352.  
*Stevens System*, 354-55.  
 Specifications, 354-55.

**Floor Construction, Vaulted.**

Guastavino Co., R., 34-35.

**Floor Deadening, see Sound Deadening Materials; Floor Construction, Sound Deadening Systems.****Floor Drains, see Drains, Floor.****Floor Guides, see Guides, Door and Floor.****Floor Hardeners, see Hardeners and Densifiers, Cement and Concrete.****Floor Lights, see Lights, Vault and Side-walk.****Floor Outlets, see Boxes, Junction or Outlet.****Floor Plates, see Plates, Floor and Ceiling.****Floor Plugs, see Plugs, Floor and Wall.**



**Floor Polish**, see Polishes, Furniture and Floor.

**Floor Stands**, see Stands, Floor, Valve.

**Floor Wax**, see Wax, Floor.

### Flooring, Asphalt.

(See also Flooring, Composition.)

Barrett Co., 394-97.

Johns-Manville Co., H. W., 331.

Mas-Oleum Floor Mfg. Co., 334.

Special Service Flooring Corporation, 336.

Warren Chemical & Mfg. Division, 309.

*Anchor*, 309.

*Johns-Manville*, 331.

*Purock Magdeburg*, 309.

*Seyssel*, 309.

*Special Service*, 336.

*Warren's*, 309.

Specifications, 309.

### Flooring, Asphalt Block.

Hastings Pavement Co., 308.

### Flooring, Beech.

Maple Flooring Manufacturers' Ass'n, 316-18.

*MFMA*, 316-18.

### Flooring, Birch.

Hasbrouck Flooring Co., 315.

Maple Flooring Manufacturers' Ass'n, 316-18.

*MFMA*, 316-18.

### Flooring, Brick.

Hood Brick Co., B. Mifflin, 80-81.

Ketcham, O. W., 118.

Kushequa Brick Co., 84-85.

*Brickette*, 84-85.

*Pottry*, 80-81.

### Flooring, Cement.

Brown Hoisting Machinery Co., 184-85.

Bruner Granitoid Co., P. M., 337.

De Smet Quartz Tile Co., 291.

Garden City Sand Co., 134-37.

Grauer & Co., Albert, 337.

Schouler Cement Construction Co., 789.

Vitrifyx Co., 343.

*De Smet*, 291.

*Ferroinclave*, 184-85.

*Stonekote*, 134-37.

*Vitrifyx*, 343.

### Flooring, Composition.

American Mason Safety Tread Co., 344-45.

American Materials Co., Inc., 133.

Armstrong Cork & Insulation Co., 323.

Beaver Tile & Specialty Co., Inc., 324.

Biegler Mfg. Co., E. N., 39.

Cheney & Co., Inc., 329.

Dreadnought Flooring Co., 325.

General Kompolite Co., 330.

Johns-Manville Co., H. W., 331.

Marbleloid Co., 332-33.

Mas-Oleum Floor Mfg. Co., 334.

Muller & Co., Franklyn R., 335.

National Kellastone Co., 138-39.

Special Service Flooring Corporation, 336.

United Cork Flooring Co., 328.

Warren Chemical & Mfg. Division, 309.

*Amflorite*, 133.

*Anchor*, 309.

*Be-ver*, 324.

*Biegler's*, 39.

*Crescent*, 328.

*Dreadnought*, 325.

*Johns-Manville*, 331.

*Karbolith*, 344-45.

*Kellastone*, 138-39.

*Kompolite*, 330.

*Linotile*, 323.

*Marbleloid*, 332-33.

*Mas-Oleum*, 334.

*Mastolith*, 330.

*Muller Asbestone*, 335.

*Special Service*, 336.

*Troegerlith*, 329.

*Unico*, 328.

*Warren's*, 309.

Specifications, 335.

### Flooring, Composition, Cork.

Armstrong Cork & Insulation Co., 323.

Beaver Tile & Specialty Co., Inc., 324.

Dreadnought Flooring Co., 325.

Kennedy, Inc., David E., 327.

United Cork Flooring Co., 328.

*Be-ver*, 324.

*Crescent*, 328.

*Dreadnought*, 325.

*Everlastic*, 327.

*Linotile*, 323.

*Unico*, 328.

Specifications, 325; 327.

### Flooring, Concrete, see Floor Construc-

tion, Fireproof.

### Flooring, Cork Tile, see Tile, Floor and

Wall, Cork.

### Flooring, Glass, see Glass Concrete Con-

struction.

### Flooring, Grate.

(See also Gratings, Sidewalk, Area, etc.)

Irving Iron Works Co., 348.

### Flooring, Hardwood.

(See also Flooring, Wood.)

Curtis Service Bureau, 578-79.

Maple Flooring Manufacturers' Ass'n,

316-18.

*Curtis*, 578-79.

*MFMA*, 316-18.

### Flooring, Linoleum, see Linoleum.

### Flooring, Maple.

Hasbrouck Flooring Co., 315.

Maple Flooring Manufacturers' Ass'n,

316-18.

*MFMA*, 316-18.

### Flooring, Mastic, see Flooring, Composi-

tion.

### Flooring, Metal Rib.

Tucker Co., Edward A., 194.

### Flooring, Mosaic, see Mosaics.

### Flooring, Oak.

Hasbrouck Flooring Co., 315.

Oak Flooring Manufacturers Association,

319.

### Flooring, Parquet.

Hasbrouck Flooring Co., 315.

Kennedy, Inc., David E., 326.

Oak Flooring Manufacturers Association,

319.

Wilson Corporation, J. G., 774-77.

*Wilson*, 774-77.

### Flooring, Pine.

Arkansas Soft Pine Bureau, 560.

Carter Lumber Co., C. J., 314.

Hasbrouck Flooring Co., 315.

North Carolina Pine Association, 562-63.

*Arkansas Soft Pine*, 560.

*Bloxonend*, 314.

### Flooring, Plank.

Hasbrouck Flooring Co., 315.

### Flooring, Plastic, see Flooring, Composi-

tion.

### Flooring, Rubber, see Tile, Floor and

Wall, Rubber.

### Flooring, Sanitary.

American Mason Safety Tread Co., 344-

45.

Armstrong Cork & Insulation Co., 323.

Ayer & Lord Tie Co., 310.

Beaver Tile & Specialty Co., Inc., 324.

Cheney & Co., Inc., 329.

Dreadnought Flooring Co., 325.

General Kompolite Co., 330.

Johns-Manville Co., H. W., 331.

Johnson, Inc., E. J., 366-67.

Kennedy, Inc., David E., 326; 327.

Marbleloid Co., 332-33.

Mas-Oleum Floor Mfg. Co., 334.

Mott Iron Works, J. L., 514-15.

Muller & Co., Franklyn R., 335.

New York Belting & Packing Co., 322.

Penrhyn Slate Co., 365.

Schouler Cement Construction Co., 789.

Special Service Flooring Corporation,

336.

### Flooring, Sanitary—Continued.

Standard Paint Co., 393.

United Cork Flooring Co., 328.

Vermont Structural Slate Co., 373.

Warren Chemical & Mfg. Division, 309.

Wilson Corporation, J. G., 774-77.

*Be-ver*, 324.

*Dreadnought*, 325.

*Everlastic*, 327.

*Johns-Manville*, 331.

*Kompolite*, 330.

*Linotile*, 323.

*Marbleloid*, 332-33.

*Mas-Oleum*, 334.

*Mastolith*, 330.

*Muller Asbestone*, 335.

*Nonpareil*, 326.

*Ru-ber-oid*, 393.

*Schouler*, 789.

*Special Service*, 336.

*Troegerlith*, 329.

*Unico*, 328.

*Wilson*, 774-77.

### Flooring, Slate.

Johnson, Inc., E. J., 366-67.

Vermont Structural Slate Co., 373.

*Old European*, 366-67.

### Flooring, Soapstone.

Alberene Stone Co., 890-81.

*Alberene Stone*, 890-91.

### Flooring, Special.

Special Service Flooring Corporation,

336.

*Special Service*, 336.

### Flooring, Stable.

Armstrong Cork & Insulation Co., 323.

Ayer & Lord Tie Co., 310.

Central Creosoting Co., 311.

Hastings Pavement Co., 308.

James Mfg. Co., 1466-70.

Jennison-Wright Co., 312-13.

Mott Iron Works, J. L., 514-15.

Schouler Cement Construction Co., 789.

Smith Wire and Iron Works, F. P., 524-

25.

United Cork Flooring Co., 328.

Warren Chemical & Mfg. Division, 309.

*Anchor*, 309.

*James*, 1466-70.

*Kreolite*, 312-13.

*Linotile*, 323.

*Schouler*, 789.

*Star*, 328.

### Flooring, Tile, see Tile, Floor and Wall.

### Flooring, Wood.

(See also Flooring, Hardwood.)

Arkansas Soft Pine Bureau, 560.

Ayer & Lord Tie Co., 310.

Brown Co., 573.

Carter Lumber Co., C. J., 314.

Central Creosoting Co., 311.

Curtis Service Bureau, 578-79.

Hasbrouck Flooring Co., 315.

Jennison-Wright Co., 312-13.

Kennedy, Inc., David E., 326.

Maple Flooring Manufacturers' Ass'n,

316-18.

Northern Hemlock and Hardwood Manu-

facturers' Association, 564-65.

Oak Bureau of the American Hardwood

Manufacturers' Association, 566-67.

Oak Flooring Manufacturers Association,

319.

North Carolina Pine Association, 562-63.

Red Gum Lumber Bureau, American

Hardwood Manufacturers' Association,

568-69.

Southern Pine Association, 561.

Wilson Corporation, J. G., 774-77.

*A and L Interior*, 310.

*Arkansas Soft Pine*, 560.

*Bloxonend*, 314.

*Curtis*, 578-79.

*Kreolite*, 312-13.

*MFMA*, 316-18.

*Wilson*, 774-77.

**Flooring, Wood Block.**

Ayer & Lord Tie Co., 310.  
Central Creosoting Co., 311.  
Hasbrouck Flooring Co., 315.  
Jennison-Wright Co., 312-13.  
Kennedy, Inc., David E., 326.  
Southern Pine Association, 561.  
Wilson Corporation, J. G., 774-77.  
*A and L Interior*, 310.  
*Kreolite*, 312-13.  
*Wilson*, 774-77.  
Specifications, 312-13.

**Flooring, Wood Block, Creosoted.**

Ayer & Lord Tie Co., 310.  
Central Creosoting Co., 311.  
Jennison-Wright Co., 312-13.  
Southern Pine Association, 561.  
*A and L Interior*, 310.  
*Kreolite*, 312-13.  
Specifications, 310.

**Flooring, Wood Block, Sectional.**

Carter Lumber Co., C. J., 314.  
*Bloxonend*, 314.

**Flooring, Wood Carpet.**

Hasbrouck Flooring Co., 315.

**Floors, see Flooring.****Flour Blenders, see Blenders, Flour.****Flue Linings, see Linings, Chimney and Flue.****Flue Thimbles, see Thimbles, Flue, Cast Iron.****Flues, Chimney or Smoke.**

Chattanooga Boiler & Tank Co., 1094.  
Custodis Chimney Construction Co.,  
Alphons, 89.  
Heinicke, Inc., H. R., 90-91.

**Flues, Metal, see Sheet Metal Work.****Flues, Soapstone,**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Flumes, Metal.**

(See also Sheet Metal Work.)  
Penn Metal Co., 216.  
*Penco*, 216.

**Flux, Asphalt.**

Warren Chemical & Mfg. Division, 309.  
*Warren's*, 309.

**Folding Gates, see Gates, Folding and Expansion.****Fonts, see Furnishings, Church.****Foot Lights, see Lighting Fixtures and Systems, Stage.****Foot Scrapers, see Scrapers, Foot or Mud.****Forgings.**

Irving Iron Works Co., 348.

**Forks, Hay.**

James Mfg. Co., 1466-70.  
Louden Machinery Co., 1471-73.  
*James*, 1466-70.

**Forms, Concrete, Metal.**

Aten Sewage Disposal Co., 879.  
Berger Mfg. Co., 202-05.  
Concrete Engineering Co., 24-25.  
Concrete Reinforcing and Engineering Co., 186-87.  
General Fireproofing Co., 210-13.  
Truscon Steel Co., 217-19.  
Tucker Co., Edward A., 194.  
Uni-Form Co., 27-29.  
Witherow Steel Co., 195.  
*Berger's* 202-05.  
*Floredomes*, 217-19.  
*Floretiles*, 217-19.  
*GF End-Tile*, 210-13.  
*GF Steel-Tile*, 210-13.  
*Truscon*, 217-19.  
*Wiscoform*, 195.

**Forms, Floor or Roof, Concrete, see Forms, Concrete, Metal.****Forms, Metal, Removable.**

Tucker Co., Edward A., 194.

**Forms, Steel, see Forms, Concrete, Metal.****Forms, Tank, Septic, see Forms, Concrete, Metal.****Foundation Boring, see Borings, Test, Foundation.****Foundations.**

Custodis Chimney Construction Co.,  
Alphons, 89.  
Foundation Co., 14.  
Heinicke, Inc., H. R., 90-91.  
MacArthur Concrete Pile & Foundation Co., 10-11.  
Mensch, L. J., 302.  
Raymond Concrete Piling Co., 12-13.

**Foundations, Bowling Alley and Machinery.**

Stevens Partition & Floor Deadener Co.,  
354-55.  
*Stevens System*, 354-55.

**Foundations, Chimney.**

Custodis Chimney Construction Co.,  
Alphons, 89.  
Heinicke, Inc., H. R., 90-91.

**Foundations, Raft.**

Mensch, L. J. 302.

**Founders, Iron.**

Tyler Co., W. S., 529.

**Fountain Jets, see Fountains, Display and Lawn.****Fountains, Bronze.**

Bureau Brothers, 498.  
Gorham Co Architectural Bronze, 502-03.  
Reed & Barton, 520-21.  
Williams, Inc., Jno., 532.

**Fountains, Display and Lawn.**

Fischer & Jirouch Co., 1404.  
Fiske Iron Works, J. W., 552-53.  
Mott Iron Works, J. L., 514-15.  
Rookwood Pottery Co., 294-95.

**Fountains, Drinking, Sanitary.**

Central Brass Mfg. Co., 852-55.  
Fiske Iron Works, J. W., 552-53.  
Fountain Faucet Co., 862.  
Glauber Brass Mfg. Co., 856-61.  
Maddock's Sons Co., Thomas, 835-42.  
Manufacturing Equipment & Engineering Co., 847.  
Monument Pottery Co., 843-46.  
Mott Iron Works, J. L., 514-15.  
Murdock Mfg. & Supply Co., 866-67.  
*Annapolis*, 856-61.  
*Carlisle*, 856-61.  
*Congressional*, 856-61.  
*Cornell*, 856-61.  
*Dartmouth*, 856-61.  
*Glauber*, 856-61.  
*Harvard*, 856-61.  
*Lily White Bubble-Font*, 866-67.  
*Maddock's* 835-42.  
*Madola*, 835-42.  
*Madorian*, 835-42.  
*Manitow*, 843-46.  
*Monument*, 843-46.  
*Muskogee*, 856-61.  
*Princeton*, 856-61.  
*Quick-pressure*, 852-55.  
*Sandow*, 866-67.  
*Vassar*, 856-61.  
*Yale*, 856-61.  
Specifications, 835-42.

**Fountains, Faience.**

Rookwood Pottery Co., 294-95.

**Fountains, Metal.**

(See also Fountains, Bronze.)  
Bureau Brothers, 498.  
McGann & Sons Co., T. F., 508-09.  
Williams, Inc., Jno., 532.

**Frames, Art Metal.**

Wagner Architectural Iron Works, A. F.,  
530-31.

**Frames, Coalhole, see Covers and Rings, Coalhole.****Frames, Door, see Trim.****Frames, Kalamein, see Kalamein Work.****Frames, Printing.**

American Drafting Furniture Co., 1.  
*American*, 1.

**Frames, Window, see Trim; Windows.****Frames and Covers, Cesspool.**

Brook Iron Works, A. T., 544-45.  
Fiske Iron Works, J. W., 552-53.  
Josam Mfg. Co., 876-78.  
Sterling Foundry Co., 274.  
*Josam*, 876-78.

**Frescoes, see Decoration, Interior.****Fresh Air Intakes, see Ventilators.****Friction Centers, see Sash Pivots; Fasteners and Adusters, Casement or Sash.****Friction Hoisting Machines, see Hoists, Friction.****Friezes, Faience, see Ornaments; Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.****Fruit Houses, see Greenhouses and Conservatories.****Fuel Chutes, see Chutes, Coal.****Fuel Economizers, see Economizers, Fuel.****Fuel Oil Plants.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Fuller Work, see Cocks and Bibbs, Fuller.****Fur Racks, see Racks, Fur, Cold Storage.****Furnaces, Annealing.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Bending, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Brick.**

Custodis Chimney Construction Co.,  
Alphons, 89.  
Heinicke, Inc., H. R., 90-91.

**Furnaces, Chain Making, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Combination, see Boilers, Heating, Steam and Hot Air, Combination; Boilers, Heating, Hot Water or Steam and Hot Air, Combination.****Furnaces, Forging, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Hot Air.**

Cox Stove Co., Abram, 960-64.  
Estate Stove Co., 1205.  
Hart & Crouse Co., 965-67.  
Hess Warming & Ventilating Co., 887.  
Holland Furnace Co., 956-57.  
International Heater Co., 968-73.  
Kelsey Heating Co., 958-59.  
Majestic Co., 271-73.  
Thatcher Furnace Co., 982-84.  
Whitaker-Glessner Co., 241.  
*Baronet*, 968-73.  
*Carton*, 968-73.  
*Count*, 968-73.  
*Duke*, 968-73.  
*Earl*, 968-73.  
*Estate*, 1205.  
*Holland*, 956-57.  
*International*, 968-73.  
*Kelsey*, 958-59.  
*Majestic Duplex One-Register*, 271-73.  
*Marvel Novelty*, 960-64.  
*Novelty*, 960-64.  
*Ottawa All Cast*, 956-57.  
*Portsmouth Iron*, 241.  
*Princess*, 968-73.  
*Queen*, 968-73.  
*Regent*, 968-73.  
*Royal*, 965-67.  
*Thatcher*, 982-84.  
*Tubular*, 982-84.

**Furnaces, Hot Air, Gas.**

International Heater Co., 968-73.  
Kelsey Heating Co., 958-59.  
*International*, 968-73.



**Furnaces, Hot Air, Gas—Continued.**

*Kelsey*, 958-59.  
*Queen*, 968-73.

**Furnaces, Hot Air, Soft Coal.**

Holland Furnace Co., 956-57.  
International Heater Co., 968-73.  
*Holland*, 956-57.  
*International*, 968-73.  
*Ottawa All Cast*, 956-57.

**Furnaces, Hot Air, Wood Burning.**

Holland Furnace Co., 956-57.  
International Heater Co., 968-73.  
Kelsey Heating Co., 958-59.  
*Holland*, 956-57.  
*International*, 968-73.  
*Kelsey*, 958-59.  
*Ottawa All Cast*, 956-57.  
*Queen*, 968-73.

**Furnaces, Pot.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Rivet Heating, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Salt Bath.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Tempering.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Upsetting, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnaces, Warm Air, see Furnaces, Hot Air.****Furnaces, Welding, Gas and Oil Fired.**

Gilbert & Barker Mfg. Co., 1478-79.  
*G & B*, 1478-79.

**Furnishings, Church.**

McGann & Sons Co., T. F., 508-09.  
Manhattan Brass Co., 513.  
Tiffany Studios, 526-27.

**Furniture, Bank, see Furniture, Office, Bank and Library.****Furniture, Barber, Chiropody and Manicure.**

Koken Barbers' Supply Co., 1395.  
*Koken*, 1395.

**Furniture, Bronze, see Furniture, Metal.****Furniture, Cafe.**

Marble & Shattuck Chair Co., 1400-01.  
*M & S*, 1400-01.

**Furniture, Cemetery, see Furniture, Garden and Park.****Furniture, Chiropody, see Furniture, Barber, Chiropody and Manicure.****Furniture, Drafting Room.**

American Drafting Furniture Co., 1.  
Economy Drawing Table Co., 2-4.  
Hamilton Mfg. Co., 5.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
New York Blue Print Paper Co., 6.  
Van Dorn Iron Works Co., 1428.  
*American*, 1.  
*Economy*, 2-4.  
*Lyon*, 1420-21.  
*NYB*, 6.  
*Van Dorn*, 1428.

**Furniture, Garden and Park, Caen Stone, Cement.**

Fischer & Jirouch Co., 1404.

**Furniture, Garden and Park, Concrete.**

Trusswall Mfg. Co., 303.

**Furniture, Garden and Park, Lead.**

Hope & Sons, Henry, 716-17.

**Furniture, Garden and Park, Metal.**

(See also Furniture, Metal.)  
Badger Wire & Iron Works, 494-95.  
Barnum, E. T., 496-97.  
Brook Iron Works, A. T., 544-45.  
Fiske Iron Works, J. W., 552-53.

**Furniture, Garden and Park, Metal—Continued.**

Gorham Co Architectural Bronze, 502-03.  
McGann & Sons Co., T. F., 508-09.  
Meyers Mfg. Co., Fred J., 516.  
Mott Iron Works, J. L., 514-15.  
St. Louis Wire & Iron Co., 523.  
Smith Wire and Iron Works, F. P., 524-25.

Stewart Iron Works Co., 556-57.  
Union Metal Mfg. Co., 304.  
Wisconsin Iron & Wire Works, 533.  
*Union*, 304.

**Furniture, Garden and Park, Slate.**

Penrhyn Slate Co., 365.

**Furniture, Garden and Park, Terra Cotta.**

Atlantic Terra Cotta Co., 112-113.

**Furniture, Garden and Park, Wood.**

Mathews Mfg. Co., 1402-03.  
*Mathews Craft*, 1402-03.

**Furniture, Hospital.**

Marble & Shattuck Chair Co., 1400-01.  
*M & S*, 1400-01.

**Furniture, Kitchen.**

Bramhall, Deane Co., 1010-11.

**Furniture, Lawn, see Furniture, Garden and Park.****Furniture, Library, see Furniture, Office, Bank and Library.****Furniture, Metal.**

(See also Furniture, Garden and Park, Metal.)

Berger Mfg. Co., 1406-08.  
Darby & Sons Co., Inc., Edward, 1409.  
Economy Drawing Table Co., 2-4.  
Edwards Mfg. Co., 1410-11.  
Federal Steel Fixture Co., 1412-13.  
Fiske Iron Works, J. W., 552-53.  
General Fireproofing Co., 1414.  
Hauserman Co., E. F., 1415.  
Koken Barbers' Supply Co., 1395.  
Library Bureau, 1418-19.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
Meyers Mfg. Co., Fred J., 516.  
Reliance Fireproof Door Co., 656-57.  
Terrell's Equipment Co., 1426-27.  
Tiffany Studios, 526-27.  
Van Dorn Iron Works Co., 1428.  
Watson Mfg. Co., Inc., 1429.  
*Economy*, 2-4.  
*Federal*, 1412-13.  
*GF Allsteel*, 1414.  
*Hauserman*, 1415.  
*Library Bureau*, 1418-19.  
*Lyon*, 1420-21.  
*Pen-Dar*, 1409.  
*Van Dorn*, 1428.

**Furniture, Office, Bank and Library.**

American Drafting Furniture Co., 1.  
Berger Mfg. Co., 1406-08.  
Darby & Sons Co., Inc., 1409.  
Economy Drawing Table Co., 2-4.  
Edwards Mfg. Co., 1410-11.  
Federal Steel Fixture Co., 1412-13.  
General Fireproofing Co., 1414.  
Gorham Co Architectural Bronze, 502-03.  
Hauserman Co., E. F., 1415.  
Library Bureau, 1418-19.  
Lyon Metallic Mfg. Co., 1420-21.  
Marble & Shattuck Chair Co., 1400-01.  
Mathews Bros. Mfg. Co., 582-83.  
Van Dorn Iron Works Co., 1428.  
Watson Mfg. Co., Inc., 1429.  
Wisconsin Iron & Wire Works, 533.  
*American*, 1.  
*Economy*, 2-4.  
*GF Allsteel*, 1414.  
*Hauserman*, 1415.  
*Lyon*, 1420-21.  
*M & S*, 1400-01.  
*Van Dorn*, 1428.

**Furniture, Park, see Furniture, Garden and Park.****Furniture, School and College.**

American Drafting Furniture Co., 1.  
Economy Drawing Table Co., 2-4.  
*American*, 1.  
*Economy*, 2-4.

**Furniture, Steel, see Furniture, Metal.****Furring, Fire Clay.**

Pennsylvania Fireproofing Co., 107.

**Furring, Hollow Tile.**

Denison Fireproofing Co., 95.  
Humphrey Brick & Tile Co., 106.  
Maurer & Son, Henry, 98-99.  
National Fire Proofing Co., 100-05.  
Pennsylvania Fireproofing Co., 107.  
United States Gypsum Co., 162-68.  
*Denison*, 95.  
*Humphrey*, 106.  
*Natco*, 100-05.  
*Pyrobar*, 162-68.

**Furring, Metal.**

Consolidated Expanded Metal Companies, 206-08.  
General Fireproofing Co., 210-13.  
Penn Metal Co., 216.  
Youngstown Pressed Steel Co., 224-26.  
*GF*, 210-13.  
*Penco*, 216.  
*Steelcrete*, 206-08.  
Specifications, 210-13.

**Furring, Terra Cotta, see Furring, Hollow Tile.****Furring Blocks, see Blocks, Building, Hollow, Fireproof; Blocks, Gypsum.****Furring Compounds.**

(See also Waterproofing and Dampproofing Paints and Compounds.)  
Bitu-Mortar Waterproofing Co., Inc., 40.  
*B-M Nos. 208 and 212*, 40.

**Fused Terminals.**

General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Fuses, Electric, Indicating.**

Economy Fuse & Mfg. Co., 1223.  
*Arkless*, 1223.

**Fuses, Electric, Plug, Link or Cartridge.**

Bryant Electric Co., 1207.  
Economy Fuse & Mfg. Co., 1223.  
General Electric Co., 1153-67.  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Stanley & Patterson, Inc., 1246-55.  
*Arkless*, 1223.  
*Bryant*, 1207.  
*Economy*, 1223.  
*Edison*, 1153-67.  
*G-E*, 1153-67.  
*Habirshaw*, 1193-1201.

**G****Gable Ornaments, see Roof Trimmings.****Gages, Ammonia.**

Pratt & Cady Co., Inc., 1090-91.

**Gages, Mercury.**

American District Steam Co., 912.  
*Adscs*, 912.

**Gages, Oil, see Gages, Recording and Indicating.****Gages, Pressure.**

Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
*Dunham Pressurestat*, 916-21.

**Gages, Recording and Indicating.**

Wayne Oil Tank & Pump Co., 1480-81.

**Gages, Water.**

American District Steam Co., 912.  
Jenkins Bros., 1086-87.  
Penberthy Injector Co., 882-83.  
Pratt & Cady Co., Inc., 1090-91.  
*Adscs*, 912.  
*Penberthy*, 882-83.

**Game Enclosures, see Fencing, Wire or Woven Wire.**

- Garage Elevators**, see Hoists, Automobile or Carriage.
- Garage Equipment**, see Specific Headings.
- Garage Gasoline and Oil Storage Equipment**, see Oil Storage and Distributing Systems.
- Garages, Metal.**  
 Chattanooga Roofing & Foundry Co., 499.  
 Edwards Mfg. Co., 418-19.  
 Howell, Field & Goddard, Inc., 652-53.  
 Stephenson, C. H., 277.  
 Truscon Steel Co., 217-19.  
 Whitaker-Glessner Co., 241.  
 Kahn, 217-19.  
 Portsmouth Iron, 241.  
 The Stephenson, 277.  
 Truscon, 217-19.
- Garages, Portable**, see Garages, Metal; Garages, Wood.
- Garages, Portable, Fireproof**, see Garages, Metal.
- Garages, Steel**, see Garages, Metal.
- Garages, Wood.**  
 Hodgson Co., E. F., 1453.  
 Hodgson, 1453.
- Garbage Burners**, see Incinerators.
- Garbage Cans**, see Receivers, Garbage.
- Garbage Receivers**, see Receivers, Garbage.
- Garden Bridges.**  
 Mathews Mfg. Co., 1402-03.
- Garden Flagging**, see Flagging.
- Garden Furniture**, see Furniture, Garden and Park.
- Garden Houses**, see Houses, Garden.
- Garden Seats**, see Furniture, Garden and Park.
- Gas Appliances.**  
 Bramhall, Deane Co., 1010-11.  
 Crane Co., William M., 1012-13.  
 General Gas Light Co., 1029.  
 Hugo Mfg. Co., 1030.  
 National Commercial Gas Association, 1009.  
 Hawks, 1030.  
 Vulcan, 1012-13.
- Gas Burners**, see Burners, Gas.
- Gas Engine Trimmings**, see Engine Trimmings, Gas.
- Gas Engines**, see Engines, Gas or Oil.
- Gas Irons**, see Heating and Cooking Appliances.
- Gas Lighting, Cost of.**  
 National Commercial Gas Association, 1009.
- Gas Logs.**  
 Crane Co., William M., 1012-13.  
 Vulcan, 1012-13.
- Gas Producers.**  
 Gerdes, Theodore R. N., 462.
- Gas Ranges**, see Ranges, Gas.
- Gas Rings, Boiler.**  
 International Heater Co., 968-73.  
 International, 968-73.
- Gas Uses.**  
 National Commercial Gas Association, 1009.
- Gasket Tubing.**  
 Jenkins Bros., 1086-87.  
 Jenkins Bros., 1086-87.
- Gaskets.**  
 Jenkins Bros., 1086-87.  
 Jenarco, 1086-87.  
 Jenkins Bros., 1086-87.  
 Jenkins 96, 1086-87.
- Gasoline Filters**, see Filters, Gasoline.
- Gasoline Pumping Systems**, see Oil Storage and Distributing Systems.
- Gasoline Storage and Distributing Systems**, see Oil Storage and Distributing Systems.
- Gates, Bronze**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Car**, see Gates, Folding and Expansion.
- Gates, Chamber, Diverting, Sewage.**  
 Aten Sewage Disposal Co., 879.  
 New York Sewage Disposal Co., 881.
- Gates, Collapsible**, see Gates, Folding and Expansion.
- Gates, Driveway and Entrance**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Elevator**, see Doors and Gates, Elevator; Gates, Folding and Expansion.
- Gates, Entrance**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Folding and Expansion.**  
 (See also Doors and Gates, Elevator.)  
 Badger Wire & Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Bigelow Wire Works, Cheney, 491.  
 Fiske Iron Works, J. W., 552-53.  
 Lasar Mfg. Co., 506-07.  
 Manhattan Brass Co., 513.  
 Meyers Mfg. Co., Fred J., 516.  
 Mott Iron Works, J. L., 514-15.  
 Page Steel and Wire Co., 549-51.  
 Penn Brass & Bronze Works, 517.  
 Pitt Composite Iron Works, William R., 558-59.  
 Price-Evans Foundry Co., 518-19.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Tyler Co., W. S., 529.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
 Bostwick, 491.  
 Pitt Bostwick, 558-59.  
 Pitt Composite, 558-59.  
 Pitt Lazy Tong, 558-59.
- Gates, Garden.**  
 Mathews Mfg. Co., 1402-03.
- Gates, Industrial Plant**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Iron or Bronze, Plain or Ornamental.**  
 American Fence Construction Co., 534-36.  
 Anchor Post Iron Works, 537-43.  
 Badger Wire & Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Brook Iron Works, A. T., 544-45.  
 Bureau Brothers, 498.  
 Carpenter & Co., Inc., Davis, 827.  
 Chattanooga Roofing & Foundry Co., 499.  
 Creswell Iron Works, Samuel J., 258-59.  
 Cyclone Fence Co., 546-48.  
 Fiske Iron Works, J. W., 552-53.  
 Gotham Co Architectural Bronze, 502-03.  
 Hall's Safe Co., 1431.  
 Irving Forge, W., 505.  
 Jackson Co., Wm. H., 512.  
 Lasar Mfg. Co., 506-07.  
 McGann & Sons Co., T. F., 508-09.  
 Mack Iron and Wire Works Co., 510-11.  
 Manhattan Brass Co., 513.  
 Meyers Mfg. Co., Fred J., 516.  
 Mott Iron Works, J. L., 514-15.  
 Page Steel and Wire Co., 549-51.  
 Penn Brass & Bronze Works, 517.  
 Pitt Composite Iron Works, William R., 558-59.  
 Polachek Bronze & Iron Co., John, 522.  
 Reed & Barton, 520-21.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Smyser-Royer Co., 528.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Steelite Co., 1293.  
 Stewart Iron Works Co., 556-57.  
 Tiffany Studios, 526-27.  
 Tyler Co., W. S., 529.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Williams, Inc., Jno., 532.
- Gates, Iron or Bronze, Plain or Ornamental—Continued.**  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
 Cyclone, 546-48.  
 Pitt, 558-59.  
 Steelite, 1293.  
 W. Irving, 505.
- Gates, Ornamental Metal**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Safety, Automatic.**  
 Eastern Machinery Co., 1268-69.
- Gates, Safety, Elevator**, see Doors and Gates, Elevator.
- Gates, Sluice.**  
 Chapman Valve Mfg. Co., 1080-81.
- Gates, Steel**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gates, Stoker.**  
 Link-Belt Co., 1310.
- Gates, Wire**, see Fencing, Wire or Woven Wire.
- Gateways, Ornamental**, see Gates, Iron or Bronze, Plain or Ornamental.
- Gauges**, see Gages.
- Gears.**  
 American Brass Co., 492-93.  
 Caldwell Co., Inc., W. E., 1093.
- Generating Sets, Gas or Oil Engine.**  
 General Electric Co., 1153-67.  
 Sturtevant Co., B. F., 1006-07.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.  
 Sturtevant, 1006-07.
- Generating Sets, Steam Engine.**  
 General Electric Co., 1153-67.  
 Sturtevant Co., B. F., 1006-07.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.  
 Sturtevant, 1006-07.
- Generating Sets, Turbo.**  
 General Electric Co., 1153-67.  
 Sturtevant Co., B. F., 1006-07.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.  
 Sturtevant, 1006-07.
- Generating Sets, Water Wheel.**  
 Westinghouse Electric & Mfg. Co., 1169-76.
- Generator Sets, Motor.**  
 General Electric Co., 1153-67.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.
- Generators.**  
 General Electric Co., 1153-67.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Sprague Electric Works, 1168.  
 Sturtevant Co., B. F., 1006-07.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.  
 Sturtevant, 1006-07.
- Generators, Motor, Battery Charging.**  
 General Electric Co., 1153-67.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 G-E, 1153-67.
- Generators, Motor, Bell Ringing.**  
 Holtzer-Cabot Electric Co., 1242-45.
- Generators, Warm Air**, see Furnaces, Hot Air.
- Geographical Globes**, see Globes, Geographical.
- Germicides.**  
 Kaustine Co., Inc., 851.  
 Kaustine, 851.



**Girder Coverings, Hollow Tile**, see  
Blocks, Building, Hollow, Fireproof.

### Girders, Steel.

(See also Structural Steel.)

Chattanooga Boiler & Tank Co., 1094.  
Kenwood Bridge Co., 17.

### Glass, Corrugated.

Pennsylvania Wire Glass Co., 816-17.

### Glass, Figured.

Highland Glass Co., 808-09.  
Mississippi Glass Co., 810-11.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Pressed Prism Plate Glass Co., 820.  
Western Glass Co., 818-19.  
Highland, 808-09.  
Imperial, 820.

**Glass, Fireproof**, see Glass, Wire: Plain,  
Rough, Ribbed, Polished or Figured.

### Glass, Florentine, see Glass, Figured.

**Glass, Leaded**, see Glass, Stained or  
Leaded.

### Glass, Ornamental.

American 3-Way Prism Co., 821.  
Keppler Glass Construction, Inc., 831-33.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Pressed Prism Plate Glass Co., 820.  
Tiffany Studios, 526-27.  
Western Glass Co., 818-19.  
Imperial, 820.  
Keppler, 831-33.  
Luxfer, 821.  
Tiffany Favre, 526-27.

### Glass, Plain.

Curtis Service Bureau, 578-79.  
Curtis, 578-79.

### Glass, Plate.

"Bilt-Well" Service Bureau, 574-75.  
Mississippi Wire Glass Co., 812-15.  
Pressed Prism Plate Glass Co., 820.  
Imperial, 820.

### Glass, Prism.

American 3-Way Prism Co., 821.  
Brooklyn Vault Light Co., 822-23.  
Bruner Granitoid Co., P. M., 824-26.  
Grauer & Co., Albert, 824-26.  
Highland Glass Co., 808-09.  
Jeanette Glass Co., 829.  
Keppler Glass Constructions, Inc., 831-33.  
Mississippi Glass Co., 810-11.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Pressed Prism Plate Glass Co., 820.  
Richards & Kelly Mfg. Co., 830.  
Western Glass Co., 818-19.  
Bruner, 824-26.  
Highland, 808-09.  
Imperial, 820.  
Keppler, 831-33.  
Lazalite, 829.  
Luxfer, 821.

**Glass, Prism, Plate**, see Glass, Prism.

### Glass, Prism, Wired.

American 3-Way Prism Co., 821.  
Luxfer, 821.

### Glass, Ribbed.

Highland Glass Co., 808-09.  
Mississippi Glass Co., 810-11.  
Pennsylvania Wire Glass Co., 816-17.  
Western Glass Co., 818-19.  
Highland, 808-09.

### Glass, Ripple.

Highland Glass Co., 808-09.  
Highland, 808-09.

### Glass, Rolled.

Highland Glass Co., 808-09.  
Mississippi Glass Co., 810-11.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Western Glass Co., 818-19.  
Highland, 808-09.

### Glass, Rough.

Highland Glass Co., 808-09.  
Mississippi Glass Co., 810-11.

### Glass, Rough—Continued.

Pennsylvania Wire Glass Co., 816-17.  
Western Glass Co., 818-19.  
Highland, 808-09.

### Glass, Sidewalk Light.

American 3-Way Prism Co., 821.  
Bruner Granitoid Co., P. M., 824-26.  
Concrete Specialties Mfg. Co., 828.  
Grauer & Co., Albert, 824-26.  
Jeanette Glass Co., 829.  
Keppler Glass Constructions, Inc., 831-33.  
Richards & Kelly Mfg. Co., 830.  
Bruner, 824-26.  
Keppler, 831-33.  
Lazalite, 829.  
Luxfer, 821.

### Glass, Skylight.

American 3-Way Prism Co., 821.  
Bruner Granitoid Co., P. M., 824-26.  
Grauer & Co., Albert, 824-26.  
Highland Glass Co., 808-09.  
Mississippi Glass Co., 810-11.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Pressed Prism Plate Glass Co., 820.  
Western Glass Co., 818-19.  
Aqueduct, 816-17.  
Bruner, 824-26.  
Highland, 808-09.  
Imperial, 820.  
Luxfer, 821.

**Glass, Skylight, Prism**, see Glass, Prism.

### Glass, Stained or Leaded.

"Bilt-Well" Service Bureau, 574-75.  
Curtis Service Bureau, 578-79.  
Hope & Sons, Henry, 716-17.  
International Casement Co., Inc., 718.  
Tiffany Studios, 526-27.  
Curtis, 578-79.

### Glass, Structural.

Jeanette Glass Co., 829.  
Vitrolite Co., 870-71.  
Lazalite, 829.  
Vitrolite, 870-71.

### Glass, Vault Light.

American 3-Way Prism Co., 821.  
Bruner Granitoid Co., P. M., 824-26.  
Concrete Specialties Mfg. Co., 828.  
Grauer & Co., Albert, 824-26.  
Jeanette Glass Co., 829.  
Keppler Glass Constructions, Inc., 831-33.  
Pennsylvania Wire Glass Co., 816-17.  
Richards & Kelly Mfg. Co., 830.  
Bruner, 824-26.  
Keppler, 831-33.  
Lazalite, 829.  
Luxfer, 821.

### Glass, Wire: Plain, Rough, Ribbed, Polished or Figured.

Highland Glass Co., 808-09.  
Mississippi Wire Glass Co., 812-15.  
Pennsylvania Wire Glass Co., 816-17.  
Western Glass Co., 818-19.  
Aqueduct, 816-17.  
Cobweb, 816-17.  
Highland, 808-09.  
Mississippi, 812-15.  
Specifications, 812-15; 816-17.

**Glass Ceilings**, see Ceilings, Glass.

### Glass Concrete Construction.

American 3-Way Prism Co., 821.  
Brooklyn Vault Light Co., 822-23.  
Bruner Granitoid Co., P. M., 824-26.  
Concrete Specialties Mfg. Co., 828.  
Federal Cement Tile Co., 429-31.  
Grauer & Co., Albert, 824-26.  
Keppler Glass Constructions, Inc., 831-33.  
Richards & Kelly Mfg. Co., 830.  
Bruner, 824-26.  
Federal, 429-31.  
Keppler, 831-33.  
Luxfer, 821.  
Specifications, 824-26.

**Glass Floors**, see Glass Concrete Construction.

**Glass Houses**, see Greenhouses and Conservatories.

### Glassware, Illuminating.

Beardslee Chandelier Mfg. Co., 1226.  
Benjamin Electric Mfg. Co., 1206.  
Friedley-Voshardt Co., 501.  
Ivanhoe-Regent Works, 1228-29.  
Luminous Unit Co., 1227.  
Reflectolyte Co., 1232-34.  
Tiffany Studios, 526-27.  
Aglite, 1227.  
Benjamin, 1206.  
Brascolite, 1227.  
Denzar, 1226.  
Druid, 1228-29.  
Holophane, 1228-29.  
Opal, 1228-29.  
Reflectolyte, 1232-34.  
Reflectolyte Junior, 1232-34.  
Regent, 1228-29.  
Sudan, 1228-29.  
Tiffany Favre, 526-27.  
Veluria, 1228-29.

### Glazing, Leaded.

Hope & Sons, Henry, 716-17.

### Glazing Beads.

International Casement Co., Inc., 718.

### Glazing Compounds.

Belknap-Moran-Allen Co., Inc., 1375.  
Kuhls, H. B. Fred, 1376.  
Pecora Paint Co., 1378-79.  
Weatherproof Calking Co., 1377.  
Elastic, 1376.  
Elastico, 1375.  
Hennen's, 1377.  
Pecora, 1378-79.  
Specifications, 1378-79.

### Glazing Construction.

(See also Glass Concrete Construction.)  
Aspromet Co., 414-16.  
Keppler Glass Constructions, Inc., 831-33.  
King Construction Co., 1456-57.  
APM, 414-16.  
Aspromet, 414-16.  
Keppler, 831-33.  
King, 1456-57.  
Waugh, 414-16.

### Globes, Geographical.

Weber Costello Co., 379.

**Globes, Lighting**, see Glassware, Illuminating.

### Glue.

Ferdinand & Co., L. W., 1394.  
Jeffery's, 1394.

**Glue, Linoleum**, see Cement, Linoleum.

### Glue, Liquid, Waterproof.

Ferdinand & Co., L. W., 1394.  
Jeffery's, 1394.

### Glue, Marine.

Ferdinand & Co., L. W., 1394.  
Jeffery's, 1394.

**Glue Cement**, see Cement, Linoleum.

### Goldsmiths.

Reed & Barton, 520-21.

**Gongs**, see Bells, Electric.

### Governors, Pump.

Atlas Valve Co., 940-41.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
Atlas, 940-41.  
Dunham, 916-21.  
Van Auken, 914-15.

**Governors, Speed, Elevator**, see Safety Operating Devices, Elevator.

**Governors, Vacuum**, see Governors, Pump.

**Grade Line Chutes**, see Chutes, Coal.

**Granite, Building**, see Granite, Structural or Monumental.

### Granite, Crushed.

Webb Pink Granite Co., 64.  
Woodbury Granite Co., 65.  
Bethel, 65.

**Granite, Crushed—Continued.**

*Wepico*, 64.  
*Woodbury*, 65.

**Granite, Dressed**, see Granite, Structural or Monumental.**Granite, Finished**, see Granite, Structural or Monumental.**Granite, Memorial**, see Granite, Structural or Monumental.**Granite, Monumental**, see Granite, Structural or Monumental.**Granite, Polished**, see Granite, Structural or Monumental.**Granite, Rough**, see Granite, Structural or Monumental.**Granite, Seam Face**, see Granite, Structural or Monumental.**Granite, Structural or Monumental.**

National Building Granite Quarries Association, 58-59.

*Presbrey-Coykendall Co.*, 62.  
*Rockport Granite Co.*, 60-61.  
*Swenson Granite Co.*, John, 63.  
*Webb Pink Granite Co.*, 64.  
*Woodbury Granite Co.*, 65.  
*Bethel*, 65.  
*Concord*, 63.  
*Imperial*, 65.  
*Peerless*, 65.  
*Rockport Gray*, 60-61.  
*Rockport Red*, 60-61.  
*Rockport Sea Green*, 60-61.  
*Vermont*, 65.  
*Webb Milford*, 64.  
*Woodbury*, 65.  
Specifications, 63.

**Graperies**, see Greenhouses and Conservatories.**Graphite.**

*Patton Paint Co.*, 1332-33.

**Grates, Fireplace.**

(See also Baskets, Fireplace; Fireplace Trimmings.)

*Chattanooga Roofing & Foundry Co.*, 278.  
*Colonial Fireplace Co.*, 279.  
*Cahill*, 278.

**Grates, Furnace**, see Grates and Grate Bars, Furnace.**Grates, Hob.**

*Irving Forge, W.*, 505.  
*W. Irving*, 505.

**Grates and Grate Bars, Furnace.**

*Chattanooga Roofing & Foundry Co.*, 278.  
*Cox Stove Co.*, Abram, 960-64.  
*Holland Furnace Co.*, 956-57.  
*Irving Forge, W.*, 505.  
*Thatcher Furnace Co.*, 982-84.  
*Cahill*, 278.  
*Holland*, 956-57.  
*Novelty*, 960-64.  
*Porcupine*, 982-84.  
*Thatcher*, 982-84.  
*W. Irving*, 505.

**Gratings, Area**, see Gratings, Sidewalk, Area, etc.**Gratings, Cellar**, see Gratings, Sidewalk, Area, etc.**Gratings, Drainage.**

*American Abrasive Metals Co.*, 346.  
*Creswell Iron Works, Samuel J.*, 258-59.  
*Irving Iron Works Co.*, 348.  
*Feralun*, 346.

**Gratings, Engine and Boiler Room.**

*Irving Iron Works Co.*, 348.

**Gratings, Interlocking Bar, Jail.**

*Pauly Jail Building Co.*, 1488.  
*Van Dorn Iron Works Co.*, 1489.  
*Van Dorn*, 1489.

**Gratings, Prison Bar.**

*Barnum Iron Works, E. T.*, 1487.  
*Pauly Jail Building Co.*, 1488.  
*Van Dorn Iron Works*, 1489.

**Gratings, Sidewalk, Area, etc.**

*American Abrasive Metals Co.*, 346.

**Gratings, Sidewalk, Area, etc.—Continued.**

*American 3-Way Prism Co.*, 821.  
*Badger Wire & Iron Works*, 494-95.  
*Barnum, E. T.*, 496-97.  
*Barnum Iron Works, E. T.*, 1487.  
*Best Register Co.*, 988-89.  
*Brook Iron Works, A. T.*, 544-45.  
*Canton Foundry & Machine Co.*, 270.  
*Creswell Iron Works, Samuel J.*, 258-59.  
*Duvinage, Pierre*, 260.  
*Fiske Iron Works, J. W.*, 552-53.  
*Highton & Sons Co., Wm.*, 992-93.  
*Hughes-Keenan Co.*, 262-65.  
*Irving Iron Works Co.*, 348.  
*Mack Iron and Wire Works Co.*, 510-11.  
*Majestic Co.*, 271-73.  
*Meyers Mfg. Co., Fred J.*, 516.  
*Mott Iron Works, J. L.*, 514-15.  
*Price-Evans Foundry Co.*, 518-19.  
*Richards & Kelly Mfg. Co.*, 830.  
*Sexauer & Lemke, Inc.*, 262-65.  
*Smith Wire and Iron Works, F. P.*, 524-25.  
*Tuttle & Bailey Mfg. Co.*, 985-87.  
*Van Dorn Iron Works Co.*, 1489.  
*Wagner Architectural Iron Works, A. F.*, 530-31.  
*Wisconsin Iron & Wire Works*, 533.  
*Wright Wire Co.*, 234-35.  
*Best*, 988-89.  
*Eggcrate*, 348.  
*Feralun*, 346.  
*Highton*, 992-93.  
*Honeycomb*, 348.  
*Subway*, 348.  
*Van Dorn*, 1489.

**Gratings and Screens, Ventilating.**

(See also Registers, Heating and Ventilating.)

*Best Register Co.*, 988-89.  
*Clinton Wire Cloth Co.*, 990-91.  
*Highton & Sons Co., Wm.*, 992-93.  
*Irving Iron Works Co.*, 348.  
*Tuttle & Bailey Mfg. Co.*, 985-87.  
*Best*, 988-89.  
*Highton*, 992-93.

**Grease Cups**, see Cups, Grease and Oil.**Grease Extractors**, see Extractors, Grease.**Greenhouse Ventilating Apparatus**, see Ventilating Systems, Greenhouse and Conservatory.**Greenhouses and Conservatories.**

*Hitchings & Co.*, 1454-55.  
*King Construction Co.*, 1456-57.  
*Lord & Burnham Co.*, 1458-61.  
*Lutton Co., William H.*, 1462-63.  
*Pierson U-Bar Co.*, 1464-65.  
*King*, 1456-57.  
*Lutton*, 1462-63.  
*U-Bar*, 1464-65.  
Specifications, 1458-61; 1464-65.

**Greenhouse and Conservatory Accessories**, see Greenhouses and Conservatories.**Griddles, Frying**, see Heating and Cooking Appliances.**Grilles, Bank and Office**, see Grilles, Metal.**Grilles, Mausoleum**, see Grilles, Metal.**Grilles, Metal.**

(See also Gratings; Registers, Heating and Ventilating; Ornamental Metal Work.)

*American Brass Co.*, 1071.  
*Anchor Post Iron Works*, 537-43.  
*Badger Wire & Iron Works*, 494-95.  
*Barnum, E. T.*, 496-97.  
*Best Register Co.*, 988-89.  
*Bigelow Wire Works, Cheney*, 491.  
*Bureau Brothers*, 498.  
*Burrowes Co., E. T.*, 790-92.  
*Chattanooga Roofing & Foundry Co.*, 499.  
*Clinton Wire Cloth Co.*, 990-91.  
*Creswell Iron Works, Samuel J.*, 258-59.  
*Darby & Sons Co., Inc.*, Edward, 1409.  
*Detroit Mausoleum Equipment Works*, 500.  
*Gorham Co Architectural Bronze*, 502-03.

**Grilles, Metal—Continued.**

*Hall's Safe Co.*, 1431.  
*Harsch & Sons Co., John*, 504.  
*Highton & Sons Co., Wm.*, 992-93.  
*Hughes-Keenan Co.*, 262-65.  
*Irving Forge, W.*, 505.  
*Lasar Mfg. Co.*, 506-07.  
*McCann & Sons Co., T. F.*, 508-09.  
*Manhattan Brass Co.*, 513.  
*Meyers Mfg. Co., Fred J.*, 516.  
*Page Steel and Wire Co.*, 549-51.  
*Penn Brass & Bronze Works*, 517.  
*Pitt Composite Iron Works, William R.*, 558-59.  
*Price-Evans Foundry Co.*, 518-19.  
*Reed & Barton*, 520-21.  
*St. Louis Wire & Iron Co.*, 523.  
*Sexauer & Lemke, Inc.*, 262-65.  
*Smith Wire and Iron Works, F. P.*, 524-25.  
*Smyser-Royer Co.*, 528.  
*Stewart Iron Works Co.*, 556-57.  
*Tuttle & Bailey Mfg. Co.*, 985-87.  
*Tyler Co., W. S.*, 529.  
*Van Dorn Iron Works Co.*, 1428.  
*Wagner Architectural Iron Works, A. F.*, 530-31.  
*Watson Mfg. Co., Inc.*, 1429.  
*Williams, Inc., Jno.*, 532.  
*Wisconsin Iron & Wire Works*, 533.  
*Wright Wire Co.*, 234-35.  
*Benedict Nickel*, 1071.  
*Best*, 988-89.  
*Highton*, 992-93.  
*Van Dorn*, 1428.  
*W. Irving*, 505.

**Grilles, Window**, see Grilles, Metal.**Grilles, Wood.**

*Morgan Co.*, 584-85.

**Grills**, see Heating and Cooking Appliances.**Ground Beads**, see Beads, Ground.**Ground Key Work**, see Cocks and Bibbs, Compression and Ground Key.**Grounding Appliances, Electrical.**

*Arrow Conductor & Mfg. Co.*, 94.  
*Gillette-Vibber Co.*, 1211.  
*Gee-Vee*, 1211.

**Grounds, Base**, see Beads, Ground.**Grounds, Moulding.**

*American 3-Way Prism Co.*, 821.

**Guards, Belt.**

*Bigelow Wire Works, Cheney*, 491.  
*Page Steel and Wire Co.*, 549-51.

**Guards, Column, Plate Steel.**

*Mesker Brothers Iron Co.*, 722-25.

**Guards, Corner**, see Guards, Jamb.**Guards, Corridor, Jail.**

*Pauly Jail Building Co.*, 1488.  
*Van Dorn Iron Works Co.*, 1489.  
*Van Dorn*, 1489.

**Guards, Curb.**

*Concrete Specialties Mfg. Co.*, 828.  
*Truscon Steel Co.*, 217-19.  
*Anchor*, 828.  
*T-Head*, 828.  
*Truscon*, 217-19.

**Guards, Door and Window.**

(See also Grilles.)

*Anchor Post Iron Works*, 537-43.  
*Badger Wire & Iron Works*, 494-95.  
*Barnum, E. T.*, 496-97.  
*Barnum Iron Works, E. T.*, 1487.  
*Bigelow Wire Works, Cheney*, 491.  
*Brook Iron Works, A. T.*, 544-45.  
*Burrowes Co., E. T.*, 790-92.  
*Chattanooga Roofing & Foundry Co.*, 499.  
*Cyclone Fence Co.*, 546-48.  
*Darby & Sons Co., Inc.*, Edward, 1409.  
*Duvinage, Pierre*, 260.  
*Fiske Iron Works, J. W.*, 552-53.  
*Mack Iron and Wire Works Co.*, 510-11.  
*Manhattan Brass Co.*, 513.  
*Meyers Mfg. Co., Fred J.*, 516.  
*Page Steel and Wire Co.*, 549-51.



**Guards, Door and Window—Continued.**

Pauly Jail Building Co., 1488.  
 Pitt Composite Iron Works, William R., 558-59.  
 Polachek Bronze & Iron Co., John, 522.  
 Price-Evans Foundry Co., 518-19.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Tyler Co., W. S., 529.  
 Van Dorn Iron Works Co., 1489.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wisconsin Wire & Iron Works, 533.  
 Wright Wire Co., 234-35.  
*Cyclone*, 546-48.  
*Pitt Bostwick*, 558-59.  
*Van Dorn*, 1489.

**Guards, Jamb.**

Canton Foundry & Machine Co., 270.  
 Duvinage, Pierre, 260.  
 Price-Evans Foundry Co., 518-19.

**Guards, Machinery.**

Anchor Post Iron Works, 537-43.  
 Bigelow Wire Works, Cheney, 491.  
 Brook Iron Works, A. T., 544-45.  
 Consolidated Expanded Metal Companies, 206-08.  
 North Western Expanded Metal Co., 214-15.  
 Page Steel and Wire Co., 549-51.  
 Wright Wire Co., 234-35.  
*Steelcrete*, 206-08.

**Guards, Paving, Expansion Joint.**

Truscon Steel Co., 217-19.  
*Kahn Armor Plate*, 217-19.  
*Truscon*, 217-19.

**Guards, Safety, Window.**

Burrowes Co., E. T., 790-92.

**Guards, Safety, Window Cleaners.**

Royal Safety Anchor Co., 766-67.  
*Royal*, 766-67.

**Guards, Skylight.**

Badger Wire & Iron Works, 494-95.  
 Page Steel and Wire Co., 549-51.  
 Smith Wire and Iron Works, F. P., 524-25.

**Guards, Snow, Roof.**

Clason Architectural Metal Works, 358.  
 Duplex Hanger Co., 253.  
 Johnson, Inc., E. J., 366-67.  
 Sheldon Slate Co., F. C., 370-72.  
*Clason*, 358.  
*Cleveland*, 253.  
*H-B*, 358.  
*Sheldon's*, 370-72.  
 Specifications, 358.

**Guards, Stall.**

Barnum, E. T., 496-97.  
 Loudon Machinery Co., 1471-73.  
 Smith Wire and Iron Works, F. P., 524-25.

**Guards, Tree, Lawn and Flower Bed.**

(See also Wire Work; Fencing, Wire or Woven Wire.)  
 American Fence Construction Co., 534-36.  
 Anchor Post Iron Works, 537-43.  
 Brook Iron Works, A. T., 544-45.  
 Fiske Iron Works, J. W., 552-53.

**Guards, Wheel.**

Anchor Post Iron Works, 537-43.  
 Brook Iron Works, A. T., 544-45.  
 Canton Foundry & Machine Co., 270.  
 Chattanooga Roofing & Foundry Co., 499.  
 Creswell Iron Works, Samuel J., 258-59.  
 Duvinage, Pierre, 260.  
 Fiske Iron Works, J. W., 552-53.  
 Price-Evans Foundry Co., 518-19.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wisconsin Wire & Iron Works, 533.

**Guards, Window**, see Guards, Door and Window.

**Guards, Window, Jail**, see Guards, Door and Window.

**Guards, Wire.**

Anchor Post Iron Works, 537-43.  
 Badger Wire & Iron Works, 494-95.  
 Brook Iron Works, A. T., 544-45.  
 Burrowes Co., E. T., 790-92.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Fiske Iron Works, J. W., 552-53.  
 Mack Iron and Wire Works Co., 510-11.  
 Pitt Composite Iron Works, William R., 558-59.  
 Price-Evans Foundry Co., 518-19.  
 St. Louis Wire & Iron Co., 523.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wisconsin Iron & Wire Works, 533.

**Guides, Curtain, Car Window.**

American Brass Co., 492-93.

**Guides, Door and Floor.**

Coburn Trolley Track Mfg. Co., 640-43.  
 McCabe Hanger Mfg. Co., 618-20.  
 Peelle Co., 684-87.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Schouler Cement Construction Co., 789.  
 Wagner Mfg. Co., 638-39.  
*Coburn*, 640-43.  
*McCabe*, 618-20.  
*Peelle*, 684-87.  
*R-W*, 630-35.  
*Schouler*, 789.

**Guides, Door and Floor, Combination Weatherstrip.**

McCabe Hanger Mfg. Co., 618-20.  
 Niagara Metal Weather Strip Co., 788.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Schouler Cement Construction Co., 789.  
*McCabe*, 618-20.  
*Peace*, 788.  
*R-W*, 630-35.  
*Schouler*, 789.  
 Specifications, 618-20.

**Gutter Boxes**, see Boxes, Gutter.

**Gutter Plates**, see Plates, Gutter, Cross-walk.

**Gutter Traps**, see Traps, Gutter, Stable.

**Gutters, Drain.**

Creswell Iron Works, Samuel J., 258-59.

**Gutters, Lead.**

Hope & Sons, Henry, 716-17.

**Gutters, Roof, Metal.**

Aspromet Co., 414-16.  
 Clason Architectural Metal Works, 358.  
 Josam Mfg. Co., 876-78.  
 Messenger & Parks Mfg. Co., 681.  
 Milwaukee Corrugating Co., 209.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*Crimpedge*, 209.  
*Josam*, 876-78.  
*Portsmouth Iron*, 241.

**Gutters, Roof, Wood.**

Brown Co., 573.

**Gutters, Stable.**

Smith Wire and Iron Works, F. P., 524-25.

**Gymnasium Apparatus.**

Medart Mfg. Co., Fred, 1423.  
*Medart*, 1423.

**Gypsum, Structural.**

United States Gypsum Co., 162-68.  
*Structolite*, 162-68.

**Gypsum Blocks**, see Blocks, Gypsum.

**Gypsum Products.**

Acme Cement Plaster Co., 140-41.  
 American Gypsum Co., 142-44.  
 Best Bros. Keene's Cement Co., 146-47.  
 Empire Gypsum Co., 152.  
 Grand Rapids Plaster Co., 148-49.  
 King & Co., J. B., 153.

**Gypsum Products—Continued.**

Niagara Gypsum Co., 156.  
 Plymouth Gypsum Co., 154-55.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 Southern Gypsum Co., Inc., 158-59.  
 United States Gypsum Co., 162-68.  
*Empire*, 152.  
*King's*, 153.  
*Niagara*, 156.  
*Peerless*, 157.

**H****Halyard Tops, Flagpole.**

Walworth Mfg. Co., 1144.  
*Walworth*, 1144.

**Hand Rail Brackets**, see Rails, Hand.

**Handbooks, Electrical.**

Society for Electrical Development, Inc., 1145-52.

**Handles, Catacomb.**

Detroit Mausoleum Equipment Works, 500.

**Handles, Door**, see Pulls, Door.

**Hangers: Beam, Joist, Timber, Wall.**

Clark Co., W. J., 252.  
 Duplex Hanger Co., 253.  
 Duvinage, Pierre, 260.  
 Ideal Hanger Co., 256.  
 Price-Evans Foundry Co., 518-19.  
 St. Louis Wire & Iron Co., 523.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Truscon Steel Co., 217-19.  
 Van Dorn Iron Works Co., 254-55.  
 Wagner Architectural Iron Works, A. F., 530-31.  
*Duplex*, 253.  
*Ideal*, 256.  
*Lane*, 252; 523.  
*Truscon*, 217-19.

**Hangers, Cement Block.**

Van Dorn Iron Works Co., 254-55.

**Hangers, Door, Accordion or Folding.**

McCabe Hanger Mfg. Co., 618-20.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
*McCabe*, 618-20.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
 Specifications, 618-20.

**Hangers, Door, Ball Bearing.**

Grant Pulley and Hardware Co., 760-61.  
 Diamond Door Hanger Co., Inc., 616-17.  
 McCabe Hanger Mfg. Co., 618-20.  
 Monroe Screen, Blind & Partition Co., 772.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Wagner Mfg. Co., 638-39.  
*Diamond*, 616-17; 760-61.  
*Grant*, 760-61.  
*McCabe*, 618-20.  
*Ne Plus Ultra*, 772.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Wagner-Star*, 638-39.

**Hangers, Door, Barn.**

Allith-Prouty Co., 614-15.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Diamond Door Hanger Co., Inc., 616-17.  
 Hunt, Helm, Ferris & Co., 644.  
 James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
 McCabe Hanger Mfg. Co., 618-20.  
 National Mfg. Co., 621-25.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Wagner Mfg. Co., 638-39.  
*Allith-Prouty*, 614-15.  
*Cannon Ball*, 644.  
*Coburn*, 640-43.

**Hangers, Door, Barn—Continued.**

*Diamond*, 616-17.  
*James*, 1466-70.  
*McCabe*, 618-20.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Wagner*, 638-39.  
*Warehouse*, 614-15.  
*Watershed*, 614-15.  
 Specifications, 618-20.

**Hangers, Door, Car, see Hangers, Door, Railroad.****Hangers, Door, Depot, see Hangers, Door, Railroad.****Hangers, Door, Elevator.**

*Allith-Prouty Co.*, 614-15.  
*Diamond Door Hanger Co., Inc.*, 616-17.  
*McCabe Hanger Mfg. Co.*, 618-20.  
*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Stowell Co.*, 636-37.  
*Wagner Mfg. Co.*, 638-39.  
*Allith-Prouty*, 614-15.  
*Diamond*, 616-17.  
*Ideal*, 630-35.  
*McCabe*, 618-20.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Wagner-Star*, 638-39.  
*Wilbern*, 636-37.  
 Specifications, 618-20; 630-35.

**Hangers, Door, Factory, see Hangers, Door, Warehouse, etc.****Hangers, Door, Fire.**

*Coburn Trolley Track Mfg. Co.*, 640-43.  
*Diamond Door Hanger Co., Inc.*, 616-17.  
*Kinnear Mfg. Co.*, 670-79.  
*Merchant & Evans Co.*, 680.  
*Stowell Co.*, 636-37.  
*Coburn*, 640-43.  
*Diamond*, 616-17.  
*Kinnear*, 670-79.  
*Wilbern*, 636-37.

**Hangers, Door, Freight House, see Hangers, Door, Railroad.****Hangers, Door, Garage.**

*Allith-Prouty Co.*, 614-15.  
*Coburn Trolley Track Mfg. Co.*, 640-43.  
*Hunt, Helm, Ferris & Co.*, 644.  
*Louden Machinery Co.*, 1471-73.  
*McCabe Hanger Mfg. Co.*, 618-20.  
*National Mfg. Co.*, 621-25.  
*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Wagner Mfg. Co.*, 638-39.  
*Allith-Prouty*, 614-15.  
*Cannon Ball*, 644.  
*Coburn*, 640-43.  
*McCabe*, 618-20.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Slidetite*, 630-35.  
*Wagner*, 638-39.  
*Warehouse*, 614-15.  
*Watershed*, 614-15.

**Hangers, Door, Parlor, etc.**

*Allith-Prouty Co.*, 614-15.  
*Coburn Trolley Track Mfg. Co.*, 640-43.  
*Diamond Door Hanger Co., Inc.*, 616-17.  
*McCabe Hanger Mfg. Co.*, 618-20.  
*National Mfg. Co.*, 621-25.  
*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Wagner Mfg. Co.*, 638-39.  
*Advance*, 630-35.  
*Allith-Prouty*, 614-15.  
*Coburn*, 640-43.  
*Diamond*, 616-17.  
*McCabe*, 618-20.  
*Parlor*, 614-15.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Silent*, 621-25.

**Hangers, Door, Parlor, etc.—Continued.**

*Wagner*, 638-39.  
 Specifications, 618-20.

**Hangers, Door, Railroad.**

*Allith-Prouty Co.*, 614-15.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Stowell Co.*, 636-37.  
*Allith-Prouty*, 614-15.  
*R-W*, 630-35.  
*Watershed*, 614-15.  
*Wilbern*, 636-37.

**Hangers, Door, Trolley.**

*Coburn Trolley Track Mfg. Co.*, 640-43.  
*Merchant & Evans Co.*, 680.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Coburn*, 640-43.  
*R-W*, 630-35.

**Hangers, Door, Warehouse, etc.**

*Allith-Prouty Co.*, 614-15.  
*Coburn Trolley Track Mfg. Co.*, 640-43.  
*Diamond Door Hanger Co., Inc.*, 616-17.  
*McCabe Hanger Mfg. Co.*, 618-20.  
*National Mfg. Co.*, 621-25.  
*Ogden Co., J. Edward*, 682-83.  
*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Stanley Works*, 608-13.  
*Stowell Co.*, 636-37.  
*Wagner Mfg. Co.*, 638-39.  
*Allith-Prouty*, 614-15.  
*Coburn*, 640-43.  
*Diamond*, 616-17.  
*McCabe*, 618-20.  
*R-W*, 630-35.  
*Reliance*, 626-29.  
*Stanley*, 608-13.  
*Wagner*, 638-39.  
*Warehouse*, 614-15.  
*Wilbern*, 636-37.

**Hangers, Garment.**

*Knape Machine Co., John*, 1399.  
*Twentieth Century*, 1399.

**Hangers, Gate.**

*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Reliance*, 626-29.

**Hangers, I-Beam, see Hangers: Beam, Joist, Timber, Wall.****Hangers, Joist, see Hangers: Beam, Joist, Timber, Wall.****Hangers, Partition, see Hangers, Door.****Hangers, Pipe.**

*Crane Co.*, 1084-85.  
*Irving Iron Works Co.*, 348.  
*Josam Mfg. Co.*, 876-78.  
*Crane*, 1084-85.

**Hangers, Sash or Screen, see Hinges, Blind, Screen, or Shutter.****Hangers, Steel.**

*Allith-Prouty Co.*, 614-15.  
*Ideal Hanger Co.*, 256.  
*McCabe Hanger Mfg. Co.*, 618-20.  
*Milwaukee Corrugating Co.*, 209.  
*National Mfg. Co.*, 621-25.  
*Reliance-Grant Elevator Equipment Corp.*, 626-29.  
*Richards-Wilcox Mfg. Co.*, 630-35.  
*Stowell Co.*, 636-37.  
*Van Dorn Iron Works Co.*, 254-55.  
*Acordion*, 618-20.  
*Adjustable Stormproof*, 621-25.  
*Allith-Prouty*, 614-15.  
*Big 4*, 621-25.  
*Corner Door*, 614-15.  
*Flexible Stormproof*, 621-25.  
*Hero*, 630-35.  
*Ideal*, 256; 630-35.  
*McCabe*, 618-20.  
*Old Reliable*, 614-15.  
*Parlor Door*, 614-15.  
*Reliance*, 626-29.  
*Rigid Stormproof*, 621-25.  
*Silent*, 621-25.  
*Warehouse*, 614-15.  
*Wilbern*, 636-37.

**Hangers, Storm Sash, see Hinges, Blind, Screen or Shutter.****Hangers, Timber, see Hangers: Beam, Joist, Timber, Wall.****Hangers, Wall, see Hangers: Beam, Joist, Timber, Wall.****Hangers, Wire.**

*Milwaukee Corrugating Co.*, 209.

**Hardeners and Densifiers, Cement and Concrete.**

*Antakwa Co.*, 37.  
*Anti-Hydro Waterproofing Co.*, 38.  
*Arco Co.*, 1316-17.  
*Bailey Co., C. C.*, 1393.  
*Belknap-Moran-Allen Co., Inc.*, 1375.  
*Biegler Mfg. Co., E. N.*, 39.  
*Billings-Chapin Co.*, 1318.  
*Bruner Granitoid Co., P. M.*, 337.  
*Ceresit Waterproofing Co.*, 41.  
*Concrete Hardening Co., Inc.*, 338.  
*De Soto Paint Mfg. Co.*, 1319.  
*General Fireproofing Co.*, 42.  
*General Kompolite Co.*, 330.  
*Grauer & Co., Albert*, 337.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Harrison Works*, 1322-25.  
*Horn Co., A. C.*, 43.  
*Lowe Brothers Co.*, 1328-29.  
*Master Builders Co.*, 339.  
*Minwax Co., Inc.*, 342.  
*Murphy Varnish Co.*, 1350-51.  
*Natroco Paint & Varnish Works*, 1334.  
*Patton Paint Co.*, 1332-33.  
*Permanent Ironite Waterproofing Co.*, 47.  
*Sonneborn Sons, Inc., L.*, 340-41.  
*Special Service Flooring Corporation*, 336.  
*Standard Paint Co.*, 48-49; 393.  
*Toch Brothers*, 50-51.  
*Tropical Paint & Oil Co.*, 1335.  
*Trus-Con Laboratories*, 52-53.  
*U. S. Gutta Percha Paint Co.*, 1336-37.  
*Vitri-fy Co.*, 343.  
*Vortex Mfg. Co.*, 1374.  
*Wadsworth, Howland & Co., Inc.*, 1338-39.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Agatex*, 52-53.  
*Anti-Hydro*, 38.  
*Arco Vitrograin*, 1316-17.  
*Bay State Agatex*, 1338-39.  
*Bilchaco*, 1318.  
*C. W. Co.*, 41.  
*Crystalrox*, 42.  
*Dustop*, 50-51.  
*Everlast*, 338.  
*Ferro Fox*, 43.  
*Flintox*, 50-51.  
*Floor Neutralizer*, 1393.  
*GF Nos. 145, 150, 151 and 155*, 42.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*High Standard*, 1328-29.  
*Hornstone*, 43.  
*Impervite*, 48-49.  
*Indurite*, 41.  
*Ironite*, 47.  
*Konkreto*, 1375.  
*Lapidolith*, 340-41.  
*Liberty*, 37.  
*Master Builders Method*, 339.  
*Mastolith*, 330.  
*Memphi*, 1319.  
*Minwax*, 342.  
*Murphy Konkreto*, 1350-51.  
*Natroco*, 1334.  
*Patton's Dur-a-tor*, 1332-33.  
*Phlorkote*, 1334.  
*Protectorine*, 77.  
*R. I. W.*, 50-51.  
*R. I. W. Toxement*, 50-51.  
*Regal*, 37.  
*Rice's Granolith*, 1336-37.  
*Saniseal*, 339.  
*SPC*, 393.  
*Special Service*, 336.  
*Tropical*, 1335.



**Hardeners and Densifiers, Cement and Concrete—Continued.**

*Trus-Con*, 52-53.  
*Tuffner*, 39.  
*Vitrifyx*, 343.  
*Vorco*, 1374.  
*Vorcoflor*, 1374.  
 Specifications, 39; 41; 52-53; 337; 339; 340-41; 342; 1316-17; 1332-33.

**Hardware, Builders.**

Lawson Mfg. Co., 604-05.  
 National Mfg. Co., 621-25.  
 Payson Mfg. Co., 750-53.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Shelby Spring Hinge Co., 606-07.  
 Stanley Works, 608-13.  
 Stover Mfg. & Engine Co., 282.  
*Katz*, 604-05.  
*Stanley*, 608-13.

**Hardware, Cabinet.**

Knape Machine Co., John, 1399.

**Hardware, Casement, see Fasteners and Adjusters, Casement or Sash; Hardware, Window, Casement.****Hardware, Colonial.**

Irving Forge, W., 505.  
*W. Irving*, 505.

**Hardware, Door.**

(See also Locks; Hinges; Holders, etc.)

Allith-Prouty Co., 614-15.  
 American Steel Window Co., 694-97.  
 Atchison Revolving Door Co., 586-87.  
 Bayley Co., William, 698-99.  
 Bommer Brothers, 600-01.  
 Burrowes Co., E. T., 790-92.  
 Carpenter Mfg. Co., R. F., 868-69.  
 Chicago Spring Butt Co., 602-03.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Cornell Iron Works, 666.  
 Dahlstrom Metallic Door Co., 649-51.  
 Diamond Door Hanger Co., Inc., 616-17.  
 Edwards Mfg. Co., 664-65.  
 Hughes-Keenan Co., 262-65.  
 Hunt, Helm, Ferris & Co., 644.  
 Irving Forge, W., 505.  
 Jamison Cold Storage Door Co., 1064-65.  
 Kane Mfg. Co., 793.  
 Kinnear Mfg. Co., 670-79.  
 Lawson Mfg. Co., 604-05.  
 Loudon Machinery Co., 1471-73.  
 McCabe Hanger Mfg. Co., 618-20.  
 McFarland-Hyde Co., 720-21.  
 Merchant & Evans Co., 680.  
 Messenger & Parks Mfg. Co., 681.  
 National Automatic Door Co., 660.  
 National Mfg. Co., 621-25.  
 Ogden Co., J. Edward, 682-83.  
 Peelle Co., 684-87.  
 Phenix Mfg. Co., 800-01.  
 Pitt Composite Iron Works, William R., 558-59.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Revolving Door & Fixture Co., 590.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Saino Fire Door & Shutter Co., 669.  
 Sexauer & Lemke, Inc., 262-65.  
 Shelby Spring Hinge Co., 606-07.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Stanley Works, 608-13.  
 Stowell Co., 636-37.  
 Universal Balance Door, Inc., 591.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co., 593-97.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wagner's Sons Co., J. F., 732-33.  
*Allith-Prouty*, 614-15.  
*American*, 694-97.  
*Bayley-Springfield*, 698-99.  
*Coburn*, 640-43.  
*Diamond*, 616-17.  
*Kinnear*, 670-79.  
*Nob-Lok*, 800-01.  
*Ogden*, 682-83.

**Hardware, Door—Continued.**

*Panik-Prufe*, 660.  
*Peelle*, 684-87.  
*Phenix*, 800-01.  
*Pitt*, 558-59.  
*R-W*, 630-35.  
*Saino*, 669.  
*Shelby Chief*, 606-07.  
*Smith's*, 592.  
*Stanley*, 608-13.  
*Universal*, 591.  
*Von Duprin*, 593-97.  
*W. Irving*, 505.  
*Wilbern*, 636-37.

**Hardware, Door, Electrically Operated.**

Allith-Prouty Co., 614-15.  
 Revolving Door & Fixture Co., 590.  
*Allith-Prouty*, 614-15.

**Hardware, Door, Fire.**

Allith-Prouty Co., 614-15.  
 Bayley Co., 698-99.  
 Chesley Co., Inc., A. C., 710-11.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Consolidated Sheet Metal Works, 712-13.  
 Dahlstrom Metallic Door Co., 649-51.  
 Edwards Mfg. Co., 664-65.  
 Kinnear Mfg. Co., 670-79.  
 McFarland-Hyde Co., 720-21.  
 Messenger & Parks Mfg. Co., 681.  
 National Automatic Door Co., 660.  
 Peelle Co., 684-87.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Saino Fire Door & Shutter Co., 669.  
 Smith Metal Window Hardware Co., 592.  
 Stowell Co., 636-37.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co., 593-97.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wagner Mfg. Co., 638-39.  
*Allith-Prouty*, 614-15.  
*Chesley*, 710-11.  
*Monarch*, 630-35.  
*Panik-Prufe*, 660.  
*Peelle*, 684-87.  
*R-W*, 630-35.  
*Saino*, 669.  
*Von Duprin*, 593-97.  
*Wilbern*, 636-37.  
 Specifications, 593-97.

**Hardware, Door, Screen.**

(See also Hinges, Spring.)

Burrowes Co., E. T., 790-92.  
 Higgin Mfg. Co., 794-95.  
 Kane Mfg. Co., 793.  
*Higgin*, 794-95.

**Hardware, Door, Sidewalk.**

Gillis & Geoghegan, 1299-1305.  
*G & G*, 1299-1305.

**Hardware, Garage.**

Allith-Prouty Co., 614-15.  
 Loudon Machinery Co., 1471-73.  
 McCabe Hanger Mfg. Co., 618-20.  
 National Mfg. Co., 621-25.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Stanley Works, 608-13.  
 Wagner Mfg. Co., 638-39.  
*Allith-Prouty*, 614-15.  
*McCabe*, 618-20.  
*Reliance*, 626-29.  
*Slidetite*, 630-35.  
*Stanley*, 608-13.

**Hardware, Screen, see Hinges, Blind, Screen or Shutter.****Hardware, Wardrobe.**

Knape Machine Co., John, 1399.

**Hardware, White Enamel.**

(See also Hardware, Door.)

Allith-Prouty Co., 614-15.  
*Allith-Prouty*, 614-15.

**Hardware, Window.**

Allith-Prouty Co., 614-15.  
 American Steel Window Co., 694-97.  
 Austral Window Co., 736.

**Hardware, Window—Continued.**

Bayley Co., William, 698-99.  
 Burrowes Co., E. T., 790-92.  
 Casement Hardware Co., 737.  
 Columbian Hardware Co., 762.  
 Crittall Casement Window Co., 714-15.  
 Detroit Steel Products Co., 700-01.  
 Friction Pivot Co., Inc., 738.  
 Grant Pulley and Hardware Co., 739; 760-61.  
 Hope & Sons, Henry, 716-17.  
 Hughes-Keenan Co., 262-65.  
 International Casement Co., Inc., 718.  
 Kane Mfg. Co., 793.  
 Kees Mfg. Co., F. D., 799.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Mallory Mfg. Co., 741.  
 Mesker Brothers Iron Co., 722-25.  
 Monarch Metal Weather Strip Co., 786-87.  
 National Mfg. Co., 621-25.  
 Payson Mfg. Co., 750-53.  
 Phenix Mfg. Co., 800-01.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Pullman Mfg. Co., 764-65.  
 Royal Safety Anchor Co., 766-67.  
 Safety Detachable Window Corporation, 730-31.  
 Sexauer & Lemke, Inc., 262-65.  
 Stanley Works, 608-13.  
 Wilkins, George Lester, 746.  
 Williams Pivot Sash Co., 742-45.  
 Winslow Bros. Co., 735.  
*Allith-Prouty*, 614-15.  
*American*, 694-97; 760-61.  
*Austral*, 736.  
*Bayley-Springfield*, 698-99.  
*C. D. T.*, 738.  
*Columbian*, 762.  
*Crittall*, 714-15.  
*Fenestra*, 700-01.  
*Grant*, 760-61.  
*Kees*, 799.  
*Lee*, 760-61.  
*Mallory*, 741.  
*Monarch*, 786-87.  
*Nob-Lok*, 800-01.  
*Phenix*, 800-01.  
*Pomeroy*, 728-29.  
*Queen*, 760-61.  
*Royal*, 766-67.  
*Security*, 746.  
*Stanley*, 608-13.  
*Tabor*, 739.  
*Wilkins*, 746.  
*Williams*, 742-45.

**Hardware, Window, Casement.**

Casement Hardware Co., 737.  
 Crittall Casement Window Co., 714-15.  
 Friction Pivot Co., Inc., 738.  
 Grant Pulley and Hardware Co., 760-61.  
 Hope & Sons, Henry, 716-17.  
 International Casement Co., Inc., 718.  
 Kees Mfg. Co., F. D., 799.  
 Payson Mfg. Co., 750-53.  
 Pullman Mfg. Co., 764-65.  
 Wilkins, George Lester, 746.  
 Williams Pivot Sash Co., 742-45.  
 Winslow Bros. Co., 735.  
*C. D. T.*, 738.  
*C-H*, 737.  
*Crittall*, 714-15.  
*Grant*, 760-61.  
*Kees*, 799.  
*Williams*, 742-45.  
*Winslow*, 735.

**Hardware, Window, Lead.**

Hope & Sons, Henry, 716-17.

**Hardware, Shutter, see Hinges, Blind, Screen or Shutter.****Hardware Specialties.**

Allith-Prouty Co., 614-15.  
 Caldwell Mfg. Co., 758-59.  
 Columbian Hardware Co., 762.  
 Diamond Door Hanger Co., 616-17.  
 Friction Pivot Co., Inc., 738.  
 Grant Pulley & Hardware Co., 760-61.

**Hardware Specialties—Continued.**

Hunt, Helm, Ferris & Co., 644.  
 L. P. T. Specialty Co., 763.  
 National Mfg. Co., 621-25.  
 Pullman Mfg. Co., 764-65.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Stanley Works, 608-13.  
 Stover Mfg. & Engine Co., 282.  
 Wagner Mfg. Co., 638-39.  
*Allith-Prouty*, 614-15.  
*C.D.T.*, 738.  
*Diamond*, 616-17.  
*L. P. T.*, 763.  
*R-W*, 630-35.  
 Stanley, 608-13.

**Harness Brackets**, see Stable Fittings and Fixtures.

**Hasps.**

National Mfg. Co., 621-25.

**Hat Racks**, see Racks, Garment.

**Hawsers, Towing.**

(See also Rope, Wire.)

American Steel & Wire Co., 30-33.

**Hay Racks**, see Stable Fittings and Fixtures; Barn Equipment.

**Headlights.**

Edison Lamp Works, 1224.

**Heads, Air Controlling.**

American Blower Co., 996-99.  
 Best Register Co., 988-89.  
 Gerdes, Theodore R. N., 462.  
 Hackney Ventilating Co., 1001.  
 Knowles Mushroom Ventilator Co., 1004.  
*ABC*, 996-99.  
*Best*, 988-89.  
*Gerdes*, 462.  
*Hackney*, 1001.  
*Knowles*, 1004.  
*Notch*, 1004.  
 Specifications, 1004.

**Heads, Exhaust.**

Burt Mfg. Co., 459-61.  
 Mannen Co., John E., 1045.  
 Ohio Blower Co., 472-74.  
*Swartwout*, 472-74.

**Heads, Leader.**

Hope & Sons, Henry, 716-17.

**Headstones, Granite**, see Granite, Structural or Monumental.

**Hearth Linings**, see Linings, Fireplace.

**Hearths, Slate**, see Slate, Structural.

**Hearths, Tile**, see Tile, Floor and Wall.

**Heat Interchangers.**

Alberger Heater Co., 901.

**Heat Regulators**, see Regulators, Temperature.

**Heaters, Air, Electric.**

Edison Electric Appliance Co., Inc., 1204.  
 General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*Hughes*, 1204.

**Heaters, Air, Steam.**

American Blower Co., 996-99.  
 Massachusetts Blower Co., 1005.  
 Sturtevant Co., B. F., 1006-07.  
*ABC*, 996-99.  
*Sturtevant*, 1006-07.

**Heaters, Carburetor, Electric.**

Edison Electric Appliance Co., Inc., 1204.  
*Hughes*, 1204.

**Heaters, Exhaust Steam**, see Heaters, Feed Water.

**Heaters, Feed Water.**

Alberger Heater Co., 901.  
 National Pipe Bending Co., 902-03.  
 Ohio Blower Co., 472-74.  
 Walsh & Weidner Boiler Co., 1096.  
 Webster & Co., Warren, 932-34.  
 Whitlock Coil Pipe Co., 904-06.  
*Alberger*, 901.

**Heaters, Feed Water—Continued.**

*American*, 904-06.  
*National*, 902-03.  
*Swartwout*, 472-74.  
*Webster*, 932-34.

**Heaters, Fireplace, Gas.**

Crane Co., William M., 1012-13.  
 General Gas Light Co., 1029.  
*Humphrey Radiantfire*, 1029.  
*Vulcan*, 1012-13.

**Heaters, Garage.**

Mannen Co., John E., 1031.  
 Thatcher Furnace Co., 982-84.  
*Age-Gar*, 1031.  
*Thatcher*, 982-84.

**Heaters, Gas.**

Crane Co., William M., 1012-13.  
 General Gas Light Co., 1029.  
 Hugo Mfg. Co., 1030.  
 Mannen Co., John E., 1031.  
*Radiantfire*, 1029.  
*Vulcan*, 1012-13.

**Heaters, Hot Water and Hot Air, Combination**, see Boilers, Heating, Hot Water or Steam and Hot Air, Combination.

**Heaters, Laundry**, see Heaters, Water, Storage, Steam.

**Heaters, Lavatory**, see Heaters, Water, Instantaneous.

**Heaters, Oil.**

Alberger Heater Co., 901.  
*Alberger*, 901.

**Heaters, Pipe<sup>1</sup> Coil**, see Heaters, Air, Steam.

**Heaters, Shower.**

Matthews & Brother, Inc., W. N., 864-65.  
*Matthews Steamix*, 864-65.

**Heaters, Soldering Iron, Electric.**

General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Heaters, Spark, Portable.**

Hugo Mfg. Co., 1030.

**Heaters, Steam and Hot Air, Combination**, see Boilers, Heating, Hot Water or Steam and Hot Air, Combination.

**Heaters, Tank**, see Heaters, Water, Storage; Boilers, Heating, Steam and Hot Water.

**Heaters, Warm Air**, see Furnaces, Hot Air.

**Heaters, Water, Auxiliary.**

International Heater Co., 968-73.  
*International*, 968-73.

**Heaters, Water, Fuel or Steam, Combination.**

National Pipe Bending Co., 902-03.  
*National*, 902-03.

**Heaters, Water, Garbage Burning**, see Incinerators.

**Heaters, Water, Instantaneous.**

American Water Heater Co., Inc., 1018-19.  
 Economy Heater Co., 1015-17.  
 Hoffman Heater Co., 1020-22.  
 Manufacturing Equipment & Engineering Co., 847.  
 Matthews & Brother, Inc., W. N., 864-65.  
 Parrott Heater Co., 1023.  
 Pittsburgh Water Heater Co., 1024-27.  
 Powers Regulator Co., 950-51.  
 Whitlock Coil Pipe Co., 904-06.

*American*, 1018-19.

*Bungalow*, 1024-27.

*Economy*, 1015-17.

*Hoffman*, 1020-22.

*Matthews Steamix*, 864-65.

*Parrott*, 1023.

*Pittsburgh*, 1024-27.

*Pittsburgh-Bungalow*, 1024-27.

*Whitlock-American*, 904-06.

Specifications, 1023; 1024-27.

**Heaters, Water, Storage, Coal.**

Bramhall, Deane Co., 1010-11.  
 International Heater Co., 968-73.  
*International*, 968-73.

**Heaters, Water, Storage, Electric.**

Edison Electric Appliance Co., Inc., 1204.  
 General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*Hughes*, 1204.

**Heaters, Water, Storage, Gas.**

American Water Heater Co., Inc., 1018-19.  
 Economy Heater Co., 1015-17.  
 Hoffman Heater Co., 1020-22.  
 Parrott Heater Co., 1023.  
 Pittsburgh Water Heater Co., 1024-27.  
*American*, 1018-19.  
*Bungalow*, 1024-27.  
*Hoffman*, 1020-22.  
*Lion*, 1024-27.  
*Parrott*, 1023.  
*Pittsburgh*, 1024-27.  
*Pittsburgh-Bungalow*, 1024-27.  
 Specifications, 1024-27.

**Heaters, Water, Storage, Steam.**

Alberger Heater Co., 901.  
 Badger & Sons Co., E. B., 892-93.  
 Kewanee Boiler Co., 975-77.  
 National Pipe Bending Co., 902-03.  
 Trageser Steam Copper Works, John, 900.  
 Whitlock Coil Pipe Co., 904-06.  
*Alberger*, 901.  
*Badger*, 892-93.  
*Kewanee*, 975-77.  
*Tabasco*, 975-77.  
*Whitlock-American*, 904-06.  
*Whitlock Junior*, 904-06.  
 Specifications, 975-77.

**Heaters, Water, Swimming Pool.**

Penberthy Injector Co., 882-83.  
*Penberthy*, 882-83.  
*XL-96*, 882-83.

**Heaters, Water and Range Boiler, Combination.**

Economy Heater Co., 1015-17.  
*Economy*, 1015-17.  
 Specifications, 1015-17.

**Heating Pads, Electric.**

Western Electric Co., 1202-03.  
*Western Electric*, 1202-03.

**Heating Plants, Isolated.**

General Fire Extinguisher Co., 1028.  
*Grinnell Ready-heat*, 1028.

**Heating Specialties**, see Specific Headings.

**Heating Systems, Air Line**, see Heating Systems, Steam.

**Heating Systems, Gas.**

General Fire Extinguisher Co., 1028.  
 Hugo Mfg. Co., 1030.  
*Grinnell Ready-heat*, 1028.

**Heating Systems, Greenhouse and Conservatory.**

Hitchings & Co., 1454-55.  
 King Construction Co., 1456-57.  
 Lord & Burnham Co., 1458-61.  
 Lutton Co., William H., 1462-63.  
 Pierson U-Bar Co., 1464-65.  
 Thatcher Furnace Co., 982-84.  
 Tyler Underground Heating System, 911.  
 Webster & Co., Warren, 932-34.  
*Adsc*, 912.  
*King*, 1456-57.  
*Thatcher*, 982-84.

**Heating Systems, Hot Air.**

(See also Furnaces, Hot Air.)  
 Cox Stove Co., Abram, 960-64.  
 Hart & Crouse Co., 965-67.  
 International Heater Co., 968-73.  
 Kelsey Heating Co., 958-59.  
 Majestic Co., 271-73.  
 Thatcher Furnace Co., 982-84.  
*International*, 968-73.  
*Kelsey*, 958-59.  
*Majestic Duplex One-Register*, 271-73.  
*Royal*, 965-67.  
*Thatcher*, 982-84.



**Heating Systems, Hot Water.**

Hart & Crouse Co., 965-67.  
Hoffman Heater Co., 1020-22.  
Lord & Burnham Co., 1458-61.  
Pittsburg Water Heater Co., 1024-27.  
Prox Co., Frank, 980-81.  
Thatcher Furnace Co., 982-84.  
*Pittsburgh*, 1024-27.  
*Thatcher*, 982-84.  
Specifications, 1024-27.

**Heating Systems, Hot Water or Steam and Hot Air, Combination.**

International Heater Co., 968-73.  
Kelsey Heating Co., 958-59.  
*International*, 968-73.  
*Kelsey*, 958-59.

**Heating Systems, Modulation, see Heating Systems, Steam.****Heating Systems, Steam.**

American District Steam Co., 912.  
Bishop-Babcock-Becker Co., 914-15.  
Cox Stove Co., Abram, 960-64.  
Dunham Co., C. A., 916-21.  
Eddy Engineering Co., 922-23.  
Haines & Co., William S., 924-25.  
Hart & Crouse Co., 965-67.  
Hoffman Heater Co., 1020-22.  
Lord & Burnham Co., 978-79; 1458-61.  
Prox Co., Frank, 980-81.  
Thatcher Furnace Co., 982-84.  
Webster & Co., Warren, 932-34.  
*Adscs*, 912.  
*Dunham*, 916-21.  
*Eddy*, 922-23.  
*Haines*, 924-25.  
*Thatcher*, 982-84.  
*Webster*, 932-34.  
Specifications, 916-21; 922-23.

**Heating Systems, Underground.**

American District Steam Co., 912.  
Tyler Underground Heating System, 911.  
*Tyler*, 911.  
Specifications, 911.

**Heating Systems, Vacuum, see Heating Systems, Steam.****Heating and Cooking Appliances, Coal.**  
(See also *Ranges*.)

Bramhall, Deane Co., 1010-11.  
Estate Stove Co., 1205.  
*Estate*, 1205.

**Heating and Cooking Appliances, Electric.**

Bramhall, Deane Co., 1010-11.  
Edison Electric Appliance Co., Inc., 1204.  
Estate Stove Co., 1205.  
General Electric Co., 1153-67.  
Powell Steel Kitchen Co., 1032-33.  
Society for Electrical Development, Inc., 1145-52.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*Estate*, 1205.  
*G-E*, 1153-67.  
*Hughes*, 1204.  
*Powell's*, 1032-33.  
*Western Electric*, 1202-03.  
Specifications, 1145-52; 1153-67.

**Heating and Cooking Appliances, Gas.**

Bramhall, Deane Co., 1010-11.  
Crane Co., William M., 1012-13.  
Estate Stove Co., 1205.  
National Commercial Gas Association, 1009.  
*Estate*, 1205.  
*Vulcan*, 1012-13.

**Heating and Ventilating Apparatus.**

(See also Heating Systems; Fans; Blowers; Ventilators.)  
American Blower Co., 996-99.  
Bishop-Babcock-Becker Co., 914-15.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1028.  
Gerdes, Theodore R. N., 462.  
Hackney Ventilating Co., 1001.  
Hugo Mfg. Co., 1030.  
Jordan & Co., Paul R., 464-65.

**Heating and Ventilating Apparatus—**

Continued.

Kelsey Heating Co., 958-59.  
King Ventilating Co., 468-69.  
Lord & Burnham Co., 747; 1458-61.  
Mannen Co., John E., 1045.  
Massachusetts Blower Co., 1005.  
Moline Heat, 939.  
Sturtevant Co., B. F., 1006-07.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*ABC*, 996-99.  
*G-E*, 1153-67.  
*Grinnell Ready-Heat*, 1028.  
*Hackney*, 1001.  
*Hawks*, 1030.  
*Kelsey*, 958-59.  
*King Aerator*, 468-69.  
*Moline*, 939.  
*Sturtevant*, 1006-07.

**Hectograph Color Copies.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Hinges, Ball Bearing.**

Bommer Brothers, 600-01.  
Carpenter Mfg. Co., R. F., 868-69.  
Chicago Spring Butt Co., 602-03.  
Lawson Mfg. Co., 604-05.  
National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.  
Stanley Works, 608-13.  
*Bommer*, 600-01.  
*Carpenter's*, 868-69.  
*Chicago*, 602-03.  
*Sanymetal*, 868-69.  
*Shelby Chief*, 606-07.  
*Stanley*, 608-13.  
Specifications, 608-13.

**Hinges, Blind, Screen or Shutter.**

Burrowes Co., E. T., 790-92.  
Irving Forge, W., 505.  
Kees Mfg. Co., F. D., 799.  
Lawson Mfg. Co., 604-05.  
Merchant & Evans Co., 680.  
National Mfg. Co., 621-25.  
Phenix Mfg. Co., 800-01.  
Shelby Spring Hinge Co., 606-07.  
Stanley Works, 608-13.  
*Kees Gossett*, 799.  
*Peerless*, 608-13.  
*Phenix*, 800-01.  
*Stanley*, 608-13.  
*W. Irving*, 505.

**Hinges, Box Stall, see Stable Fittings and Fixtures.****Hinges, Casement.**

Friction Pivot Co., Inc., 738.  
Hope & Sons, Henry, 716-17.  
International Casement Co., Inc., 718.  
Stanley Works, 608-13.  
*C. D. T.*, 738.  
*Stanley*, 608-13.

**Hinges, Closet Seat.**

Chicago Spring Butt Co., 602-03.  
*Sanitax*, 602-03.

**Hinges, Fire House and Garage.**

Chicago Spring Butt Co., 602-03.  
National Mfg. Co., 621-25.  
Stanley Works, 608-13.  
*Chicago*, 602-03.  
*Stanley*, 608-13.

**Hinges, Floor, see Hinges, Spring, Floor.****Hinges, Friction.**

Friction Pivot Co., Inc., 738.  
*C. D. T.*, 738.

**Hinges, Garage, see Hinges, Fire House and Garage.****Hinges, Gravity.**

Carpenter Mfg. Co., R. F., 868-69.  
*Carpenter's*, 868-69.  
*Sanymetal*, 868-69.

**Hinges, Invisible.**

Bommer Brothers, 600-01.  
*Bommer*, 600-01.

**Hinges, Lavatory and Hospital Door.**

Bommer Brothers, 600-01.  
Chicago Spring Butt Co., 602-03.

**Hinges, Lavatory and Hospital Door—**

Continued.

Lawson Mfg. Co., 604-05.  
National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.  
*Bommer*, 600-01.  
*Chicago*, 602-03.  
*Katz*, 604-05.  
*Triplex*, 602-03.

**Hinges, Pivot.**

(See also Hinges, Spring; Hinges, Friction.)

Bommer Brothers, 600-01.  
Chicago Spring Butt Co., 602-03.  
Detroit Mausoleum Equipment Works, 500.  
Friction Pivot Co., Inc., 738.  
Lawson Mfg. Co., 604-05.  
*Ajax*, 602-03.  
*Bommer*, 600-01.  
*C. D. T.*, 738.  
*Chicago*, 602-03.  
*Premier*, 602-03.  
*Relax*, 602-03.

**Hinges, Sash or Screen, see Hinges, Blind, Screen or Shutter.****Hinges, Spring.**

Allith-Prouty Co., 614-15.  
Bommer Brothers, 600-01.  
Burrowes Co., E. T., 790-92.  
Chicago Spring Butt Co., 602-03.  
Lawson Mfg. Co., 604-05.  
National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.  
Stanley Works, 608-13.  
*Ajax*, 602-03.  
*Allith-Prouty*, 614-15.  
*Bommer*, 600-01.  
*Chicago*, 602-03.  
*Premier*, 602-03.  
*Relax*, 602-03.  
*Sagless*, 602-03.  
*Shelby*, 606-07.  
*Stanley*, 608-13.  
*Triplex*, 602-03.

**Hinges, Spring, Floor.**

Allith-Prouty Co., 614-15.  
Bommer Brothers, 600-01.  
Chicago Spring Butt Co., 602-03.  
Lawson Mfg. Co., 604-05.  
National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.  
*Allith-Prouty*, 614-15.  
*Bommer*, 600-01.  
*Chicago*, 602-03.  
*Relax*, 602-03.  
*Shelby Chief*, 606-07.

**Hinges, Window, see Hinges, Blind, Screen or Shutter.****Hinges, Wrought Iron or Steel.**

Bommer Brothers, 600-01.  
National Mfg. Co., 621-25.  
Stanley Works, 608-13.  
Wisconsin Wire & Iron Works, 533.  
*Bommer*, 600-01.  
*Stanley*, 608-13.

**Hips, Hip Rolls and Hip Coverings, see Roof Trimmings.****Hitching Posts, see Posts, Hitching.****Hitching Weights, see Weights, Hitching.****Hog Killing Equipment, see Slaughter House Equipment.****Hog Pens, see Pens, Live Stock.****Hog Waterers, see Troughs, Water.****Hoisting Machinery, see Elevating and Conveying Machinery.****Hoists, Automatic, see Elevating and Conveying Machinery.****Hoists, Automobile or Carriage.**

A. B. See Electric Elevator Co., 1262-63.  
American Elevator & Machine Co., 1261.  
Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Energy Elevator Co., 1270-73.

**Hoists, Automobile or Carriage—Continued.**

Hollister-Whitney Co., 1274.  
Kimball Brothers Co., 1275.  
Otis Elevator Co., 1280-84.  
Sedgwick Machine Works, 1285-89.  
Chelsea, 1265-67.  
Kimball, 1275.  
Otis, 1280-84.  
Sedgwick, 1285-89.

**Hoists, Carriage, see Hoists, Automobile or Carriage.****Hoists, Cellar and Ash.**

(See also Elevators, Sidewalk.)

Chelsea Elevator Co., 1265-67.  
Cohoes Iron Foundry and Machine Co., 1264.  
Energy Elevator Co., 1270-73.  
Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Olson & Co., Samuel, 1312-13.  
Otis Elevator Co., 1280-84.  
Payne Co., F. S., 1290-91.  
Sedgwick Machine Works, 1285-89.  
Chelsea, 1265-67.  
Ernst, 1294-97.  
G & G, 1299-1305.  
Otis, 1280-84.  
Payne, 1290-91.  
Sedgwick, 1285-89.  
Specifications, 1299-1305.

**Hoists, Electric.**

Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Otis Elevator Co., 1280-84.  
Sprague Electric Works, 1168.  
Ernst, 1294-97.  
G & G, 1299-1305.  
Otis, 1280-84.  
Specifications, 1299-1305.

**Hoists, Friction.**

Eastern Machinery Co., 1268-69.

**Hoists, Furnace.**

Chelsea Elevator Co., 1265-67.  
Otis Elevator Co., 1280-84.  
Chelsea, 1265-67.  
Otis, 1280-84.

**Hoists, Hand.**

Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Olson & Co., Samuel, 1312-13.  
Sedgwick Machine Works, 1285-89.  
Ernst, 1294-97.  
G & G, 1299-1305.  
Sedgwick, 1285-89.  
Specifications, 1299-1305.

**Hoists, Hatchway, see Hoists, Cellar and Ash.****Hoists, Hay.**

Louden Machinery Co., 1471-73.

**Hoists, Hydraulic.**

Payne Co., F. S., 1290-91.  
Payne, 1290-91.

**Hoists, Sidewalk, see Hoists, Cellar and Ash; Elevators, Sidewalk.****Hoists, Telescopic.**

Ernst Specialty Co., C. K., 1294-97.  
Gillis & Geoghegan, 1299-1305.  
Ernst, 1294-97.  
G & G, 1299-1305.  
Specifications, 1299-1305.

**Hoists, Whip.**

Otis Elevator Co., 1280-84.  
Otis, 1280-84.

**Holdbacks.**

Irving Forge, W., 505.  
W. Irving, 505.

**Holders, Door.**

(See also Checks and Springs, Door.)

Bommer Brothers, 600-01.  
Caldwell Mfg. Co., 758-59.  
Chicago Spring Butt Co., 602-03.  
Lawson Mfg. Co., 604-05.  
National Mfg. Co., 621-25.  
Shelby Spring Hinge Co., 606-07.  
Stanley Works, 608-13.

**Holders, Door—Continued.**

Vonnegut Hardware Co., 593-97.  
Bommer, 600-01.  
Caldwell, 758-59.  
Chicago, 602-03.  
Empire, 758-59.  
Junior, 758-59.  
Katz, 604-05.  
Stanley, 608-13.  
Vertical, 758-59.  
Von Duprin, 593-97.

**Holders, Shade, Electric.**

Bryant Electric Co., 1207.  
Bryant, 1207.

**Holders, Soap.**

Searls Mfg. Co., 888-89.

**Holders, Soap and Sponge, Combination.**

Searls Mfg. Co., 888-89.

**Holders, Soap and Tumbler, Combination.**

Searls Mfg. Co., 888-89.

**Holders, Sponge.**

Searls Mfg. Co., 888-89.

**Holders, Stanchion, Adjustable.**

Louden Machinery Co., 1471-73.  
Louden, 1471-73.

**Holders, Toilet Paper.**

Carpenter Mfg. Co., R. F., 868-69.  
Eustis Mfg. Co., 885.  
Searls Mfg. Co., 888-89.  
Brasscrafters White, 885.  
Sanymetal, 868-69.

**Holders, Toothbrush.**

Searls Mfg. Co., 888-89.

**Holders, Toothbrush and Tumbler, Combination.**

Searls Mfg. Co., 888-89.

**Holders, Tumbler.**

Searls Mfg. Co., 888-89.

**Holders, Umbrella.**

Clark Co., W. J., 252.  
Ideal, 252.

**Holders, Window, French, see Fasteners and Adjusters, Casement or Sash.****Hollow Tile, see Tile, Hollow, Fireproof.****Hoods, Fireplace.**

Chattanooga Roofing & Foundry Co., 278.

**Hoods, Laboratory, Fume or Vapor.**

Alberene Stone Co., 890-91.  
Aspromet Co., 414-16.  
Alberene Stone, 890-91.  
APM, 414-16.

**Hoods, Radiator.**

Fulton Co., 937-38.  
Tiffany Studios, 526-27.

**Hooks, Coat and Hat.**

Allith-Prouty Co., 614-15.  
Carpenter Mfg. Co., R. F., 868-69.  
Searls Mfg. Co., 888-89.  
Sanymetal, 868-69.

**Hooks, Coat and Hat, Locking.**

Payson Mfg. Co., 750-53.

**Hooks, Extension, Sash, see Fasteners and Adjusters, Casement or Sash.****Hooks, Fire.**

Safety Fire Extinguisher Co., 1141.  
Simmons Co., John, 1142-43.

**Hooks, Pipe, Conductor.**

Wheeling Corrugating Department, 242-43.

**Hooks, Wire.**

American Chain Co., Inc., 754.  
American Steel & Wire Co., 30-33.  
National Mfg. Co., 621-25.  
American, 754.

**Hooks and Eyes.**

National Mfg. Co., 621-25.

**Hoops.**

Smith Wire and Iron Works, F. P., 524-25.  
Youngstown Sheet & Tube Co., 1074-75.

**Horns, Fire Alarm, see Alarms, Burglar or Fire.****Hose, Air.**

Sprague Electric Works, 1168.

**Hose, Armored.**

Sprague Electric Works, 1168.

**Hose, Fire, Linen.**

Allen Mfg. Co., W. D., 1131-33.  
New York Brass Foundry Co., 1134-35.  
Safety Fire Extinguisher Co., 1134-35.  
Simmons Co., John, 1142-43.  
Sprague Electric Works, 1168.  
SS, 1142-43.  
Stillbeck, 1134-35.

**Hose, Fire, Rubber Lined Cotton.**

New York Brass Foundry Co., 1134-35.  
Stillbeck, 1134-35.

**Hose, Gasoline or Oil.**

Wayne Oil Tank & Pump Co., 1480-81.

**Hose, Steam and Water.**

Allen Mfg. Co., W. D., 1131-33.  
New York Brass Foundry Co., 1134-35.  
Safety Fire Extinguisher Co., 1141.  
Simmons Co., John, 1142-43.  
Sprague Electric Works, 1168.  
SS, 1142-43.  
Stillbeck, 1134-35.

**Hose Cabinets, see Cabinets, Hose.****Hose Carts, see Carts, Hose.****Hose Racks and Reels, see Racks and Reels, Hose.****Hose Valves, see Valves, Hose.****Hospital Elevators, see Elevators, Invalid.****Hospital Fixtures, see Specific Headings.****Hospital Signal Systems, see Signal Systems, Electric.****Hospital Sterilizers, see Sterilizers.****Hot Plates, see Heating and Cooking Appliances.****Hot Water Supplies, see Specific Headings.****Hotel Mirror Fixtures, see Bathroom Accessories.****House Elevators, see Elevators, Freight or Passenger, Power.****House Wire, see Wire and Cables, Electric.****Houses, Contractors.**

(See also Houses, Portable.)

Howell, Field & Goddard, Inc., 652-53.  
Stephenson, C. H., 277.  
Truscon Steel Co., 217-19.  
Kahn, 217-19.  
The Stephenson, 277.  
Truscon, 217-19.

**Houses, Garden.**

Hartmann-Sanders Co., 298-99.  
Mathews Mfg. Co., 1402-03.

**Houses, Hose and Hydrant.**

Safety Fire Extinguisher Co., 1141.

**Houses, Metal.**

Edwards Mfg. Co., 418-19.  
Howell, Field & Goddard, Inc., 652-53.  
Stephenson, C. H., 277.  
Truscon Steel Co., 217-19.  
Kahn, 217-19.  
The Stephenson, 277.  
Truscon, 217-19.

**Houses, Mining, Steel, see Houses, Metal.****Houses, Play, Childrens.**

Mathews Mfg. Co., 1402-03.

**Houses, Portable.**

Edwards Mfg. Co., 418-19.  
Hodgson Co., E. F., 1453.  
Howell, Field & Goddard, Inc., 652-53.  
Stephenson, C. H., 277.  
Truscon Steel Co., 217-19.  
Hodgson, 1453.  
Kahn, 217-19.  
The Stephenson, 277.  
Truscon, 217-19.

**Houses, Poultry.**

Hodgson Co., E. F., 1453.  
Hodgson, 1453.



**Houses, Sectional**, see Houses, Portable.  
**Houses, Summer and Tea**, see Houses, Garden.  
**Humidifiers**, see Air Conditioning Apparatus.

**Humidostats**.  
 Johnson Service Co., 942-46.  
*Johnson*, 942-46.  
 Specifications, 942-46.

**Hydrants, Fire**.  
 Chapman Valve Mfg. Co., 1080-81.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Murdock Mfg. & Supply Co., 866-67.  
 Pratt & Cady Co., Inc., 1090-91.  
 Simmons Co., John, 1142-43.

**Hydrated Lime**, see Lime, Finishing and Hydrated.

**Hydraulic Engineers**, see Engineers, Hydraulic.

**Hydraulic Machinery**.  
 Goulds Mfg. Co., 1108-09.

**Hydraulic Rams**, see Rams, Hydraulic.

**Hydro-electric Stations**.  
 General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Hydro-pneumatic Booster Systems**.  
 Kerr Machinery & Supply Co., 1110-11.  
*Kerr*, 1110-11.

**Hygrostats**.  
 Bishop-Babcock-Becker Co., 914-15.

## I

**I-beam Hangers**, see Hangers: Beam, Joist, Timber, Wall.

**I-beams**, see Structural Steel.

**Ice Boxes**, see Refrigerators and Coolers.

**Ice Cans**, see Cans, Ice.

**Ice Chests**, see Refrigerators and Coolers.

**Ice Cream Cabinets**, see Refrigerators and Coolers.

**Ice Cream Cases**, see Refrigerators and Coolers.

**Ice Cream Machines**.  
 Bramhall, Deane Co., 1010-11.  
 York Mfg. Co., 1055.

**Ice Handling Machinery**.  
 (See also Elevating and Conveying Machinery.)  
 Gifford-Wood Co., 1298.  
 Olson & Co., Samuel, 1312-13.  
*G-W*, 1298.

**Ice Making and Refrigerating Machinery**.

Automatic Refrigerating Co., 1048-49.  
 Brecht Co., 1050-52.  
 Carbondale Machine Co., 1053.  
 Guardian Refrigerator Co., 1056.  
 Isko, Inc., 1057.  
 McCray Refrigerator Co., 1062.  
 Peerless Ice Machine Co., 1054.  
 Spalt & Sons, Inc., Geo., 1058.  
 York Mfg. Co., 1055.  
*Baby Automatic*, 1048-49.  
*Brecht*, 1050-52.  
*Isko*, 1057.  
*McCray*, 1062.  
*Peerless*, 1054.  
*Spalt*, 1058.

**Idlers, Belt**.  
 Link-Belt Co., 1310.

**Illumination, Electrical, Notes on**.  
 Society for Electrical Development, Inc., 1145-52.

**Illumination, Electrical, Terms Used**.  
 Society for Electrical Development, Inc., 1145-52.

**Incandescent Lamps**, see Lamps, Electric.

**Incinerator Chimneys**, see Chimneys.

## Incinerators.

Domestic Laundry Equipment Corporation, 1042-43.  
 Grand Crossing Boiler Works, 907.  
 Kerner Incinerator Co., 908.  
 Kewanee Boiler Co., 975-77.  
 Majestic Co., 271-73.  
 Stearns & Co., E. C., 909.  
 Wheeling Corrugating Department, 242-43.  
*Domestic*, 1042-43.  
*Dube*, 907.  
*Incinerite*, 909.  
*Kernerator*, 908.  
*Kewanee*, 975-77.  
 Specifications, 975-77.

**Incinerators, Water Heating**, see Incinerators.

**Indiana Limestone**, see Limestone.

**Indicator Posts**, see Posts, Indicator, Valve.

**Indicators, Frequency**.  
 General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Indicators, Power Factor**.  
 General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Indicators, Synchronism**.  
 General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Indirect Lighting**, see Lighting Fixtures.

**Industrial Building Construction**, see Engineers or Contractors.

**Information, Enclosure, Elevator**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Fire Retardant**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Fireproofing**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Metal Lath**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Mill Construction**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Plastering**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Stucco**.  
 Associated Metal Lath Manufacturers, 196-201.

**Information, Switchboard**.  
 Society for Electrical Development, Inc., 1145-52.

**Information, Telephone**.  
 American Telephone and Telegraph Co., 1237.

**Ingot Metal**, see Metal, Ingot.

**Injectors**.  
 Jenkins Bros., 1086-87.  
 Penberthy Injector Co., 882-83.  
*Jenkins Bros.*, 1086-89.  
*Penberthy*, 882-83.

**Inkstands, Self-closing**.  
 Sengbusch Self-Closing Inkstand Co., 7.  
*Lock-Well*, 7.  
*Sengbusch*, 7.

**Inlay Work**.  
 (See also Decoration, Interior; Mosaic Work.)  
 Reed & Barton, 520-21.  
 Tiffany Studios, 526-27.

**Insect Screens**, see Screens, Door and Window.

**Inserts, Concrete**.  
 Ankyra Mfg. Co., 244-45.  
 Barton Spider-Web System, 20-21.  
 Concrete Steel Co., 188-89.  
 Dayton Malleable Iron Co., 246.  
 Donley Brothers Co., 247.  
 Duplex Hanger Co., 253.

## Inserts, Concrete—Continued.

Ideal Hanger Co., 256.  
 Josam Mfg. Co., 876-78.  
 Kohler Die & Specialty Co., 248.  
 Richmond Screw Anchor Co., 249.  
 Security Insert Co., 250.  
 Truscon Steel Co., 217-19.  
 Wright & Alexander Co., 251.  
*Ankyra Ankor*, 244-45.  
*Dayton*, 246.  
*D-B*, 247.  
*Duplex*, 253.  
*Havemeyer*, 188-89.  
*Josam Sureline*, 876-78.  
*Kohler*, 248.  
*Security*, 250.  
*Truscon*, 217-19.  
*Wrialco*, 251.  
*Y*, 188-89.

**Inserts, Pressed Steel**, see Inserts, Concrete.

**Inspection Engineers**, see Engineers, Inspection.

**Instruments, Waterproof Testing**.  
 Standard Paint Co., 48-49.

**Insulating Materials, Electric**.  
 American Steel & Wire Co., 1182-87.  
 Boston Insulated Wire & Cable Co., 1192.  
 Electric Cable Co., 1190-91.  
 General Electric Co., 1153-67.  
 Habirshaw Electric Cable Co., 1193-1201.  
 Standard Paint Co., 393.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*Ecco*, 1190-91.  
*G-E*, 1153-67.  
*P & B*, 393.

**Insulating Paper**, see Building Papers.

**Insulating and Sheathing Materials**, see Sound Deadening Materials; Building Papers; Felt.

**Insulation, Building**, see Sound Deadening Materials.

**Insulation, Cold Storage and Refrigerating**.

Armstrong Cork & Insulation Co., 349-51.  
 Banner Rock Products Co., 352.  
 Bird & Son, 390-91.  
 Cabot, Inc., Samuel, 1382-85.  
 Certain-teed Products Corporation, 399-401.  
 Garrett & Son Corp., C. S., 392.  
 Hydrex Felt & Engineering Co., 44.  
 International Insulation Co., 174.  
 Johns-Manville Co., H. W., 1076-77.  
 Stone, Junius H., 353.  
 United Cork Companies, 356.  
 United States Mineral Wool Co., 357.  
*Acme*, 349-51.  
*Anti-sweat*, 1076-77.  
*Best*, 392.  
*Certain-teed*, 399-401.  
*Eureka*, 349-51.  
*Hydrex*, 44.  
*Neponset*, 390-91.  
*Nonpareil*, 349-51.  
*Non-Plus Ultra*, 353.  
*Quilt*, 1382-85.  
*Raw-Hide*, 392.  
*Rock Cork*, 352.  
*Universal Insulite*, 174.

**Insulation, Cork**.  
 Armstrong Cork & Insulation Co., 349-51.  
 Banner Rock Products Co., 352.  
 Stone, Junius H., 353.  
 United Cork Companies, 356.  
*Acme*, 349-51.  
*Eureka*, 349-51.  
*Nonpareil*, 349-51.  
*Non-Plus Ultra*, 353.  
*Rock*, 352.

**Insulation, Electrical**, see Insulating Materials, Electric.

**Insulation, Hair**.  
 Johns-Manville Co., H. W., 36; 1076-77.

**Insulation, Magnesia.**

Johns-Manville Co., H. W., 1076-77.  
 Magnesia Association of America, 1078-79.  
 85% Magnesia, 1076-77.  
 Johns-Manville, 1076-77.

**Insulation, Mineral Wool.**

Banner Rock Products Co., 352.  
 United States Mineral Wool Co., 357.  
 Rock Cork, 352.

**Insulation, Pipe, see Coverings, Pipe and Boiler, Steam or Hot Water.****Insulation, Pipe, Underground.**

Johns-Manville Co., H. W., 910.  
 Johns-Manville, 910.

**Insulation, Refrigerating, see Insulation, Cold Storage and Refrigerating.****Insulation, Thermal, see Insulation, Cold Storage and Refrigerating.****Insulator Supports, see Supports, Insulator.****Intakes, Fresh Air.**

Gerdes, Theodore R. N., 462.

**Intercommunicating Cable, see Cables, Intercommunicating.****Intercommunicating Telephones, see Telephones, Intercommunicating.****Interior Decoration, see Decoration, Interior.****Interior Marble Work, see Contractors, Marble, Interior.****Interior Telephones, see Telephones, Intercommunicating.****Interior Woodwork, see Cabinet Work; Trim.****Interphones, see Telephones, Intercommunicating.****Iron, see Sheets, Iron or Steel, Galvanized or Painted.****Iron Rustproofing, see Rustproofing, Iron or Steel.****Iron Sheets, see Sheets, Iron or Steel, Galvanized or Painted.****Iron Skelp, see Skelp, Iron or Steel.****Iron Work, Builders, see Structural Steel or Iron Work.****Iron Work, Ornamental, see Ornamental Metal Work.****Iron Work, Structural, see Structural Steel or Iron Work.****Ironing Boards, Stationary or Portable.**

Chicago Dryer Co., 1038-41.  
 Domestic Laundry Equipment Corporation, 1042-43.  
 Chicago, 1038-41.

**Ironing Machines.**

(See also Laundry Equipment and Machinery.)

American Laundry Machinery Co., 1036.  
 Chicago Dryer Co., 1038-41.  
 Domestic Laundry Equipment Corporation, 1042-43.  
 Western Electric Co., 1202-03.  
 American, 1036.  
 Chicago, 1038-41; 1042-43.  
 Domestic Laundryette, 1042-43.  
 Western Electric, 1202-03.

**Irons, Electric, see Heating and Cooking Appliances, Electric.****Irons, Gas, see Heating and Cooking Appliances, Gas.****Ivory Sheets, Paper.**

New York Silicate Book Slate Co., 378.

**J****Jacks, Lamp.**

Globe Ventilator Co., 463.  
 Globe, 463.

**Jacks, Pump.**

Goulds Mfg. Co., 1108-09.

**Jail Cells, see Cells, Prison.****Jail Construction and Equipment.**

Barnum Iron Works, E. T., 1487.  
 Edwards Mfg. Co., 664-65.  
 Mack Iron and Wire Works Co., 510-11.  
 Meyers Mfg. Co., Fred J., 516.  
 Pauly Jail Building Co., 1488.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Van Dorn Iron Works Co., 1489.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Van Dorn, 1489.  
 White Diamond, 1489.

**Jamb Guards, see Guards, Jamb.****Jambs, Metal.**

Angle Window and Door Co., 709.  
 Bayley Co., William, 698-99.  
 Central Metallic Door Co., 648.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Consolidated Sheet Metal Works, 712-13.  
 Crittall Casement Window Co., 714-15.  
 Dahlstrom Metallic Door Co., 649-51.  
 Detroit Steel Products Co., 700-01.  
 Hope & Sons, Henry, 716-17.  
 Howell, Field & Goddard, Inc., 652-53.  
 Interior Metal Mfg. Co., 654-55.  
 International Casement Co., Inc., 718.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Mesker Brothers Iron Co., 722-25.  
 National Automatic Door Co., 660.  
 Pomeroy Co., S. H., 728-29.  
 Riester & Thesmacher Co., 658-59.  
 Solar Metal Products Co., Inc., 645.  
 Truscon Steel Co., 702-03.  
 Wagner's Sons Co., J. F., 732-33.  
 Acme, 652-53.  
 Fenestra, 700-01.  
 Lee, 719.  
 Lupton, 704-08.  
 Pomeroy, 728-29.  
 R & T, 658-59.

**Janitors Cans, see Cans, Waste.****Japans.**

(See also Varnish.)

Billings-Chapin Co., 1318.  
 De Soto Paint Mfg. Co., 1319.  
 Harrison Works, 1322-25.  
 Lowe Brothers Co., 1328-29.  
 Murphy Varnish Co., 1350-51.  
 Standard Varnish Works, 1356-63.  
 Twin City Varnish Co., 1365.  
 Valentine & Co., 1366-67.  
 Harrisons, 1322-25.  
 High Standard, 1328-29.  
 Kleartone, 1356-63.  
 Memphis Fillac, 1319.  
 Valentine's, 1366-67.  
 Specifications, 1356-63.

**Joints, Expansion, Pipe.**

Tyler Underground Heating System, 911.  
 Tyler, 911.

**Joints, Expansion, Roofing.**

Carey Co., Philip, 398.  
 Hydrex Felt & Engineering Co., 44.  
 Elastite, 398.  
 Hydrex, 44.

**Joints, Expansion, Vent.**

Barrett Co., 442.  
 Holt, 442.

**Joist Anchors, see Anchors, Building: Ashlar, Terra Cotta, Wall Plate.****Joist Hangers, see Hangers: Beam, Joist, Timber, Wall.****Joists, Pressed Steel.**

(See also Lumber, Metal.)

Berger Mfg. Co., 176-82.  
 Truscon Steel Co., 217-19.  
 Metal Lumber, 176-82.  
 Truscon, 217-19.

**Junction Boxes, see Boxes, Junction or Outlet.****K****Kalamein Work.**

(See also Doors, Fire, Metal or Metal Covered; Trim, Metal or Metal Covered.)  
 National Skylight and Ventilator Co., 448-49.  
 Newark Cornice and Skylight Works, 726-27.  
 Reliance Fireproof Door Co., 656-57.  
 Van Noorden Co., E., 452-53.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Specifications, 726-27.

**Kalsomines.**

Natroco Paint & Varnish Works, 1334.  
 Kalsolite, 1334.

**Keene's Cement, see Cement, Keene's.****Keepers, Door, see Holders, Door.****Kennel Yards, see Fencing, Wire or Woven Wire.****Kennels, Portable, Wood.**

Hodgson Co., E. F., 1453.  
 Hodgson, 1453.

**Kettles, Soda.**

Manufacturing Equipment & Engineering Co., 847.

**Kettles, Steam Jacketed, Hotel.**

Bramhall, Deane Co., 1010-11.

**Kick Plates, see Plates, Door, Kick or Push.****Kilns.**

American Blower Co., 996-99.  
 Custodis Chimney Construction Co., Alphons, 89.  
 Massachusetts Blower Co., 1005.  
 ABC, 996-99.

**Kitchen Boilers, see Boilers, Range; Kettles, Steam Jacketed, Hotel.****Kitchen Equipment.**

Bramhall, Deane Co., 1010-11.  
 Crane Co., William M., 1012-13.  
 Edison Electric Appliance Co., Inc., 1204.  
 Fearless Dishwasher Co., Inc., 1034.  
 Mannen Co., John E., 1031.  
 Powell Steel Kitchen Co., 1032-33.  
 Hughes, 1204.  
 Manest, 1031.  
 Powell's, 1032-33.  
 Vulcan, 1012-13.

**Kitchen Sinks, see Sinks and Sink Fixtures.****Kitchenettes, see Cabinets, Kitchen; Kitchens, Buffet.****Kitchens, Buffet.**

Powell Steel Kitchen Co., 1032-33.  
 Powell's, 1032-33.

**Knife Switches, see Switches, Electric, Knife.****Knobs, Door, see Hardware, Door.****Knockers, Door.**

Irving Forge, W., 505.  
 W. Irving, 505.

**L****Laboratory Fixtures.**

Alberene Stone Co., 890-91.  
 American Brass Co., 1071.  
 Alberene Stone, 890-91.  
 Benedict Nickel, 1071.

**Lacquers.**

Marietta Paint & Color Co., 1330.  
 Pratt & Lambert, Inc., 1354-55.  
 Alcolac, 1354-55.  
 French, 1330.  
 Marietta, 1330.

**Ladders.**

Allith-Prouty Co., 614-15.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Mack Iron and Wire Works Co., 510-11.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Smith Wire and Iron Works, F. P., 524-25.



**Ladders—Continued.**

Union Blind & Ladder Co., Inc., 778.  
Wagner Architectural Iron Works, A. F., 530-31.  
Wisconsin Wire & Iron Works, 533.  
*Allith-Prouty*, 614-15.  
*R-W*, 630-35.

**Ladders, Rolling, Store**, see **Ladders**.

**Ladders, Swimming Pool.**

Wisconsin Wire & Iron Works, 533.

**Lamp Brackets**, see **Standards and Brackets, Lamp**.

**Lamp Cord**, see **Cord, Electric**.

**Lamp Posts**, see **Standards and Brackets, Lamp**.

**Lamp Shades**, see **Shades, Lamp**.

**Lamp Standards**, see **Standards and Brackets, Lamp**.

**Lamps, Arc.**

National X-Ray Reflector Co., 1231-34.  
Universal Electric Stage Lighting Co., 1235.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*Westinghouse*, 1169-76.  
*X-Ray*, 1231-34.

**Lamps, Bronze.**

Gorham Co Architectural Bronze, 502-03.  
Jackson Co., Wm. H., 512.  
Manhattan Brass Co., 513.  
Smith Wire and Iron Works, F. P., 524-25.

**Lamps, Desk.**

Miller & Co., Edward, 1230.  
*Miller*, 1230.

**Lamps, Electric.**

Benjamin Electric Mfg. Co., 1206.  
Edison Lamp Works, 1224.  
General Electric Co., 1153-67.  
Manhattan Brass Co., 513.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Westinghouse Lamp Co., 1225.  
*Benjamin*, 1206.  
*Edison*, 1224.  
*Edison Mazda B and C*, 1224.  
*G-E*, 1153-67.  
*Sunbeam Mazda*, 1202-03.  
*Western Electric*, 1202-03.  
*Westinghouse*, 1169-76.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Automobile.**

Edison Lamp Works, 1224.

**Lamps, Electric, Candelabra.**

Edison Lamp Works, 1224.

**Lamps, Electric, Compensator.**

Westinghouse Electric Co., 1225.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Flood Lighting.**

Edison Lamp Works, 1224.  
General Electric Co., 1153-67.  
Western Electric Co., 1202-03.  
Westinghouse Lamp Co., 1225.  
*Edison Mazda*, 1224.  
*G-E*, 1153-67.

*Western Electric*, 1202-03.

*Westinghouse Mazda*, 1225.

**Lamps, Electric, Gas Filled.**

Edison Lamp Works, 1224.  
Westinghouse Lamp Co., 1225.  
*Edison Mazda C*, 1224.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Portable, Hand.**

Benjamin Electric Mfg. Co., 1206.  
*Benjamin*, 1206.

**Lamps, Electric, Railway Car.**

Edison Lamp Works, 1224.

**Lamps, Electric, Series.**

Edison Lamp Works, 1224.  
Westinghouse Lamp Co., 1225.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Sign.**

Edison Lamp Works, 1224.

**Lamps, Electric, Sign—Continued.**

Westinghouse Lamp Co., 1225.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Stereopticon.**

Edison Lamp Works, 1224.  
Westinghouse Lamp Co., 1225.  
*Westinghouse Mazda*, 1225.

**Lamps, Electric, Vacuum Filled.**

Edison Lamp Works, 1224.  
Westinghouse Lamp Co., 1225.  
*Edison Mazda B*, 1224.  
*Westinghouse Mazda*, 1225.

**Lamps, Gas.**

National Commercial Gas Association, 1009.

**Lamps, Iron**, see **Lamps, Metal**.

**Lamps, Kerosene.**

Manhattan Brass Co., 513.

**Lamps, Metal.**

(See also **Lighting Fixtures**.)  
Anchor Post Iron Works, 537-43.  
Beardslee Chandelier Mfg. Co., 1226.  
Fiske Iron Works, J. W., 552-53.  
Gorham Co Architectural Bronze, 502-03.  
McGann & Sons Co., T. F., 508-09.  
Page Steel and Wire Co., 549-51.  
Reed & Barton, 520-21.  
Smith Wire and Iron Works, F. P., 524-25.  
Wagner Architectural Iron Works, A. F., 530-31.

**Lamps, Piano.**

Miller & Co., Edward, 1230.  
*Miller*, 1230.

**Lamps, Portable.**

Manhattan Brass Co., 513.  
Western Electric Co., 1202-03.  
*Western Electric*, 1202-03.

**Lamps, Sanctuary**, see **Furnishings, Church**.

**Lamps, Table.**

Miller & Co., Edward, 1230.  
Western Electric Co., 1202-03.  
*Miller*, 1230.  
*Western Electric*, 1202-03.

**Lanterns, Dry Battery.**

Western Electric Co., 1202-03.  
*Western Electric*, 1202-03.

**Lanterns, Metal.**

(See also **Lighting Fixtures; Standards and Brackets, Lamps**.)  
Friedley-Voshardt Co., 501.  
Irving Forge, W., 505.  
Mott Iron Works, J. L., 514-15.  
Polachek Bronze & Iron Co., John, 522.  
Smyser-Royer Co., 528.  
Stewart Iron Works Co., 556-57.  
Tiffany Studios, 526-27.  
Wisconsin Iron & Wire Works, 533.  
*W. Irving*, 505.

**Lard Machinery.**

Brecht Co., 1050-52.

**Latches, Cabinet**, see **Latches, Door**.

**Latches, Door.**

Allith-Prouty Co., 614-15.  
Bommer Brothers, 600-01.  
Chesley Co., Inc., A. C., 710-11.  
Chicago Spring Butt Co., 602-03.  
Lawson Mfg. Co., 604-05.  
Miller Lock Co., 598-99.  
National Mfg. Co., 621-25.  
Smith Wire and Iron Works, F. P., 524-25.  
Stanley Works, 608-13.  
Vonnegut Hardware Co., 593-97.  
Wagner Mfg. Co., 638-39.  
*A. C. Chesley*, 710-11.  
*Allith-Prouty*, 614-15.  
*Bommer*, 600-01.  
*Chicago*, 602-03.  
*Stanley*, 608-13.  
*Von Duprin*, 593-97.

**Latches, Lavatory Door**, see **Latches, Door**.

**Latches, Night**, see **Latches, Door**.

**Latches, Safety Exit**, see **Locks, Emergency Exit**.

**Latches, Sliding Door**, see **Locks, Sliding Door**.

**Latches, Thumb**, see **Latches, Door**.

**Latches and Locks.**

Irving Forge, W., 505.  
Wagner Mfg. Co., 638-39.  
*W. Irving*, 505.

**Lath, Acid Resisting.**

North Western Expanded Metal Co., 214-15.  
*XX Century*, 214-15.

**Lath, Composition.**

Composition Metal Lath Co., 236-38.  
Ford Mfg. Co., 239.  
*Brick Lath*, 236-38.  
*Terra Cotta Lath*, 236-38.  
Specifications, 236-38.

**Lath, Expanded Metal**, see **Lath, Metal**.

**Lath, Metal.**

Banner Rock Products Co., 352.  
Berger Mfg. Co., 202-05.  
Clinton Wire Cloth Co., 227-31.  
Composite Metal Lath Co., 236-38.  
Concrete Engineering Co., 24-25.  
Consolidated Expanded Metal Companies, 206-08.  
Corrugated Bar Co., 190-92.  
Edwards Mfg. Co., 418-19.  
General Fireproofing Co., 210-13.  
Milwaukee Corrugating Co., 209.  
North Western Expanded Metal Co., 214-15.  
Penn Metal Co., 216.  
Smith Wire and Iron Works, F. P., 524-25.  
Stark Rolling Mill Co., 424-25.  
Sykes Metal Lath and Roofing Co., 220-21.  
Truscon Steel Co., 217-19.  
Wheeling Corrugating Department, 242-43.  
Witherow Steel Co., 195.  
Wright Wire Co., 234-35.  
Youngstown Pressed Steel Co., 224-25.  
*Berger's*, 202-05.  
*Brick Lath*, 236-38.  
*Ceco*, 24-25.  
*Chanelath*, 214-15.  
*Clinton*, 227-31.  
*Corr-Mesh*, 190-92.  
*Detroit Diamond*, 217-19.  
*Diamond Mesh*, 214-15.  
*Economy*, 220-21.  
*Eureka*, 214-15.  
*Excelsior*, 234-35.  
*GF*, 210-13.  
*Herringbone*, 210-13.  
*Hy-Rib*, 217-19.  
*Ideal*, 224-26.  
*Key*, 210-13.  
*Keyridge*, 418-19.  
*Kno-Burn*, 214-15.  
*Kno-Fur*, 214-15.  
*Mahoning*, 224-26.  
*Netmesh*, 209.  
*P. O. Special*, 214-15.  
*Penco*, 216.  
*Pure Iron*, 214-15.  
*Rib-Lath*, 217-19.  
*Rock Cork*, 352.  
*Steelcrete*, 206-08.  
*Sykes*, 220-21.  
*Terra Cotta Lath*, 236-38.  
*Toncan Metal*, 424-25.  
*Truscon*, 217-19.  
*XX Century*, 214-15.  
*Universal Diamond*, 217-19.  
*Wisco*, 195.  
*Youngstown*, 224-26.  
Specifications, 209; 220-21; 236-38.

**Lath, Metal, Composite**, see **Lath, Composition**.

**Lath, Metal, Information on.**  
Associated Metal Lath Manufacturers, 196-201.

**Lath, Metal and Tarred Felt, Combination.**  
Clinton Wire Cloth Co., 227-31.  
*Clinton*, 227-31.

**Lath, Self-furring.**  
North Western Expanded Metal Co., 214-15.  
Sykes Metal Lath and Roofing Co., 220-21.  
*Kno-Fur*, 214-15.  
*Sykes*, 220-21.

**Lath, Sheet**, see Lath, Metal.

**Lath, Wire**, see Lath, Metal.

**Lath, Wood.**  
Arkansas Soft Pine Bureau, 560.  
Brown Co., 573.  
Ford Mfg. Co., 239.  
North Carolina Pine Association, 562-63.  
Southern Pine Association, 561.  
*Arkansas Soft Pine*, 560.  
*Gal-va-nite*, 239.

**Lattice Fencing**, see Fencing, Wood.

**Laundry Equipment, Gas.**  
Crane Co., William M., 1012-13.  
*Vulcan*, 1012-13.

**Laundry Equipment and Machinery.**  
American Laundry Machinery Co., 1036.  
Chicago Dryer Co., 1038-41.  
Crane Co., William M., 1012-13.  
Domestic Laundry Equipment Corporation, 1042-43.  
Mannen Co., John E., 1045.  
*American*, 1036.  
*Chicago*, 1038-41.  
*Laundryette*, 1042-43.  
*Vulcan*, 1012-13.

**Laundry Machinery**, see Laundry Equipment and Machinery.

**Laundry Stoves**, see Stoves, Laundry.

**Laundry Tubs**, see Tubs and Trays, Laundry.

**Lavatories, Battery.**  
Manufacturing Equipment & Engineering Co., 847.

**Lavatories, Dental.**  
Maddock's Sons Co., Thomas, 835-42.  
*Maddock's*, 835-42.  
*Madenta*, 835-42.  
Specifications, 835-42.

**Lavatories, Earthenware, Porcelain or Vitreous China.**  
Crane Co., 1084-85.  
Glauber Brass Mfg. Co., 856-61.  
Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
*Blackstone*, 843-46.  
*Crane*, 1084-85.  
*Delphi*, 843-46.  
*Glauber*, 856-61.  
*Madbury*, 835-42.  
*Maddock's*, 835-42.  
*Madrid*, 835-42.  
*Mohican*, 843-46.  
*Monument*, 843-46.  
*Potomac*, 843-46.  
Specifications, 835-42.

**Lavatories, Enameled.**  
Manufacturing Equipment & Engineering Co., 847.  
Specifications, 847.

**Lavatories, Hospital.**  
Maddock's Sons Co., Thomas, 835-42.

**Lavatories, Pedestal**, see Lavatories, Earthenware, Porcelain or Vitreous China.

**Lavatories, Porcelain**, see Lavatories, Earthenware, Porcelain or Vitreous China.

**Lavatories, Vitreous China**, see Lavatories, Earthenware, Porcelain or Vitreous China.

**Lavatory Fittings and Fixtures**, see Plumbing Fixtures.

**Lawn Furniture**, see Furniture, Garden and Park.

**Lead.**  
Eagle-Picher Lead Co., 875.  
Merchant & Evans Co., 420.  
*Eagle*, 875.  
*M & E Co.*, 420.

**Lead, Came.**  
Eagle-Picher Lead Co., 875.

**Lead, Glaziers**, see Lead, Came.

**Lead, Pig**, see Lead.

**Lead, Red**, see Red Lead.

**Lead, Sheet.**  
Eagle-Picher Lead Co., 875.

**Lead, White**, see White Lead.

**Lead Corroders**, see Corroders, Lead.

**Lead Oxides.**  
Eagle-Picher Lead Co., 875.

**Lead Washers**, see Washers, Lead.

**Leaded Glass**, see Glass, Stained or Leaded.

**Leaded Glazing**, see Glazing, Leaded.

**Leader Shoes**, see Pipe, Conductor.

**Leaders, Roof.**  
Barrett Co., 442.  
*Holt*, 442.

**Leadwork, Decorative.**  
Hope & Sons, Henry, 716-17.

**Lecturns**, see Furnishings, Church.

**Legs, Bench.**  
Manufacturing Equipment & Engineering Co., 847.

**Legs, Lavatory**, see Lavatories.

**Lens, Vault Light.**  
Brooklyn Vault Light Co., 822-23.  
*Bullseye*, 822-23.

**Letter Boxes**, see Boxes, Mail.

**Letter Trays**, see Trays, Letter, Metal.

**Letters, Metal.**  
Bigelow Wire Works, Cheney, 491.  
Harsch & Sons Co., John, 504.  
Penn Brass & Bronze Works, 517.  
Polachek Bronze & Iron Co., John, 522.  
Williams, Inc., Jno., 532.

**Letters, Paper.**  
Tablet & Ticket Co., 1436-37.  
*Willson's*, 1436-37.

**Letters and Characters, Bulletin Board.**  
Tablet & Ticket Co., 1436-37.  
United States Changeable Sign Co., 1435.  
*Willson's*, 1436-37.

**Leveling Rods.**  
New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Library Furniture**, see Furniture, Office, Bank and Library.

**Lifts**, see Elevators; Hoists; Dumbwaiters.

**Lighting, Colored.**  
Society for Electrical Development, Inc., 1145-52.

**Lighting, Gas.**  
National Commercial Gas Association, 1009.

**Lighting, Industrial.**  
Beardslee Chandelier Mfg. Co., 1226.  
Benjamin Electric Mfg. Co., 1206.  
Edison Lamp Works, 1224.  
General Electric Co., 1153-67.  
Ivanhoe-Regent Works, 1228-29.  
Luminous Unit Co., 1227.  
Miller & Co., Edward, 1230.  
National X-Ray Reflector Co., 1231.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Westinghouse Lamp Co., 1225.  
*Benjamin*, 1206.  
*Brascolite*, 1227.  
*Denzer*, 1226.  
*G-E*, 1153-67.  
*Industrolite*, 1227.  
*Miller*, 1230.  
*Regent*, 1228-29.  
*X-Ray*, 1231.

**Lighting, Ornamental.**  
Beardslee Chandelier Mfg. Co., 1226.  
Edison Lamp Works, 1224.  
General Electric Co., 1153-67.  
Ivanhoe-Regent Works, 1228-29.  
National X-Ray Reflector Co., 1231.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Westinghouse Lamp Co., 1225.  
*Denzar*, 1226.  
*Edison Mazda B*, 1224.  
*G-E*, 1153-67.  
*Regent*, 1228-29.  
*X-Ray*, 1231.

**Lighting, Showcase**, see Lighting, Store Window.

**Lighting, Store Window.**  
General Electric Co., 1153-67.  
Ivanhoe-Regent Works, 1228-29.  
National X-Ray Reflector Co., 1231.  
Westinghouse Lamp Co., 1225.  
*G-E*, 1153-67.  
*Regent*, 1228-29.  
*X-Ray*, 1231.

**Lighting Apparatus, Stage**, see Lighting Fixtures and Systems, Stage.

**Lighting Bowls**, see Glassware, Illuminating; Lighting Fixtures.

**Lighting Fixtures.**  
Beardslee Chandelier Mfg. Co., 1226.  
Benjamin Electric Mfg. Co., 1206.  
Bryant Electric Co., 1207.  
Cold Light Mfg. Co., 1210.  
Friedley-Voshardt Co., 501.  
Gorham Co Architectural Bronze, 502-03.  
Harsch & Sons Co., John, 504.  
Hart & Hegeman Mfg. Co., 1214-15.  
Irving Forge, W., 505.  
Ivanhoe-Regent Works, 1228-29.  
Jackson Co., Wm. H., 512.  
Luminous Unit Co., 1227.  
Manhattan Brass Co., 513.  
Miller & Co., Edward, 1230.  
Mott Iron Works, J. L., 514-15.  
National Commercial Gas Association, 1009.  
National X-Ray Reflector Co., 1231.  
Price-Evans Foundry Co., 518-19.  
Reed & Barton, 520-21.  
Reflectolyte Co., 1232-34.  
Smyser-Royer Co., 528.  
Tiffany Studios, 526-27.  
Universal Electric Stage Lighting Co., 1235.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*Ag-lite*, 1227.  
*Benjamin*, 1206.  
*Brascolite*, 1227.  
*Bryant*, 1207.  
*Denzar*, 1226.  
*H & H*, 1214-15.  
*Industrolite*, 1227.  
*Ivanhoe Reflecto-Cap*, 1228-29.  
*Marvelite*, 1210.  
*Miller*, 1230.  
*Reflectolyte*, 1232-34.  
*Reflectolyte Junior*, 1232-34.  
*Regent*, 1228-29.  
*W. Irving*, 505.  
*X-Ray*, 1231.

**Lighting Fixtures, All-glass.**  
Luminous Unit Co., 1227.  
*Ag-lite*, 1227.  
*Brascolite*, 1227.

**Lighting Fixtures, Exterior.**  
(See also Standards and Brackets, Lamp.)  
General Electric Co., 1153-67.  
National X-Ray Reflector Co., 1231.  
Smyser-Royer Co., 528.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*X-Ray*, 1231.

**Lighting Fixtures, Gas.**  
National Commercial Gas Association, 1009.



**Lighting Fixtures, Indirect and Semi-indirect.**

(See also Glassware, Illuminating.)

Beardslee Chandelier Mfg. Co., 1226.  
 Benjamin Electric Mfg. Co., 1206.  
 Friedley-Voshardt Co., 501.  
 Luminous Unit Co., 1227.  
 Miller & Co., Edward, 1230.  
 National Commercial Gas Association, 1009.  
 National X-Ray Reflector Co., 1231.  
 Reflectolyte Co., 1232-34.  
 Tiffany Studios, 526-27.  
*Benjamin*, 1206.  
*Brascolite*, 1227.  
*Denzar*, 1226.  
*Miller*, 1230.  
*Reflectolyte*, 1232-34.  
*Reflectolyte Junior*, 1232-34.  
*X-Ray*, 1231.

**Lighting Fixtures and Systems, Stage.**

General Electric Co., 1153-67.  
 Universal Electric Stage Lighting Co., 1235.  
*G-E*, 1153-67.  
*Kleigl*, 1235.

**Lighting Glassware, see Glassware, Illuminating.****Lighting Installations, Notes on.**  
 Society for Electrical Development, Inc., 1145-52.**Lighting Plants, Electric.**

General Electric Co., 1153-67.  
 Kewanee Private Utilities Co., 1112-13.  
 Society for Electrical Development, Inc., 1145-52.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*Western Electric*, 1202-03.  
*Westinghouse*, 1169-76.

**Lighting Rings, Semi-indirect, see Lighting Fixtures.****Lighting Specialties, see Specific Headings.****Lighting Systems, Electric, see Lighting Plants, Electric.****Lighting Units, Choice of.**

Society for Electrical Development, Inc., 1145-52.

**Lighting Units, Electric.**

Beardslee Chandelier Mfg. Co., 1226.  
 Benjamin Electric Mfg. Co., 1206.  
 General Electric Co., 1153-67.  
 Ivanhoe-Regent Works, 1228-29.  
 Luminous Unit Co., 1227.  
 Miller & Co., Edward, 1230.  
 Reflectolyte Co., 1232-34.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*Aglite*, 1227.  
*Benjamin*, 1206.  
*Brascolite*, 1227.  
*Compo*, 1232-34.  
*Denzar*, 1226.  
*G-E*, 1153-67.  
*Holophane Realite*, 1228-29.  
*Miller*, 1230.  
*Reflectolyte*, 1232-34.  
*Regent*, 1228-29.  
*Western Electric*, 1202-03.

**Lighting Units, Gas.**

National Commercial Gas Association, 1009.

**Lighting Units, Types of.**

Society for Electrical Development, Inc., 1145-52.

**Lighting and Ignition, Automobile.**

Connecticut Telephone & Electric Co., Inc., 1240-41.  
 General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*Connecticut*, 1240-41.  
*G-E*, 1153-67.

**Lightning Rods or Conductors, see Conductors, Lightning.****Lights, Border, Stage, see Lights, Proscenium.****Lights, Bunch, see Lighting Fixtures and Systems, Stage.****Lights, Ceiling, see Lighting Fixtures.****Lights, Flood.**

(See also Projectors, Flood Lighting.)  
 Edison Lamp Works, 1224.  
 General Electric Co., 1153-67.  
 National X-Ray Reflector Co., 1231.  
 Universal Electric Stage Lighting Co., 1235.  
 Westinghouse Lamp Co., 1225.  
*G-E*, 1153-67.  
*Kleigl*, 1235.  
*X-Ray*, 1231.

**Lights, Floor, see Lights, Vault and Sidewalk.****Lights, Prismatic, see Lights, Vault and Sidewalk.****Lights, Proscenium.**

Universal Electric Stage Lighting Co., 1235.

**Lights, Roof, see Skylights; Lights, Vault and Sidewalk.****Lights, Sidewalk, see Lights, Vault and Sidewalk.****Lights, Spot.**

Universal Electric Stage Lighting Co., 1235.  
*Kleigl*, 1235.

**Lights, Strip, see Lights, Proscenium.****Lights, Vault and Sidewalk.**

American Abrasive Metals Co., 346.  
 American Mason Safety Tread Co., 344-45.  
 American 3-Way Prism Co., 821.  
 Barnum, E. T., 496-97.  
 Brooklyn Vault Light Co., 822-23.  
 Bruner Granitoid Co., P. M., 824-26.  
 Carpenter & Co., Inc., Davis, 827.  
 Concrete Specialties Mfg. Co., 828.  
 Grauer & Co., Albert, 824-26.  
 Jeanette Glass Co., 829.  
 Keppler Glass Constructions, Inc., 831-33.  
 Meyers Mfg. Co., Fred J., 516.  
 Mississippi Wire Glass Co., 812-15.  
 Price-Evans Foundry Co., 518-19.  
 Richards & Kelly Mfg. Co., 830.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wagner Architectural Iron Works, A. F., 532.  
*Bruner*, 824-26.  
*Feralun*, 346.  
*Fresnel Simplex*, 821.  
*Keppler*, 831-33.  
*Lazalite*, 829.  
*Mason*, 344-45.  
*Paschall*, 821.  
*Ransom*, 821.  
*Ransome*, 827.  
*Ray-Placeable*, 827.  
*Screw Glass Simplex*, 821.  
*Standard Simplex*, 821.

**Lime, Finishing and Hydrated.**

American Gypsum Co., 142-44.  
 Fowler & Pay, 132.  
 Grand Rapids Plaster Co., 148-49.  
 Kelley Island Lime & Transport Co., 150-51.  
 Niagara Gypsum Co., 156.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 United States Gypsum Co., 162-68.  
*Albion*, 132.  
*Ivory*, 162-68.  
*Niagara*, 156.  
*Peerless*, 157.  
*Tiger*, 150-51.  
 Specifications, 150-51.

**Lime, Hydraulic.**

Fowler & Pay, 132.  
 Brown, 132.

**Limestone.**

Fowler & Pay, 132.  
 Kelley Island Lime & Transport Co., 150-51.  
 Matthews Brothers Co., 66.  
 Shea & Donnelly Co., 67.  
*Buff*, 66.  
*Gray (Blue)*, 66.  
*Real Bedford*, 67.  
*Variegated (Mixed)*, 66.

**Lined Pipe, see Pipe, Lined, Brass or Copper; Pipe, Lead or Tin Lined.****Linen Fire Hose, see Hose, Fire, Linen.****Lines, Awning.**

Samson Cordage Works, 755.  
*Samson*, 755.

**Lines, Clothes, see Clothes Lines.****Lining, Wall, Jail.**

Barnum Iron Works, E. T., 1487.

**Linings, Acid Resisting.**

Grueby Faience & Tile Co., 292.  
 United States Roofing Tile Co., 440-41.  
*Grueby*, 292.

**Linings, Case, Cloth-backed.**

Hydrex Felt & Engineering Co., 44.  
*Hydrex*, 44.

**Linings, Chimney and Flue.**

Armstrong Cork & Insulation Co., 349-51.  
 Bannon Pipe Co., P., 110.  
 Campfield Raggle Block Co., 108-09.  
 Custodis Chimney Construction Co., Alphons, 89.  
 Ketcham, O. W., 118.  
 Maurer & Son, Henry, 98-99.  
 Sewer Pipe Manufacturers Association, 111.  
*Campfield*, 108-09.  
*Nonpareil*, 349-51.

**Linings, Concrete Roof.**

International Insulation Co., 174.  
*Universal Insulate*, 174.

**Linings, Fireplace.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Linings, Flue, see Linings, Chimney and Flue.****Linings, Furnace.**

Armstrong Cork & Insulation Co., 349-51.  
*Nonpareil*, 349-51.

**Linings, Kiln.**

Armstrong Cork & Insulation Co., 349-51.  
 Carey Co., Philip, 172.  
*Ceil-Board*, 172.  
*Nonpareil*, 349-51.

**Linings, Nickel.**

American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Linings, Oven, Bake.**

Armstrong Cork & Insulation Co., 349-51.  
*Nonpareil*, 349-51.

**Linings, Pantry.**

Penrhyn Slate Co., 365.

**Linings, Refrigerator.**

Stark Rolling Mill Co., 424-25.  
 Vitrolite Co., 870-71.  
*Toncan Metal*, 424-25.  
*Vitrolite*, 870-71.

**Linings, Safe, see Linings, Vault.****Linings, Swimming Pool.**

(See also Tile, Floor and Wall; Waterproofing and Dampproofing.)  
 Booraem, J. Francis, 288.  
 Jackson Co., Wm. H., 289.  
 Mas-Oleum Floor Mfg. Co., 334.  
*Mas-Oleum*, 334.

**Linings, Tank.**

Armstrong Cork & Insulation Co., 349-51.  
 Grueby Faience & Tile Co., 292.  
 United States Roofing Tile Co., 440-41.  
*Grueby*, 292.

**Linings, Vault.**

Hall's Safe Co., 1431.

**Links, Fusible.**

Coburn Trolley Track Mfg. Co., 640-43.

**Links, Fusible—Continued.**

Consolidated Sheet Metal Works, 712-13.  
 Economy Fuse & Mfg. Co., 1223.  
 Edwards Mfg. Co., 664-65.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Stowell Co., 636-37.  
*Drop-out*, 1223.  
 Kinnear, 670-79.  
 R-W, 630-35.

**Linoleum.**

Armstrong Cork Co., 1390-92.  
 Bailey Co., C. C., 1393.  
 General Kompolite Co., 330.  
 Mas-Oleum Floor Mfg. Co., 334.  
*Armstrong's*, 1390-92.  
*Armstrong's Jaspe*, 1390-92.  
*Mastolith*, 330.  
*Mas-Oleum*, 334.  
 Specifications, 1390-92.

**Linoleum, Battleship.**

Armstrong Cork Co., 1390-92.  
 Bailey Co., C. C., 1393.  
 General Kompolite Co., 330.  
*Armstrong's*, 1390-92.  
*Mastolith*, 330.

**Linoleum, Mastic or Plastic.**

General Kompolite Co., 330.  
 Mas-Oleum Floor Mfg. Co., 334.  
*Mas-Oleum*, 334.  
*Mastolith*, 330.

**Linoleum, Printed, see Linoleum.****Linoleum Cement, see Cement, Linoleum.****Lintels, Cast Iron.**

Price-Evans Foundry Co., 518-19.

**Lintels, Gypsum.**

Acme Cement Plaster Co., 140-41.  
*Acme*, 140-41.  
 Specifications, 140-41.

**Lintels, Steel.**

Chattanooga Boiler & Tank Co., 1094.

**Litharge.**

Carter White Lead Co., 1315.

**Loaders and Unloaders, Car or Wagon.**

Gifford-Wood Co., 1298.  
 Kenwood Bridge Co., 17.  
 Link-Belt Co., 1310.  
 Minnesota Manufacturers' Association, 1311.  
 Olson & Co., Samuel, 1312-13.  
 G-W, 1298.

**Lockers, Metal.**

Badger Wire & Iron Works, 494-95.  
 Berger Mfg. Co., 1406-08.  
 Clark Co., W. J., 252.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Edwards Mfg. Co., 1410-11.  
 Federal Steel Fixture Co., 1412-13.  
 Hart & Hutchinson Co., 1416-17.  
 Hauserman Co., E. F., 1415.  
 Hess Warming & Ventilating Co., 887.  
 Lyon Metallic Mfg. Co., 1420-21.  
 Manufacturing Equipment & Engineering Co., 1422.  
 Medart Mfg. Co., Fred, 1423.  
 Penn Metal Co., 734.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Terrell's Equipment Co., 1426-27.  
 Van Dorn Iron Works Co., 1428.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Watson Mfg. Co., Inc., 1429.  
*Berger's*, 1406-08.  
*Edwards*, 1410-11.  
*Federal*, 1412-13.  
*H & H*, 1416-17.  
*Hauserman*, 1415.  
*Hess*, 887.  
*Lyon*, 1420-21.  
*Medart*, 1423.  
*Pen-Dar*, 1409.  
*Penco*, 734.  
*Terrell's*, 1426-27.  
*Van Dorn*, 1428.  
 Specifications, 1420-21; 1423.

**Lockers, Steel, see Lockers, Metal.****Lockers, Wire, see Lockers, Metal.****Locking Devices, Cell Door.**

Barnum Iron Works, E. T., 1487.  
 Pauly Jail Building Co., 1488.  
 Van Dorn Iron Works Co., 1489.  
*Van Dorn*, 1489.

**Locking and Releasing Devices, see Fasteners and Adjusters, Casement or Sash.****Locknuts, Conduit.**

Steel City Electric Co., 1222.  
*Fullman Star*, 1222.

**Locks, Bar.**

Dahlstrom Metallic Door Co., 649-51.  
 Diamond Door Hanger Co., Inc., 616-17.  
 McCabe Hanger Mfg. Co., 618-20.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Stanley Works, 608-13.  
 Vonnegut Hardware Co., 593-97.  
*Diamond*, 616-17.  
*McCabe*, 618-20.  
*Reliance*, 626-29.  
*Stanley*, 608-13.  
*Von Duprin*, 593-97.  
 Specifications, 618-20.

**Locks, Cabinet.**

Miller Lock Co., 598-99.  
*Standard Time*, 598-99.

**Locks, Cell Door.**

(See also Jail Construction and Equipment.)  
 Pauly Jail Building Co., 1488.

**Locks, Combination, see Locks, Time and Combination.****Locks, Door.**

Chesley Co., Inc., A. C., 710-11.  
 Chicago Spring Butt Co., 602-03.  
 Diamond Door Hanger Co., Inc., 616-17.  
 Elevator Locks Co., 1292.  
 Hunt, Helm, Ferris & Co., 644.  
 Lawson Mfg. Co., 604-05.  
 McCabe Hanger Mfg. Co., 618-20.  
 National Automatic Door Co., 660.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Vonnegut Hardware Co., 593-97.  
 Wagner Mfg. Co., 638-39.  
*Chesley*, 710-11.  
*Chicago*, 602-03.  
*Diamond*, 616-17.  
*Katz*, 604-05.  
*M-C-K*, 1292.  
*Panik-Prufe*, 660.  
*Smith's*, 592.  
*Star*, 644.  
*Von Duprin*, 593-97.

**Locks, Elevator Door.**

Diamond Door Hanger Co., Inc., 616-17.  
 Elevator Locks Co., 1292.  
 McCabe Hanger Mfg. Co., 618-20.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Wagner Mfg. Co., 638-39.  
*Diamond*, 616-17.  
*M-C-K*, 1292.  
*Wagner-Star*, 638-39.

**Locks, Elevator Door, Safety.**

Elevator Locks Co., 1292.  
*M-C-K*, 1292.

**Locks, Emergency Exit.**

Chesley Co., Inc., A. C., 710-11.  
 Columbia Iron & Wire Works Co., 268-69.  
 Dahlstrom Metallic Door Co., 649-51.  
 Grant Pulley and Hardware Co., 760-61.  
 National Automatic Door Co., 660.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Vonnegut Hardware Co., 593-97.  
*Chesley*, 710-11.  
*Panik-Prufe*, 660.  
*Smith's Improved*, 592.  
*Von Duprin*, 593-97; 760-61.

**Locks, Gravity.**

Dahlstrom Metallic Door Co., 649-51.  
 Reliance-Grant Elevator Equipment Corp., 626-29.

**Locks, Keyless.**

Miller Lock Co., 598-99.  
*Standard Time*, 598-99.

**Locks, Mausoleum Door.**

Detroit Mausoleum Equipment Works, 500.

**Locks, Padlock.**

Miller Lock Co., 598-99.  
*Standard Time*, 598-99.

**Locks, Sash, see Fasteners and Adjusters, Casement or Sash.****Locks, Sliding Door.**

Diamond Door Hanger Co., Inc., 616-17.  
 McCabe Hanger Mfg. Co., 618-20.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Stanley Works, 608-13.  
 Wagner Mfg. Co., 638-39.  
*Diamond*, 616-17.  
*McCabe*, 618-20.  
*Stanley*, 608-13.

**Locks, Stanchion.**

James Mfg. Co., 1466-70.  
*James*, 1466-70.

**Locks, Switch, see Locks, Padlock.****Locks, Time and Combination.**

Hall's Safe Co., 1431.  
 Miller Lock Co., 598-99.

**Lockups, see Jail Construction and Equipment.****Loggia Screens, see Screens, Loggia.****Logs, Wood, Electric Illuminated.**

Universal Electric Stage Lighting Co., 1235.

**Louvers.**

(See also Shutters, Metal or Metal Covered.)  
 Brooklyn Vault Light Co., 822-23.  
 Highton & Sons Co., Wm., 992-93.  
 Ilg Electric Ventilating Co., 1002-03.  
 Jeter & Co., Inc., A. H., 446-47.  
 Lupton's Sons Co., David, 704-08.  
*Highton*, 992-93.  
*Ilg*, 1002-03.  
*Waldmire*, 704-08.

**Lubricators, Mechanical.**

Commonwealth Brass Corporation, 1082.

**Lumber, Birch.**

Northern Hemlock and Hardwood Manufacturers' Association, 564-65.

**Lumber, Creosoted.**

Ayer & Lord Tie Co., 310.  
 Central Creosoting Co., 311.  
 Jenson-Wright Co., 312-13.

**Lumber, Cypress.**

Southern Cypress Manufacturers' Association, 570-71.

**Lumber, Fir.**

Brown Co., 573.

**Lumber, Kyanized.**

Brown Co., 573.

**Lumber, Manufactured, see Trim, Wood.****Lumber, Metal.**

Berger Mfg. Co., 176-82.  
 Truscon Steel Co., 217-19.  
*Berger's*, 176-82.  
*Kahn*, 217-19.  
*Metal Lumber*, 176-82.  
*Truscon*, 217-19.  
 Specifications, 176-82.

**Lumber, Oak.**

Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.

**Lumber, Pine.**

Arkansas Soft Pine Bureau, 560.  
 Brown Co., 573.  
 North Carolina Pine Association, 562-63.  
 Southern Pine Association, 561.  
 White Pine Bureau, 572.  
*Arkansas Soft Pine*, 560.  
 Specifications, 562-63.



**Lumber, Red Gum.**

Red Gum Lumber Bureau, American  
Hardwood Manufacturers' Association,  
568-69.

**Lumber, Sap Gum.**

Red Gum Lumber Bureau, American  
Hardwood Manufacturers' Associa-  
tion, 568-69.

**Lumber, Spruce.**

Brown Co., 573.

**Lumber, Treated.**

Brown Co., 573.  
Carbolineum Wood Preserving Co., 1386.

**Luminous Compound.**

Cold Light Mfg. Co., 1210.  
*Marvelite*, 1210.

**Lytho-zinc Reproductions, see Reproductions, Lytho-zinc.****M****Machinery Isolation, see Sound Deadening Materials.****Machinery Sound Deadening, see Foundations, Bowling Alley and Machinery.****Machinists.**

Olson & Co., Samuel, 1312-13.

**Magnesite.**

General Kopolite Co., 330.

**Magneto Watchmans Clocks, see Clocks, Watchmans.****Magnetos.**

Holtzer-Cabot Electric Co., 1242-45.

**Mail Boxes, see Boxes, Mail.****Mail Chutes, see Chutes, Mail.****Mangers, see Stable Fittings and Fixtures; Barn Equipment.****Manhole Covers, see Covers and Rings, Manhole.****Manicure Furniture, see Furniture, Barber, Chiropody and Manicure.****Mantel Facings, see Facings, Mantel.****Mantels.**

(See also Fireplaces.)

Curtis Service Bureau, 578-79.  
Fischer & Jirouch Co., 1404.  
Matthews Bros. Mfg. Co., 582-83.  
Rookwood Pottery Co., 294-95.  
*Curtis*, 578-79.

**Mantels, Wood, see Cabinet Work.****Map Drawers, see Cabinets, Plan Drawer.****Map Mounting.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Marble, Decorative, see Marble, Structural or Monumental.****Marble, Exterior, see Marble, Structural or Monumental.****Marble, Interior.**

Davis Marble Co., 283.  
Georgia Marble Co., 68-69.  
Tompkins-Kiel Marble Co., 70.

**Marble, Structural or Monumental.**

Davis Marble Co., 283.  
Georgia Marble Co., 68-69.  
Tompkins-Kiel Marble Co., 70.  
*Alabama*, 70.  
*American Cream White Lens*, 70.  
*Amicalola*, 68-69.  
*Antwerp Black*, 70.  
*Basseville*, 70.  
*Bianco Statuary Veined*, 70.  
*Black and Gold*, 70.  
*Blanco P.*, 70.  
*Bongardt*, 70.  
*Botticino*, 70.  
*Breche, Blanc*, 70.  
*Breche Opal*, 70.  
*Breche Violet*, 70.  
*Champville Emerald Green Escallotte*, 70.  
*Creole*, 68-69.  
*Eastman's* 70.

**Marble, Structural or Monumental—Continued.**

*Easton Green*, 70.  
*English Veined*, 70.  
*Eschallion*, 70.  
*Famosa*, 70.  
*Fleuri de Peche*, 70.  
*Fossil Eschallion*, 70.  
*Genoa Green*, 70.  
*Hauteville*, 70.  
*Italian*, 70.  
*Italian Pavonazzo*, 70.  
*Kennesaw*, 68-69.  
*Light Cherokee*, 68-69.  
*Littleton Stone*, 70.  
*Mezzotint*, 68-69.  
*Napoleon Gray*, 70.  
*Nebo Golden Travis*, 70.  
*Onyx Pedrara*, 70.  
*Pink*, 68-69.  
*Rosato*, 70.  
*Schuppach*, 70.  
*Second Statuary*, 70.  
*Silver Gray*, 68-69.  
*Statuary Veined*, 70.  
*Tavernelle*, 70.  
*Tennessee*, 70.  
*Tranville*, 70.  
*Ural*, 70.  
*Verde de Estours*, 70.  
*Verona (Red)*, 70.  
*Verona (Yellow)*, 70.  
*Vert Maurin (French Alpsgreen)*, 70.  
*Westfield Green*, 70.  
*White*, 68-69.  
*White Georgia*, 68-69.  
*York Fossil*, 70.

**Marble Dust and Flour.**

King & Co., J. B., 153.  
*King's*, 153.

**Marble Work, see Contractors, Marble, Interior.****Market Fixtures.**

Brecht Co., 1050-52.

**Marquises.**

American 3-Way Prism Co., 821.  
Badger Wire & Iron Works, 494-95.  
Barnum, E. T., 496-97.  
Chattanooga Roofing & Foundry Co., 499.  
Fiske Iron Works, J. W., 552-53.  
Friedley-Voshardt Co., 501.  
Harsch & Sons Co., John, 504.  
Hughes-Keenan Co., 262-65.  
Jackson Co., Wm. H., 512.  
Lasar Mfg. Co., 506-07.  
McGann & Sons Co., T. F., 508-09.  
Mack Iron and Wire Works Co., 510-11.  
Manhattan Brass Co., 513.  
Meyers Mfg. Co., Fred J., 516.  
Mott Iron Works, J. L., 514-15.  
Newark Cornice and Skylight Works, 726-27.  
Page Steel and Wire Co., 549-51.  
Penn Brass & Bronze Works, 517.  
Pitt Composite Iron Works, William R., 558-59.  
Polachek Bronze & Iron Co., John, 522.  
Price-Evans Foundry Co., 518-19.  
Reed & Barton, 520-21.  
St. Louis Wire & Iron Co., 523.  
Sexauer & Lemke, Inc., 262-65.  
Smith Wire and Iron Works, F. P., 524-25.  
Smyser-Royer Co., 528.  
Tiffany Studios, 526-27.  
Tyler Co., W. S., 529.  
Wagner Architectural Iron Works, A. F., 530-31.  
Wisconsin Iron & Wire Works, 533.

**Masons Lines.**

Samson Cordage Works, 755.  
Silver Lake Co., 756.  
Samson, 755.  
Silver Lake, 756.

**Mats, Floor.**

North Western Expanded Metal Co., 214-15.  
*Nemco*, 214-15.

**Mausoleum Fittings, see Mausoleum Work.****Mausoleum Slabs, see Slabs, Mausoleum.****Mausoleum Work.**

Bureau Brothers, 498.  
Detroit Mausoleum Equipment Works, 500.  
Gorham Co Architectural Bronze, 502-03.  
McGann & Sons Co., T. F., 508-09.  
Penn Brass & Bronze Works, 517.  
Polachek Bronze & Iron Co., John, 522.  
Presbrey-Coykendall Co., 62.  
Reed & Barton, 520-21.  
Tiffany Studios, 526-27.  
Williams, Inc., Jno., 532.

**Mausoleums, Granite, see Granite, Structural or Monumental.****Mazda Lamps, see Lamps, Electric.****Meat Industry Machinery.**

Brecht Co., 1050-52.

**Mechanical Draft Apparatus and Equipment, see Draft Apparatus, Mechanical; Fans; Blowers.****Mechanical Engineers, see Engineers, Mechanical.****Mechanical Refrigeration, see Ice Making and Refrigerating Machinery.****Medallions, Metal, see Ornamental Metal Work.****Medicine Cabinets, see Cabinets, Medicine.****Memorial Windows, see Glass, Ornamental; Glass, Stained or Leaded.****Memorials, Metal, see Tablets, Memorial; Ornamental Metal Work.****Memorials, Stone, see Granite, Structural or Monumental.****Metal, Asbestos Protected.**

Aspromet Co., 414-16.  
Johns-Manville Co., H. W., 402-05.  
*APM*, 414-16.  
*Johns-Manville*, 402-05.

**Metal, Expanded.**

Berger Mfg. Co., 202-05.  
Concrete Engineering Co., 24-25.  
Consolidated Expanded Metal Companies, 206-08.  
Corrugated Bar Co., 190-92.  
General Fireproofing Co., 210-13.  
Milwaukee Corrugating Co., 209.  
North Western Expanded Metal Co., 214-15.  
Penn Metal Co., 216.  
Stark Rolling Mill Co., 424-25.  
Truscon Steel Co., 217-19.  
*Ceco*, 24-25.  
*Corr-Mesh*, 190-92.  
*Econo*, 214-15.  
*GF*, 210-13.  
*Steelcrete*, 206-08.  
*Toncan Metal*, 424-25.  
*Truscon*, 217-19.

**Metal, Ingot.**

American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Metal Ceilings, see Ceilings, Metal.****Metal Lath, see Lath, Metal.****Metal Paint, see Paint, Metal Protective.****Metal Work, Ornamental, see Ornamental Metal Work.****Metal Work, Sheet, see Sheet Metal Work.****Metallic Floor Hardeners, see Hardeners and Densifiers, Cement and Concrete.****Meters, Condensation.**

Tyler Underground Heating System, 911.  
*Tyler*, 911.

**Meters, Flush, see Valves, Flushing, Closet.****Meters, Heater.**

Webster & Co., Warren, 932-34.  
*Webster*, 932-34.

**Meters, Hot Water.**

Tyler Underground Heating System, 911.  
*Tyler*, 911.

**Meters, Oil or Gasoline.**

Allen Pressure System Co., Inc., 1474-75.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Chicago Steel Tank Co., 1482.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Wayne Oil Tank & Pump Co., 1480-81.  
*Apsco*, 1474-75.  
*Bowser*, 1476-77.  
*G & B*, 1478-79.

**Meters, Watthour, see Wattmeters.****Milk Receivers, see Receivers, Milk and Package.****Mill Construction, see Engineers or Contractors, Building; Concrete Construction.****Mill Construction, Information on.**

Associated Metal Lath Manufacturers, 196-201.

**Millwork.**

"Bilt-Well" Service Bureau, 574-75.  
 Brown Co., 573.  
 Curtis Service Bureau, 578-79.  
 Carnahan Mfg. Co., 576-77.  
 Morgan Co., 584-85.  
*Bilt-Well*, 574-75.

**Millwork, Exterior, see Woodwork, Exterior.****Millwork, Interior, see Cabinet Work; Trim.****Mineral Prospecting, see Prospecting, Mineral.****Mineral Wool, see Wool, Mineral.****Mirrors.**

Searls Mfg. Co., 888-89.

**Miters, Roof, Metal, see Roofing, Metal.****Mixers, Shower Bath.**

(See also Baths, Shower or Needle.)  
 Glauber Brass Mfg. Co., 856-61.  
 Hoffmann & Billings Mfg. Co., 863.  
 Manufacturing Equipment & Engineering Co., 847.  
 Matthews & Brother, Inc., W. N., 864-65.  
 Powers Regulator Co., 950-51.  
*Glauber*, 856-61.  
*Matthews Steamix*, 864-65.  
*Niedecken*, 863.

**Modeling, see Sculptors and Modelers.****Moisteners, Air, see Air Conditioning Apparatus.****Moisteners, Finger, Sanitary.**

Sengbusch Self-Closing Inkstand Co., 7.  
*Ideal*, 7.

**Monoliths, Marble.**

Georgia Marble Co., 68-69.

**Monorail Systems, see Cranes, Monorail; Elevating and Conveying Machinery.****Monumental Marble, see Marble, Structural or Monumental.****Monumental Work, Metal, see Ornamental Metal Work.****Monuments, Marble, see Marble, Structural or Monumental.****Mortar, Asbestos, see Plasters, Asbestos.****Mortar, Cement, see Mortar, Cement, Portland.****Mortar, Cement, Portland.**

(See also Cement, Mortar.)  
 Carney's Cement Co., 129.  
 Connelly Co., Thomas, 130-31.  
 Flexner-Taylor Co., 320.  
 Fowler & Pay, 132.  
 Garden City Sand Co., 134-37.  
 King & Co., J. B., 153.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
*Austin*, 132.  
*Carney's*, 129.  
*Hydro-Lytic*, 320.  
*Peerless*, 157.  
*Stonekote*, 134-37.  
*Utica*, 130-31.

**Mortar, Waterproofed, see Plasters, Waterproofed.****Mortar, Wood, see Plasters, Wood Fibered.****Mortar Cement, see Cement, Mortar.****Mortar Colors, see Colors, Cement and Mortar.****Mortar Facings, Waterproof.**

Standard Paint Co., 48-49.  
*Impervite*, 48-49.  
 Specifications, 48-49.

**Mortar Plaster, see Plasters.****Mortuary Work, see Mausoleum Work.****Mosaic Work.**

Associated Tile Manufacturers, 284-87.  
 Davis Marble Co., 283.  
 Grueby Faience & Tile Co., 292.  
 Mueller Mosaic Co., 293.  
 Tiffany Studios, 526-27.  
*Grueby*, 292.

**Mosaics, Ceramic, Faience.**

Associated Tile Manufacturers, 284-87.  
 Davis Marble Co., 283.  
 Grueby Faience & Tile Co., 292.  
 Mueller Mosaic Co., 293.  
*Grueby*, 292.

**Mosaics, Marble.**

Davis Marble Co., 283.

**Motor Generator Sets, see Generator Sets, Motor.****Motor Starters, see Starters, Motor.****Motors, Constant Speed, see Motors, Electric, A. C. or D. C.****Motors, Crane and Hoist, see Motors, Elevator.****Motors, Electric, A. C. or D. C.**

A. B. See Electric Elevator Co., 1262-63.  
 American Elevator & Machine Co., 1261.  
 Eastern Machinery Co., 1268-69.  
 General Electric Co., 1153-67.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Ilg Electric Ventilating Co., 1002-03.  
 Kaestner & Hecht Co., 1276-77.  
 Otis Elevator Co., 1280-84.  
 Payne Co., F. S., 1290-91.  
 Sprague Electric Works, 1168.  
 Sturtevant Co., B. F., 1006-07.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*Ilg*, 1002-03.  
*K. & H.*, 1276-77.  
*Otis*, 1280-84.  
*Sturtevant*, 1006-07.  
*Western Electric*, 1202-03.  
*Westinghouse*, 1169-76.

**Motors, Elevator.**

A. B. See Electric Elevator Co., 1262-63.  
 American Elevator & Machine Co., 1261.  
 Eastern Machinery Co., 1268-69.  
 General Electric Co., 1153-67.  
 Kaestner & Hecht Co., 1276-77.  
 Otis Elevator Co., 1280-84.  
 Payne Co., F. S., 1290-91.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*K. & H.*, 1276-77.  
*Otis*, 1280-84.  
*Westinghouse*, 1169-76.

**Motors, Fan or Blower.**

General Electric Co., 1153-67.  
 Ilg Electric Ventilating Co., 1002-03.  
 Sprague Electric Works, 1168.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.  
*Ilg*, 1002-03.  
*Westinghouse*, 1169-76.

**Motors, Induction, see Motors, Electric, A. C. or D. C.****Motors, Laundry Machinery, see Motors, Electric, A. C. or D. C.****Motors, Notes on.**

Society for Electrical Development, Inc., 1145-52.

**Motors, Pump, see Motors, Electric, A. C. or D. C.****Motors, Reversible, see Motors, Electric, A. C. or D. C.****Motors, Spring.**

Minneapolis Heat Regulator Co., 948-49.  
*Minneapolis*, 948-49.

**Motors, Vacuum Cleaner.**

United Electric Co., 1258-59.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*Tuec*, 1258-59.  
*Westinghouse*, 1169-76.

**Motors, Variable Speed, see Motors, Electric, A. C. or D. C.****Motors, Damper Regulator, see Regulators, Damper.****Moulding Machines, Roller Ramming.**

Snead & Co. Iron Works, Inc., 1424-25.  
*Macdonald*, 1424-25.

**Mouldings, Faience.**

Mueller Mosaic Co., 293.  
 Rookwood Pottery Co., 294-95.

**Mouldings, Kalamein, see Mouldings, Metal or Metal Covered.****Mouldings, Metal or Metal Covered.**

American Brass Co., 492-93; 1071.  
 Brasco Mfg. Co., 481.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Coulson & Co., J. W., 482-83.  
 Dahlstrom Metallic Door Co., 649-51.  
 Interior Metal Mfg. Co., 654-55.  
 Kawneer Mfg. Co., 488-90.  
 Manhattan Brass Co., 513.  
 National Skylight and Ventilator Co., 448-49.  
 Newark Cornice and Skylight Works, 726-27.  
 Reliance Fireproof Door Co., 656-57.  
 Union Metal Corner Co., 222-23.  
*Benedict Nickel*, 1071.  
*Kawneer*, 488-90.  
*Outersite*, 222-23.

**Mouldings, Picture.**

Dahlstrom Metallic Door Co., 649-51.  
 Union Metal Corner Co., 222-23.  
*Outersite*, 222-23.

**Mouldings, Sanitary Base, see Mouldings, Metal or Metal Covered.****Mouldings, Slate.**

Penrhyn Slate Co., 365.

**Mouldings, Tile, see Tile, Floor and Wall.****Mouldings, Wood, see Trim, Wood.****Moving Picture Machine Lamps, see Lamps, Electric, Stereopticon.****Mucilage Appliers.**

Sengbusch Self-Closing Inkstand Co., 7.

**Museum Equipment, Metal.**

Library Bureau, 1418-19.  
 Snead & Co., Iron Works, Inc., 1424-25.  
*Library Bureau*, 1418-19.

**Museum Equipment, Wood.**

Library Bureau, 1418-19.

**Mushroom Ventilators, see Ventilators, Mushroom.****Music Stands, see Stands, Music.****Muslin.**

Wiggin's Sons Co., H. B., 1388-89.  
*Fab-Rik-O-Na*, 1388-89.  
*Ko-Na*, 1388-89.  
*Lining Ko-Na*, 1388-89.

## N

**Nailing Base or Grounds, Composition.**

Flexner-Taylor Co., 320.  
 Mende, Paul, 321.  
*Flex-or-Crete*, 320.  
*Nailcode*, 321.  
 Specifications, 321.

**Nails.**

United States Gypsum Co., 162-68.



**Nails—Continued.**

Wheeling Corrugating Department, 242-43.

Youngstown Sheet & Tube Co., 1074-75.

**Name Plates, Metal.**

(See also Tablets, Memorial.)

Highton & Sons Co., Wm., 992-93.

Lasar Mfg. Co., 506-07.

Highton, 992-93.

**National Electrical Code.**

Society for Electrical Development, Inc., 1145-52.

**Netting, Poultry,** see Netting, Wire.

**Netting, Screen,** see Cloth, Wire.

**Netting, Wire.**

Clinton Wire Cloth Co., 227-31.

Cyclone Fence Co., 546-48.

Smith Wire and Iron Works, F. P., 524-25.

Wright Wire Co., 234-35.

Clinton, 227-31.

Cyclone, 546-48.

Specifications, 546-48.

**Newel Lamps,** see Lighting Fixtures.

**Newel Posts,** see Posts, Newel, Wood.

**Newels, Metal.**

(See also Balustrades.)

Hughes-Keenan Co., 262-65.

Mesker Brothers Iron Co., 722-25.

Penn Brass & Bronze Works, 517.

Sexauer & Lemke, Inc., 262-65.

Union Metal Mfg. Co., 304.

Westinghouse Electric & Mfg. Co., 1169-76.

Union, 304.

**Newels, Wood.**

"Bilt-Well" Service Bureau, 574-75.

Bilt-Well, 574-75.

**Newspaper Stacks,** see Stacks, Newspaper.

**Nosings, Stair, Concrete,** see Nosings, Stair, Metal.

**Nosings, Stair, Metal.**

American Abrasive Metals Co., 346.

American Brass Co., 492-93.

American Mason Safety Tread Co., 344-45.

Concrete Steel Co., 188-89.

Dreadnought Flooring Co., 325.

Hughes-Keenan Co., 262-65.

Mesker Brothers Iron Co., 722-25.

New York Belting & Packing Co., 322.

Sexauer & Lemke, Inc., 262-65.

Universal Safety Tread Co., 347.

Cooper, 344-45.

Dreadnought, 325.

Feralun, 346.

Havemeyer, 188-89.

Mason, 344-45.

Universal, 347.

**Nosings, Stair, Rubber.**

New York Belting & Packing Co., 322.

**Nozzles, Hose.**

Allen Mfg. Co., W. D., 1131-33.

New York Brass Foundry Co., 1134-35.

Simmons Co., John, 1142-43.

Wayne Oil Tank & Pump Co., 1480-81.

Hart, 1142-43.

Stillbeck, 1134-35.

**O****Oakum, Prepared.**

Campfield Raggle Block Co., 108-09.

Campfield, 108-09.

**Oat Cleaners,** see Barn Equipment.

**Oat Mangers,** see Stable Fittings and Fixtures; Barn Equipment.

**Office Furniture,** see Furniture, Office, Bank and Library.

**Oil Cups,** see Cups, Grease and Oil.

**Oil Filters,** see Filters, Oil.

**Oil Reclaiming Systems.**

Bowser & Co., Inc., S. F., 1476-77.

Bowser, 1476-77.

**Oil Separators,** see Separators, Oil.

**Oil Storage and Distributing Systems.**

Allen Pressure System Co., Inc., 1474-75.

Bowser & Co., Inc., S. F., 1476-77.

Chicago Steel Tank Co., 1482.

Gilbert & Barker Mfg. Co., 1478-79.

Wayne Oil Tank & Pump Co., 1480-81.

Apsco, 1474-75.

Bowser, 1476-77.

G & B, 1478-79.

Specifications, 1474-75.

**Oilers, Mechanical,** see Lubricators, Mechanical.

**Oils, Floor.**

Cheney & Co., Inc., 329.

Pollo, 329.

**Oils, Wood Preserving,** see Preservatives, Wood.

**Oleo and Oil Machinery.**

Brecht Co., 1050-52.

**Omnibuses, Vault and Office.**

(See also Filing Equipment.)

Federal Steel Fixture Co., 1412-13.

General Fireproofing Co., 1414.

Half's Safe Co., 1431.

Library Bureau, 1418-19.

Van Dorn Iron Works Co., 1428.

Watson Mfg. Co., Inc., 1429.

Federal, 1412-13.

GF Allsteel, 1414.

Library Bureau, 1418-19.

Van Dorn, 1428.

**Operators, Door, Sidewalk.**

Gillis & Geoghegan, 1299-1305.

G & G, 1299-1305.

**Operators, Door or Gate, Elevator.**

(See also Hardware, Door.)

Carpenter & Co., Inc., Davis, 827.

Pelle Co., 684-87.

Pitt Composite Iron Works, William R., 558-59.

Reliance-Grant Elevator Equipment Corp., 626-29.

Pelle, 684-87.

Pitt, 558-59.

**Orchard Houses,** see Greenhouses and Conservatories.

**Ornamental Brass Work,** see Ornamental Metal Work.

**Ornamental Bronze Work,** see Ornamental Metal Work.

**Ornamental Iron Work,** see Ornamental Metal Work.

**Ornamental Lighting,** see Lighting, Ornamental.

**Ornamental Metal Work.**

American Brass Co., 492-93.

Anchor Post Iron Works, 537-43.

Badger Wire & Iron Works, 494-95.

Barnum, E. T., 496-97.

Beardslee Chandelier Mfg. Co., 1226.

Bigelow Wire Works, Cheney, 491.

Brasco Mfg. Co., 481.

Brook Iron Works, A. F., 544-45.

Bureau Brothers, 498.

Carpenter & Co., Inc., Davis, 827.

Central Architectural Iron Works, 261.

Chattanooga Roofing & Foundry Co., 278; 499.

Colonial Fireplace Co., 279.

Columbia Iron & Wire Works Co., 268-69.

Creswell Iron Works, Samuel J., 258-59.

Dahlstrom Metallic Door Co., 649-51.

Detroit Mausoleum Equipment Works, 500.

Duvinaige, Pierre, 260.

Eastern Bridge & Structural Co., 18-19.

Fiske Iron Works, J. W., 552-53.

Friedley-Voshardt Co., 501.

Gorham Co Architectural Bronze, 502-03.

Guaranty Iron & Wire Co., 667.

Harsch & Sons Co., John, 504.

Highton & Sons Co., Wm., 992-93.

Hughes-Keenan Co., 262-65.

Irving Forge, W., 505.

**Ornamental Metal Work—Continued.**

Irving Iron Works Co., 348.

Jackson Co., Wm. H., 512.

Lasar Mfg. Co., 506-07.

McFarland-Hyde Co., 720-21.

McGann & Sons Co., T. F., 508-09.

Mack Iron and Wire Works Co., 510-11.

Manhattan Brass Co., 513.

Mannen Co., John E., 1045.

Mesker Brothers Iron Co., 722-25.

Meyers Mfg. Co., Fred J., 516.

Mott Iron Works, J. L., 514-15.

Newark Cornice and Skylight Works, 726-27.

Page Steel and Wire Co., 549-51.

Penn Brass & Bronze Works, 517.

Pitt Composite Iron Works, William R., 558-59.

Polachek Bronze & Iron Co., John, 522.

Price-Evans Foundry Co., 518-19.

Reed & Barton, 1050-21.

St. Louis Wire & Iron Co., 523.

Sexauer & Lemke, Inc., 262-65.

Smith Wire and Iron Works, F. P., 524-25.

Smyser-Royer Co., 528.

Snow Iron Works, Inc., W. A., 554-55.

Steelite Co., 1293.

Stewart Iron Works Co., 556-57.

Thorp Fire Proof Door Co., 661-63.

Tiffany Studios, 526-27.

Tuttle & Bailey Mfg. Co., 985-87.

Tyler Co., W. S., 529.

Union Metal Mfg. Co., 304.

Van Dorn Iron Works Co., 1428.

Wagner Architectural Iron Works, A. F., 530-31.

Watson Mfg. Co., Inc., 1429.

Williams, Inc., Jno., 532.

Wisconsin Iron & Wire Works, 533.

Wright Wire Co., 234-35.

Highton, 992-93.

Union, 304.

Van Dorn, 1428.

W. Irving, 505.

**Ornamental Wire Work,** see Wire Work.

**Ornamental Zinc Work, Sheet.**

Friedley-Voshardt Co., 501.

**Ornaments: Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.**

Fischer & Jirouch Co., 1405.

Hartmann-Sanders Co., 298-99.

Rookwood Pottery Co., 294-95.

Trusswall Mfg. Co., 303.

**Ornaments, Sheet Metal.**

Friedley-Voshardt Co., 501.

**Ornaments, Tower.**

Smith Wire and Iron Works, F. P., 524-25.

**Ornaments, Wood.**

North Carolina Pine Association, 562-63.

**Outlet Boxes and Covers,** see Boxes, Junction or Outlet.

**Outlets, Roof, Metal.**

Barrett Co., 442.

Wheeling Corrugating Department, 242-43.

**Ovens, Baking, Electric.**

Bramhall, Deane Co., 1010-11.

Edison Electric Appliance Co., Inc., 1204.

General Electric Co., 1153-67.

Westinghouse Electric & Mfg. Co., 1169-76.

G-E, 1153-67.

Hughes, 1204.

**Ovens, Baking, Gas.**

Crane Co., William M., 1012-13.

Vulcan, 1012-13.

**Ovens, Core.**

Ohio Blower Co., 472-74.

Swartwout, 472-74.

**Ovens, Enameling, Electric.**

Edison Electric Appliance Co., Inc., 1204.

Hughes, 1204.

**Ovens, Laboratory, Electric.**  
Edison Electric Appliance Co., Inc., 1204.  
*Hughes*, 1204.

**Overflows**, see Plumbing Fixtures, Traps, Lavatory.

**Overhead Conveyors**, see Telpherage Systems.

**Ozonators.**  
General Electric Co., 1153-67.  
Sprague Electric Works, 1168.  
*G-E*, 1153-67.  
*Universal*, 1153-67.

## P

**Packing, Sheet.**  
*Jenkins Bros.*, 1086-87.  
*Jenarco*, 1086-87.  
*Jenkins Bros.*, 1086-87.  
*Jenkins '96*, 1086-87.

**Packing House Equipment.**  
(See also Refrigerators and Coolers.)  
*Allith-Prouty Co.*, 614-15.  
*Brecht Co.*, 1050-52.  
*Olson & Co., Samuel*, 1312-13.

**Paddock Enclosures**, see Fencing.

**Padlocks**, see Locks, Padlock.

**Paging Systems, Electric.**  
*Winkler-Reichmann Co.*, 1236.  
*Electrical Page Boy*, 1236.  
*Still Small Voice*, 1236.  
Specifications, 1236.

**Paint, Acidproof.**  
*American Bitumastic Enamels Co.*, 1373.  
*Arco Co.*, 1316-17.  
*Belknap-Moran-Allen Co., Inc.*, 1375.  
*Biegler Mfg. Co., E. N.*, 39.  
*General Fireproofing Co.*, 42.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Hetzel, Estate of J. G.*, 443.  
*Hydrex Felt & Engineering Co.*, 44.  
*Johnson & Co., Inc., Oliver*, 1326-27.  
*National Paint & Varnish Co.*, 1331.  
*Toch Brothers*, 50-51.  
*U. S. Gutta Percha Paint Co.*, 1336-37.  
*Vitrifyx Co.*, 343.  
*Vortex Mfg. Co.*, 1374.  
*Wadsworth, Howland & Co., Inc.*, 1338-39.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Arco*, 1316-17.  
*Bay State*, 1338-39.  
*Biegler's*, 39.  
*Coat-o-lite*, 1331.  
*Elastico*, 1375.  
*GF No. 99*, 42.  
*Hampden*, 1320-21.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*Hydrex*, 44.  
*Ojaco*, 1326-27.  
*Protectorine*, 57.  
*R. I. W.*, 50-51.  
*Rice's*, 1336-37.  
*Vitrifyx*, 343.  
*Vorco*, 1374.

**Paint, Aluminum.**  
*Certain-teed Products Corporation*, 399-401.  
*Harrison Works*, 1322-25.  
*Lowe Brothers Co.*, 1328-29.  
*Certain-teed*, 399-401.  
*Harrisons*, 1322-25.  
*High Standard*, 1328-29.

**Paint, Asphalt.**  
*Bird & Son*, 390-91.  
*Certain-teed Products Corporation*, 399-401.  
*Ford Mfg. Co.*, 239.  
*Hetzel, Estate of J. G.*, 443.  
*Hydrex Felt & Engineering Co.*, 44.  
*Johns-Manville Co., H. W.*, 36; 402-05.  
*Natroco Paint & Varnish Works*, 1334.  
*Patent Vulcanite Roofing Co.*, 406-07.  
*Warren Chemical & Mfg. Division*, 408-09.

**Paint, Asphalt—Continued.**  
*Anchor*, 408-09.  
*Asphaltus Roof Coating*, 1334.  
*Certain-teed*, 399-401.  
*Hetzel's*, 443.  
*Hydrex*, 44.  
*Johns-Manville*, 36; 402-05.  
*Neponset*, 390-91.

**Paint, Bonding.**  
*Arco Co.*, 1316-17.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Dum Dum*, 1316-17.

**Paint, Boiler, Stack and Gas Holder.**  
(See also Paint, Metal Protective.)  
*American Bitumastic Enamels Co.*, 1373.  
*Biegler Mfg. Co., E. N.*, 39.  
*Billings-Chapin Co.*, 1318.  
*Ceresit Waterproofing Co.*, 41.  
*Clinton Metallic Paint Co.*, 1380.  
*Harrison Works*, 1322-25.  
*Hetzel, Estate of J. G.*, 443.  
*Lowe Brothers Co.*, 1328-29.  
*Natroco Paint & Varnish Works*, 1334.  
*Patton Paint Co.*, 1332-33.  
*Standard Paint Co.*, 393.  
*Toch Brothers*, 50-51.  
*Tropical Paint & Oil Co.*, 1335.  
*Trus-Con Laboratories*, 52-53.  
*Vortex Mfg. Co.*, 1374.  
*Wadsworth, Howland & Co., Inc.*, 1338-39.  
*Warren Chemical & Mfg. Division*, 408-09.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Anchor*, 408-09.  
*Bay State*, 1338-39.  
*Biegler's*, 39.  
*Cem-bric*, 41.  
*Clinton*, 1380.  
*English*, 1335.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*High Standard*, 1328-29.  
*Patton's Ironhide*, 1332-33.  
*Protec-Stac*, 1334.  
*Protectorine*, 57.  
*R.I.W.*, 50-51.  
*Rostnicht*, 1318.  
*SPC*, 393.  
*Trus-Con Bar-Ox Inhibitive*, 52-53.  
*Vorco*, 1374.  
*Vortex*, 1374.  
Specifications, 1374.

**Paint, Bonding.**  
*General Fireproofing Co.*, 42.  
*Toch Brothers*, 50-51.  
*GF No. 200*, 42.

**Paint: Brick, Cement, Concrete, Plaster, Stone.**  
*American Bitumastic Enamels Co.*, 1373.  
*Antakwa Co.*, 37.  
*Arco Co.*, 1316-17.  
*Belknap-Moran-Allen Co., Inc.*, 1375.  
*Biegler Mfg. Co., E. N.*, 39.  
*Billings-Chapin Co.*, 1318.  
*Bitu-Mortar Waterproofing Co., Inc.*, 40.  
*Cabot, Inc., Samuel*, 1382-85.  
*Ceresit Waterproofing Co.*, 41.  
*Certain-teed Products Corporation*, 399-401.  
*Chicago Varnish Co.*, 1342-43.  
*De Soto Paint Mfg. Co.*, 1319.  
*Dexter Brothers Co.*, 1381.  
*Garden City Sand Co.*, 134-37.  
*General Fireproofing Co.*, 42.  
*Glidden Co.*, 1344-45.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Harrison Works*, 1322-25.  
*Hetzel, Estate of J. G.*, 443.  
*Horn Co., A. C.*, 43.  
*Hydrex Felt & Engineering Co.*, 44.  
*Johns-Manville Co., H. W.*, 36.  
*Johnson & Co., Inc., Oliver*, 1326-27.  
*Keystone Varnish Co.*, 1347-48.  
*Lowe Brothers Co.*, 1328-29.  
*National Paint & Varnish Co.*, 1331.  
*Natroco Paint & Varnish Works*, 1334.

**Paint: Brick, Cement, Concrete, Plaster, Stone—Continued.**  
*Patton Paint Co.*, 1332-33.  
*Pecora Paint Co.*, 1378-79.  
*Permanent Ironite Waterproofing Co.*, 47.  
*Pratt & Lambert, Inc.*, 1354-55.  
*Sonneborn Sons, Inc., L.*, 340-41.  
*Standard Paint Co.*, 393.  
*Standard Varnish Works*, 1356-63.  
*Thomson Wood Finishing Co.*, 1364.  
*Toch Brothers*, 50-51.  
*Tropical Paint & Oil Co.*, 1335.  
*Trus-Con Laboratories*, 52-53.  
*U. S. Gutta Percha Paint Co.*, 1336-37.  
*Vitrifyx Co.*, 343.  
*Vortex Mfg. Co.*, 1374.  
*Wadsworth, Howland & Co., Inc.*, 1338-39.  
*Warren Chemical & Mfg. Division*, 408-09.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Anchor*, 408-09.  
*Antakwa*, 37.  
*Arco*, 1316-17.  
*Arco-Rays*, 1316-17.  
*B-M Nos. 208 and 212*, 40.  
*Bay State*, 1338-39.  
*Biegler's*, 39.  
*Bilchaco*, 1318.  
*Cabot's*, 1382-85.  
*Cemcoat*, 340-41.  
*Cementkote*, 1335.  
*Certain-teed*, 399-401.  
*Coat-o-lite*, 1331.  
*Curtiss*, 134-37.  
*Drival*, 1318.  
*Elastikote*, 1335.  
*Flat Wall-Paynt*, 1342-43.  
*French Caen Stone*, 1344-45.  
*GF No. 101*, 42.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*Hetzel's, R. O. P.*, 443.  
*High Standard*, 1328-29.  
*Hydrex*, 44.  
*Ironite*, 47.  
*Johns-Manville*, 36.  
*Keystone*, 1347-48.  
*Koncrex*, 43.  
*Konkreto*, 1375.  
*Liberty*, 37.  
*Memphi*, 1319.  
*National Bondkote*, 1334.  
*Ojaco*, 1326-27.  
*Ojaco Kon-Krete-Kote*, 1326-27.  
*Patton's Alba-Lux*, 1332-33.  
*Pecora*, 1378-79.  
*Petrifax*, 1381.  
*Phlorokote*, 1334.  
*Protectorine*, 57.  
*R. I. W., Liquid Konkerit*, 50-51.  
*R. I. W., Toxlepxore*, 50-51.  
*Regal*, 37.  
*Rice's*, 1336-37.  
*Satinette*, 1356-63.  
*SPC*, 393.  
*SPC Masonry Finish*, 393.  
*Stucolor*, 1344-45.  
*Trus-Con*, 52-53.  
*Vorco*, 1374.  
*Vitralite*, 1354-55.  
*Vitrifyx*, 343.  
*Vorcoflor*, 1374.  
Specifications, 1316-17; 1326-27; 1336-37; 1338-39; 1344-45; 1356-63.

**Paint, Bridge**, see Paint, Metal Protective.

**Paint, Carbon.**  
*Barrett Co.*, 394-97.  
*Biegler Mfg. Co., E. N.*, 39.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Lowe Brothers Co.*, 1328-29.  
*Biegler's*, 39.  
*Everjet*, 394-97.  
*Hampden*, 1320-21.  
*High Standard*, 1328-29.  
*Rubercoat*, 1320-21.



**Paint, Cement and Concrete**, see **Paint**:  
Brick, Cement, Concrete, Plaster,  
Stone.

**Paint, Cold Water.**

Hampden Paint & Chemical Co., 1320-21.  
King & Co., J. B., 153.  
Vortex Mfg. Co., 1374.  
Hampden, 1320-21.  
King's, 153.  
Regal, 1320-21.  
Vorco, 1374.

**Paint, Dampproofing**, see **Waterproofing**  
and **Dampproofing Paint** and **Com-**  
**pounds.**

**Paint, Decorative**, see **Paint, Interior.**

**Paint, Enamel**, see **Enamels.**

**Paint, Exterior.**

American Bitumastic Enamels Co., 1373.  
Antakwa Co., 37.  
Arco Co., 1316-17.  
Belknap-Moran-Allen Co., Inc., 1375.  
Billings-Chapin Co., 1318.  
Bird & Son, 390-91.  
Bridgeport Wood Finishing Works, 1369.  
Cabot, Inc., Samuel, 1382-85.  
Carter White Lead Co., 1315.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
Clinton Metallic Paint Co., 1380.  
General Fireproofing Co., 42.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Horn Co., A. C., 43.  
Hydrex Felt & Engineering Co., 44.  
Johnson & Co., Inc., Oliver, 1326-27.  
Keystone Varnish Co., 1347-48.  
Lowe Brothers Co., 1328-29.  
Marietta Paint & Color Co., 1330.  
National Paint & Varnish Co., 1331.  
Natroco Paint & Varnish Works, 1334.  
Patton Paint Co., 1332-33.  
Pratt & Lambert, Inc., 1354-55.  
Sonneborn Sons, Inc., L., 340-41.  
Standard Paint Co., 393.  
Toch Brothers, 50-51.  
Tropical Paint & Oil Co., 1335.  
U. S. Gutta Percha Paint Co., 1336-37.  
Valentine & Co., 1366-67.  
Vortex Mfg. Co., 1374.  
Wadsworth, Howland & Co., Inc., 1338-39.  
Wilson Corporation, J. G., 804-05.  
Zibell Damp Resisting Paint Co., 57.  
Antakwa, 37.  
Arco Increte, 1316-17.  
Arco Inhibitive, 1316-17.  
Bay State, 1338-39.  
Cabot's 1382-85.  
Cem-bric, 41.  
Cemcoat, 340-41.  
Cementkote, 1335.  
Certain-teed, 399-401.  
Clinton, 1380.  
Corporation, 1334.  
Egyptian, 1334.  
Elastico, 1375.  
Elastikote, 1335.  
Flex-Sicco, 50-51.  
GF, 42.  
Hampden, 1320-21.  
Harrisons, 1322-25.  
Hermastic, 1373.  
High Standard, 1328-29.  
Hydrex, 44.  
Kon-Krete-Kote, 1326-27.  
Marietta, 1330.  
National, 1331.  
Natroco, 1334.  
Neponset, 390-91.  
Ojaco, 1326-27.  
Patton's Porchite, 1332-33.  
Patton's Sun-Proof, 1332-33.  
Protectorine, 57.  
R. I. W., 50-51.  
R. I. W. Verte Antique, 50-51.

**Paint, Exterior—Continued.**

Rice's Reinforced, 1336-37.  
SPC, 393.  
Stucolor, 1344-45.  
Tropical, 1335.  
Val-Primer, 1366-67.  
Vitrallite, 1354-55.  
Vorco, 1374.  
Vorcolastic, 1374.  
Wheeler's, 1369.  
Zinolin, 1347-48.  
Specifications, 41; 340-41; 1326-27;  
1332-33; 1338-39.

**Paint, Fire Resisting.**

Edwards Mfg. Co., 418-19.  
Vortex Mfg. Co., 1374.  
Wadsworth, Howland & Co., Inc., 1338-39.  
Zibell Damp Resisting Paint Co., 57.  
Bay State, 1338-39.  
Edmanco Tightcote, 418-19.  
Vorco, 1374.

**Paint, Floor**, see **Paint, Interior.**

**Paint, Floor, Concrete.**

(See also **Paint**: Brick, Cement, Concrete,  
Plaster, Stone; **Hardeners** and **Densi-**  
**fiers**, **Cement** and **Concrete**.)

Antakwa Co., 37.  
Arco Co., 1316-17.  
Belknap-Moran-Allen Co., Inc., 1375.  
Billings-Chapin Co., 1318.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
De Soto Paint Mfg. Co., 1319.  
General Fireproofing Co., 42.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Horn Co., A. C., 43.  
Johnson & Co., Inc., Oliver, 1326-27.  
Lowe Brothers Co., 1328-29.  
Master Builders Co., 339.  
Murphy Varnish Co., 1350-51.  
National Paint & Varnish Co., 1331.  
Natroco Paint & Varnish Works, 1334.  
Patton Paint Co., 1332-33.  
Pratt & Lambert, Inc., 1354-55.  
Sonneborn Sons, Inc., L., 340-41.  
Standard Paint Co., 393.  
Toch Brothers, 50-51.  
U. S. Gutta Percha Paint Co., 1336-37.  
Vortex Mfg. Co., 1374.  
Wadsworth, Howland & Co., Inc., 1338-39.  
Zibell Damp Resisting Paint Co., 57.  
Arco Vitrograin, 1316-17.  
Bay State Agatex, 1338-39.  
Bilchaco, 1318.  
Cem-bric, 41.  
Cemcoat, 340-41.  
Certain-teed, 399-401.  
Coat-O-Lite, 1331.  
Crystalrox, 42.  
Dustop, 50-51.  
Flintox, 50-51.  
Florhide, 1332-33.  
GF Nos. 145, 150, 151, and 155, 42.  
Hampden, 1320-21.  
Harrisons, 1322-25.  
High Standard, 1328-29.  
Indurite, 41.  
Koncrex, 43.  
Konkreto, 1375.  
Lapidolith, 340-41.  
Memphi, 1319.  
Natroco, 1334.  
Ojaco, 1326-27.  
Ojaco Kon-Krete-Kote, 1326-27.  
Phlorkote, 1334.  
Protectorine, 57.  
R.I.W., 50-51.  
R.I.W. Toxement, 50-51.  
Regal, 37.  
Rice's Granolith, 1336-37.  
SPC, 393.  
Stucolor, 1344-45.  
Vorco, 1374.

**Paint, Floor, Concrete—Continued.**

Vorcoflor, 1374.  
Specifications, 1320-21; 1336-37; 1338-39.  
**Paint, Galvanized Iron**, see **Paint, Metal**  
**Protective.**

**Paint, Graphite.**  
Biegler Mfg. Co., E. N., 39.  
Certain-teed Products Corporation, 399-401.  
Harrison Works, 1322-25.  
Johnson & Co., Inc., Oliver, 1326-27.  
Lowe Brothers Co., 1328-29.  
National Paint & Varnish Co., 1331.  
Natroco Paint & Varnish Works, 1334.  
Standard Paint Co., 393.  
Vortex Mfg. Co., 1374.  
Biegler's, 39.  
Certain-teed, 399-401.  
Harrisons, 1322-25.  
High Standard, 1328-29.  
National, 1331.  
National XX, 1334.  
Ojaco, 1326-27.  
SPC, 393.  
Vorco, 1374.

**Paint, Gutta Percha.**  
U. S. Gutta Percha Paint Co., 1336-37.

**Paint, Heat Resisting.**  
Harrison Works, 1322-25.  
U. S. Gutta Percha Paint Co., 1336-37.  
Harrisons, 1322-25.  
Rice's, 1336-37.

**Paint, Insulating.**  
American Bitumastic Enamels Co., 1373.  
Biegler Mfg. Co., E. N., 39.  
Billings-Chapin Co., 1318.  
Permanent Ironite Waterproofing Co., 47.  
Standard Paint Co., 393.  
Toch Brothers, 50-51.  
Biegler's, 39.  
Hermastic, 1373.  
Ironite, 47.  
P & B, 393.  
Peacock, 393.  
R.I.W., 50-51.  
Rostnicht, 1318.  
SPC, 393.

**Paint, Interior.**  
American Bitumastic Enamels Co., 1373.  
Antakwa Co., 37.  
Arco Co., 1316-17.  
Belknap-Moran-Allen Co., Inc., 1375.  
Berry Brothers, 1346.  
Billings-Chapin Co., 1318.  
Bridgeport Wood Finishing Works, 1369.  
Cabot, Inc., Samuel, 1382-85.  
Carter White Lead Co., 1315.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
Dexter Brothers Co., 1381.  
General Fireproofing Co., 42.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Horn Co., A. C., 43.  
Hydrex Felt & Engineering Co., 44.  
Johnson & Co., Inc., Oliver, 1326-27.  
Keystone Varnish Co., 1347-48.  
Lowe Brothers Co., 1328-29.  
Marietta Paint & Color Co., 1330.  
National Paint & Varnish Co., 1331.  
Natroco Paint & Varnish Works, 1334.  
Patton Paint Co., 1332-33.  
Pecora Paint Co., 1378-79.  
Pratt & Lambert, Inc., 1354-55.  
Sonneborn Sons, Inc., L., 340-41.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
Toch Brothers, 50-51.  
Tropical Paint & Oil Co., 1335.  
U. S. Gutta Percha Paint Co., 1336-37.  
Valentine & Co., 1366-67.  
Vortex Mfg. Co., 1374.  
Wadsworth, Howland & Co., Inc., 1338-39.

**Paint, Interior—Continued.**

Wilson Corporation, J. G., 804-05.  
 Zibell Damp Resisting Paint Co., 57.  
*Antakwa Plaster Key*, 37.  
*Arco N. B. Wall Primer*, 1316-17.  
*Arco Nitrograin*, 1316-17.  
*Arco-Rays*, 1316-17.  
*Artone*, 1318.  
*Bay State*, 1338-39.  
*Cabot's*, 1382-85.  
*Cem-bric*, 41.  
*Cemcoat*, 340-41.  
*Certain-teed*, 399-401.  
*Coat-o-lite*, 1331.  
*Corporation*, 1334.  
*Diffuselite*, 804-05.  
*Dum Dum*, 1316-17.  
*Egyptian*, 1334.  
*Factrolite*, 1334.  
*Ferro-Keep*, 1322-25.  
*Flat Wall-Paynt*, 1342-43.  
*French Caen Stone*, 1344-45.  
*GF*, 42.  
*GF No. 151*, 42.  
*Glidden*, 1344-45.  
*Gloss O-Lite*, 1336-37.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*High Standard*, 1328-29.  
*Hydrex*, 44.  
*Keystone*, 1347-48.  
*Luxeberry*, 1346.  
*Luxstar White*, 41.  
*Marietta*, 1330.  
*Mello-Gloss*, 1328-29.  
*Mellotone*, 1328-29.  
*Memphi*, 1319.  
*Mill White*, 1328-29.  
*Natroco*, 1334.  
*New-Tynt*, 1375.  
*Ojaco*, 1326-27.  
*Ojaco Dec-O-Kote*, 1326-27.  
*Patton's Velumina*, 1332-33.  
*Pecora*, 1378-79.  
*Princess*, 1332-33.  
*Protectorine*, 57.  
*R. I. W. Verte Antique*, 50-51.  
*Regal*, 37.  
*Rice's*, 1336-37.  
*Rice's Flow-on*, 1336-37.  
*Roman Calx*, 1381.  
*Sanatone*, 1364.  
*Satinette*, 1356-63.  
*Spartan*, 1330.  
*Sulphurproof*, 1374.  
*Symmentrex*, 43.  
*Tocotone*, 1335.  
*Val-Primer*, 1366-67.  
*Vitralite*, 1354-55.  
*Vorco*, 1374.  
*Vorcolastic*, 1374.  
*Wheeler's*, 1369.  
 Specifications, 328; 340-41; 1320-21; 1326-27; 1336-37; 1342-43; 1344-45; 1347-48.

**Paint, Luminous.**

Cold Light Mfg. Co., 1210.  
*Marvelite*, 1210.

**Paint, Machine and Casting.**

Toch Brothers, 50-51.  
*R. I. W.*, 50-51.

**Paint, Marine.**

Lowe Brothers Co., 1328-29.  
*High Standard*, 1328-29.

**Paint, Metal Protective.**

American Bitumastic Enamels Co., 1373.  
 American Chemical Paint Co., 1372.  
*Antakwa Co.*, 37.  
*Arco Co.*, 1316-17.  
*Barrett Co.*, 394-97.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Biegler Mfg. Co., E. N., 39.  
 Billings-Chapin Co., 1318.  
 Bird & Son, 390-91.  
 Cabot, Inc., Samuel, 1382-85.  
 Certain-teed Products Corporation, 399-401.  
 Clinton Metallic Paint Co., 1380.

**Paint, Metal Protective—Continued.**

General Fireproofing Co., 42.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Hetzel, Estate of J. G., 443.  
 Horn Co., A. C., 43.  
 Hydrex Felt & Engineering Co., 44.  
 Johns-Manville Co., H. W., 402-05.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Keystone Varnish Co., 1347-48.  
 Lowe Brothers Co., 1328-29.  
 National Paint & Varnish Co., 1331.  
 Natroco Paint & Varnish Works, 1334.  
 Patton Paint Co., 1332-33.  
 Permanent Ironite Waterproofing Co., 47.  
 Pratt & Lambert, Inc., 1354-55.  
 Sonneborn Sons, Inc., L., 340-41.  
 Standard Paint Co., 393.  
 Thomson Wood Finishing Co., 1364.  
 Toch Brothers, 50-51.  
 Tropical Paint & Oil Co., 1335.  
 Trus-Con Laboratories, 52-53.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 Vortex Mfg. Co., 1374.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Warren Chemical & Mfg. Division, 408-09.  
 Zibell Damp Resisting Paint Co., 57.  
*Anchor*, 408-09.  
*Antakwa Black*, 37.  
*Arco*, 1316-17.  
*Arco Increte*, 1316-17.  
*Arco Inhibitive*, 1316-17.  
*Bay State*, 1338-39.  
*Biegler's*, 39.  
*Cemcoat*, 340-41.  
*Certain-teed*, 399-401.  
*Durable Green*, 1374.  
*Duro-Carbo*, 39.  
*Elastico*, 1375.  
*Elasticote*, 1335.  
*English*, 1335.  
*Eric*, 1336-37.  
*Eternium*, 394-97.  
*Everjet*, 394-97.  
*Ferro-Keep*, 1322-25.  
*Flexite*, 393.  
*GF Nos. 300, 325 and 350*, 42.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*High Standard*, 1328-29.  
*Hydrex*, 44.  
*Ironite*, 47.  
*Johns-Manville*, 402-05.  
*Keystona*, 1347-48.  
*Metal*, 1380.  
*Metalkote*, 1328-29.  
*N. R. C. Protective*, 1334.  
*National*, 1331.  
*National Tinner's Red*, 1331.  
*Neponset*, 390-91.  
*Ojaco*, 1326-27.  
*Ojaco Chrom-Oxid*, 1326-27.  
*Ojaco Light Gray Chrom-Oxid*, 1326-27.  
*P & B*, 393.  
*Patton's Ironhide*, 1332-33.  
*Peacock*, 393.  
*Protectorine*, 57.  
*R. I. W.*, 50-51.  
*R. I. W. Tochoolith*, 50-51.  
*Red Lead Lute*, 1328-29.  
*Rostnicht*, 1318.  
*Rust Baar*, 43.  
*Trus-Con Bar-Ox Inhibitive*, 52-53.  
*Vitralite*, 1354-55.  
*Vorco*, 1374.  
 Specifications, 52-53; 1316-17; 1320-21; 1326-27; 1332-33.

**Paint, Mill White.**

*Arco Co.*, 1316-17.  
 Certain-teed Products Corporation, 399-401.  
 Glidden Co., 1344-45.  
 Hampden Paint & Chemical Co., 1320-21.

**Paint, Mill White—Continued.**

Harrison Works, 1322-25.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Lowe Brothers Co., 1328-29.  
 Marietta Paint & Color Co., 1330.  
 National Paint & Varnish Co., 1331.  
 Natroco Paint & Varnish Works, 1334.  
 Patton Paint Co., 1332-33.  
 Pecora Paint Co., 1378-79.  
 Tropical Paint & Oil Co., 1335.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 Vortex Mfg. Co., 1374.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
*Arco-Rays*, 1316-17.  
*Barreled Sunlight*, 1336-37.  
*Bay State*, 1338-39.  
*Certain-teed*, 399-401.  
*Coat-o-lite*, 1331.  
*Daylight*, 1344-45.  
*Factrolite*, 1334.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*High Standard*, 1328-29.  
*Marietta*, 1330.  
*Ojaco*, 1326-27.  
*Patton's Alba-Lux*, 1332-33.  
*Pecora*, 1378-79.  
*Rice's*, 1336-37.  
*Toco*, 1335.  
*Vorco*, 1374.  
 Specifications, 1320-21; 1326-27; 1336-37; 1378-79.

**Paint, Oil.**

*Antakwa Co.*, 37.  
*Arco Co.*, 1316-17.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Berry Brothers, 1346.  
 Billings-Chapin Co., 1318.  
 Bridgeport Wood Finishing Works, 1369.  
 Cabot, Inc., Samuel, 1382-85.  
 Carter White Lead Co., 1315.  
 Ceresit Waterproofing Co., 41.  
 De Soto Paint Mfg. Co., 1319.  
 Dexter Brothers Co., 1381.  
 Glidden Co., 1344-45.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Keystone Varnish Co., 1347-48.  
 Lowe Brothers Co., 1328-29.  
 Marietta Paint & Color Co., 1330.  
 Natroco Paint & Varnish Works, 1334.  
 Patton Paint Co., 1332-33.  
 Pecora Paint Co., 1378-79.  
 Pratt & Lambert, Inc., 1354-55.  
 Standard Paint Co., 393.  
 Standard Varnish Works, 1356-63.  
 Thomson Wood Finishing Co., 1364.  
 Toch Brothers, 50-51.  
 Tropical Paint & Oil Co., 1335.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 Vortex Mfg. Co., 1374.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Zibell Damp Resisting Paint Co., 57.  
*Antakwa*, 37.  
*Antakwa Black*, 37.  
*Arco Increte*, 1316-17.  
*Arco Inhibitive*, 1316-17.  
*Arco N.B. Wall Primer*, 1316-17.  
*Arco-Rays*, 1316-17.  
*Arco Vitrograin*, 1316-17.  
*Artone*, 1318.  
*Aurora*, 1330.  
*Bay State*, 1338-39.  
*Bilchaco*, 1318.  
*Cabot's*, 1382-85.  
*Carter*, 1315.  
*Cementkote*, 1335.  
*Coat-O-Lite*, 1331.  
*Daylight*, 1344-45.  
*Driwal*, 1318.  
*Dum Dum*, 1316-17.  
*Dustop*, 50-51.  
*Elastico*, 1375.  
*Elasticote*, 1335.  
*English*, 1335.  
*Factrolite*, 1334.  
*Flexite*, 393.



**Paint, Oil—Continued.**

*Flex-o-Flint Finish*, 1318.  
*Flex-Sicco*, 50-51.  
*Flintox*, 50-51.  
*French Caen Stone*, 1344-45.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*High Standard*, 1328-29.  
*Keystona*, 1347-48.  
*Luxeberry*, 1346.  
*Luxstar White*, 41.  
*Marietta*, 1330.  
*Mello-Gloss*, 1328-29.  
*Mellotone*, 1328-29.  
*Memphi*, 1319.  
*Natroco*, 1334.  
*New-Tynt*, 1375.  
*Ojaco*, 1326-27.  
*Patton's Velumina*, 1332-33.  
*Pecora*, 1378-79.  
*Petrifax*, 1381.  
*Protectorine*, 57.  
*Rice's*, 1336-37.  
*R.I.W.*, 50-51.  
*R.I.W. Liquid Konkerit*, 50-51.  
*R.I.W. Tockolith*, 50-51.  
*R.I.W. Toxement*, 50-51.  
*R.I.W. Toxolopore*, 50-51.  
*R.I.W. Verte Antique*, 50-51.  
*Regal*, 37.  
*Roman Calx*, 1381.  
*Sanatone*, 1364.  
*Satinette*, 1356-63.  
*Spartan*, 1330.  
*Stucolor*, 1344-45.  
*Sulphurproof*, 1374.  
*Toco*, 1335.  
*Tocotone*, 1335.  
*Tropical*, 1335.  
*Vitralite*, 1354-55.  
*Vorco*, 1374.  
*Wheeler's*, 1369.

**Paint, Oilproof.**

*Vortex Mfg. Co.*, 1374.  
*Vorco*, 1374.  
*Vortex*, 1374.  
 Specifications, 1374.

**Paint, Plaster**, see **Paint: Brick, Cement, Concrete, Plaster, Stone.**

**Paint, Porch**, see **Paint, Exterior.**

**Paint, Preservative**, see **Paint, Metal Protective.**

**Paint, Priming and Sizing.**

*American Bitumastic Enamels Co.*, 1373.  
*American Chemical Paint Co.*, 1372.  
*Arco Co.*, 1316-17.  
*Carter White Lead Co.*, 1315.  
*De Soto Paint Mfg. Co.*, 1319.  
*General Fireproofing Co.*, 42.  
*Glidden Co.*, 1344-45.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Harrison Works*, 1322-25.  
*Horn Co., A. C.*, 43.  
*Johns-Manville Co., H. W.*, 36; 402-05.  
*Johnson & Co., Inc., Oliver*, 1326-27.  
*Keystone Varnish Co.*, 1347-48.  
*Lowe Brothers Co.*, 1328-29.  
*Pecora Paint Co.*, 1378-79.  
*Standard Varnish Works*, 1356-63.  
*Toch Brothers*, 50-51.  
*U. S. Gutta Percha Paint Co.*, 1336-37.  
*Valentine & Co.*, 1366-67.  
*Wadsworth, Howland & Co.*, 1338-39.  
*Wiggin's Sons Co., H. B.*, 1388-89.  
*Arco N. B. Wall Primer*, 1316-17.  
*Bay State*, 1338-39.  
*Carter*, 1315.  
*GF Nos. 150 and 350*, 42.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*High Standard*, 1328-29.  
*Johns-Manville*, 36; 402-05.  
*Keystona*, 1347-48.  
*Kling-Ko-Na*, 1388-89.  
*Ojaco*, 1326-27.

**Paint, Priming and Sizing—Continued.**

*Ojaco Kon-Krete-Kote*, 1326-27.  
*Pecora*, 1378-79.  
*R.I.W. Liquid Konkerit*, 50-51.  
*Rice's*, 1336-37.  
*Satinette*, 1356-63.  
*Sealcote*, 1328-29.  
*Sizing*, 1319.  
*Stanvar*, 1356-63.  
*Val-Primers*, 1366-67.  
*Wahcolite*, 1338-39.  
*Zinolin*, 1347-48.

**Paint, Roof.**

*Barrett Co.*, 394-97.  
*Biegler Mfg. Co., E. N.*, 39.  
*Billings-Chapin Co.*, 1318.  
*Bird & Son*, 390-91.  
*Carey Co., Philip*, 398.  
*Certain-teed Products Corporation*, 399-401.  
*Hampden Paint & Chemical Co.*, 1320-21.  
*Harrison Works*, 1322-25.  
*Hetzel, Estate of J. G.*, 443.  
*Horn Co., A. C.*, 43.  
*Hydrex Felt & Engineering Co.*, 44.  
*Johns-Manville Co., H. W.*, 402-05.  
*Lowe Brothers Co.*, 1328-29.  
*Natroco Paint & Varnish Works*, 1334.  
*Patent Vulcanite Roofing Co.*, 406-07.  
*Sonneborn Sons, Inc., L.*, 340-41.  
*Standard Paint Co.*, 393.  
*Toch Brothers*, 50-51.  
*Tropical Paint & Oil Co.*, 1335.  
*Warren Chemical & Mfg. Division*, 408-09.  
*Wheeling Corrugating Department*, 242-43.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Anchor*, 408-09.  
*Asphaltus Roof Coating*, 1334.  
*Biegler's*, 39.  
*Cemcoat*, 340-41.  
*Certain-teed*, 399-401.  
*Egyptian*, 1334.  
*Everjet*, 394-97.  
*Flexo-Flint Finish*, 1318.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hetzel's Rub-on*, 443.  
*High Standard*, 1328-29.  
*Hydrex*, 44.  
*Johns-Manville Regal*, 402-05.  
*Neponset*, 390-91.  
*Neponset Paroid*, 390-91.  
*Peacock*, 393.  
*R. I. W.*, 50-51.  
*Ru-ber-ine*, 393.  
*Rubercoat*, 1320-21.  
*Tropical*, 1335.

**Paint, Rustproof**, see **Paint, Metal Protective.**

**Paint, Seam**, see **Calking Compounds and Materials.**

**Paint, Smokestack**, see **Paint, Boiler, Stack and Gas Holder.**

**Paint, Special Formula or Technical.**

*Antakwa Co.*, 37.  
*Biegler Mfg. Co., E. N.*, 39.  
*General Fireproofing Co.*, 42.  
*Horn Co., A. C.*, 43.  
*Hydrex Felt & Engineering Co.*, 44.  
*Lowe Brothers Co.*, 1328-29.  
*Natroco Paint & Varnish Works*, 1334.  
*Sonneborn Sons, Inc., L.*, 340-41.  
*Standard Paint Co.*, 393.  
*Thomson Wood Finishing Co.*, 1364.  
*Toch Brothers*, 50-51.  
*Tropical Paint & Oil Co.*, 1335.  
*Trus-Con Laboratories*, 52-53.  
*U. S. Gutta Percha Paint Co.*, 1336-37.  
*Vortex Mfg. Co.*, 1374.  
*Zibell Damp Resisting Paint Co.*, 57.  
*Antakwa*, 37.  
*Biegler's*, 39.  
*GF*, 42.  
*High Standard*, 1328-29.  
*Hydrex*, 44.  
*N. R. C. Protective*, 1334.

**Paint, Special Formula or Technical—Continued.**

*R. I. W.*, 50-51.  
*Tropical*, 1335.  
*Trus-Con*, 52-53.  
*Vorco*, 1374.

**Paint, Stone**, see **Paint: Brick, Cement, Concrete, Plaster, Stone.**

**Paint, Structural Steel**, see **Paint, Metal Protective.**

**Paint, Technical**, see **Paint, Special Formula or Technical.**

**Paint, Wall and Ceiling**, see **Paint, Interior.**

**Paint, Waterproofing**, see **Waterproofing and Dampproofing Paint and Compounds.**

**Paint, Wire Screen.**

*Harrison Works*, 1322-25.  
*Harrisons*, 1322-25.

**Palm Houses**, see **Greenhouses and Conservatories.**

**Panelboard Cabinets**, see **Cabinets and Boxes, Panelboard.**

**Panelboards.**

(See also **Switchboards.**)

*Benjamin Electric Co.*, 1177.  
*Crouse-Hinds Co.*, 1178.  
*General Electric Co.*, 1153-67.  
*Hart & Hegeman Mfg. Co.*, 1214-15.  
*Holtzer-Cabot Electric Co.*, 1242-45.  
*Mutual Electric & Machine Co.*, 1179.  
*Sprague Electric Works*, 1168.  
*Trumbull Electric Mfg. Co.*, 1218-21.  
*United States Gypsum Co.*, 162-68.  
*Vermont Structural Slate Co.*, 373.  
*Westinghouse Electric & Mfg. Co.*, 1169-76.  
*Benjamin*, 1177.  
*Bull Dog*, 1179.  
*G-E*, 1153-67.  
*H & H*, 1214-15.  
*Safety Service*, 1218-21.  
*Westinghouse*, 1169-76.  
 Specifications, 1153-67.

**Panelboards, Safety.**

*Mutual Electric & Machine Co.*, 1179.  
*Trumbull Electric Mfg. Co.*, 1218-21.  
*Bull Dog*, 1179.  
*Safety Service*, 1218-21.

**Paneling, Church**, see **Trim, Wood.**

**Paneling, Wood**, see **Trim, Wood.**

**Panels, Electric**, see **Panelboards.**

**Panels, Liquid Distributing**, see **Oil Storage and Distributing Systems.**

**Panels, Metal.**

*Badger Wire & Iron Works*, 494-95.  
*Barnum, E. T.*, 496-97.  
*Lyon Metallic Mfg. Co.*, 1420-21.  
*Lyon*, 1420-21.

**Panels, Metering**, see **Panelboards.**

**Panels, Wall, Faience.**

*Rookwood Pottery Co.*, 294-95.

**Panels, Wood.**

*Curtis Service Bureau*, 578-79.  
*North Carolina Pine Association*, 562-63.  
*Curtis*, 578-79.

**Panels, Wood Fiber**, see **Boards, Wall or Ceiling.**

**Panic Exit Locks**, see **Locks, Emergency Exit.**

**Pans, Bidet.**

*Maddock's Sons Co., Thomas*, 835-42.  
*Maddock's*, 835-42.  
*Madelta*, 835-42.  
*Madet*, 835-42.  
 Specifications, 835-42.

**Pans, Splash.**

*Wayne Oil Tank & Pump Co.*, 1480-81.

**Pans, Stable**, see **Stable Fittings and Fixtures.**

**Pans, Sweating.**

*Carbondale Machine Co.*, 1053.

**Pantry Linings**, see Linings, Pantry.

**Pantry Sinks**, see Sinks and Sink Fixtures.

**Paper, Blue Print.**

New York Blue Print Paper Co., 6.  
*Gold Seal*, 6.  
*NYB*, 6.  
*Superior*, 6.

**Paper, Brown Print.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.  
*Superior*, 6.

**Paper, Building**, see Building Papers.

**Paper, Drawing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Paper, Fiber.**

Brown Co., 573.  
*Nibroc*, 573.

**Paper, Insulating**, see Building Papers.

**Paper, Kraft.**

Brown Co., 573.  
*Nibroc*, 573.

**Paper, Roofing**, see Building Papers.

**Paper, Sensitized.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Paper, Sheathing**, see Building Papers.

**Paper, Tracing.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Paper, Wall**, see Wall Papers.

**Paper, Waterproof**, see Building Papers.

**Papers, Wrapping.**

Brown Co., 573.

**Paper Holders**, see Holders, Toilet Paper.

**Papier-mache Work**, see Ornaments: Caen  
 Stone, Cement, Composition, Papier-  
 mache, Plaster, Staff, Stucco, Wood.

**Paraffin Wax Machinery.**

Carbondale Machine Co., 1053.

**Parallel Rule Attachments.**

American Drafting Furniture Co., 1.  
 Economy Drawing Table Co., 2-4.  
 Hamilton Mfg. Co., 5.  
*American*, 1.  
*Economy*, 2-4.

**Parcels Post Chutes**, see Chutes, Mail.

**Park Benches**, see Furniture, Garden and  
 Park.

**Partition Blocks**, see Blocks, Building,  
 Hollow, Fireproof: Blocks, Gypsum.

**Partition Boards**, see Boards, Wall or  
 Ceiling.

**Partition Deadening**, see Sound Deadening  
 Materials.

**Partition Studs**, see Studding, Metal.

**Partitions, Bank and Office.**

Cyclone Fence Co., 546-48.  
 Fiske Iron Works, J. W., 552-53.  
 Folding Partition Co., 769.  
 Grant Pulley and Hardware Co., 770.  
 Hauserman Co., E. F., 1415.  
 Improved Office Partition Co., 771.  
 Solar Metal Products Co., Inc., 645.  
 Watson Mfg. Co., Inc., 1429.  
 Wilson Corporation, J. G., 774-77.  
*Cyclone*, 546-48.  
*Grant*, 770.  
*Hauserman*, 1415.  
*Sectionfold*, 769.  
*Telesco*, 771.  
*Wilson*, 774-77.

**Partitions, Coiling**, see Partitions, Folding  
 or Rolling, Wood or Steel.

**Partitions, Concrete**, see Concrete Con-  
 struction.

**Partitions, Fire Retarding**, see Partitions,  
 Metal or Metal Covered.

**Partitions, Folding or Rolling, Wood or  
 Steel.**

Dodge & Co., H. B., 768.

**Partitions, Folding or Rolling, Wood or  
 Steel—Continued.**

Edwards Mfg. Co., 664-65.  
 Folding Partition Co., 769.  
 Grant Pulley and Hardware Co., 770.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Monroe Screen, Blind & Partition Co.,  
 772.  
 Swedish Venetian Blind Co., 773.  
 Union Blind & Ladder Co., Inc., 778.  
 Wilson Corporation, J. G., 774-77.  
*Acme*, 778.  
*Grant*, 770.  
*Kinnear*, 670-79.  
*Monroe's*, 772.  
*Sectionfold*, 769.  
*Wilson*, 774-77.  
*Wilson's*, 768.  
 Specifications, 769; 774-77.

**Partitions, Glass.**

Bruner Granitoid Co., P. M., 824-26.  
 Grauer & Co., Albert, 824-26.  
 Keppler Glass Constructors, Inc., 831-33.  
 Mesker Brothers Iron Co., 722-25.  
 Mississippi Wire Glass Co., 812-15.  
 Pennsylvania Wire Glass Co., 816-17.  
 Pressed Prism Plate Glass Co., 820.  
 Truscon Steel Co., 702-03.  
 Western Glass Co., 818-19.  
*Bruner*, 824-26.  
*Imperial*, 820.  
*Keppler*, 831-33.  
*Truscon*, 702-03.

**Partitions, Glass, Jail.**

Pauly Jail Building Co., 1488.

**Partitions, Hollow Metal**, see Partitions,  
 Metal or Metal Covered.

**Partitions, Interchangeable**, see Parti-  
 tions, Portable, Wood or Steel.

**Partitions, Kalamein**, see Partitions,  
 Metal or Metal Covered.

**Partitions, Metal Lath, Data on.**

Associated Metal Lath Manufacturers,  
 196-201.

**Partitions, Metal or Metal Covered.**

Alignum Fireproof Products Co., Inc.,  
 646-47.  
 American Steel Window Co., 694-97.  
 Bayley Co., William, 698-99.  
 Central Metallic Door Co., 648.  
 Chesley Co., Inc., A. C., 710-11.  
 Dahlstrom Metallic Door Co., 649-51.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Detroit Steel Products Co., 700-01.  
 Hauserman Co., E. F., 1415.  
 Hughes-Keenan Co., 262-65.  
 Improved Office Partition Co., 771.  
 Interior Metal Mfg. Co., 654-55.  
 Kinnear Mfg. Co., 670-79.  
 Lupton's, Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 McFarland-Hyde Co., 720-21.  
 Manhattan Brass Co., 513.  
 Mesker Brothers Iron Co., 722-25.  
 Newark Cornice and Skylight Works, 726-  
 27.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Sexauer & Lemke, Inc., 262-65.  
 Solar Metal Products Co., Inc., 645.  
 Thorp Fire Proof Door Co., 661-63.  
 Truscon Steel Co., 702-03.  
 Tyler Co., W. S., 529.  
 Watson Mfg. Co., Inc., 1429.  
*Alignum*, 646-47.  
*American*, 694-97.  
*Bayley-Springfield*, 698-99.  
*Chesley*, 710-11.  
*Fenestra*, 700-01.  
*Hauserman*, 1415.  
*Kinnear*, 670-79.  
*Lupton*, 704-08.  
*Lyon*, 1420-21.  
*Pomeroy*, 728-29.  
*Telesco*, 771.  
*Truscon*, 702-03.

**Partitions, Office**, see Partitions, Bank and  
 Office.

**Partitions, Plaster Board.**

United States Gypsum Co., 162-68.  
*Jester-Sackett*, 162-68.  
 Specifications, 162-68.

**Partitions, Portable, Wood or Steel.**

Improved Office Partition Co., 771.  
 Interior Metal Mfg. Co., 654-55.  
*Telesco*, 771.

**Partitions, Rolling, Wood or Steel**, see  
 Partitions, Folding or Rolling, Wood  
 or Steel.

**Partitions, Stall**, see Stable Fittings and  
 Fixtures; Barn Equipment.

**Partitions, Steel**, see Partitions, Metal or  
 Metal Covered.

**Partitions, Stock Room**, see Enclosures,  
 Stock and Tool Room.

**Partitions, Telescoping.**

Improved Office Partition Co., 771.  
*Telesco*, 771.

**Partitions, Toilet**, see Stalls, Shower,  
 Toilet or Urinal.

**Partitions, Urinal or Closet.**

(See also Stalls, Shower, Toilet or Urinal.)  
 Carpenter Mfg. Co., R. F., 868-69.  
 Vitrolite Co., 870-71.  
*Carpenter's*, 868-69.  
*Sanymetal*, 868-69.  
*Vitrolite*, 870-71.

**Partitions, Wire.**

Anchor Post Iron Works, 537-43.  
 Badger Wire & Iron Works, 494-95.  
 Bigelow Wire Works, Cheney, 491.  
 Brook Iron Works, A. T., 544-45.  
 Cyclone Fence Co., 546-48.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Fiske Iron Works, J. W., 552-53.  
 Mack Iron and Wire Works Co., 510-11.  
 Page Steel and Wire Co., 549-51.  
 Pitt Composite Iron Works, William R.,  
 558-59.  
 Price-Evans Foundry Co., 518-19.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Tyler Co., W. S., 529.  
 Wisconsin Iron & Wire Works, 267; 533.  
 Wright Wire Co., 234-35.  
*Cyclone*, 546-48.

**Partitions, Wood.**

Chesley Co., Inc., A. C., 710-11.  
 Folding Partition Co., 769.  
 Grant Pulley and Hardware Co., 770.  
 Improved Office Partition Co., 771.  
 Kinnear Mfg. Co., 670-79.  
 Monroe Screen, Blind & Partition Co.,  
 772.  
 Swedish Venetian Blind Co., 773.  
 Wilson Corporation, J. G., 774-77.  
*Chesley*, 710-11.  
*Grant*, 770.  
*Kinnear*, 670-79.  
*Monroe*, 772.  
*Sectionfold*, 769.  
*Telesco*, 771.  
*Wilson*, 774-77.

**Passenger Elevators**, see Elevators,  
 Freight or Passenger, Power.

**Paste, Calking**, see Calking Compounds  
 and Materials.

**Paste, Linoleum.**

Armstrong Cork Co., 1390-92.  
*Armstrong's*, 1390-92.

**Paste, Waterproofing**, see Waterproofing  
 and Dampproofing Paint and Com-  
 pounds.

**Paste Reducer.**

Harrison Works, 1322-25.  
*Harrisons*, 1322-25.

**Pastry Boards**, see Boards, Pastry.

**Pattern Drawing Machines.**

Snead & Co. Iron Works, Inc., 1424-25.

**Paumelles**, see Hinges.



**Pavement Lights**, see Lights, Vault and Sidewalk.

### **Pavements.**

Ayer & Lord Tie Co., 310.  
Barrett Co., 394-97.  
Bradford Pressed Brick Co., 78-79.  
Central Creosoting Co., 311.  
Ford Mfg. Co., 239.  
Hastings Pavement Co., 308.  
Hydraulic-Press Brick Co., 82-83.  
Ketcham, O. W., 118.  
Kushequa Brick Co., 84-85.  
Rockport Granite Co., 60-61.  
Schouler Cement Construction Co., 789.  
Southern Pine Association, 561.  
United Cork Flooring Co., 328.  
Warren Chemical & Mfg. Division, 309.  
Woodbury Granite Co., 65.  
*Hy-tex*, 82-83.  
*Interior*, 310.  
*Star*, 328.

### **Paving, Asphalt.**

Barrett Co., 394-97.  
Ford Mfg. Co., 239.  
Hastings Pavement Co., 308.  
Warren Chemical & Mfg. Division, 309.  
*Anchor*, 309.  
*Tarvia*, 394-97.  
*Warren's*, 309.

### **Paving, Concrete.**

Schouler Cement Construction Co., 789.

**Paving, Tile**, see Tile, Floor and Wall; Tile, Promenade or Quarry.

### **Paving, Wood Block, Creosoted.**

Ayer & Lord Tie Co., 310.  
Central Creosoting Co., 311.  
Southern Pine Association, 561.

**Paving Blocks**, see Blocks, Paving.

### **Pedestals, Metal.**

Fiske Iron Works, J. W., 552-53.

### **Pedestals, Wood.**

(See also Trim, Wood.)  
Curtis Service Bureau, 578-79.  
*Curtis*, 578-79.

**Pendants**, see Lighting Fixtures.

### **Pens, Live Stock.**

(See also Stable Fittings and Fixtures; Barn Equipment.)  
Fiske Iron Works, J. W., 552-53.  
James Mfg. Co., 1466-70.  
Louden Machinery Co., 1471-73.  
*James*, 1466-70.

**Percolators, Coffee**, see Heating and Cooking Appliances.

### **Perforated Metal.**

Best Register Co., 988-89.  
Clinton Wire Cloth Co., 990-91.  
Highton & Sons Co., Wm., 992-93.  
Tuttle & Bailey Mfg. Co., 985-87.  
*Best*, 988-89.  
*Highton*, 992-93.

### **Pergolas.**

Fischer & Jirouch Co., 1404.  
Hartmann-Sanders Co., 298-99.  
Mathews Mfg. Co., 1402-03.  
Union Metal Mfg. Co., 304.  
*Lock-Joint*, 298-99.  
*Union*, 304.

### **Permeameter.**

Standard Paint Co., 48-49.

### **Photographic Reduction.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Picture Mouldings**, see Mouldings, Picture.

### **Pipe, Conductor.**

**Pier Plates and Brackets**, see Plates and Brackets, Pier.

### **Piers, Concrete.**

Raymond Concrete Pile Co., 12-13.  
White Fireproof Construction Co., 16.

### **Pig Iron.**

Youngstown Sheet & Tube Co., 1074-75.

**Pig Lead**, see Lead.

### **Pilasters, Brass or Bronze.**

American Brass Co., 492-93.

### **Pilasters, Brick.**

Bradford Pressed Brick Co., 78-79.

### **Pilasters, Concrete.**

Trusswall Mfg. Co., 303.

### **Pilasters, Metal.**

Union Metal Mfg. Co., 304.  
Wheeling Corrugating Department, 242-43.  
*Union*, 304.

**Pilasters, Staff**, see Columns: Cement, Composition, Plaster, Staff, etc.

### **Piles, Concrete.**

MacArthur Concrete Pile & Foundation Co., 10-11.  
Mensch, L. J., 302.  
Raymond Concrete Pile Co., 12-13.  
*Raymond*, 12-13.  
Specifications, 10-11; 12-13.

### **Piles, Pipe, Steel.**

MacArthur Concrete Pile & Foundation Co., 10-11.

### **Piles, Wood and Concrete, Combination.**

Mensch, L. J., 302.

### **Piling, Wood, Creosoted.**

Ayer & Lord Tie Co., 310.  
Central Creosoting Co., 311.  
Jennison-Wright Co., 312-13.  
Southern Pine Association, 561.

**Piling Contractors**, see Contractors, Piling.

**Pine Lumber**, see Lumber, Pine.

### **Pipe, Acidproof.**

United Lined Tube & Valve Co., 1072-73.

### **Pipe, Ammonia.**

Automatic Refrigerating Co., 1048-49.  
Youngstown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

### **Pipe, Asphalted.**

Youngstown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

### **Pipe, Clay.**

Bannon Pipe Co., P., 110.  
Sewer Pipe Manufacturers Association, 111.

### **Pipe, Conductor.**

Aspromet Co., 414-16.  
Canton Foundry & Machine Co., 270.  
Chattanooga Roofing & Foundry Co., 499.  
Clason Architectural Metal Works, 358.  
Edwards Mfg. Co., 418-19.  
Fiske Iron Works, J. W., 552-53.  
Messenger & Parks Mfg. Co., 681.  
Milwaukee Corrugating Co., 209.  
Mott Iron Works, J. L., 514-15.  
Stark Rolling Mill Co., 424-25.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co., 241.  
*APM*, 414-16.  
*Interlock*, 209.  
*Milwaukee*, 209.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.

### **Pipe, Corrosionproof.**

United Lined Tube & Valve Co., 1072-73.

**Pipe, Culvert, Vitriefid**, see Pipe, Clay.

### **Pipe, Drill or Drive.**

Youngstown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

**Pipe, Dry Kiln**, see Pipe, Iron or Steel.

### **Pipe, Fill.**

Allen Pressure System Co., Inc., 1474-75.  
Chicago Steel Tank Co., 1482.  
Wayne Oil Tank & Pump Co., 1480-81.  
*Apsco*, 1474-75.

**Pipe, Flanged**, see Pipe, Iron or Steel.

### **Pipe, Galvanized.**

Mannen Co., John E., 1045.  
Youngstown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

**Pipe, Gas**, see Pipe, Iron or Steel.

### **Pipe, Heating and Ventilating.**

Eagle-Picher Lead Co., 875.  
International Heater Co., 968-73.  
Mannen Co., John E., 1045.  
Stark Rolling Mill Co., 424-25.  
*International*, 968-73.  
*Toncan Metal*, 424-25.

### **Pipe, Iron or Steel.**

Simmons Co., John, 1142-43.  
Tyler Underground Heating System, 911.  
Whitlock Coil Pipe Co., 904-06.  
Youngtown Sheet & Tube Co., 1074-75.  
*Tyler*, 911.  
*Youngtown Star Brand*, 1074-75.  
Specifications, 1074-75.

### **Pipe, Lead.**

Eagle-Picher Lead Co., 875.  
Hope & Sons, Henry 716-17.

### **Pipe, Lead or Tin Lined.**

United Lined Tube & Valve Co., 1072-73.  
*United*, 1072-73.

**Pipe, Lidded**, see Casing, Pipe.

### **Pipe, Lined, Brass or Copper.**

United Lined Tube & Valve Co., 1072-73.  
*United*, 1072-73.

### **Pipe, Oil.**

Wayne Oil Tank & Pump Co., 1480-81.  
Youngtown Sheet & Tube Co., 1074-75.  
*Youngstown*, 1074-75.

### **Pipe, Riveted, Steel.**

Walsh & Weidner Boiler Co., 1096.

**Pipe, Sewer**, see Pipe, Clay.

**Pipe, Signal**, see Pipe, Iron or Steel.

**Pipe, Steam**, see Pipe, Iron or Steel.

**Pipe, Steel**, see Pipe, Iron or Steel.

### **Pipe, Tin.**

Eagle-Picher Lead Co., 875.

**Pipe, Water**, see Pipe, Iron or Steel.

**Pipe, Wrought Iron**, see Pipe, Iron or Steel.

**Pipe Bends**, see Coils and Bends, Pipe.

**Pipe Covering**, see Coverings, Pipe and Boiler, Steam or Hot Water.

**Pipe Driving, Artesian Well**, see Artesian Wells.

### **Pipe Driving, Hydraulic Elevator.**

Artesian Well and Supply Co., 1092.

**Pipe Fittings**, see Fittings, Pipe.

**Pipe Flashings**, see Flashings, Roof.

**Pipe Hangers**, see Hangers, Pipe.

### **Pipe Joint Compounds.**

Hetzel, Estate of J. G., 443.  
*Hetzel's*, 443.

**Pipe Railings**, see Railings, Pipe.

**Pipe Sleeves**, see Sleeves, Pipe, Cast Iron.

**Pipe Supports**, see Supports, Pipe.

### **Pipe Taplets, Electric.**

Bryant Electric Co., 1207.  
Hart & Hegeman Mfg. Co., 1214-15.  
*Bryant*, 1207.  
*H & H*, 1214-15.  
*Paiste*, 1214-15.

**Pipe Unions**, see Fittings, Pipe.

### **Piping, Automatic Sprinkler.**

General Fire Extinguisher Co., 1136-39.  
*Grinnell*, 1136-39.

### **Piping, Ice Making and Refrigerating.**

Automatic Refrigerating Co., 1048-49.

### **Piping Schedules, Gas.**

National Commercial Gas Association, 1009.

### **Piping Systems, Underground.**

Tyler Underground Heating System, 911.  
*Tyler*, 911.

### **Pitch, Roofing.**

Barrett Co., 394-97.  
Certain-teed Products Corporation, 399-401.  
Ford Mfg. Co., 239.  
*Barrett Specification*, 394-97.  
*Certain-teed*, 399-401.

**Pitch, Waterproofing.**

Barrett Co., 394-97.  
*Barrett Specification*, 394-97.

**Pivoted Sash**, see Sash, Pivoted.**Pivots, Friction**, see Sash Pivots; Fasteners and Adjusters, Casement or Sash.**Plan Files**, see Filing Equipment; Cabinets, Blue Print.**Plaster Bases.**

Composite Metal Lath Co., 236-38.  
 International Insulation Co., 174.  
*Brick Lath*, 236-38.  
*Terra Cotta Lath*, 236-38.

**Plaster Blocks**, see Blocks, Gypsum.**Plaster Boards**, see Boards, Plaster.**Plaster Bonds.**

American Gypsum Co., 142-44.  
 Antakwa Co., 37.  
 Arco Co., 1316-17.  
 Banner Rock Products Co., 352.  
 Biegler Mfg. Co., E. N., 39.  
 Ceresit Waterproofing Co., 41.  
 Composite Metal Lath Co., 236-38.  
 Garrett & Son Corp., C. S., 392.  
 General Fireproofing Co., 42.  
 Natroco Paint & Varnish Works, 1334.  
 Trus-Con Laboratories, 52-53.  
 United States Gypsum Co., 162-68.  
*Antakwa Plaster Key*, 37.  
*Arco*, 1316-17.  
*Biegler's*, 39.  
*Brick Lath*, 236-38.  
*C.S.G.*, 392.  
*C. W. Co.*, 41.  
*Dum Dum*, 1316-17.  
*GF Nos. 200 and 400*, 42.  
*National Bondkote*, 1334.  
*Rock Cork*, 352.  
*Terra Cotta Lath*, 236-38.  
*Trus-Con*, 52-53.  
*U.S.G.*, 162-68.  
 Specifications, 39; 52-53; 142-44; 162-68.

**Plaster of Paris.**

American Gypsum Co., 142-44.  
 King & Co., J. B., 153.  
 Niagara Gypsum Co., 156.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 United States Gypsum Co., 162-68.  
*Anchor*, 142-44.  
*Champion*, 162-68.  
*King's Diamond*, 153.  
*King's Hillsborough*, 153.  
*King's Snowflake*, 153.  
*Michigan Perfection*, 162-68.  
*Monarch*, 142-44.  
*Niagara*, 156.  
*Peerless*, 157.  
*Quality Calcined Plaster*, 162-68.  
*Riverside*, 160.  
*20th Century*, 142-44.  
*White Rock*, 142-44.

**Plaster Ornaments**, see Ornaments; Caen Stone, Cement, Composition, Papier-mache, Plaster, Staff, Stucco, Wood.**Plastering, Information on.**

Associated Metal Lath Manufacturers, 196-201.

**Plasters, Asbestos.**

American Gypsum Co., 142-44.  
 Reeb Corporation, M. A., 157.  
*Anchor*, 142-44.  
*Monarch*, 142-44.  
*Peerless*, 157.  
*20th Century*, 142-44.

**Plasters, Calcined.**

(See also Plasters, Gypsum.)  
 Grand Rapids Plaster Co., 148-49.  
 United States Gypsum Co., 162-68.  
*Acorn*, 148-49.  
*Challenge*, 162-68.  
*Champion*, 162-68.  
*Golden Seal*, 162-68.  
*Green A*, 148-49.  
*H. R. M.*, 148-49.

**Hovey's Eagle**, 148-49.

*Michigan A*, 162-68.  
*Michigan Perfection*, 162-68.  
*N. Y. Finishing*, 162-68.  
*Plaster of Paris*, 162-68.  
*Quality Calcined Plaster*, 162-68.  
*Quality Finish*, 162-68.  
*Star*, 162-68.

**Plasters, Casting and Moulding.**

Acme Cement Plaster Co., 140-41.  
 American Gypsum Co., 142-44.  
 Garden City Sand Co., 134-37.  
 Plymouth Gypsum Co., 154-55.  
 United States Gypsum Co., 162-68.  
*Anchor*, 142-44.  
*Golden Seal Moulding*, 162-68.  
*New York City Mills*, 162-68.  
*Terra Cotta Moulding*, 162-68.  
*Stonekote*, 134-37.  
*U. S. G.*, 162-68.

**Plasters, Cement**, see Plasters, Gypsum.**Plasters, Concrete, Bonding.**

Empire Gypsum Co., 152.  
 Niagara Gypsum Co., 156.  
 Plymouth Gypsum Co., 154-55.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 Southern Gypsum Co., Inc., 158-59.  
 United States Gypsum Co., 162-68.  
*Concrete Special*, 158-59.  
*Empire*, 152.  
*Kon-Kreet*, 156.  
*Niagara*, 156.  
*Peerless*, 157.  
 Specifications, 158-59.

**Plasters, Dental.**

United States Gypsum Co., 162-68.  
*U. S. G.*, 162-68.

**Plasters, Exterior**, see Stucco.**Plasters, Finishing, Interior.**

Acme Cement Plaster Co., 140-41.  
 American Gypsum Co., 142-44.  
 Best Bros. Keene's Cement Co., 146-47.  
 Empire Gypsum Co., 152.  
 Fowler & Pay, 132.  
 Garden City Sand Co., 134-37.  
 Grand Rapids Plaster Co., 148-49.  
 Kelley Island Lime & Transport Co., 150-51.  
 King & Co., J. B., 153.  
 National Kellastone Co., 138-39.  
 Niagara Gypsum Co., 156.  
 Plymouth Gypsum Co., 154-55.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 Southern Gypsum Co., Inc., 158-59.  
 Texas Cement Plaster Co., 161.  
 United States Gypsum Co., 162-68.  
*Acme*, 140-41.  
*Adamant*, 162-68.  
*Alabaster*, 162-68.  
*Anchor*, 142-44.  
*Baker*, 162-68.  
*Big Four*, 162-68.  
*Buckhorn*, 162-68.  
*Carara*, 158-59.  
*Eldorado*, 162-68.  
*Excelsior*, 152.  
*Flint*, 162-68.  
*Gilt Edge*, 154-55.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Imperial*, 162-68.  
*Iowa*, 154-55.  
*Ivory*, 162-68.  
*Kellastone*, 138-39.  
*King's Superfine Windsor*, 153.  
*Monarch*, 142-44.  
*Natural*, 158-59.  
*Niagara*, 156.  
*O. K.*, 162-68.  
*Pearl Gray*, 158-59.  
*Peerless*, 157.  
*Plymouth Empire*, 154-55.  
*Plymouth Superfine*, 154-55.  
*Pyramid*, 162-68.  
*Rock*, 162-68.

**Plasters, Finishing, Interior—Continued.**

*Stonekote*, 134-37.  
*Texas*, 161.  
*20th Century*, 142-44.  
*U. S. G.*, 162-68.  
*White Quartz Sand Finish*, 158-59.  
*White Rock*, 142-44.  
*Zenith*, 162-68.  
 Specifications, 142-44; 154-55; 158-59; 161; 162-68.

**Plasters, Gaging.**

Rock Plaster Mfg. Co., 160.  
 United States Gypsum Co., 162-68.  
*Challenge*, 162-68.  
*Champion*, 162-68.  
*Golden Seal*, 162-68.  
*Michigan A*, 162-68.  
*Michigan Perfection*, 162-68.  
*N. Y. Finishing*, 162-68.  
*Plaster of Paris*, 162-68.  
*Quality Calcined Plaster*, 162-68.  
*Quality Finish*, 162-68.  
*Star*, 162-68.  
*U. S. G.*, 162-68.  
 Specifications, 162-68.

**Plasters, Gypsum.**

Acme Cement Plaster Co., 140-41.  
 American Gypsum Co., 142-44.  
 Best Bros. Keene's Cement Co., 146-47.  
 Empire Gypsum Co., 152.  
 Fowler & Pay, 132.  
 Garden City Sand Co., 134-37.  
 Grand Rapids Plaster Co., 148-49.  
 Kelley Island Lime & Transport Co., 150-51.  
 King & Co., J. B., 153.  
 National Kellastone Co., 138-39.  
 Niagara Gypsum Co., 156.  
 Plymouth Gypsum Co., 154-55.  
 Reeb Corporation, M. A., 157.  
 Rock Plaster Mfg. Co., 160.  
 Southern Gypsum Co., Inc., 158-59.  
 Texas Cement Plaster Co., 161.  
 United States Gypsum Co., 162-68.  
*Acme*, 140-41.  
*Acolite*, 154-55.  
*Acorn*, 148-49.  
*Adamant*, 162-68.  
*Alabaster*, 162-68.  
*Anchor*, 142-44.  
*Apex*, 140-41.  
*Baker*, 162-68.  
*Big Four*, 162-68.  
*Blue Rock*, 148-49.  
*Blue Seal*, 160.  
*Boone*, 158-59.  
*Buckhorn*, 162-68.  
*Carara*, 158-59.  
*Challenge*, 162-68.  
*Champion*, 162-68.  
*Cherokee*, 158-59.  
*Climax*, 140-41.  
*Concrete*, 154-55.  
*Concrete Special*, 158-59.  
*Crystal*, 148-49.  
*Eldorado*, 162-68.  
*Elephant*, 148-49.  
*Empire*, 152.  
*Excelsior*, 152.  
*Flint*, 162-68.  
*Gilt Edge*, 154-55.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Green A*, 148-49.  
*Gypsum*, 148-49.  
*H.R.M.*, 148-49.  
*Hardernell*, 154-55.  
*Hercules*, 148-49.  
*Hovey's Eagle*, 148-49.  
*Imperial*, 162-68.  
*Independent*, 140-41.  
*Iowa*, 154-55.  
*Iowa Special*, 154-55.  
*Ivory*, 162-68.  
*Jasper Hardwall*, 132.  
*Kellastone*, 138-39.  
*King's*, 153.  
*King's Mountain*, 158-59.



**Plasters, Gypsum—Continued.**

*King's Superfine Windsor*, 153.  
*King's Windsor*, 153.  
*Kon-Kreet*, 156.  
*Laramie Standard*, 140-41.  
*Michigan A*, 162-68.  
*Michigan Perfection*, 162-68.  
*Mission*, 140-41.  
*Monarch*, 142-44.  
*Natural*, 158-59.  
*New York City Mills*, 162-68.  
*N. Y. Finishing*, 162-68.  
*Niagara*, 156.  
*O. K.*, 162-68.  
*Pearl Gray*, 158-59.  
*Peerless*, 157.  
*Plaster of Paris*, 162-68.  
*Plymouth*, 154-55.  
*Plymouth Empire*, 154-55.  
*Plymouth Superfine*, 154-55.  
*Pyramid*, 162-68.  
*Quality Calcined Plaster*, 162-68.  
*Quality Finish*, 162-68.  
*Reliance*, 152.  
*Rock*, 160; 162-68.  
*Royal*, 140-41.  
*Sanded*, 154-55.  
*Star*, 162-68.  
*Stonekote*, 134-37.  
*Superior*, 148-49.  
*Terra Cotta Moulding*, 162-68.  
*Texas*, 161.  
*20th Century*, 142-44.  
*U. S. G.*, 162-68.  
*Walton*, 160.  
*Watauga*, 158-59.  
*White Quartz Sand Finish*, 158-59.  
*White Rock*, 142-44.  
*White Top*, 158-59.  
*Wood Fiber*, 154-55.  
*Zenith*, 162-68.  
 Specifications, 140-41; 142-44; 152; 154-55; 158-59; 161; 162-68.

**Plasters, Hair Fibered.**

(See also Plasters, Gypsum.)  
*American Gypsum Co.*, 142-44.  
*Empire Gypsum Co.*, 152.  
*Grand Rapids Plaster Co.*, 148-49.  
*Southern Gypsum Co., Inc.*, 158-59.  
*United States Gypsum Co.*, 162-68.  
*Adamant*, 162-68.  
*Alabaster*, 162-68.  
*Anchor*, 142-44.  
*Baker*, 162-68.  
*Big Four*, 162-68.  
*Blue Rock*, 148-49.  
*Buckhorn*, 162-68.  
*Crystal*, 148-49.  
*Eldorado*, 162-68.  
*Elephant*, 148-49.  
*Empire*, 152.  
*Flint*, 162-68.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Gypsum*, 148-49.  
*Hercules*, 148-49.  
*Imperial*, 162-68.  
*Ivory*, 162-68.  
*Monarch*, 142-44.  
*O. K.*, 162-68.  
*Pyramid*, 162-68.  
*Rock*, 162-68.  
*20th Century*, 142-44.  
*White Rock*, 142-44.  
*Zenith*, 162-68.  
 Specifications, 142-44; 148-49.

**Plasters, Land.**

*Grand Rapids Plaster Co.*, 148-49.  
*King & Co., J. B.*, 153.  
*United States Gypsum Co.*, 162-68.  
*King's*, 153.  
*U.S.G.*, 162-68.

**Plasters, Lime, Hydrated.**

(See also Plasters, Finishing, Interior.)  
*Kelley Island Lime & Transport Co.*, 150-51.

*United States Gypsum Co.*, 162-68.

**Plasters, Moulding**, see Plasters, Casting and Moulding.**Plasters, Patent**, see Plasters, Gypsum.**Plasters, Pottery.**

*United States Gypsum Co.*, 162-68.  
*U.S.G.*, 162-68.

**Plasters, Prepared**, see Plasters, Gypsum.**Plasters, Pulp.**

*American Gypsum Co.*, 142-44.  
*King & Co., J. B.*, 153.  
*United States Gypsum Co.*, 162-68.  
*Alabaster*, 162-68.  
*Baker*, 162-68.  
*Big Four*, 162-68.  
*Buckhorn*, 162-68.  
*Eldorado*, 162-68.  
*Flint*, 162-68.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Imperial*, 162-68.  
*Ivory*, 162-68.  
*King's Windsor*, 153.  
*O. K.*, 162-68.  
*Pyramid*, 162-68.  
*Rock*, 162-68.  
*20th Century*, 142-44.  
*Zenith*, 162-68.

**Plasters, Sand or White Finish**, see Plasters, Finishing, Interior.**Plasters, Sanded.**

(See also Plasters, Gypsum.)  
*American Gypsum Co.*, 142-44.  
*Empire Gypsum Co.*, 152.  
*Rock Plaster Mfg. Co.*, 160.  
*United States Gypsum Co.*, 162-68.  
*Adamant*, 162-68.  
*Alabaster*, 162-68.  
*Anchor*, 142-44.  
*Baker*, 162-68.  
*Big Four*, 162-68.  
*Buckhorn*, 162-68.  
*Eldorado*, 162-68.  
*Excelsior*, 152.  
*Flint*, 162-68.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Imperial*, 162-68.  
*Ivory*, 162-68.  
*Monarch*, 142-44.  
*O. K.*, 162-68.  
*Pyramid*, 162-68.  
*Rock*, 160; 162-68.  
*20th Century*, 142-44.  
*White Rock*, 142-44.  
*Zenith*, 162-68.

**Plasters, Slow Set.**

*Rock Plaster Mfg. Co.*, 160.  
*Walton*, 160.

**Plasters, Unsanded.**

(See also Plasters, Gypsum.)  
*Niagara Gypsum Co.*, 156.  
*United States Gypsum Co.*, 162-68.  
*Niagara*, 156.

**Plasters, Wall**, see Plasters, Gypsum.**Plasters, Waterproofed.**

*Garden City Sand Co.*, 134-37.  
*Standard Paint Co.*, 48-49.  
*Vitrifyx Co.*, 343.  
*Stonekote*, 134-37.  
*Vitrifyx*, 343.

**Plasters, Wood Fibered.**

(See also Plasters, Gypsum.)  
*Acme Cement Plaster Co.*, 140-41.  
*American Gypsum Co.*, 142-44.  
*Empire Gypsum Co.*, 152.  
*Grand Rapids Plaster Co.*, 148-49.  
*King & Co., J. B.*, 153.  
*Niagara Gypsum Co.*, 156.  
*Plymouth Gypsum Co.*, 154-55.  
*Reeb Corporation, M. A.*, 157.  
*Rock Plaster Mfg. Co.*, 160.  
*Southern Gypsum Co., Inc.*, 158-59.  
*United States Gypsum Co.*, 162-68.  
*Acme*, 140-41.  
*Adamant*, 162-68.  
*Alabaster*, 162-68.  
*Anchor*, 142-44.  
*Baker*, 162-68.  
*Big Four*, 162-68.

**Plasters, Wood Fibered—Continued.**

*Blue Rock*, 148-49.  
*Boone*, 158-59.  
*Buckhorn*, 162-68.  
*Cherokee*, 158-59.  
*Climax*, 148-49.  
*Crystal*, 148-49.  
*Eldorado*, 162-68.  
*Elephant*, 148-49.  
*Flint*, 162-68.  
*Golden Seal*, 162-68.  
*Granite*, 162-68.  
*Hardernell*, 154-55.  
*Imperial*, 162-68.  
*Ivory*, 162-68.  
*King's*, 153.  
*King's Mountain*, 158-59.  
*Monarch*, 142-44.  
*Niagara*, 156.  
*O. K.*, 162-68.  
*Peerless*, 157.  
*Plymouth*, 154-55.  
*Pyramid*, 162-68.  
*Reliance*, 152.  
*Rock*, 162-68.  
*Superior*, 148-49.  
*20th Century*, 142-44.  
*U. S. G.*, 162-68.  
*Walton*, 160.  
*Watauga*, 158-59.  
*White Rock*, 142-44.  
*Zenith*, 162-68.  
 Specifications, 140-41; 142-44; 148-49; 162-68.

**Plate Warmers**, see Heating and Cooking Appliances.**Plates: Brass, Iron, Copper, Steel**, see Plates, Metal.**Plates, Door, Kick or Push.**

*American Brass Co.*, 1071.  
*Brasco Mfg. Co.*, 481.  
*Coulson & Co., J. W.*, 482-83.  
*Detroit Show Case Co.*, 477-80.  
*Lawson Mfg. Co.*, 604-05.  
*Manhattan Brass Co.*, 513.  
*National Mfg. Co.*, 621-25.  
*Pittsburgh Plate Glass Co.*, 484-85.  
*Shelby Spring Hinge Co.*, 606-07.  
*Wisconsin Iron & Wire Works*, 533.  
*Wright Wire Co.*, 234-35.  
*Benedict Nickel*, 1071.  
*Katz*, 604-05.

**Plates, Floor and Ceiling.**

*American Abrasive Metals Co.*, 346.  
*Beaton & Corbin Mfg. Co.*, 935.  
*Chicago Spring Butt Co.*, 602-03.  
*Milwaukee Corrugating Co.*, 421.  
*Snead & Co. Iron Works, Inc.*, 1424-25.  
*B. & C.*, 935.  
*Feralun*, 346.

**Plates, Gutter, Crosswalk.**

*American Cement Tile Mfg. Co.*, 432-33.  
*Canton Foundry & Machine Co.*, 270.

**Plates, Gypsum.**

*King & Co., J. B.*, 153.  
*King's*, 153.

**Plates, Hot**, see Heating and Cooking Appliances.**Plates, Kick and Push**, see Plates, Door, Kick or Push.**Plates, Mending.**

*National Mfg. Co.*, 621-25.

**Plates, Metal.**

*Beaton & Corbin Mfg. Co.*, 935.  
*Duvinage, Pierre*, 260.  
*Milwaukee Corrugating Co.*, 421.  
*Wheeling Corrugating Department*, 242-43.  
*Youngstown Sheet & Tube Co.*, 1074-75.  
*B. & C.*, 935.

**Plates, Name**, see Name Plates, Metal.**Plates, Reinforcing, Concrete**, see Con-Plugs, Floor and Wall.**Plates, Shower, Stamped.**

*Friedley-Voshardt Co.*, 501.

**Plates, Sill.**

Duvinage, Pierre, 260.  
Truscon Steel Co., 217-19.  
Truscon, 217-19.

**Plates, Wall.**

Duplex Hanger Co., 253.  
Duvinage, Pierre, 260.  
Ideal Hanger Co., 256.  
Van Dorn Iron Works Co., 254-55.  
Duplex, 253.

**Plates, Wall, Cement Tile.**

American Cement Tile Mfg. Co., 432-33.  
Bonanza, 432-33.

**Plates and Brackets, Pier.**

Duvinage, Pierre, 260.

**Platforms, Ice Recording.**

Jamison Cold Storage Door Co., 1064-65.

**Platforms, Slate, see Slate, Structural.****Playground Apparatus.**

Medart Mfg. Co., Fred, 1423.  
Medart, 1423.

**Plinths, Iron.**

Covert Co., H. W., 280.  
Hartmann-Sanders Co., 298-99.

**Plinths, Slate.**

Vermont Structural Slate Co., 373.

**Plinths, Tile.**

De Smet Quartz Tile Co., 291.  
Kushequa Ceramic Co., 436-37.  
United States Roofing Tile Co., 440-41.  
De Smet, 291.

**Plugs, Electric, Attachment.**

Benjamin Electric Mfg. Co., 1206.  
Bryant Electric Co., 1207.  
Cutler-Hammer Mfg. Co., 1208-09.  
General Electric Co., 1153-67.  
Hart Mfg. Co., 1212-13.  
Hart & Hegeman Mfg. Co., 1214-15.  
Hubbell, Inc., Harvey, 1216-17.  
Steel City Electric Co., 1222.  
Trumbull Electric Mfg. Co., 1218-21.  
Universal Electric Stage Lighting Co., 1235.  
Western Electric Co., 1202-03.  
Benjamin, 1206.  
Bryant, 1207.  
C-H, 1208-09.  
Campbell, 1222.  
Diamond H., 1212-13.  
G-E, 1153-67.  
H & H, 1214-15.  
Hubbell, 1216-17.  
Paiste, 1214-15.  
Western Electric, 1202-03.

**Plug, Floor and Wall.**

American 3-Way Prism Co., 821.  
Bryant Electric Co., 1207.  
Ketcham, O. W., 118.  
Richmond Screw Anchor Co., 249.  
Van Dorn Iron Works Co., 254-55.  
Bryant, 1207.

**Plumbers and Steam Fitters Supplies.**

Crane Co., 1084-85.  
Crane, 1084-85.

**Plumbing Brass Goods.**

Central Brass Mfg. Co., 852-55.  
Commonwealth Brass Corporation, 1082.  
Crane Co., 1084-85.  
Glauber Brass Mfg. Co., 856-61.  
Hoffmann & Billings Mfg. Co., 863.  
Kenney Mfg. Co., 834.  
Simmons Co., John, 1142-43.  
CC, 1084-85.  
Central, 852-55.  
Glauber, 856-61.  
Quick-pressure, 852-55.

**Plumbing Fittings, Nickel.**

(See also Plumbing, Brass Goods.)  
American Brass Co., 1071.  
Benedict Nickel, 1071.

**Plumbing Fixtures.**

(See also Bathroom Accessories; Closet Seats; Closets; Ejectors, Sewage; Stalls; Shower, Toilet or Urinal; Tanks; Traps; Urinals; Valves.)  
American Brass Co., 1071.

**Plumbing Fixtures—Continued.**

Central Brass Mfg. Co., 852-55.  
Compound Injector & Specialty Co., 872-73.  
Crampton-Farley Brass Co., 874.  
Crane Co., 1084-85.  
Dail Steel Products Co., 850.  
Eagle-Picher Lead Co., 875.  
Fountain Faucet Co., 862.  
Glauber Brass Mfg. Co., 856-61.  
Hoffmann & Billings Mfg. Co., 863.  
Josam Mfg. Co., 876-78.  
Kaustine Co., Inc., 851.  
Kenney Mfg. Co., 834.  
Maddock's Sons Co., Thomas, 835-42.  
Manufacturing Equipment & Engineering Co., 847.  
Matthews & Brother, Inc., W. N., 864-65.  
Monument Pottery Co., 843-46.  
Pauly Jail Building Co., 1488.  
Benedict Nickel, 1071.  
Crane, 1084-85.  
Dehn's, 872-73.  
Glauber, 856-61.  
Ionia, 834.  
Kaustine, 851.  
Maddock's, 835-42.  
Monument, 843-46.  
Niche, 1488.  
Quick-pressure, 852-55.

**Plumbing Fixtures, Hospital.**

Maddock's Sons Co., Thomas, 835-42.  
Maddock's, 835-42.

**Plumbing Fixtures, Porcelain or Vitreous China.**

Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
Maddock's, 835-42.  
Monument, 843-46.

**Plumbing Fixtures, Prison.**

Pauly Jail Building Co., 1488.  
Niche, 1488.

**Plumbing Lead Goods.**

Eagle-Picher Lead Co., 875.

**Plumbing Specialties, see Specific Headings.****Pockets, Stage, Electric.**

Universal Electric Stage Lighting Co., 1235.

**Pockets, Waterproof.**

Universal Electric Stage Lighting Co., 1235.

**Poles, Concrete, Pre-moulded.**

Mensch, L. J., 302.

**Poles, Fire.**

Simmons Co., John, 1142-43.

**Police Stations.**

Barnum Iron Works, E. T., 1487.  
Pauly Jail Building Co., 1488.  
Van Dorn Iron Works Co., 1489.  
Van Dorn, 1489.

**Polishes, Furniture and Floor.**

(See also Wax, Floor.)  
Butcher Polish Co., 1368.  
Butcher's, 1368.  
Butcher's Boston, 1368.  
Butcher's No. 3 Reviver, 1368.

**Polychrome Work, see Terra Cotta, Architectural.****Porch Blinds, Venetian, see Blinds, Awning; Blinds, Ventian.****Porch Column Bases, see Caps and Bases, Column.****Porch Enclosures, see Screens, Door and Window.****Porch Screens, see Screens, Door and Window.****Portable Garages, see Garages, Metal; Garages, Wood.****Portable Houses, see Houses, Portable.****Porte-cochères.**

Lasar Mfg. Co., 506-07.

**Porte-cochères—Continued.**

Smith Wire and Iron Works, F. P., 524-25.  
Wagner Architectural Iron Works, A. F., 530-31.

**Porticos.**

Barnum, E. T., 496-97.

**Portland Cement, see Cement, Portland.****Portraits, Bronze.**

Williams, Inc., Jno., 532.

**Post Caps and Bases, see Caps and Bases, Post.****Posts, Anchor, Galvanized.**

Anchor Post Iron Works, 537-43.

**Posts, Clothes.**

Anchor Post Iron Works, 537-43.

**Posts, Fence.**

American Fence Construction Co., 534-36.  
Anchor Post Iron Works, 537-43.  
Brook Iron Works, A. T., 544-45.  
Central Creosoting Co., 311.  
Cyclone Fence Co., 546-48.  
Fiske Iron Works, J. W., 552-53.  
Page Steel and Wire Co., 549-51.  
Stewart Iron Works Co., 556-57.  
Cyclone, 546-48.

**Posts, Hitching.**

Price-Evans Foundry Co., 518-19.  
Smith Wire and Iron Works, F. P., 524-25.

**Posts, Indicator, Valve.**

Chapman Valve Mfg. Co., 1080-81.  
Pratt & Cady Co., Inc., 1090-91.

**Posts, Lamp, see Standards and Brackets, Lamp.****Posts, Metal, see Posts, Fence.****Posts, Newel, Wood.**

Southern Pine Association, 561.

**Posts, Sign.**

Anchor Post Iron Works, 537-43.  
Fiske Iron Works, J. W., 552-53.

**Posts, Stall.**

James Manufacturing Co., 1466-70.  
Smith Wire and Iron Works, F. P., 524-25.  
James, 1466-70.

**Posts, Wood, see Millwork.****Pot Head Wire, see Wire and Cables, Electric.****Pot Lead, see Lead.****Pottery.**

(See also Furniture, Garden and Park, Terra Cotta; Terra Cotta, Architectural.)  
Atlantic Terra Cotta Co., 112-13.  
Rookwood Pottery Co., 294-95.

**Pottery, Terra Cotta.**

Hood Brick Co., B. Mifflin, 80-81.  
Pottry, 80-81.

**Poultry Netting, see Netting, Wire.****Poultry Runs, see Fencing, Wire or Woven Wire.****Powder, Waterproofing, see Waterproofing and Dampproofing Paint and Compounds.****Power Cable, see Wire and Cables, Electric.****Power Plant Construction, Hydroelectric or Steam.**

Foundation Co., 14.

**Power Transmission Machinery.**

Caldwell Co., Inc., W. E., 1093.  
Link-Belt Co., 1310.

Olson & Co., Samuel, 1312-13.

**Preservatives, Metal, see Paint, Metal Protective.****Preservatives, Road.**

Barrett Co., 394-97.  
Tarvia, 394-97.

**Preservatives, Wood.**

Barber Cre-Sote Stained Shingle Co. Inc., H. S., 381.



**Preservatives, Wood—Continued.**

- Barrett Co., 394-97.  
 Cabot, Inc., Samuel, 1382-85.  
 Carbolineum Wood Preserving Co., 1386.  
 Certain-teed Products Corporation, 399-401.  
 De Soto Paint Mfg. Co., 1319.  
 Ford Mfg. Co., 239.  
 General Fireproofing Co., 42.  
 Horn Co., A. C., 43.  
 Northeastern Co., 1387.  
 Toch Brothers, 50-51.  
*Barrett's Carbosota Creosote*, 394-97.  
*Cabot's*, 1382-85.  
*Certain-teed*, 399-401.  
*Conservo*, 1382-85.  
*Cre-Sote*, 381.  
*GF No. 550*, 42.  
*H. S. Barber's Crest*, 381.  
*Kopper Karbol*, 43.  
*Letteney*, 1387.  
*Memphi*, 1319.  
*Protexol*, 1386.  
*Pyramid*, 239.  
*R. I. W.*, 50-51.  
*Woodcrex*, 43.  
 Specifications, 1386; 1387.

**Pressed Steel Cores**, see Forms, Concrete, Metal.**Presses, Filter, Hydraulic.**

- Carbondale Machine Co., 1053.

**Primers**, see Paint, Priming and Sizing.**Prism Glass**, see Glass, Prism.**Prisons.**

- Pauly Jail Building Co., 1488.  
 Van Dorn Iron Works Co., 1489.  
*Van Dorn*, 1489.

**Projectors, Flood Lighting.**

- (See also Lights, Flood.)  
 General Electric Co., 1153-67.  
*G-E*, 1153-67.

**Proofers, Bakery, Automatic.**

- Olson & Co., Samuel, 1312-13.

**Prospecting, Mineral.**

- Artesian Well and Supply Co., 1092.

**Pull Rings**, see Rings, Pull.**Pulleys, Curtain or Shade.**

- Austral Window Co., 736.  
*Austral*, 736.

**Pulleys, Friction Clutch.**

- Caldwell Co., Inc., W. E., 1093.

**Pulleys, Hay.**

- James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
*James*, 1466-70.

**Pulleys, Overhead**, see Pulleys, Sash.**Pulleys, Sash.**

- American Pulley Co., 757.  
 Columbian Hardware Co., 762.  
 Grant Pulley and Hardware Co., 760-61.  
 L. P. T. Specialty Co., 763.  
*American*, 757; 760-61.  
*Columbian*, 762.  
*Eagle*, 757.  
*Gardner*, 762.  
*Grant*, 760-61.  
*L. P. T.*, 763.  
*Lee*, 760-61.  
*Merit*, 757.  
*Queen*, 760-61.

**Pulleys, Sash, Ball or Roller Bearing.**

- American Pulley Co., 757.  
 Columbian Hardware Co., 762.  
*American*, 757.  
*Columbian*, 762.  
*Gardner*, 762.

**Pulleys, Sash, Pressed Metal.**

- American Pulley Co., 757.  
*American*, 757.  
*Eagle*, 757.  
*Merit*, 757.

**Pulls, Door.**

- Allith-Prouty Co., 614-15.  
 National Mfg. Co., 621-25.

**Pulls, Door—Continued.**

- Reliance-Grant Elevator Equipment Corp., 626-29.  
 Stanley Works, 608-13.  
*Stanley*, 608-13.

**Pulls, Drawer.**

- Allith-Prouty Co., 614-15.

**Pulp.**

- Brown Co., 573.

**Pulpits**, see Furnishings, Church; Contractors, Cut Stone; Ornamental Metal Work.**Pump Cylinders**, see Pumps, Deep Well.**Pump Jacks**, see Jacks, Pump.**Pump Stands**, see Stands, Floor, Valve.**Pumping Machinery**, see Pumps.**Pumping Outfits.**

- Carbondale Machine Co., 1053.  
 Church, Stephen B., 1100.  
 Deming Co., 1104-07.  
 Economy Pumping Machinery Co., 1101.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Kewanee Private Utilities Co., 1112-13.  
 Milwaukee Air Power Pump Co., 1114-15.  
 United Pump & Power Co., 1116-19.  
 Yeomans Brothers Co., 1122-23.  
*Church*, 1100.  
*Economy*, 1101.  
*Kerr*, 1110-11.  
*Kewanee*, 1112-13.  
*Yeomans*, 1122-23.  
 Specifications, 1110-11.

**Pumping Outfits, Portable.**

- Deming Co., 1104-07.

**Pumping Units**, see Pumping Outfits.**Pumps, Acid.**

- United Lined Tube & Valve Co., 1072-73.

**Pumps, Air Displacement.**

- Milwaukee Air Power Pump Co., 1114-15.  
 United Pump & Power Co., 1116-19.

**Pumps, Ammonia.**

- Carbondale Machine Co., 1053.  
 York Mfg. Co., 1055.

**Pumps, Bilge**, see Pumps, Sump.**Pumps, Booster.**

- Kerr Machinery & Supply Co., 1110-11.  
*Kerr*, 1110-11.

**Pumps, Brine.**

- Kerr Machinery & Supply Co., 1110-11.  
*Kerr*, 1110-11.

**Pumps, Centrifugal and Multistage.**

- Chicago Pump Co., 1097.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Sturtevant Co., B. F., 1006-07.  
 Yeomans Brothers Co., 1122-23.  
*Goulds*, 1108-09.  
*Kerr*, 1110-11.  
*Sturtevant*, 1006-07.  
*Yeomans*, 1122-23.

**Pumps, Circulating**, see Pumps, Centrifugal and Multistage.**Pumps, Cistern**, see Pumps, House or Tank.**Pumps, Condensation.**

- Chicago Pump Co., 1097.  
 Connorsville Blower Co., 1102-03.  
 Economy Pumping Machinery Co., 1101.  
 Yeomans Brothers Co., 1122-23.  
*Economy*, 1101.  
*Yeomans*, 1122-23.

**Pumps, Deep Well.**

- Burnett-Larsh Mfg. Co., 1098-99.  
 Church, Stephen B., 1100.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Kewanee Private Utilities Co., 1112-13.  
 Milwaukee Air Power Pump Co., 1114-15.  
 United Pump & Power Co., 1116-19.  
 Vaile-Kimes Co., 1120-21.  
*Church*, 1100.  
*Deming*, 1104-07.

**Pumps, Deep Well—Continued.**

- Duro*, 1098-99.  
*Goulds*, 1108-09.  
*Straight-Line*, 1104-07.  
*V & K*, 1120-21.  
 Specifications, 1104-07.

**Pumps, Diaphragm.**

- Goulds Mfg. Co., 1108-09.  
 United Lined Tube & Valve Co., 1072-73.

**Pumps, Electric Driven.**

- Bishop-Babcock-Becker Co., 914-15.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Chicago Pump Co., 1097.  
 Church, Stephen B., 1100.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Vaile-Kimes Co., 1120-21.  
 Yeomans Brothers Co., 1122-23.  
*Church*, 1100.  
*Duro*, 1098-99.  
*Kerr*, 1110-11.  
*Pyramid*, 1108-09.  
*V & K*, 1120-21.  
*Yeomans*, 1122-23.

**Pumps, Elevator.**

- Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
*Deming*, 1104-07.  
 Specifications, 1104-07.

**Pumps, Feed Water**, see Pumps, Centrifugal and Multistage.**Pumps, Fire Protection.**

- Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.

**Pumps, Force and Lift**, see Pumps, Centrifugal and Multistage.**Pumps, Gasoline**, see Pumps, Oil or Gasoline.**Pumps, Gasoline Engine Driven.**

- (See also Pumping Outfits.)  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Vaile-Kimes Co., 1120-21.  
*Duro*, 1098-99.  
*V & K*, 1120-21.

**Pumps, Hand.**

- Bowser & Co., Inc., S. F., 1476-77.  
 Chicago Steel Tank Co., 1482.  
 Deming Co., 1104-07.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Goulds Mfg. Co., 1108-09.  
 Wayne Oil Tank & Pump Co., 1480-81.  
*Bowser*, 1476-77.  
*G & B*, 1478-79.

**Pumps, House or Tank.**

- Burnett-Larsh Mfg. Co., 1098-99.  
 Chicago Pump Co., 1097.  
 Deming Co., 1104-07.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 United Pump & Power Co., 1116-19.  
 Vaile-Kimes Co., 1120-21.  
 Yeomans Brothers Co., 1122-23.  
*Duro*, 1098-99.  
*G & B*, 1478-79.  
*Kerr*, 1110-11.  
*Marvel*, 1104-07.  
*Pyramid*, 1108-09.  
*V & K*, 1120-21.  
*Yeomans*, 1122-23.

**Pumps, Hydraulic Driven.**

- Bishop-Babcock-Becker Co., 914-15.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.

**Pumps, Lard.**

- Brecht Co., 1050-52.  
 Connorsville Blower Co., 1102-03.

**Pumps, Multistage**, see Pumps, Centrifugal and Multistage.**Pumps, Oil or Gasoline.**

- Bowser & Co., Inc., S. F., 1476-77.

**Pumps, Oil or Gasoline—Continued.**

Chicago Steel Tank Co., 1482.  
 Connersville Blower Co., 1102-03.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Kerr Machinery & Supply Co., 1110-11.  
 Stephenson, C. H., 277.  
 Wayne Oil Tank & Pump Co., 1480-81.  
*Bowser*, 1476-77.  
*G & B*, 1478-79.  
*Kerr*, 1110-11.  
*The Stephenson*, 277.

**Pumps, Oil or Gasoline, Measuring and Sidewalk.**

Allen Pressure System Co., 1474-75.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Chicago Steel Tank Co., 1482.  
 Gilbert & Barker Mfg. Co., 1478-79.  
 Wayne Oil Tank & Pump Co., 1480-81.  
*Bowser*, 1476-77.  
*Chief Sentry*, 1476-77.  
*G & B*, 1478-79.  
*Red Chief*, 1476-77.  
*Red Sentry*, 1476-77.

**Pumps, Plunger, Triplex, see Pumps, Power.****Pumps, Power.**

Bishop-Babcock-Becker Co., 914-15.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Carbondale Machine Co., 1053.  
 Chicago Pump Co., 1097.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Vaile-Kimes Co., 1120-21.  
 Yeomans Brothers Co., 1122-23.  
*Deming*, 1104-07.  
*Duro*, 1098-99.  
*Goulds*, 1108-09.  
*Kerr*, 1110-11.  
*Pyramid*, 1108-09.  
*Yeomans*, 1122-23.  
 Specifications, 1108-09.

**Pumps, Pressure, see Pumps, House or Tank.****Pumps, Rotary, Hand and Power.**

Connersville Blower Co., 1102-03.  
 Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.

**Pumps, Sewage, see Pumps, Sump.****Pumps, Shallow Well, see Pumps, Sump.****Pumps, Soapstock.**

Connersville Blower Co., 1102-03.

**Pumps, Spray.**

Deming Co., 1104-07.

**Pumps, Suction, Triplex.**

Kewanee Private Utilities Co., 1112-13.  
*Kewanee*, 1112-13.

**Pumps, Sump.**

Chicago Pump Co., 1097.  
 Economy Pumping Machinery Co., 1101.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Milwaukee Air Power Pump Co., 1114-15.  
 United Pump & Power Co., 1116-19.  
 Vaile-Kimes Co., 1120-21.  
 Yeomans Brothers Co., 1122-23.  
*Economy*, 1101.  
*Kerr*, 1110-11.  
*V & K*, 1120-21.  
*Yeomans*, 1122-23.

**Pumps, Tank, see Pumps, House and Tank.****Pumps, Tar.**

Connersville Blower Co., 1102-03.

**Pumps, Trench, see Pumps, Diaphragm; Pumps, Sump.****Pumps, Triplex.**

Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Kewanee Private Utilities Co., 1112-13.  
*Goulds*, 1108-09.  
*Kewanee*, 1112-13.  
 Specifications, 1104-07; 1108-09.

**Pumps, Turbine.**

Chicago Pump Co., 1097.

**Pumps, Turbine—Continued.**

Kerr Machinery & Supply Co., 1110-11.  
 Sturtevant Co., B. F., 1006-07.  
*Kerr*, 1110-11.  
*Sturtevant*, 1006-07.

**Pumps, Vacuum, Heating or Air Line.**

(See also Pumps, Condensation.)  
 Bishop-Babcock-Becker Co., 914-15.  
 Brecht Co., 1050-52.  
 Chicago Pump Co., 1097.  
 Connersville Blower Co., 1102-03.  
 Dunham Co., C. A., 916-21.  
 Economy Pumping Machinery Co., 1101.  
 Goulds Mfg. Co., 1108-09.  
 Kerr Machinery & Supply Co., 1110-11.  
 Wing Mfg. Co., L. J., 1008.  
*Dunham-Thompson*, 916-21.  
*Economy*, 1101.  
*Goulds*, 1108-09.  
*Kerr*, 1110-11.  
*Reliable*, 914-15.

**Pumps, Vacuum, Hydraulic.**

Bishop-Babcock-Becker Co., 914-15.  
*Reliable*, 914-15.

**Pumps, Vacuum, Return Line, see Pumps, Vacuum, Heating or Air Line.****Pumps, Vacuum, Valveless.**

Connersville, Blower Co., 1102-03.  
*Connersville*, 1102-03.  
 Specifications, 1102-03.

**Pumps, Water Works.**

(See also Water Supply Systems.)

Deming Co., 1104-07.  
 Goulds Mfg. Co., 1108-09.  
 Vaile-Kimes Co., 1120-21.  
*Deming*, 1104-07.  
*V & K*, 1120-21.  
 Specifications, 1104-07.

**Pumps, Well, see Pumps, Deep Well.****Pumps, Windmill, see Pumps, Deep Well.****Punching Machines, Slate, see Tools, Slaters.****Purifiers, Air, see Air Conditioning Apparatus.****Purifiers, Water.**

(See also Filters, Water.)

International Filter Co., 1124.  
 Loomis-Manning Filter Distributing Co., 1125.  
 National Pipe Bending Co., 902-03.  
 New York Continental Jewell Filtration Co., 1126.  
 Norwood Engineering Co., 1127.

**Push Bars, Door.**

Shelby Spring Hinge Co., 606-07.

**Push Button Specialties.**

Bishop-Babcock-Becker Co., 914-15.  
 Connecticut Telephone & Electric Co., Inc., 1240-41.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Stanley & Patterson, Inc., 1246-55.  
*C-H*, 1208-09.  
*Connecticut*, 1240-41.

**Push Plates, see Plates, Door, Kick or Push.****Putty, Greenhouse, Liquid.**

Weatherproof Calking Co., 1377.  
*Hennen's*, 1377.

**Putty, Lead or Zinc.**

Belknap-Moran-Allen Co., Inc., 1375.  
 Clinton Metallic Paint Co., 1380.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Pecora Paint Co., 1378-79.  
 Weatherproof Calking Co., 1377.  
*Belknap's*, 1375.  
*Clinton*, 1380.  
*Hennen's*, 1377.  
*Holdfast*, 1375.  
*Ojaco*, 1326-27.  
*Ojaco No. 1071*, 1326-27.  
*Pecora*, 1378-79.

**Putty, Metal Sash.**

Belknap-Moran-Allen Co., Inc., 1375.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Pecora Paint Co., 1378-79.  
 Weatherproof Calking Co., 1377.  
*Hennen's*, 1377.  
*Holdfast*, 1375.  
*Ojaco*, 1326-27.  
*Ojaco No. 1071*, 1326-27.  
*Pecora*, 1378-79.

**Putty, Roof, see Cement, Roofing.****Putty, Stove.**

Clinton Metallic Paint Co., 1380.  
*Clinton*, 1380.

**Putty, White Lead, see Putty, Lead or Zinc.**

## Q

**Quarry Waste.**

Woodbury Granite Co., 65.

**Quartered Oak, see Lumber, Oak.****Quartz, Filtering.**

Loomis-Manning Filter Distributing Co., 1125.

**Quoins, Tile.**

Kushequa Ceramic Co., 436-37.

## R

**Racks, Book, see Stacks, Book.****Racks, Bottle.**

Soellner, Herman, 1070.  
*Honeycomb*, 1070.

**Racks, Fur, Cold Storage.**

Hughes-Keenan Co., 262-65.  
 Sexauer & Lemke, Inc., 262-65.

**Racks, Garment.**

Manhattan Brass Co., 513.

**Racks, Hay and Feed, see Stable Fittings and Fixtures; Barn Equipment.****Racks, Stock, see Racks, Storage, Metal.****Racks, Storage, Metal.**

Berger Mfg. Co., 1406-08.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Edwards Mfg. Co., 1410-11.  
 Federal Steel Fixture Co., 1412-13.  
 General Fireproofing Co., 1414.  
 Library Bureau, 1418-19.  
 Lupton's Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 Manufacturing Equipment & Engineering Co., 1422.  
 Medart Mfg. Co., Fred, 1423.  
 Terrell's Equipment Co., 1426-27.  
*GF Allsteel*, 1414.  
*Library Bureau*, 1418-19.  
*Lupton*, 704-08.  
*Lyon*, 1420-21.  
*Medart*, 1423.

**Racks, Towel.**

Searls Mfg. Co., 888-89.

**Racks, Umbrella.**

Manhattan Brass Co., 513.

**Racks and Reels, Hose.**

Allen Mfg. Co., W. D., 1131-33.  
 Majestic Co., 271-73.  
 New York Brass Foundry Co., 1134-35.  
 Safety Fire Extinguisher Co., 1141.  
 Simmons Co., John, 1142-43.  
*Acme*, 1134-35.  
*Bowes*, 1131-33.  
*Duplex*, 1134-35.  
*Lightning*, 1142-43.  
*Star*, 1142-43.  
*Stillbech*, 1134-35.  
*Yale*, 1131-33.

**Radiator Brackets, see Brackets, Wall, Radiator.****Radiator Covers, Air Moistener and Dust Collector.**

Gerdes, Theodore R. N., 462.



**Radiator Covers, Temperature Controlling.**

Fulton Co., 937-38.

*Ja-Nar*, 937-38.

Specifications, 937-38

**Radiator Hoods**, see Hoods, Radiator.**Radiator Shields**, see Shields, Radiator.**Radiators, Electric.**

General Electric Co., 1153-67.

Westinghouse Electric &amp; Mfg. Co., 1169-76.

*G-E*, 1153-67.**Radiators, Gas.**

General Fire Extinguisher Co., 1028.

Hugo Mfg. Co., 1030.

*Grinnell Ready-heat*, 1028.*Hawks*, 1030.

Specifications, 1030.

**Radiators, Sheet Metal.**

American Pressweld Radiator Corporation, 952-53.

*Pressweld*, 952-53.**Radiators, Steam or Hot Water.**

American Pressweld Radiator Corporation, 952-53.

Hart &amp; Crouse Co., 965-67.

Kewanee Boiler Co., 975-77.

*Pressweld*, 952-53.*Kewanee*, 975-77.**Rafters, Metal, Lumber, Metal.****Raggle Blocks**, see Blocks, Raggle.**Ragglet Cement**, see Cement, Ragglet.**Rail Beads**, see Beads, Corner.**Rail Bolts**, see Bolts, Rail.**Railing Fixtures**, see Railings, Metal.**Railings**, see Specific Types; also Rails.**Railings, Balcony.**

Badger Wire &amp; Iron Works, 494-95.

Barnum, E. T., 496-97.

Bureau Brothers, 498.

Chattanooga Roofing and Foundry Co., 499.

Mack Iron and Wire Works Co., 510-11.

Meyers Mfg. Co., Fred J., 516.

Penn Brass &amp; Bronze Works, 517.

Price-Evans Foundry Co., 518-19.

Smith Wire and Iron Works, F. P., 524-25.

Wisconsin Iron &amp; Wire Works, 533.

**Railings, Bank and Office.**

Brook Iron Works, A. T., 544-45.

Fiske Iron Works, J. W., 552-53.

McGann &amp; Sons Co., T. F., 508-09.

Meyers Mfg. Co., Fred J., 516.

Pitt Composite Iron Works, William R., 558-59.

Price-Evans Foundry Co., 518-19.

St. Louis Wire &amp; Iron Co., 523.

Smith Wire and Iron Works, F. P., 524-25.

Wagner Architectural Iron Works, A. F., 530-31.

Wright Wire Co., 234-35.

**Railings, Brass and Bronze**, see Railings, Metal.**Railings, Bridge.**

Mack Iron and Wire Works Co., 510-11.

**Railings, Concrete, Reinforced.**

Trusswall Mfg. Co., 303.

**Railings, Counter**, see Railings, Bank and Office.**Railings, Iron**, see Railings, Metal.**Railings, Mausoleum.**

Gorham Co Architectural Bronze, 502-03.

**Railings, Metal.**

American Brass Co., 1071.

American Fence Construction Co., 534-36.

Anchor Post Iron Works, 537-43.

Badger Wire &amp; Iron Works, 494-95.

Barnum, E. T., 496-97.

Bigelow Wire Works, Cheney, 491.

Brasco Mfg. Co., 481.

Brook Iron Works, A. T., 544-45.

**Railings, Metal—Continued.**

Chattanooga Roofing &amp; Foundry Co., 499.

Creswell Iron Works, Samuel J., 258-59.

Cyclone Fence Co., 546-48.

Duvinage, Pierre, 260.

Eastern Bridge &amp; Structural Co., 18-19.

Fiske Iron Works, J. W., 552-53.

Gorham Co Architectural Bronze, 502-03.

Hughes-Keenan Co., 262-65.

Irving Forge, W., 505.

Jackson Co., Wm. H., 512.

Lasar Mfg. Co., 506-07.

McGann &amp; Sons Co., T. F., 508-09.

Mack Iron and Wire Works Co., 510-11.

Manhattan Brass Co., 513.

Mesker Brothers Iron Co., 722-25.

Meyers Mfg. Co., Fred J., 516.

Mott Iron Works, J. L., 514-15.

Page Steel and Wire Co., 549-51.

Penn Brass &amp; Bronze Works, 517.

Pitt Composite Iron Works, William R., 558-59.

Polachek Bronze &amp; Iron Co., John, 522.

Reed &amp; Barton, 520-21.

St. Louis Wire &amp; Iron Co., 523.

Sexauer &amp; Lemke, Inc., 262-65.

Smith Wire and Iron Works, F. P., 524-25.

Smyser-Royer Co., 528.

Snow Iron Works, Inc., W. A., 554-55.

Stewart Iron Works Co., 556-57.

Tiffany Studios, 526-27.

Wagner Architectural Iron Works, A. F., 530-31.

Wisconsin Iron &amp; Wire Works, 533.

Wright Wire Co., 234-35.

*Benedict Nickel*, 1071.*Cyclone*, 546-48.*W. Irving*, 505.**Railings, Office**, see Railings, Bank and Office.**Railings, Pipe.**

Anchor Post Iron Works, 537-43.

Duvinage, Pierre, 260.

Fiske Iron Works, J. W., 552-53.

Mack Iron and Wire Works Co., 510-11.

Mesker Brothers Iron Co., 722-25.

St. Louis Wire &amp; Iron Co., 523.

Smith Wire and Iron Works, F. P., 524-25.

Williams, Inc., Jno., 532.

Wisconsin Iron &amp; Wire Works, 533.

**Railings, Stair.**

(See also Balustrades.)

Barnum, E. T., 496-97.

Jackson Co., Wm. H., 512.

Mesker Brothers Iron Co., 722-25.

Page Steel and Wire Co., 549-51.

Penn Brass &amp; Bronze Works, 517.

Reed &amp; Barton, 520-21.

Tiffany Studios, 526-27.

Williams, Inc., Jno., 532.

**Railings, Theater**, see Railings, Metal.**Railings, Tube**, see Railings, Pipe.**Railings, Wire.**

Badger Wire &amp; Iron Works, 494-95.

Barnum, E. T., 496-97.

Brook Iron Works, A. T., 544-45.

Fiske Iron Works, J. W., 552-53.

Mesker Brothers Iron Co., 722-25.

Smith Wire and Iron Works, F. P., 524-25.

Snow Wire Works, Inc., W. A., 554-55.

**Railings, Wood.**

Indiana Lumber &amp; Mfg. Co., 580-81.

North Carolina Pine Association, 562-63.

**Rails, Altar.**

McGann &amp; Sons Co., T. F., 508-09.

Polachek Bronze &amp; Iron Co., John, 522.

**Rails, Chair.**

Dahlstrom Metallic Door Co., 649-51.

**Rails, Chalk.**

Dudfield Mfg. Co., 380.

*Dudfield's Dustless*, 380.**Rails, Door**, see Guards, Door and Window; Track, Door.**Rails, Foot.**

Wright Wire Co., 234-35.

**Rails, Hand.**

American Brass Co., 492-93.

Mesker Brothers Iron Co., 722-25.

Searls Mfg. Co., 888-89.

Wisconsin Iron &amp; Wire Works, 533.

**Rails, Sidewalk.**

Truscon Steel Co., 217-19.

*Kahn*, 217-19.*Truscon*, 217-19.**Rails, Wood.**

Morgan Co., 584-85.

Southern Pine Association, 561.

**Railways, Inclined.**

Otis Elevator Co., 1280-84.

*Otis*, 1280-84.**Rams, Hydraulic.**

Deming Co., 1104-07.

Goulds Mfg. Co., 1108-09.

**Ranges, Cabinet.**

Cox Stove Co., Abram, 960-64.

Estate Stove Co., 1205.

Thatcher Furnace Co., 982-84.

Thomas, Roberts, Stevenson Co., 1014.

*Estate*, 1205.*Fortune*, 1014.*Novelty Kitchener*, 960-64.*Suburban Novelty*, 960-64.*Thatcher*, 982-84.*Twin-Fire*, 982-84.*Yearound Novelty*, 960-64.**Ranges, Coal.**

Bramhall, Deane Co., 1010-11.

Cox Stove Co., Abram, 960-64.

Estate Stove Co., 1205.

Thatcher Furnace Co., 982-84.

*Deane*, 1010-11.*Estate*, 1205.*Novelty Kitchener*, 960-64.*Thatcher*, 982-84.**Ranges, Coal and Electric, Combination.**

Estate Stove Co., 1205.

*Estate*, 1205.**Ranges, Coal and Gas, Combination.**

Bramhall, Deane Co., 1010-11.

Cox Stove Co., Abram, 960-64.

Thatcher Furnace Co., 982-84.

*Deane*, 1010-11.*Duplex Novelty*, 960-64.*Junior Yearound Novelty*, 960-64.*Novelty Kitchener*, 960-64.*Suburban Novelty*, 960-64.*Thatcher*, 982-84.*Twin-Fire*, 982-84.*Yearound Novelty*, 960-64.**Ranges, Double Oven.**

Cox Stove Co., Abram, 960-64.

Thomas, Roberts, Stevenson Co., 1014.

*Fortune*, 1014.*French Novelty*, 960-64.*Home Novelty*, 960-64.*Regal Novelty*, 960-64.**Ranges, Electric.**

Bramhall, Deane Co., 1010-11.

Edison Electric Appliance Co., Inc., 1204.

Estate Stove Co., 1205.

General Electric Co., 1153-67.

Western Electric Co., 1202-03.

Westinghouse Electric &amp; Mfg. Co., 1169-76.

*Deane*, 1010-11.*Estate*, 1205.*G-E*, 1153-67.*Hughes*, 1204.*Western Electric*, 1202-03.**Ranges, Electric, Information on.**

Society for Electrical Development, Inc., 1145-52.

**Ranges, French.**

Bramhall, Deane Co., 1010-11.

*Deane*, 1010-11.

Specifications, 1010-11.

**Ranges, Gas.**

Bramhall, Deane Co., 1010-11.  
Crane Co., William M., 1012-13.  
Thomas, Roberts, Stevenson Co., 1014.  
Deane, 1010-11.  
Fortune, 1014.  
Vulcan, 1012-13.

**Ranges, Gas and Electric, Combination.**

Westinghouse Electric & Mfg. Co., 1169-76.

**Ranges, Wood Burning.**

Bramhall, Deane Co., 1010-11.

**Ratchet Dampers, see Dampers, Fire-place.****Receivers, Air.**

Walsh & Weidner Boiler Co., 1096.

**Receivers, Alternating.**

Thermograde Valve Co., 913.  
Van Auker, 913.

**Receivers, Ammonia.**

Automatic Refrigerating Co., 1048-49.

**Receivers, Ash.**

Gillis & Geoghegan, 1299-1305.  
Sharp Rotary Ash Receiver Co., Inc., 954-55.  
Stephenson, C. H., 277.  
G & G, 1299-1305.  
Sharp, 954-55.  
The Stephenson, 277.  
Specifications, 954-55.

**Receivers, Ash, Rotary.**

Sharp Rotary Ash Receiver Co., Inc., 954-55.  
Sharp, 954-55.

**Receivers, Ash, Underfloor.**

Sharp Rotary Ash Receiver Co., Inc., 954-55.  
Stephenson, C. H., 277.  
Sharp, 954-55.  
The Stephenson, 277.

**Receivers, Condensation.**

American District Steam Co., 912.  
Chicago Pump Co., 1097.  
Economy Pumping Machinery Co., 1101.  
Adco, 912.  
Economy, 1101.

**Receivers, Garbage.**

Colonial Fireplace Co., 279.  
Majestic Co., 271-73.  
Sharp Rotary Ash Receiver Co., Inc., 954-55.  
Stephenson, C. H., 277.  
Bestovall, 279.  
Majestic, 271-73.  
Sharp, 954-55.  
The Stephenson, 277.

**Receivers, Garbage, Built-in.**

Majestic Co., 271-73.  
Majestic, 271-73.

**Receivers, Garbage and Refuse, Under-ground.**

Majestic Co., 271-73.  
Sharp Rotary Ash Receiver Co., Inc., 954-55.  
Stephenson, C. H., 277.  
Sharp, 954-55.  
The Stephenson, 277.

**Receivers, Milk and Package.**

Majestic Co., 271-73.  
Majestic, 271-73.

**Receivers, Package, see Receivers, Milk and Package.****Receivers, Refuse, Street and Park.**

Majestic Co., 271-73.  
Stephenson, C. H., 277.  
The Stephenson, 277.

**Receptacles, Electric.**

Benjamin Electric Mfg. Co., 1206.  
Bryant Electric Co., 1207.  
Crouse-Hinds Co., 1178.  
Cutler-Hammer Mfg. Co., 1208-09.  
General Electric Co., 1153-67.  
Hart Mfg. Co., 1212-13.  
Hart & Hegeman Mfg. Co., 1214-15.

**Receptacles, Electric—Continued.**

Hubbell, Inc., Harvey, 1216-17.  
Steel City Electric Co., 1222.  
Trumbull Electric Mfg. Co., 1218-21.  
Universal Electric Stage Lighting Co., 1235.  
Western Electric Co., 1202-03.  
Benjamin, 1206.  
Bryant, 1207.  
C-H, 1208-09.  
Campbell, 1222.  
Diamond H, 1212-13.  
G-E, 1153-67.  
H & H, 1214-15.  
Hubbell, 1216-17.  
New Wrinkle, 1207.  
Paiste, 1214-15.  
Western Electric, 1202-03.  
Specifications, 1153-67.

**Receptacles, Electric, Automatic Flush, see Receptacles, Electric.****Receptacles, Electric, Canopy Plug, see Receptacles, Electric.****Receptacles, Electric, Conduit, see Receptacles, Electric.****Receptacles, Electric, Pilot Lamp, see Receptacles, Electric.****Receptacles, Electric, Plug and Lamp, see Receptacles, Electric.****Receptacles, Electric, Porcelain, see Receptacles, Electric.****Receptors, Shower or Needle.**

(See also Slate, Structural; Glass, Structural.)  
Monument Pottery Co., 843-46.  
Monument, 843-46.

**Recorders, Time.**

Eco Clock Co., 1442.  
Holtzer-Cabot Electric Co., 1242-45.  
Newman Clock Co., 1443.  
Standard Electric Time Co., 1450.  
Stanley & Patterson, Inc., 1246-55.  
Time-Systems Co., 1448-49.  
Boston, 1442.  
Eco, 1442.  
Hahl, 1448-49.  
Standard, 1450.

**Recording Oil or Gasoline Meters, see Meters, Oil or Gasoline.****Rectifiers, Electric.**

General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
G-E, 1153-67.  
Tungar, 1153-67.  
Westinghouse-Cooper-Hewitt, 1169-76.

**Red Lead.**

Carter White Lead Co., 1315.  
Eagle-Picher Lead Co., 875.  
Harrison Works, 1322-25.  
Carter, 1315.  
Eagle, 875.  
Harrisons, 1322-25.

**Red Oak, see Lumber, Oak.****Reflectors, Glass Lined.**

National X-Ray Reflector Co., 1231.  
Universal Electric Stage Lighting Co., 1235.  
Kleigl, 1235.  
X-Ray, 1231.

**Reflectors, Lighting.**

Benjamin Electric Mfg. Co., 1206.  
Ivanhoe-Regent Works, 1228-29.  
Luminous Unit Co., 1227.  
National X-Ray Reflector Co., 1231.  
Reflectolyte Co., 1232-34.  
Universal Electric Stage Lighting Co., 1235.  
Benjamin, 1206.  
Brascolite, 1227.  
Holophane, 1228-29.  
Ivanhoe, 1228-29.  
Reflectolyte, 1232-34.  
Regent, 1228-29.  
X-Ray, 1231.

**Reflectors, Lighting, Glass or Glass Lined, see Glassware, Illuminating.****Reflectors, Lighting, Metal.**

Benjamin Electric Mfg. Co., 1206.  
Ivanhoe-Regent Works, 1228-29.  
Reflectolyte Co., 1232-34.  
Benjamin, 1206.  
Ivanhoe, 1228-29.  
Reflectolyte, 1232-34.  
Reflectolyte Junior, 1232-34.  
Regent, 1228-29.

**Reflectors, Mirror Lined.**

National X-Ray Reflector Co., 1231.  
X-Ray, 1231.

**Refrigerating Controlling Device, see Safety Devices, Refrigerating, Automatic.****Refrigerating Machinery, see Ice Making and Refrigerating Machinery.****Refrigerating Safety Devices, see Safety Devices, Refrigerating, Automatic.****Refrigeration Thermostats, see Thermostats, Refrigeration.****Refrigerator Insulation, see Insulation, Cold Storage and Refrigerating; Sound Deadening Materials; Building Papers; Felt, Insulating and Sheathing.****Refrigerators and Coolers.**

Brecht Co., 1050-52.  
Fearless Dishwasher Co., Inc., 1034.  
Fritts-Gilbert Refrigerator Co., 1059.  
Guardian Refrigerator Co., 1056.  
Herrick Refrigerator Co., 1060-61.  
Isko, Inc., 1057.  
McCray Refrigerator Co., 1062.  
Seeger Refrigerator Co., 1063.  
Stark Rolling Mill Co., 424-25.  
Barron, 1034.  
Fritts-Gilbert, 1059.  
Herrick, 1060-61.  
Isko, 1057.  
McCray, 1062.  
Seeger, 1063.  
Toncan Metal, 424-25.  
Specifications, 1060-61.

**Refrigerators and Coolers, Display.**

Fritts-Gilbert Refrigerator Co., 1059.  
Herrick Refrigerator Co., 1060-61.  
McCray Refrigerator Co., 1062.  
Seeger Refrigerator Co., 1063.  
Fritts-Gilbert, 1059.  
Herrick, 1060-61.  
McCray, 1062.

**Refrigerators and Coolers, Mechanical. (See also Ice Making and Refrigerating Machinery.)**

Fritts-Gilbert Refrigerator Co., 1059.  
Guardian Refrigerator Co., 1056.  
Isko, Inc., 1057.  
McCray Refrigerator Co., 1062.  
Fritts-Gilbert, 1059.  
Guardian Refrigerator, 1056.  
Isko, 1057.  
McCray, 1062.

**Refrigerators and Coolers, Mortuary.**

McCray Refrigerator Co., 1062.  
McCray, 1062.

**Refrigerators and Coolers, Special.**

Fritts-Gilbert Refrigerator Co., 1059.  
Herrick Refrigerator Co., 1060-61.  
McCray Refrigerator Co., 1062.  
Seeger Refrigerator Co., 1063.  
Fritts-Gilbert, 1059.  
Herrick, 1060-61.  
McCray, 1062.  
Seeger, 1063.

**Refuse Receivers, see Receivers, Refuse.****Register Boxes, see Boxes, Register.****Register Faces, see Registers, Heating and Ventilating.****Register Fittings, see Fittings, Register.****Registers, Floor or Wall, see Registers, Heating and Ventilating.****Registers, Heating and Ventilating.**

(See also Grilles, Metal.)  
Best Register Co., 988-89.



**Registers, Heating and Ventilating—Continued.**

Clinton Wire Cloth Co., 990-91.  
Highton & Sons Co., Wm., 992-93.  
Majestic Co., 271-73.  
Rock Island Register Co., 994-95.  
Tuttle & Bailey Mfg. Co., 985-87.  
*Best*, 988-89.  
*Duplex*, 271-73.  
*Highton*, 992-93.  
*No Streak*, 994-95.  
*Rock Island*, 994-95.

**Registers, Semisteel**, see Registers, Heating and Ventilating.**Registers, Special**, see Registers, Heating and Ventilating.**Regulators, Clock**, see Clocks, Regulator.**Regulators, Damper.**

American District Steam Co., 912.  
Atlas Valve Co., 940-41.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
Minneapolis Heat Regulator Co., 948-49.  
Powers Regulator Co., 947; 950-51.  
Webster & Co., Warren, 932-34.  
Wing Mfg. Co., L. J., 1008.  
*Adsc*, 912.  
*Dunham*, 916-21.  
*Powers*, 950-51.  
*Victor*, 940-41.  
*Webster*, 932-34.

**Regulators, Fan Engine.**

Atlas Valve Co., 940-41.

**Regulators, Feed Water.**

Atlas Valve Co., 940-41.  
Wing Mfg. Co., L. J., 1008.

**Regulators, Furnace**, see Regulators, Damper.**Regulators, Heat**, see Regulators, Temperature.**Regulators, Humidity.**

(See also Humidostats.)  
Atlas Valve Co., 940-41.

**Regulators, Illumination, Clock.**

Howard Clock Co., E., 1444-45.

**Regulators, Motor Speed.**

Cutler-Hammer Mfg. Co., 1208-09.  
*C-H*, 1208-09.

**Regulators, Pressure.**

Atlas Valve Co., 940-41.  
Bishop-Babcock-Becker Co., 914-15.  
Milwaukee Air Power Pump Co., 1114-15.  
*Atlas*, 940-41.

**Regulators, Temperature.**

Atlas Valve Co., 940-41.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Fulton Co., 937-38.  
Johnson Service Co., 942-46.  
Minneapolis Heat Regulator Co., 948-49.  
Moline Heat, 939.  
Powers Regulator Co., 947; 950-51.  
Sarco Co., Inc., 931.  
Webster & Co., Warren, 932-34.  
Western Electric Co., 1202-03.  
*American Utilostat*, 914-15.  
*Dunham*, 916-21.  
*Ja-Nar*, 937-38.  
*Johnson*, 942-46.  
*Minneapolis*, 948-49.  
*Powers*, 947; 950-51.  
*Sarco*, 931.  
*Webster*, 932-34.  
*Western Electric*, 1202-03.  
Specifications, 942-46; 948-49.

**Regulators, Thermostatic**, see Regulators, Temperature.**Reports, Timber.**

Carbolineum Wood Preserving Co., 1386.

**Reproductions, Lithographic.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Reproductions, Lytho-zinc.**

New York Blue Print Paper Co., 6.  
*NYB*, 6.

**Reredos**, see Furnishings, Church.**Restaurant Fixtures**, see Specific Headings.**Rheostats.**

Cutler-Hammer Mfg. Co., 1208-09.  
*C-H*, 1208-09.

**Riddles, Foundry.**

Darby & Sons Co., Inc., Edward, 1409.  
Wright Wire Co., 234-35.

**Ridge Rolls**, see Roof Trimmings.**Ridging, Ventilated**, see Ventilators; Ridging.**Rings, Pull.**

Irving Forge, W., 505.  
*W. Irving*, 505.

**Rip Rap.**

National Building Granite Quarries Association, 58-59.  
Woodbury Granite Co., 65.

**Risers, Stair**, see Treads and Risers, Stair.**Road Boxes, Cast Iron**, see Castings, Iron.**Roads, Concrete**, see Paving, Concrete.**Roadway Grates**, see Castings, Iron.**Rods: Brass, Copper, German Silver and Nickel.**

American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Rods, Tie or Truss.**

Chattanooga Roofing & Foundry Co., 499.  
Duvinage, Pierre, 260.  
Price-Evans Foundry Co., 518-19.  
Smith Wire and Iron Works, F. P., 524-25.  
Wagner Architectural Iron Works, A. F., 530-31.

**Rods, Wire.**

Youngstown Sheet & Tube Co., 1074-75.

**Roller Inclines**, see Chutes, Gravity, Straight or Spiral, Merchandise.**Roller Spirals**, see Chutes, Gravity, Straight or Spiral, Merchandise.**Rollers, Barn Door**, see Hardware, Door.**Rollers, Gravity**, see Conveyors, Gravity.**Rood Screens**, see Furnishings, Church.**Roof, Thatched.**

Transfer Stained Shingle Co., Inc., 384.

**Roof Construction, Fireproof.**

American Cement Tile Mfg. Co., 432-33.  
Aspromet Co., 414-16.  
Barton Spider-Web System, 20-21.  
Berger Mfg. Co., 176-82; 202-05.  
Brown Hoisting Machinery Co., 184-85.  
Corrugated Bar Co., 190-92.  
Federal Cement Tile Co., 429-31.  
Flexner-Taylor Co., 320.  
General Fireproofing Co., 210-13.  
Mende, Paul, 321.  
National Fire Proofing Co., 100-05.  
Taylor Co., N. & G., 426-28.  
Uni-Form Co., 27-29.  
United States Gypsum Co., 438-39.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*Aspromet*, 414-16.  
*Bonanza*, 432-33.  
*Corr-Mesh*, 190-92.  
*Federal*, 429-31.  
*Ferroinclave*, 184-85.  
*Flex-or-Crete*, 320.  
*Metal Lumber*, 176-82.  
*Nailcode*, 321.  
*Natco*, 100-05.  
*Pyrobar*, 438-39.  
*Self-Sentering*, 210-13.  
Specifications, 190-92.

**Roof Construction, Glass.**

(See also Skylights, Glass.)  
Bruner Granitoid Co., P. M., 824-26.  
Grauer & Co., Albert, 824-26.  
Keppler Glass Constructions, Inc., 831-33.  
Pennsylvania Wire Glass Co., 816-17.

**Roof Construction, Glass—Continued.**

*Bruner*, 824-26.  
*Keppler*, 831-33.

**Roof Construction, Gypsum, Reinforced**, see Roof Construction, Fireproof.**Roof Crestings**, see Roof Trimmings, Metal.**Roof Lights**, see Skylights; Lights, Vault and Sidewalk.**Roof Snow Guards**, see Guards, Snow, Roof.**Roof Trimmings, Asbestos.**

Johns-Manville Co., H. W., 386-87.  
National Asbestos Mfg. Co., 385.  
*Johns-Manville*, 386-87.  
*National*, 385.

**Roof Trimmings, Metal.**

American Sheet and Tin Plate Co., 412-13.  
Aspromet Co., 414-16.  
Chattanooga Roofing & Foundry Co., 499.  
Clason Architectural Metal Works, 358.  
Consolidated Sheet Metal Works, 712-13.  
Edwards Mfg. Co., 418-19.  
Friedley-Voshardt Co., 501.  
Hope & Sons, Henry, 716-17.  
Josam Mfg. Co., 876-78.  
Merchant & Evans Co., 420.  
Messenger & Parks Mfg. Co., 681.  
Meurer Bros. Co., Inc., 422-23.  
Milwaukee Corrugating Co., 421.  
Mott Iron Works, J. L., 514-15.  
Smith Wire and Iron Works, F. P., 524-25.  
Stark Rolling Mill Co., 424-25.  
Wagner Architectural Iron Works, A. F., 530-31.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co., 241.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*M & E Co.*, 420.  
*Meurer*, 422-23.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.

**Roof Trimmings, Terra Cotta.**

Campfield Raggle Block Co., 108-09.  
Hood Brick Co., B. Mifflin, 80-81.  
Huntington Roofing Tile Co., 434-35.  
*Campfield*, 108-09.  
*Pottery*, 80-81.

**Roof Trimmings, Tile.**

American Cement Tile Mfg. Co., 432-33.  
Federal Cement Tile Co., 429-31.  
Huntington Roofing Tile Co., 434-35.  
Kushequa Ceramic Co., 436-37.  
United States Roofing Tile Co., 440-41.  
*Bonanza*, 432-33.  
*Federal*, 429-31.  
*Huntington*, 434-35.  
*Kushequa*, 436-37.  
*Ox-blood*, 436-37.

**Roof Vent Connections**, see Vent Connections, Roof.**Roofers Supplies.**

(See also Tools, Roofers; Tools, Slaters.)  
Friedley-Voshardt Co., 501.  
Merchant & Evans Co., 420.  
Sheldon Slate Co., F. C., 370-72.  
*M & E Co.*, 420.  
*Sheldon's*, 370-72.

**Roofing, Asbestos.**

Aspromet Co., 414-16.  
Barrett Co., 394-97.  
Carey Co., Philip, 398.  
Johns-Manville Co., H. W., 386-87; 402-05.  
National Asbestos Mfg. Co., 385.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*Barrett Specification*, 394-97.  
*Carey*, 398.  
*Johns-Manville*, 386-87; 402-05.  
*Johns-Manville Phoenix*, 402-05.  
*National*, 385.

**Roofing, Asphalt.**

Asphalt Ready Roofing Co., 388.  
 Certain-teed Products Corporation, 399-401.  
 Ford Mfg. Co., 239.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Warren Chemical & Mfg. Division, 408-09.  
*Anchor*, 408-09.  
*Arrow*, 388.  
*Certain-teed*, 399-401.  
*National*, 389.  
*Natroco*, 389.  
*Protection*, 388.  
*Rockland*, 388.  
*Security Wide-weld*, 389.  
*Sparkloid*, 389.  
*Vulcanite*, 406-07.

**Roofing, Built-up.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 172; 398.  
 Certain-teed Products Corporation, 399-401.  
 Johns-Manville Co., H. W., 402-05.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Ajax*, 402-05.  
*Anchor*, 408-09.  
*Barrett Specification*, 394-97.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*Johns-Manville*, 402-05.  
*Neponset*, 390-91.  
*Ru-ber-oid*, 393.  
*Security Wide-weld*, 389.  
*Vulcanite*, 406-07.  
 Specifications, 394-97; 398; 402-05; 406-07; 408-09.

**Roofing, Canvas.**

Barrell Co., William L., 410.  
 Boyle & Co., Inc., John, 411.  
 Hydrex Felt & Engineering Co., 44.  
 Standard Paint Co., 393.  
*Bayonne*, 411.  
*Con-Ser-Tex*, 410.  
*Gulf Stream*, 411.  
*Hydrex*, 44.  
*SPC*, 393.  
 Specifications, 410-11.

**Roofing, Cement, Flexible.**

Carey Co., Philip, 398.  
*Carey*, 398.

**Roofing, Corrugated.**

American Sheet and Tin Plate Co., 412-13.  
 Aspromet Co., 414-16.  
 Edwards Mfg. Co., 418-19.  
 Johns-Manville Co., H. W., 402-05.  
 Merchant & Evans Co., 420.  
 Milwaukee Corrugating Co., 209.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Youngstown Sheet & Tube Co., 1074-75.  
*APM*, 414-16.  
*Apollo*, 412-13.  
*Edwards*, 418-19.  
*Johns-Manville*, 402-05.  
*M & E Co.*, 420.  
*New Process*, 1074-75.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.  
*Youngstown*, 1074-75.

**Roofing, Felt.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Ford Mfg. Co., 239.

**Roofing, Felt—Continued.**

Garrett & Son Corp., C. S., 392.  
 Johns-Manville Co., H. W., 386-87; 402-05.  
 National Roofing Co., 389.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Barrett Specification*, 394-97.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*Hudson*, 388.  
*Johns-Manville*, 386-87; 402-05.  
*National*, 389.  
*Neponset*, 390-91.  
*Ru-ber-oid*, 393.  
*Tile-Tite*, 408-09.

**Roofing, Formed, see Roofing, Iron or Steel, Galvanized or Painted.****Roofing: Gravel, Sand, Slag or Crushed Stone.**

Asphalt Ready Roofing Co., 388.  
 Garrett & Son Corp., C. S., 392.  
 National Roofing Co., 389.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Safeguard*, 408-09.  
*Security Wide-weld*, 389.  
*SPC*, 393.  
 Specifications, 392; 408-09.

**Roofing, Iron or Steel, Galvanized or Painted.**

American Sheet and Tin Plate Co., 412-13.  
 Clason Architectural Metal Works, 358.  
 Consolidated Sheet Metal Works, 712-13.  
 Edwards Mfg. Co., 418-19.  
 Mannen Co., John E., 1045.  
 Merchant & Evans Co., 420.  
 Meurer Bros. Co., Inc., 422-23.  
 Milwaukee Corrugating Co., 209.  
 Newark Cornice and Skylight Works, 726-27.  
 Penn Metal Co., 216.  
 Stark Rolling Mill Co., 424-25.  
 Taylor Co., N. & G., 426-28.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Youngstown Sheet & Tube Co., 1074-75.  
*American Numethodd*, 412-13.  
*American Old Style*, 412-13.  
*Apollo Best Bloom*, 412-13.  
*Columbia Extra Coated*, 426-28.  
*Edwards*, 418-19.  
*Fire Protection Terne*, 426-28.  
*Keystone*, 412-13.  
*Meurer*, 422-23.  
*Meurer Old Method*, 422-23.  
*MF*, 412-13.  
*M & E Co.*, 420.  
*New Process*, 1074-75.  
*Penco*, 216.  
*Portsmouth Iron*, 241.  
*Target and Arrow*, 426-28.  
*Taylor's Old Style*, 426-28.  
*Taylor's Special*, 426-28.  
*Toncan Metal*, 424-25.  
*Youngstown*, 1074-75.

**Roofing, Metal.**

American Sheet and Tin Plate Co., 412-13.  
 Consolidated Sheet Metal Works, 712-13.

**Roofing, Metal, Asbestos Covered.**

Aspromet Co., 414-16.  
 Johns-Manville Co., H. W., 402-05.  
*APM*, 414-16.  
*Asbestosteel*, 414-16.  
*Johns-Manville*, 402-05.

**Roofing, Prepared or Ready.**

Asphalt Ready Roofing Co., 388.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Ford Mfg. Co., 239.

**Roofing, Prepared or Ready—Continued.**

Garrett & Son Corp., C. S., 392.  
 Hydrex Felt & Engineering Co., 44.  
 Johns-Manville Co., H. W., 402-05.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Standard Paint Co., 393.  
 Stark Rolling Mill Co., 424-25.  
 Warren Chemical & Mfg. Division, 408-09.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Youngstown Sheet & Tube Co., 1074-75.  
*Aquanon*, 408-09.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*Cronolite*, 393.  
*Gal-va-nite*, 239.  
*Everlastic*, 394-97.  
*Hudson*, 388.  
*Hydrex-Pluvinox*, 44.  
*Imp*, 393.  
*Johns-Manville*, 402-05.  
*Johns-Manville Regal*, 402-05.  
*Natroco*, 389.  
*Neponset Paroid*, 390-91.  
*Portsmouth Iron*, 241.  
*Red Seal*, 394-97.  
*Ru-ber-oid*, 393.  
*Safeguard*, 408-09.  
*Sparkloid*, 389.  
*SPC*, 393.  
*Starex*, 393.  
*Toncan Metal*, 424-25.  
*Vulcanite*, 406-07.  
*Warren's*, 408-09.  
*Youngstown*, 1074-75.  
*Zylex*, 393.

**Roofing, Ready, see Roofing, Prepared or Ready.****Roofing, Roll, see Roofing, Prepared or Ready.****Roofing, Rubber.**

Barrett Co., 394-97.  
 Carey Co., Philip, 398.  
 Garrett & Son Corp., C. S., 392.  
 Johns-Manville Co., H. W., 402-05.  
 National Roofing Co., 389.  
*Carey*, 398.  
*Champion*, 389.  
*Jefferson*, 389.  
*Johns-Manville Slatekote*, 402-05.  
*Marley*, 392.  
*Triumph*, 389.

**Roofing, Shingle, see Shingles.****Roofing, Slate.**

Auld & Conger Co., 359.  
 Chapman Slate Co., 360-61.  
 Consolidated Sheet Metal Works, 712-13.  
 Ford Mfg. Co., 239.  
 General Slate Co., 362-64.  
 Jeter & Co., Inc., A. H., 446-47.  
 Johnson, Inc., E. J., 366-67.  
 McFarland-Hyde Co., 720-21.  
 National Asbestos Mfg. Co., 385.  
 Penrhyn Slate Co., 365.  
 Rising & Nelson Slate Co., 368-69.  
 Sheldon Slate Co., F. C., 370-72.  
 Standard Paint Co., 393.  
 Vendor Slate Co., 374-75.  
 Vermont Structural Slate Co., 373.  
*Albion or Jackson Bangor*, 374-75.  
*Alpha or Herco No. 1*, 374-75.  
*Arabian Red*, 370-72.  
*Bangorvein*, 366-67.  
*Clear Purple*, 366-67.  
*Clear Red*, 366-67.  
*Copper Green*, 362-64.  
*Genuine Bangor*, 374-75.  
*Genuine Certificate Bangor*, 359.  
*Green Opal*, 362-64.  
*Hard Vein Variegated Green and Purple*, 370-72.  
*Kent Stone*, 370-72.  
*Monson Lustre*, 362-64.  
*Mottled Green and Purple*, 359; 370-72.  
*Mottled Purple and Green*, 366-67.



**Roofing, Slate**—Continued.

*Mottled Red*, 366-67.  
*Old Copper*, 362-64.  
*Old English*, 370-72.  
*Old European*, 366-67.  
*Olive Gray*, 362-64.  
*Peerless Unfading Green*, 365.  
*Penrhyn Purple*, 365.  
*Purple Opal*, 362-64.  
*Sheldon's*, 370-72.  
*Sherman Unfading*, 362-64.  
*Slate-Kote*, 239.  
*Slates of Quality*, 359.  
*Slatington Big Bed*, 374-75.  
*SPC*, 393.  
*Superior Gray*, 366-67.  
*Unfading Green*, 362-64; 366-67.  
*Unfading Greens, Grays and Blues*, 370-72.  
*Variiegated Green*, 366-67.  
*Variiegated Green and Purple*, 366-67.  
*Weathering Green*, 359.  
*Weathering Greens and Grays*, 370-72.  
*Welchcraft Blue*, 370-72.  
*William Chapman*, 360-61.  
 Specifications, 360-61; 366-67; 368-69; 374-75.

**Roofing, Slate, Strip.**

Ford Mfg. Co., 239.  
*Slate-Kote*, 239.

**Roofing, Slate Surfaced.**

Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Garrett & Son Corp., C. S., 392.  
 Standard Paint Co., 393.  
*Everlastic*, 394-97.  
*Garrettite*, 392.  
*Neponset Paroid*, 390-91.  
*SPC*, 393.

**Roofing, Steel**, see Roofing, Iron or Steel, Galvanized or Painted.**Roofing, Tile**, see Tile, Roofing.**Roofing, Tin.**

American Sheet and Tin Plate Co., 412-13.  
 Merchant & Evans Co., 420.  
 Meurer Bros. Co., Inc., 422-23.  
 Taylor Co., N. & G., 426-28.  
 Wheeling Corrugating Department, 242-43.  
*California*, 422-23.  
*Columbia Extra Coated*, 426-28.  
*Fire Protection Terne*, 426-28.  
*Flushing*, 422-23.  
*Franklin Old Style*, 420.  
*Keystone*, 412-13.  
*M & E Co.*, 420.  
*Merchant's Old Method*, 420.  
*Pullman*, 422-23.  
*Target and Arrow*, 426-28.  
*Taylor's Old Style*, 426-28.  
*Taylor's Special*, 426-28.  
 Specifications, 426-28.

**Roofing, Tin, Accessories**, see Roofing, Tin.**Roofing Buttons**, see Buttons, Roofing.**Roofing Cement**, see Cement, Roofing.**Roofing Contractors**, see Contractors, Roofing.**Roofing Paper**, see Building Papers.**Roofing Pitch**, see Pitch, Roofing.**Roofs, Thatched.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Creo-Dipt Co., Inc., 382-83.  
*Creo-Dipt*, 382-83.  
*H. S. Barber's Cre-Sote-Stained*, 381.

**Roofs, Vaulted.**

Guastavino Co., R., 34-35.

**Rope, Cableway**, see Rope, Wire.**Rope, Cotton.**

Samson Cordage Works, 755.  
 Silver Lake Co., 756.  
*Samson*, 755.  
*Silver Lake*, 756.

**Rope, Drilling**, see Rope, Wire.**Rope, Dumbwaiter.**

American Steel & Wire Co., 30-33.  
 Samson Cordage Works, 755.  
 Silver Lake Co., 756.  
 Wright Wire Co., 234-35.  
*Samson*, 755.  
*Silver Lake*, 756.

**Rope, Galvanized**, see Rope, Wire.**Rope, Guy**, see Rope, Wire.**Rope, Haulage and Hoisting**, see Rope, Wire.**Rope, Tiller or Hand.**

(See also Rope, Wire.)  
 American Steel & Wire Co., 30-33.

**Rope, Transmission.**

American Steel & Wire Co., 30-33.  
 Samson Cordage Works, 755.  
 Silver Lake Co., 756.  
 Wright Wire Co., 234-35.  
*Samson*, 755.  
*Silver Lake*, 756.

**Rope, Wire.**

American Steel & Wire Co., 30-33.  
 Page Steel and Wire Co., 549-51.  
 Wright Wire Co., 234-35.

**Roseblocks, Wood.**

North Carolina Pine Association, 562-63.

**Rosettes.**

Benjamin Electric Mfg. Co., 1206.  
 Bryant Electric Co., 1207.  
 Crouse-Hinds Co., 1178.  
 Hart & Hegeman Mfg. Co., 1214-15.  
 Trumbull Electric Mfg. Co., 1218-21.  
*Benjamin*, 1206.  
*Bryant*, 1207.  
*H & H*, 1214-15.  
*Paiste*, 1214-15.

**Rosters**, see Boards, Bulletin; Boards, Directory.**Roughing-in Measurements, Plumbing.**

Maddock's Sons Co., Thomas, 835-42.

**Rubber Goods, Mechanical.**

Jenkins Bros., 1086-87.  
*Jenkins Bros.*, 1086-87.

**Rubbish Burners**, see Incinerators.**Rubble.**

National Building Granite Quarries Association, 58-59.  
 Rockport Granite Co., 60-61.

**Rugs.**

Tiffany Studios, 526-27.

**Rustproofing, Iron or Steel.**

American Chemical Paint Co., 1372.  
 Parker Rust-Proof Company of America, 1370-71.  
*Deoxidine*, 1372.  
*Deoxylite*, 1372.  
*Parker Process*, 1370-71.  
 Specifications, 1372.

**Rustproofing Processes**, see Rustproofing, Iron or Steel.

## S

**Saddles, Beam, Adjustable.**

Concrete Steel Co., 188-89.  
*Havemeyer*, 188-89.

**Saddles, Cast Iron.**

Duvinage, Pierre, 260.

**Saddles, Door**, see Sills, Door and Window.**Safes, Burglarproof.**

Hall's Safe Co., 1431.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Safe-Cabinet Co., 1430.  
 York Safe and Lock Co., 1433.  
*Safe-Cabinet*, 1430.

**Safes, Car.**

Hall's Safe Co., 1431.

**Safes, Conductor.**

Hall's Safe Co., 1431.

**Safes, Filing**, see Filing Equipment.**Safes, Fireproof.**

Hall's Safe Co., 1431.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Safe-Cabinet Co., 1430.  
 York Safe and Lock Co., 1433.  
*Safe-Cabinet*, 1430.

**Safes, Light Weight.**

General Fireproofing Co., 1414.  
 Hall's Safe Co., 1431.  
 Safe-Cabinet Co., 1430.  
 Van Dorn Iron Works Co., 1428.  
 Watson Mfg. Co., Inc., 1429.  
*GF Allsteel*, 1414.  
*Safe-Cabinet*, 1430.  
*Van Dorn*, 1428.

**Safes, Sheet Metal**, see Safes, Light Weight.**Safes, Wall.**

Hall's Safe Co., 1431.  
 Herring-Hall-Marvin Safe Co., 1432.  
 York Safe and Lock Co., 1433.

**Safety Devices, Refrigerating, Automatic.**

Automatic Refrigerating Co., 1048-49.

**Safety Devices, Window Cleaners.**

Royal Safety Anchor Co., 766-67.  
*Royal*, 766-67.

**Safety Exit Locks**, see Locks, Emergency Exit.**Safety Operating Devices, Elevator.**

Eastern Machinery Co., 1268-69.  
 Elevator Locks Co., 1292.  
 Otis Elevator Co., 1280-84.  
 Payne Co., F. S., 1290-91.  
*M-C-K*, 1292.  
*Otis*, 1280-84.

**Safety Treads**, see Treads, Safety.**Sand, Filtering.**

International Filter Co., 1124.  
 Loomis-Manning Filter Distributing Co., 1125.

**Sanitary Engineers**, see Engineers, Sanitation.**Sanitary Wardrobes**, see Wardrobes, School, Sanitary.**Sarcophagi.**

Gorham Co Architectural Bronze, 502-03.  
 McGann & Sons Co., T. F., 508-09.  
 Presbrey-Coykendall Co., 62.

**Sash, Continuous.**

(See also Windows.)  
 American Steel Window Co., 694-97.  
 Bayley Co., William, 698-99.  
 Detroit Steel Products Co., 700-01.  
 Lupton's Sons Co., David, 704-08.  
 Mesker Brothers Iron Co., 722-25.  
 National Ventilating Co., 454-56.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Truscon Steel Co., 702-03.  
*American*, 694-97.  
*Bayley-Springfield*, 698-99.  
*Fenestra*, 700-01.  
*Lupton*, 704-08.  
*Pomeroy*, 728-29.  
*Pond*, 704-08.  
*Truscon*, 702-03.

**Sash, Counterbalanced.**

Angle Window and Door Co., 709.  
 Austral Window Co., 736.  
 Bayley Co., William, 698-99.  
 Lupton's Sons Co., David, 704-08.  
 Mesker Brothers Iron Co., 722-25.  
 Riester & Thesmacher Co., 658-59.  
 Truscon Steel Co., 702-03.  
 Wagner's Sons Co., J. F., 732-33.  
*Austral*, 736.  
*Bayley-Springfield*, 698-99.  
*Lupton*, 704-08.  
*R & T*, 658-59.  
*Truscon*, 702-03.

**Sash, Diffusing**, see Glass, Prism.**Sash, Folding, Section.**

Folding Partition Co., 769.  
*Sectionfold*, 769.

**Sash, Metal**, see Sash, Steel.

**Sash, Monitor or Sawtooth Roof.**

American Steel Window Co., 694-97.  
 Aspromet Co., 414-16.  
 Bayley Co., William, 698-99.  
 Consolidated Sheet Metal Works, 712-13.  
 Detroit Steel Products Co., 700-01.  
 Drouvé Co., G., 444-45.  
 Lupton's Sons Co., David, 704-08.  
 Mesker Bros. Iron Co., 722-25.  
 National Ventilating Co., 454-56.  
 Truscon Steel Co., 702-03.  
*American*, 694-97.  
*APM*, 414-16.  
*Bayley-Springfield*, 698-99.  
*Fenestra*, 700-01.  
*Lupton*, 704-08.  
*Truscon*, 702-03.

**Sash, Pivoted.**

American Steel Window Co., 694-97.  
 Angle Window and Door Co., 709.  
 Austral Window Co., 736.  
 Bayley Co., William, 698-99.  
 Consolidated Sheet Metal Works, 712-13.  
 Detroit Steel Products Co., 700-01.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 Mesker Brothers Iron Co., 722-25.  
 National Ventilating Co., 454-56.  
 Newark Cornice and Skylight Works, 726-27.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Riester & Thesmacher Co., 658-59.  
 Truscon Steel Co., 702-03.  
 Wagner's Sons Co., J. F., 732-33.  
 Williams Pivot Sash Co., 742-45.  
 Winslow Bros. Co., 735.  
*American*, 694-97.  
*Austral*, 736.  
*Bayley-Springfield*, 698-99.  
*Fenestra*, 700-01.  
*Lee*, 719.  
*Lupton*, 704-08.  
*Pomeroy*, 728-29.  
*R & T*, 658-59.  
*Truscon*, 702-03.  
*Williams*, 742-45.  
*Winslow*, 735.

**Sash, Powerhouse, see Sash, Steel.****Sash, Side Wall, see Sash, Steel.****Sash, Sliding, Horizontal or Vertical, see Sash, Steel.****Sash, Steel.**

American Steel Window Co., 694-97.  
 Angle Window and Door Co., 709.  
 Bayley Co., William, 698-99.  
 Crittall Casement Window Co., 714-15.  
 Detroit Steel Products Co., 700-01.  
 Drouvé Co., G., 444-45.  
 Edwards Mfg. Co., 418-19.  
 Hughes-Keenan Co., 262-65.  
 International Casement Co., Inc., 718.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Mesker Brothers Iron Co., 722-25.  
 National Skylight and Ventilator Co., 448-49.  
 National Ventilating Co., 454-56.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Sexauer & Lemke, Inc., 262-65.  
 Truscon Steel Co., 702-03.  
 Wagner's Sons Co., J. F., 732-33.  
 Winslow Bros. Co., 735.  
*American*, 694-97.  
*Bayley-Springfield*, 698-99.  
*Fenestra*, 700-01.  
*Lupton*, 704-08.  
*Mesker*, 722-25.  
*Pomeroy*, 728-29.  
*Thinbar*, 732-33.  
*Truscon*, 702-03.  
*Winslow*, 735.

**Sash, Storm.**

McFarland-Hyde Co., 720-21.  
 Phenix Mfg. Co., 800-01.

**Sash, Storm—Continued.**

Safety Detachable Window Corporation, 730-31.  
*Mono-Sash*, 730-31.  
*Phenix*, 800-01.  
**Sash Adjusters**, see Fasteners and Adjusters, Casement or Sash.  
**Sash Balances**, see Balances, Sash.  
**Sash Centers**, see Centers, Sash and Transom.  
**Sash Cord**, see Cord, Sash.  
**Sash Fixtures.**  
 Friction Pivot Co., Inc., 738.  
 Grant Pulley and Hardware Co., 760-61.  
 Mesker Brothers Iron Co., 722-25.  
*C. D. T.*, 738.  
*Grant*, 760-61.

**Sash Locks**, see Fasteners and Adjusters, Casement or Sash.**Sash Operators and Gearing.**

American Steel Window Co., 694-97.  
 Austral Window Co., 736.  
 Bayley Co., William, 698-99.  
 Casement Hardware Co., 737.  
 Crittall Casement Window Co., 714-15.  
 Detroit Steel Products Co., 700-01.  
 Drouvé Co., G., 444-45.  
 Grant Pulley and Hardware Co., 760-61.  
 Hitchings & Co., 1454-55.  
 King Construction Co., 1456-57.  
 Lord & Burnham Co., 747.  
 Lupton's Sons Co., David, 704-08.  
 Mallory Mfg. Co., 741.  
 Metallic Sash-Operator Co., 748-49.  
 National Skylight and Ventilator Co., 448-49.  
 National Ventilating Co., 454-56.  
 Payson Mfg. Co., 750-53.  
 Pierson U-Bar Co., 1464-65.  
 Truscon Steel Co., 702-03.  
*American*, 694-97.  
*Austral*, 736.  
*Bayley-Springfield*, 698-99.  
*Bull-Dog*, 737.  
*Crittall*, 714-15.  
*Dearborn*, 750-53.  
*Fenestra*, 700-01.  
*Grant*, 760-61.  
*Harris*, 750-53.  
*Hold-Fast*, 737.  
*Ideal*, 750-53.  
*King*, 1456-57.  
*Lovell*, 444-45.  
*Lovell Dreadnought*, 444-45.  
*Mallory*, 741.  
*Master*, 737.  
*National*, 454-56.  
*Peerless*, 750-53.  
*Pond*, 704-08.  
*Straight-Push*, 444-45.  
*Superior*, 750-53.  
*Truscon*, 702-03.  
*Victor*, 750-53.

**Sash Pivots.**

(See also Centers, Sash and Transom.)  
 Friction Pivot Co., Inc., 738.  
*C. D. T.*, 738.

**Sash Pulleys**, see Pulleys, Sash.**Sash and Frames**, see Windows.**Saturated Fabric**, see Waterproofing and Dampproofing Felt, Cloth and Fabric.**Sausage Making Machinery**, see Meat Industry Machinery.**Scale Removers.**

Compound Injector & Specialty Co., 872-73.  
*Dehn's*, 872-73.

**School Bells**, see Bells: Church, Fire Alarm, Fog Signal, School, etc.**School Signal Systems**, see Signal Systems, Electric.**School Supplies.**

Dudfield Mfg. Co., 380.  
 Weber Costello Co., 379.

**Scrapers, Foot or Mud.**

Irving Forge, W., 505.  
 National Mfg. Co., 621-25.  
 Sterling Foundry Co., 274.  
*W. Irving*, 505.

**Screeds, Base**, see Beads, Ground.**Screeds, Floor**, see Beads, Ground.**Screen Cloth**, see Cloth, Wire.**Screen Doors**, see Screens, Door and Window.**Screen Enclosures, Veranda**, see Screens, Door and Window.**Screen Netting**, see Cloth, Wire.**Screens, Adjustable**, see Screens, Door and Window.**Screens, Bank and Counter.**

Badger Wire & Iron Works, 494-95.  
 Best Register Co., 988-89.  
 Bigelow Wire Works, Cheney, 491.  
 Clinton Wire Cloth Co., 990-91.  
 Dahlstrom Metallic Door Co., 649-51.  
 Gorham Co Architectural Bronze, 502-03.  
 Interior Metal Mfg. Co., 654-55.  
 Jackson Co., Wm. H., 512.  
 Lasar Mfg. Co., 506-07.  
 McGann & Sons Co., T. F., 508-09.  
 Manhattan Brass Co., 513.  
 Penn Brass & Bronze Works, 517.  
 Polachek Bronze & Iron Co., John, 522.  
 Reed & Barton, 520-21.  
 St. Louis Wire & Iron Co., 523.  
 Tiffany Studios, 526-27.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Tyler Co., W. S., 529.  
 Watson Mfg. Co., Inc., 1429.  
 Williams, Inc., Jno., 532.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
*Best*, 988-89.

**Screens, Casement**, see Screens, Door and Window.**Screens: Coal, Sand, Gravel and Rock.**

Link-Belt Co., 1310.  
 St. Louis Wire & Iron Co., 523.  
 Wright Wire Co., 234-35.

**Screens, Door and Window.**

American 3-Way Prism Co., 821.  
 Atchison Revolving Door Co., 586-87.  
 Burlington Venetian Blind Co., 802-03.  
 Burrowes Co., E. T., 790-92.  
 Higgin Mfg. Co., 794-95.  
 Kane Mfg. Co., 793.  
 Lutton Co., William H., 1462-63.  
 Manhattan Brass Co., 513.  
 Phenix Mfg. Co., 800-01.  
 Reese Mfg. Co., 796-97.  
 Safety Detachable Window Corporation, 730-31.  
 Watson Mfg. Co., Inc., 798.  
*Atchison*, 586-87.  
*Burlington*, 802-03.  
*Burrowes*, 790-92.  
*Higgin*, 794-95.  
*Kane*, 793.  
*New Century*, 790-92.  
*Permex*, 796-97.  
*Phenix*, 800-01.  
*Primus*, 790-92.  
*Regis*, 790-92.  
 Specifications, 730-31.

**Screens, Door and Window, Ventilator.**

Burrowes Co., E. T., 790-92.

**Screens, Hospital, Metal.**

Carpenter Mfg. Co., R. F., 868-69.  
*Sanymetal*, 868-69.

**Screens, Jail.**

Pauly Jail Building Co., 1488.

**Screens, Loggia.**

Burrowes Co., E. T., 790-92.

**Screens, Metal Frame**, see Screens, Door and Window.**Screens, Mining**, see Screens: Coal, Sand, Gravel and Rock.



- Screens, Porch or Veranda**, see Screens, Door and Window.
- Screens, Revolving.**  
Brecht Co., 1050-52.
- Screens, Rewireable.**  
Burrowes Co., E. T., 790-92.  
Higgin Mfg. Co., 794-95.  
Kane Mfg. Co., 793.  
Reese Mfg. Co., 796-97.  
Watson Mfg. Co., Inc., 798.  
Higgin, 794-95.  
Permex, 796-97.
- Screens, Roller, Window.**  
Higgin Mfg. Co., 794-95.  
Watson Mfg. Co., Inc., 798.  
Higgin, 794-95.
- Screens, Sand**, see Screens: Coal, Sand Gravel and Rock.
- Screens, Sliding**, see Screens, Door and Window.
- Screens, Smoke, Metal.**  
Solar Metal Products Co., Inc., 645.
- Screens, Steel Sash, Pivoted.**  
Reese Mfg. Co., 796-97.  
Permex, 796-97.
- Screens, Storm.**  
Safety Detachable Window Corporation, 730-31.  
Mono-Sash, 730-31.
- Screens, Toilet, Metal.**  
Carpenter Mfg. Co., R. F., 868-69.
- Screens, Water Intake.**  
Link-Belt Co., 1310.  
Link-Belt, 1310.
- Screens, Window**, see Screens, Door and Window.
- Screens, Window Ventilator**, see Screens, Door and Window.
- Screens, Wire.**  
Best Register Co., 988-89.  
Burlington Venetian Blind Co., 802-03.  
Burrowes Co., E. T., 790-92.  
Darby & Sons Co., Inc., Edward, 1409.  
Higgin Mfg. Co., 794-95.  
Highton & Sons Co., Wm., 992-93.  
Kane Mfg. Co., 793.  
Phenix Mfg. Co., 800-01.  
Reese Mfg. Co., 796-97.  
Tuttle & Bailey Mfg. Co., 985-87.  
Watson Mfg. Co., Inc., 798.  
Wisconsin Iron & Wire Works, 533.  
Best, 988-89.  
Higgin, 794-95.  
Highton, 992-93.  
Phenix, 800-01.
- Screens, Wood Frame**, see Screens, Door and Window.
- Screens and Awnings, Combined.**  
Phenix Mfg. Co., 800-01.  
Phenix, 800-01.
- Screw Anchors**, see Anchors, Screw.
- Sculptors and Modelers.**  
Fischer & Jirouch Co., 1405.
- Scuppers.**  
Watertite Drain & Scupper Co., Inc., 275.  
Windshield Scupper Co., 276.  
Windshield, 276.  
Specifications, 275; 276.
- Sea Walls**, see Walls, Retaining or Sea, Concrete.
- Seats, Built-in.**  
"Bilt-Well" Service Bureau, 574-75.  
Bilt-Well, 574-75.
- Seats, Closet**, see Closet Seats.
- Sectional Filing Cases**, see Filing Equipment.
- Self-closing Work**, see Cocks and Bibbs, Self-closing.
- Separators, Air.**  
Bishop-Babcock-Becker Co., 914-15.
- Separators, Dust.**  
American Blower Co., 996-99.  
Bicalky Fan Co., 1000.  
Bicalky, 1000.
- Separators, Oil.**  
Automatic Refrigerating Co., 1048-49.  
Dunham Co., C. A., 916-21.  
National Pipe Bending Co., 902-03.  
Ohio Blower Co., 472-74.  
Thermograde Valve Co., 913.  
Webster & Co., Warren, 932-34.  
Dunham, 916-21.  
National, 902-03.  
Swartwout, 472-74.  
Webster, 932-34.
- Separators, Steam.**  
Dunham Co., C. A., 916-21.  
Ohio Blower Co., 472-74.  
Webster & Co., Warren, 932-34.  
Dunham, 916-21.  
Swartwout, 472-74.  
Webster, 932-34.
- Septic Tanks**, see Tanks, Septic or Sewage.
- Settees, Metal.**  
(See also Furniture.)  
Badger Wire & Iron Works, 494-95.  
Fiske Iron Works, J. W., 552-53.  
Smith Wire and Iron Works, F. P., 524-25.
- Settees, Park**, see Furniture, Garden and Park.
- Settees, Wood.**  
(See also Furniture.)  
Marble & Shattuck Chair Co., 1400-01.  
Mathews Mfg. Co., 1402-03.  
M & S, 1400-01.
- Settings, Boiler.**  
Armstrong Cork & Insulation Co., 349-51.  
Custodis Chimney Construction Co., Al-  
phons, 89.  
Heinicke, Inc., H. R., 90-91.  
Walsh & Weidner Boiler Co., 1096.  
Nonpareil, 349-51.
- Sewage Disposal Plants.**  
Aten Sewage Disposal Co., 879.  
Blackburn-Smith Corporation, 880.  
Kewanee Private Utilities Co., 1112-13.  
New York Sewage Disposal Co., 881.  
Aten, 879.  
Blackburn-Smith, 880.  
Kewanee, 1112-13.  
Specifications, 880.
- Sewage Disposal Tile**, see Tile, Sewage Disposal, Porous.
- Sewage Ejectors**, see Ejectors, Sewage.
- Sewage Siphons**, see Siphons, Sewage, Automatic.
- Sewage Systems**, see Sewage Disposal Plants.
- Sewer, Pipe**, see Pipe, Clay.
- Sewing Machines, Portable.**  
Western Electric Co., 1202-03.  
Western Electric, 1202-03.
- Shackles.**  
American Steel & Wire Co., 30-33.
- Shade Cord**, see Cord, Curtain and Shade.
- Shades, Lamp.**  
Tiffany Studios, 526-27.  
Tiffany Favrile, 526-27.
- Shades, Lighting**, see Glassware, Illuminating; Lighting Fixtures; Reflectors, Lighting.
- Shades, Window.**  
Draper Shade Co., Luther O., 807.  
Monroe Screen, Blind & Partition Co., 772.  
Bell, 807.  
Draper Number 2, 807.  
Draper Number 3, 807.  
Eclipse A, 807.  
Sanitary, 807.
- Shale Brick**, see Brick, Hollow.
- Shampoo Fixtures**, see Mixers, Shower Bath.
- Sheathing, Asphalt, Waterproof.**  
Standard Paint Co., 393.  
Warren Chemical & Mfg. Division, 408-09.  
SPC, 393.  
Tile-Tite, 408-09.
- Sheathing, Mineral Wool.**  
Banner Rock Products Co., 352.  
Rock Cork, 352.
- Sheathing, Welded**, see Lath, Metal and Tarred Felt, Combination.
- Sheathing, Wood.**  
Brown Co., 573.  
Southern Pine Association, 561.
- Sheathing Boards**, see Boards, Sheathing.
- Sheathing Materials**, see Building Papers; Sound Deadening Materials.
- Sheathing Paper**, see Building Papers.
- Sheaves.**  
American Steel & Wire Co., 30-33.  
Grant Pulley and Hardware Co., 760-61.  
Grant, 760-61.
- Sheep Pens**, see Pens, Live Stock.
- Sheet Lath**, see Lath, Metal.
- Sheet Metal, Beaded.**  
Aspromet Co., 414-16.  
Wheeling Corrugating Department, 242-43.  
APM, 414-16.
- Sheet Metal, Corrosion Resisting.**  
Aspromet Co., 414-16.  
Stark Rolling Mill Co., 424-25.  
APM, 414-16.  
Toncan Metal, 424-25.
- Sheet Metal, Corrugated**, see Sheet Metal, Galvanized or Black.
- Sheet Metal, Corrugated, Asbestos.**  
Aspromet Co., 414-16.  
Johns-Manville Co., H. W., 402-05.  
APM, 414-16.  
Johns-Manville, 402-05.
- Sheet Metal, Galvanized or Black.**  
American Sheet and Tin Plate Co., 412-13.  
Aspromet Co., 414-16.  
Edwards Mfg. Co., 418-19.  
Merchant & Evans Co., 420.  
Stark Rolling Mill Co., 424-25.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co., 241.  
APM, 414-16.  
Apollo Best Bloom, 412-13.  
Edwards, 418-19.  
Keystone, 412-13.  
M & E Co., 420.  
Portsmouth Iron, 241.  
Toncan Metal, 424-25.
- Sheet Metal, Plain.**  
Wheeling Corrugating Department, 242-43.
- Sheet Metal Ornaments**, see Ornaments, Sheet Metal.
- Sheet Metal Work.**  
Chattanooga Roofing & Foundry Co., 499.  
Clark Co., W. J., 252.  
Clason Architectural Metal Works, 358.  
Consolidated Sheet Metal Works, 712-13.  
Edwards Mfg. Co., 418-19.  
Friedley-Voshardt Co., 501.  
Jeter & Co., Inc., A. H., 446-47.  
Lupton Sons Co., David, 704-08.  
McFarland-Hyde Co., 720-21.  
Merchant & Evans Co., 420.  
Messenger & Parks Mfg. Co., 681.  
Milwaukee Corrugating Co., 209.  
Newark Cornice and Skylight Works, 726-27.  
Ohio Blower Co., 472-74.  
Riester & Thesmacher Co., 658-59.  
Stark Rolling Mill Co., 424-25.

**Sheet Metal Work—Continued.**

Taylor Co., N. & G., 426-28.  
 Wagner's Sons Co., J. F., 732-33.  
 Walsh & Weidner Boiler Co., 1096.  
 Whitaker-Glessner Co., 241.  
*Handiline*, 472-74.  
*Lupton*, 704-08.  
*M & E Co.*, 420.  
*Portsmouth Iron*, 241.  
*R & T*, 658-59.  
*Toncan Metal*, 424-25.

**Sheets, Insulating.**

Johns-Manville Co., H. W., 1076-77.  
*Asbestocel*, 1076-77.  
*Asbesto-Sponge Felted*, 1076-77.  
*Thermo*, 1076-77.  
*Vitribestos*, 1076-77.  
*Vitro*, 1076-77.

**Sheets, Iron, Planished.**

American Sheet and Tin Plate Co., 412-13.

**Sheets, Iron, Tinned.**

Meurer Bros. Co., Inc., 422-23.  
 Taylor Co., N. & G., 426-28.  
*Meurer*, 422-23.  
*Target and Arrow*, 426-28.  
*Taylor's Special*, 426-28.

**Sheets, Iron or Steel, Corrugated, see Sheets, Iron or Steel, Galvanized or Painted.****Sheets, Iron or Steel, Galvanized or Painted.**

American Sheet and Tin Plate Co., 412-13.  
 Merchant & Evans Co., 420.  
 Milwaukee Corrugating Co., 209.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Youngstown Pressed Steel Co., 224-26.  
 Youngstown Sheet & Tube Co., 1074-75.  
*Copperoid*, 209.  
*M & E Co.*, 420.  
*New Process*, 1074-75.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.  
*Wellsville*, 412-13.  
*Youngstown*, 1074-75.

**Sheets, Kalameined.**

Wheeling Corrugating Department, 242-43.

**Sheets, Nickel.**

American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Shellac, see Varnish; Japans.****Shelves, see Shelving.****Shelving, Bottle, Hexagonal.**

Soellner, Herman, 1070.  
*Honeycomb*, 1070.

**Shelving, Dairy.**

Penrhyn Slate Co., 365.

**Shelving, Glass.**

Searls Mfg. Co., 888-89.

**Shelving, Greenhouse.**

Penrhyn Slate Co., 365.

**Shelving, Laboratory.**

Alberene Stone Co., 890-91.  
 Penrhyn Slate Co., 365.  
*Alberene Stone*, 890-91.

**Shelving, Mantel, see Shelving, Wood.****Shelving, Metal.**

(See also Racks.)  
 Berger Mfg. Co., 1406-08.  
 Clark Co., W. J., 252.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Edwards Mfg. Co., 1410-11.  
 Federal Steel Fixture Co., 1412-13.  
 General Fireproofing Co., 1414.  
 Hart & Hutchinson Co., 1416-17.  
 Hauserman Co., E. F., 1415.  
 Library Bureau, 1418-19.  
 Lupton's Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.

**Shelving, Metal—Continued.**

Manufacturing Equipment & Engineering Co., 1422.  
 Medart Mfg. Co., Fred, 1423.  
 Penn Metal Co., 734.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Terrell's Equipment Co., 1426-27.  
 Van Dorn Iron Works Co., 1428.  
 Watson Mfg. Co., Inc., 1429.  
*Berger's*, 1406-08.  
*Federal*, 1412-13.  
*GF Allsteel*, 1414.  
*Hauserman*, 1415.  
*Library Bureau*, 1418-19.  
*Lupton*, 704-08.  
*Lyon*, 1420-21.  
*Medart*, 1423.  
*Penco*, 734.  
*Pen-Dar*, 1409.  
*R-W*, 630-35.  
*Terrell's*, 1426-27.  
*Van Dorn*, 1428.

**Shelving, Pantry, see Shelving, Slate.****Shelving, Slate.**

(See also Slate, Structural.)  
 Penrhyn Slate Co., 365.

**Shelving, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Shelving, Wood.**

(See also Trim; Cabinet Work.)  
 "Bilt-Well" Service Bureau, 574-75.  
 Library Bureau, 1418-19.  
 Morgan Co., 584-85.  
 Bilt-Well, 574-75.  
 Library Bureau, 1418-19.

**Shields, Expansion.**

Richmond Screw Anchor Co., 249.

**Shields, Radiator.**

Gerdes, Theodore R. N., 462.  
 McCain Co., W. W., 1044.  
*Hawkins*, 1044.

**Shingle Stains, see Stains, Shingle.****Shingles, Asbestos.**

Johns-Manville Co., H. W., 386-87.  
 National Asbestos Mfg. Co., 385.  
*Johns-Manville*, 386-87.  
*National*, 385.  
*Neverburn*, 385.  
*Wearforever*, 385.  
 Specifications, 385; 386-87.

**Shingles, Asphalt.**

Asphalt Ready Roofing Co., 388.  
 Bird & Son, 390-91.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 Garrett & Son Corp., C. S., 392.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Standard Paint Co., 393.  
*American*, 390-91.  
*Carey Asfaltslate*, 398.  
*Certain-teed*, 399-401.  
*Hudson*, 388.  
*Natroco*, 389.  
*Neponset*, 390-91.  
*Neponset Twin*, 390-91.  
*Proslate*, 390-91.  
*Ru-ber-oid*, 393.  
*Vulcanite*, 406-07.

**Shingles, Asphalt, Self-spacing.**

Patent Vulcanite Roofing Co., 406-07.  
*Vulcanite*, 406-07.  
 Specifications, 406-07.

**Shingles, Asphalt, Slab or Strip.**

Asphalt Ready Roofing Co., 388.  
 Garrett & Son Corp., C. S., 392.  
 National Roofing Co., 389.  
 Patent Vulcanite Roofing Co., 406-07.  
 Standard Paint Co., 393.  
*Garrettite*, 392.  
*Hudson*, 388.  
*Ru-ber-oid*, 393.  
*Security Wide Lap*, 389.  
*Vulcanite*, 406-07.

**Shingles, Asphalt, Slate Surfaced.**

Barrett Co., 394-97.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 National Roofing Co., 389.  
 Standard Paint Co., 393.  
*Carey Asfaltslate*, 398.  
*Certain-teed*, 399-401.  
*Everlastic Tylike*, 394-97.  
*Multi-Shingles*, 394-97.  
*Natroco*, 389.  
*SPC*, 393.

**Shingles, Cedar, see Shingles, Wood.****Shingles, Composition, Strip.**

Standard Paint Co., 393.  
*Ru-ber-oid*, 393.  
*SPC*, 393.

**Shingles, Copper, see Shingles, Metal.****Shingles, Cypress, see Shingles, Wood.****Shingles, Galvanized, see Shingles, Metal.****Shingles, Metal.**

Chattanooga Roofing & Foundry Co., 499.  
 Edwards Mfg. Co., 418-19.  
 Merchant & Evans Co., 420.  
 Meurer Bros. Co., Inc., 422-23.  
 Milwaukee Corrugating Co., 421.  
 Penn Metal Co., 216.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
*Corco*, 242-43.  
*M & E Co.*, 420.  
*Meurer*, 422-23.  
*Penco*, 216.  
*Portsmouth Iron*, 241.  
*Reo*, 418-19.  
*The Edwards*, 418-19.  
*Titelock*, 421.  
*Titelock American*, 421.  
*Toncan Metal*, 424-25.  
*Virginia*, 242-43.  
*Wheeling*, 242-43.

**Shingles, Slate, Strip.**

Ford Mfg. Co., 239.  
*Slate-Kote*, 239.

**Shingles, Slate Surfaced, see Shingles, Asphalt, Slate Surfaced.****Shingles, Stained.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Creo-Dipt Co., Inc., 382-83.  
 Transfer Stained Shingle Co., Inc., 384.  
*Creo-Dipt*, 382-83.  
*Cre-Sote*, 381.  
*H. S. Barber's Crest*, 381.  
*Weatherbest*, 384.

**Shingles, Wood.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Brown Co., 573.  
 Creo-Dipt Co., Inc., 382-83.  
 North Carolina Pine Association, 562-63.  
 Southern Cypress Manufacturers' Association, 570-71.  
 Southern Pine Association, 561.  
 Transfer Stained Shingle Co., Inc., 384.  
*Creo-Dipt*, 382-83.  
*H. S. Barber's Crest*, 381.  
*Weatherbest*, 384.

**Shingles, Wood, Creosoted.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Creo-Dipt Co., Inc., 382-83.  
 Transfer Stained Shingle Co., Inc., 384.  
*Creo-Dipt*, 382-83.  
*H. S. Barber's Cre-Sote-Stained*, 381.  
*Weatherbest*, 384.

**Shingles, Wood, Stained.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Creo-Dipt Co., Inc., 382-83.  
 Transfer Stained Shingle Co., Inc., 384.  
*Creo-Dipt*, 382-83.



**Shingles, Wood, Stained**—Continued.  
*H. S. Barber's Cre-Sote-Stained*, 381.  
*Weatherbest*, 384.  
 Specifications, 381; 382-83; 384.

**Ship Bells**, see Bells: Church, Fire Alarm.  
 Fog Signal, School, etc.

**Ship Construction.**  
 Foundation Co., 14.

**Ship Gratings**, see Gratings, Engine and Boiler Room.

**Ship Tanks**, see Tanks, Storage, Steel.

**Shipyards Installation Contractors**, see Contractors, Shipyards Installation.

**Shoes, Conductor Pipe**, see Pipe, Conductor.

**Shoes, Ladder, Non-slip.**  
 American Mason Safety Tread Co., 344-45.  
*Mason*, 344-45.

**Shoring and Underpinning.**  
 Foundation Co., 14.

**Showcases.**  
 Kawneer Mfg. Co., 488-90.  
 Van Dorn Iron Works Co., 1428.  
*Kawneer*, 488-90.  
*Van Dorn*, 1428.

**Shower Bath Mixers**, see Mixers, Shower Bath.

**Shower Bath Partitions**, see Stalls, Shower, Toilet or Urinal.

**Shower Plates**, see Plates, Shower, Stamped.

**Shutter Eyes.**  
 Duvinage, Pierre, 260.

**Shutter Fasteners and Fixtures**, see Fasteners and Adjusters, Blind, Awning, Screen or Shutter.

**Shutter Workers**, see Fasteners and Adjusters, Awning, Blind, Screen or Shutter.

**Shutters, Fire or Fireproof**, see Shutters, Metal or Metal Covered.

**Shutters, Metal or Metal Covered.**  
 (See also Louvers.)  
 Barnum, E. T., 496-97.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Cornell Iron Works, 666.  
 Duvinage, Pierre, 260.  
 Edwards Mfg. Co., 664-65.  
 Guaranty Iron & Wire Co., 667.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Lupton's Sons Co., David, 704-08.  
 Mack Iron and Wire Works Co., 510-11.  
 Merchant & Evans Co., 680.  
 Mesker Brothers Iron Co., 722-25.  
 Messenger & Parks Mfg. Co., 681.  
 Price-Evans Foundry Co., 518-19.  
 Saino Fire Door & Shutter Co., 669.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Swedish Venetian Blind Co., 773.  
 Variety Mfg. Co., 688-91.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wilson Corporation, J. G., 692-93.  
 Wisconsin Iron & Wire Works, 533.  
*Evans Almet*, 680.  
*Kinnear*, 670-79.  
*Lupton*, 704-08.  
*National*, 640-43.  
*Saino*, 669.  
*Salamander*, 692-93.  
 Specifications, 681.

**Shutters, Rolling or Coiling, Wood or Steel.**

Cornell Iron Works, 666.  
 Edwards Mfg. Co., 664-65.  
 Guaranty Iron & Wire Co., 667.  
 Johnson Mfg. Co., Geo. W., 668.  
 Kinnear Mfg. Co., 670-79.  
 Merchant & Evans Co., 680.  
 Saino Fire Door & Shutter Co., 669.  
 Swedish Venetian Blind Co., 773.

**Shutters, Rolling or Coiling, Wood or Steel**—Continued.

Variety Mfg. Co., 688-91.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wilson Corporation, J. G., 692-93.  
*Almet*, 680.  
*Kinnear*, 670-79.  
*Saino*, 669.  
*Salamander*, 692-93.  
*Wilson*, 692-93.  
 Specifications, 692-93.

**Shutters, Sheet Steel**, see Shutters, Metal or Metal Covered.

**Shutters, Tin Clad**, see Shutters, Metal or Metal Covered.

**Shutters, Wood.**  
 Wilson Corporation, J. G., 692-93.  
*Wilson*, 692-93.

**Siamese Connections, Hose.**  
 Allen Mfg. Co., W. D., 1131-33.  
 New York Brass Foundry Co., 1134-35.  
 Simmons Co., John, 1142-43.  
*Stillbech*, 1134-35.

**Side Lights**, see Sash.

**Sideboards.**  
 (See also Furniture.)  
 "Bilt-Well" Service Bureau, 574-75.  
 Curtis Service Bureau, 578-79.  
*Bilt-Well*, 574-75.  
*Curtis*, 578-79.

**Sidewalk Door Operators**, see Operators, Door, Sidewalk.

**Sidewalk Gratings**, see Gratings, Sidewalk, Area, etc.

**Sidewalk Lights**, see Lights, Vault and Sidewalk.

**Sidewalks.**  
 (See also Pavements.)  
 Schouler Construction Co., 789.

**Siding, Asbestos.**  
 Aspromet Co., 414-16.  
 Johns-Manville Co., H. W., 402-05.  
 National Asbestos Mfg. Co., 385.  
*APM*, 414-16.  
*Johns-Manville Asbestoside*, 402-05.

**Siding, Asphalt, Prepared.**  
 Asphalt Ready Roofing Co., 388.  
 Carey Co., Philip, 172.  
 Johns-Manville Co., H. W., 402-05.  
*Black Jack*, 172.  
*Johns-Manville Asbestoside*, 402-05.  
*Rockland*, 388.

**Siding, Clapboard, Metal.**  
 Aspromet Co., 414-16.  
*APM*, 414-16.

**Siding, Concrete.**  
 Brown Hoisting Machinery Co., 184-85.  
*Ferrominclave*, 184-85.

**Siding, Corrugated.**  
 American Sheet and Tin Plate Co., 412-13.  
 Aspromet Co., 414-16.  
 Edwards Mfg. Co., 418-19.  
 Stark Rolling Mill Co., 424-25.  
*APM*, 414-16.  
*Toncan Metal*, 424-25.

**Siding, Iron or Steel, Galvanized or Painted.**

Edwards Mfg. Co., 418-19.  
 Merchant & Evans Co., 420.  
 Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
*M & E Co.*, 420.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.

**Siding, Metal.**  
 American Sheet and Tin Plate Co., 412-13.  
 Aspromet Co., 414-16.  
 Edwards Mfg. Co., 418-19.  
 Friedley-Voshardt Co., 501.  
 Merchant & Evans Co., 420.  
 Milwaukee Corrugating Co., 209.

**Siding, Metal**—Continued.

Stark Rolling Mill Co., 424-25.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Youngstown Sheet & Tube Co., 1074-75.  
*APM*, 414-16.  
*M & E Co.*, 420.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.

**Siding, Metal, Asbestos Covered.**  
 Aspromet Co., 414-16.  
 Johns-Manville Co., H. W., 402-05.  
*APM*, 414-16.  
*Johns-Manville*, 402-05.

**Siding, Wood.**  
 Brown Co., 573.  
 North Carolina Pine Association, 562-63.  
 Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.  
 Southern Pine Association, 561.  
 White Pine Bureau, 572.

**Siding Clips**, see Clips, Siding.

**Sieves.**  
 Darby & Sons Co., Inc., Edward, 1409.

**Signal Cord**, see Cord, Ventilator and Signal.

**Signal Systems, Electric.**  
 Automatic Electric Co., 1238-39.  
 Bryant Electric Co., 1207.  
 General Electric Co., 1153-67.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Stanley & Patterson, Inc., 1246-55.  
 Winkler-Reichmann Co., 1236.  
*Bryant Silent*, 1207.  
*De Veau*, 1246-55.  
*G-E*, 1153-67.

**Signs, Bronze**, see Signs, Metal.

**Signs, Exit, Electric.**  
 Universal Electric Stage Lighting Co., 1235.

**Signs, Luminous.**  
 Cold Light Mfg. Co., 1210.  
*Marvelite*, 1210.

**Signs, Metal.**  
 Gorham Co Architectural Bronze, 502-03.  
 Harsch & Sons Co., John, 504.  
 Highton & Sons Co., Wm., 992-93.  
 McGann & Sons Co., T. F., 508-09.  
 Manhattan Brass Co., 513.  
 Meyers Mfg. Co., Fred J., 516.  
 Penn Brass & Bronze Works, 517.  
 Polachek Bronze & Iron Co., John, 522.  
 Reed & Barton, 520-21.  
 Williams, Inc., Jno., 532.  
*Highton*, 992-93.

**Signs, Monogram, Electric.**  
 Universal Electric Stage Lighting Co., 1235.

**Signs, Wire.**  
 Badger Wire & Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Bigelow Wire Works, Cheney, 491.  
 Mack Iron and Wire Works Co., 510-11.  
 Smith Wire and Iron Works, F. P., 524-25.

Wisconsin Iron & Wire Works, 533.

**Sill Plates**, see Plates, Sill.

**Sills, Door and Window.**  
 American Abrasive Metals Co., 346.  
 American Mason Safety Tread Co., 344-45.

Duvinage, Pierre, 260.  
 Kawneer Mfg. Co., 488-90.  
 Niagara Metal Weather Strip Co., 788.  
 Ogden Co., J. Edward, 682-83.  
 Pittsburgh Plate Glass Co., 484-85.  
 Price-Evans Foundry Co., 518-19.  
 Southern Pine Association, 561.  
 Vermont Structural Slate Co., 373.  
 Vonnegut Hardware Co., 593-97.  
*Feralun*, 346.  
*Kawneer*, 488-90.  
*Mason*, 344-45.  
*Von Duprin*, 593-97.

**Sills, Elevator.**

American Abrasive Metals Co., 346.  
American Mason Safety Tread Co., 344-45.

*Feralun*, 346.

**Sills, Fire Door.**

American Abrasive Metals Co., 346.  
*Feralun*, 346.

**Silos, Concrete.**

Brown Hoisting Machinery Co., 184-85.  
*Ferrocine*, 184-85.

**Silos, Hollow Tile.**

National Fire Proofing Co., 100-05.  
*Natco*, 100-05.

**Silver Burnishing Machines**, see Burnishing Machines, Silver.**Silverplated Tableware**, see Tableware, Silverplated.**Silversmiths.**

Reed & Barton, 520-31.

**Sink Boards**, see Sinks and Sink Fixtures.**Sinks**, see Sinks and Sink Fixtures.**Sinks and Sink Fixtures, Cork.**

United Cork Flooring Co., 328.  
*Unico*, 328.

**Sinks and Sink Fixtures, Laboratory.**

Alberene Stone Co., 890-91.  
Penrhyn Slate Co., 365.  
*Alberene Stone*, 890-91.

**Sinks and Sink Fixtures: Metal, Copper, White Metal and German Silver.**

American Brass Co., 1071.  
Badger & Sons Co., E. B., 892-93.  
Bramhall, Deane Co., 1010-11.  
Glauber Brass Mfg. Co., 856-61.  
Litterer Bros. Mfg. Co., 894-95.  
Riverside Boiler Works, Inc., 896-99.  
Trageser Steam Copper Works, John, 900.  
*Badger*, 892-93.  
*Benedict Nickel*, 1071.  
*Butler's*, 900.  
*Elco*, 894-95.  
*Manhattan*, 900.  
*Riverside*, 896-99.  
*West End*, 900.

**Sinks and Sink Fixtures, Porcelain or Vitreous China.**

Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
*Madiator*, 835-42.  
*Monument*, 843-46.  
*Porpan*, 835-42.  
*Vitrico*, 843-46.  
Specifications, 835-42.

**Sinks and Sink Fixtures, Slate.**

Penrhyn Slate Co., 779.

**Sinks and Sink Fixtures, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Siphons, Sewage, Automatic.**

Aten Sewage Disposal Co., 879.  
Kewanee Private Utilities Co., 1112-13.  
New York Sewage Disposal Co., 881.

**Sizing**, see Paint, Priming and Sizing.**Skelp, Iron or Steel.**

Youngtown Sheet & Tube Co., 1074-75.

**Skylight Glass**, see Glass, Skylight.**Skylight Guards**, see Guards, Skylight.**Skylights, Cast Iron**, see Skylights, Metal.**Skylights, Copper**, see Skylights, Metal.**Skylights, Glass.**

American 3-Way Prism Co., 821.  
Bruner Granitoid Co., P. M., 824-26.  
Grauer & Co., Albert, 824-26.  
Keppler Glass Constructions, Inc., 831-33.  
Pressed Prism Plate Glass Co., 820.  
*Bruner*, 824-26.  
*Fresnel Simplex*, 821.  
*Imperial*, 820.  
*Keppler*, 831-33.  
*Paschall*, 821.  
*Ransom*, 821.

**Skylights, Glass—Continued.**

*Screw Glass Simplex*, 821.  
*Standard Simplex*, 821.

**Skylights, Metal.**

American Steel Window Co., 694-97.  
Aspromet Co., 414-16.  
Bayley Co., William, 696-99.  
Burt Mfg. Co., 459-61.  
Chattanooga Roofing & Foundry Co., 499.  
Clason Architectural Metal Works, 358.  
Consolidated Sheet Metal Works, 712-13.  
Drouvé Co., G., 444-45.  
Edwards Mfg. Co., 418-19.  
Jeter & Co., Inc., A. H., 446-47.  
Lupton's Sons Co., David, 704-08.  
McFarland-Hyde Co., 720-21.  
Mannen Co., John E., 1045.  
Messenger & Parks Mfg. Co., 681.  
National Skylight and Ventilator Co., 448-49.  
National Ventilating Co., 454-56.  
Newark Cornice and Skylight Works, 726-27.  
Nonpareil Skylight Co., 450-51.  
Richards & Kelly Mfg. Co., 830.  
Riester & Thesmacher Co., 658-59.  
Stark Rolling Mill Co., 424-25.  
Van Noorden & Co., E., 452-53.  
Wagner's Sons Co., J. F., 732-33.  
Whitaker-Glessner Co., 241.  
*American*, 694-97.  
*Anchor-Bar*, 452-53.  
*Anti-Pluvius*, 444-45.  
*Aspromet*, 414-16.  
*Bayley-Springfield*, 698-99.  
*Burt*, 459-61.  
*Lupton*, 704-08.  
*National*, 448-49.  
*Nonpareil*, 450-51; 720-21.  
*Nooga*, 499.  
*Portsmouth Iron*, 241.  
*Toncan Metal*, 424-25.  
*Wagner*, 732-33.  
Specifications, 446-47.

**Skylights, Puttyless.**

Aspromet Co., 414-16.  
Drouvé Co., G., 444-45.  
Jeter & Co., Inc., A. H., 446-47.  
Lupton's Sons Co., David, 704-08.  
McFarland-Hyde Co., 720-21.  
National Skylight and Ventilator Co., 448-49.  
National Ventilating Co., 454-56.  
Newark Cornice and Skylight Works, 726-27.  
Nonpareil Skylight Co., 450-51.  
Van Noorden & Co., E., 452-53.  
*APM*, 414-16.  
*Anchor-Bar*, 452-53.  
*Anti-Pluvius*, 444-45.  
*Lupton*, 704-08.  
*National*, 448-49.  
*Nonpareil*, 450-51; 720-21.  
Specifications, 450-51; 454-56.

**Skylights, Steel**, see Skylights, Metal.**Skylights, Ventilating**, see Skylights, Metal.**Slab Construction, Concrete**, see Concrete Reinforcement, Flat Slab.**Slabs, Cement, Reinforced.**

Federal Cement Tile Co., 429-31.  
*Federal*, 429-31.

**Slabs, Floor, Cement and Concrete.**

Federal Cement Tile Co., 429-31.  
*Federal*, 429-31.

**Slabs, Floor, Concrete.**

American Steel & Wire Co., 232-33.

**Slabs, Floor, Slate.**

Johnson, Inc., E. J., 366-67.  
Penrhyn Slate Co., 365.  
Vermont Structural Slate Co., 373.

**Slabs, Floor, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Slabs, Glass Insert.**

Federal Cement Tile Co., 429-31.  
*Federal*, 429-31.

**Slabs, Hollow, Interlocking.**

(See also Tile, Hollow, Interlocking.)  
Federal Cement Tile Co., 429-31.  
*Federal*, 429-31.

**Slabs, Mausoleum.**

Penrhyn Slate Co., 365.

**Slabs, Sidewalk Light.**

American 3-Way Prism Co., 821.

**Slabs, Steel.**

Youngtown Sheet & Tube Co., 1074-75.

**Slate.**

Auld & Conger Co., 359.  
Chapman Slate Co., 360-61.  
General Slate Co., 362-64.  
Johnson, Inc., E. J., 366-67.  
Penrhyn Slate Co., 365.  
Rising & Nelson Slate Co., 368-69.  
Sheldon Slate Co., F. C., 370-72.  
Vendor Slate Co., 374-75.  
Vermont Structural Slate Co., 373.  
*Albion or Jackson Bangor*, 374-75.  
*Alpha or Herco No. 1*, 374-75.  
*Black Stone*, 368-69.  
*Clear Purple*, 368-69.  
*Colonial*, 368-69.  
*Copper Green*, 368-69.  
*Cotswold*, 368-69.  
*Garnet*, 368-69.  
*Genuine Bangor*, 374-75.  
*Genuine Certificate Bangor*, 379.  
*Hardvein Variegated*, 368-69.  
*Imperial Purple*, 368-69.  
*Monson Lustre*, 362-64.  
*Mottled Green and Purple*, 359; 368-69.  
*Mottled Purple and Green*, 368-69.  
*Mottled Red*, 368-69.  
*Old English*, 368-69.  
*Red Slate*, 368-69.  
*Rustic Gray*, 368-69.  
*Sea Green*, 368-69.  
*Sheldon's*, 370-72.  
*Slates of Quality*, 359.  
*Slatington Big Bed*, 374-75.  
*Tudor Stone*, 368-69.  
*Tudor Stone, Jr.*, 368-69.  
*Unfading Green*, 362-64; 368-69.  
*Unfading Mottled Green*, 368-69.  
*Variegated Purple Copper*, 368-69.  
*Velenheli Purple*, 368-69.  
*Verde Unique*, 368-69.  
*Vermont*, 362-64.  
*Vermont Gray or Black*, 368-69.  
*Weathering Green*, 359; 368-69.  
*William Chapman*, 360-61.  
Specifications, 374-75.

**Slate, Asbestos.**

National Asbestos Mfg. Co., 385.  
*National*, 385.  
Specifications, 385.

**Slate, Electrical**, see Slate, Structural.**Slate, Metal.**

(See also Shingles, Metal.)  
Meurer Bros. Co., Inc., 422-23.  
*Unique*, 422-23.

**Slate, Structural.**

Auld & Conger Co., 359.  
General Slate Co., 362-64.  
Johnson, Inc., E. J., 366-67.  
Penrhyn Slate Co., 365.  
Rising & Nelson Slate Co., 368-69.  
Sheldon Slate Co., F. C., 370-72.  
Vermont Structural Slate Co., 373.  
*Bangorvein Ribbon*, 366-67.  
*Monson Lustre*, 362-64.  
*Peerless Unfading Green*, 365.  
*Penrhyn Purple*, 365.  
*Sheldon's*, 370-72.  
*Unfading Green*, 362-64.  
*Vermont*, 362-64.

**Slate Blackboards**, see Blackboards, Slate.**Slate Roofing**, see Roofing, Slate.**Slate Flooring**, see Flooring, Slate.**Slated Cloth**, see Cloth, Slated.



**Slaters Cement**, see Cement, Roofing.

**Slaters Machines**, see Tools, Slaters.

**Slaters Supplies**, see Tools, Slaters.

**Slaters Tools**, see Tools, Slaters.

**Slates, Book.**

New York Silicate Book Slate Co., 378.

**Slating, Blackboard.**

Weber Costello Co., 379.

*Andrew's*, 379.

*Special AA*, 379.

**Slating, Liquid.**

New York Silicate Book Slate Co., 378.

Weber Costello Co., 379.

*Andrew's*, 379.

*Black Diamond*, 378.

*Special AA*, 379.

**Slaughter House Equipment.**

Brecht Co., 1050-52.

**Sleepers, Floor.**

United States Gypsum Co., 162-68.

*Simplex*, 162-68.

**Sleepers, Wood.**

Southern Pine Association, 561.

**Sleeves, Floor, Adjustable.**

Beaton & Corbin Mfg. Co., 935.

*Adjusto*, 935.

*B. & C.*, 935.

**Sleeves, Pipe, Cast Iron.**

Watertite Drain & Scupper Co., Inc., 275.

*Dryceil*, 275.

**Slide Dampers**, see Dampers, Heating and Ventilating.

**Slides, Drawer.**

Grant Pulley and Hardware Co., 760-61.

Reliance-Grant Elevator Equipment Corp., 626-29.

*Reliance*, 626-29.

*Turner*, 760-61.

**Slides, Drawer, Ball Bearing.**

Reliance-Grant Elevator Equipment Corp., 626-29.

*Reliance*, 626-29.

**Sliding Blinds**, see Blinds, Folding, Rolling and Sliding.

**Slings, Hay.**

James Mfg. Co., 1466-70.

Louden Machinery Co., 1471-73.

*James*, 1466-70.

**Slings, Wire Rope**, see Rope, Wire.

**Slop Sinks**, see Sinks and Sink Fixtures.

**Sluice Gates**, see Gates, Sluice.

**Smoke Jacks**, see Caps and Tops, Chimney.

**Smokestacks, Steel.**

(See also Chimneys.)

Chattanooga Boiler & Tank Co., 1094.

Chicago Bridge & Iron Works, 1095.

Whitaker-Glessner Co., 241.

*Portsmouth Iron*, 241.

**Snow Guards**, see Guards, Snow, Roof.

**Sockets, Anchor.**

Donley Brothers Co., 247.

Sterling Foundry Co., 274.

*D-B*, 247.

*Best*, 274.

**Sockets, Ceiling.**

(See also Inserts, Concrete.)

Barton Spider-Web System, 20-21.

Dayton Malleable Iron Co., 246.

Security Insert Co., 250.

Wright & Alexander Co., 251.

*Bigelow*, 246.

*Dayton*, 246.

*Security*, 250.

*Wrialco*, 251.

**Sockets, Electric.**

Benjamin Electric Mfg. Co., 1206.

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

General Electric Co., 1153-67.

Hart & Hegeman Mfg. Co., 1214-15.

Hubbell, Inc., Harvey, 1216-17.

**Sockets, Electric—Continued.**

Universal Electric Stage Lighting Co., 1235.

*Benco*, 1206.

*Benjamin*, 1206.

*Bryant*, 1207.

*C-H*, 1208-09.

*G-E*, 1153-67.

*H & H*, 1214-15.

*Hubbell*, 1216-17.

*Paiste*, 1214-15.

**Sockets, Electric, Candle Length.**

Cutler-Hammer Mfg. Co., 1208-09.

*C-H*, 1208-09.

**Sockets, Electric, Dimming.**

Cutler-Hammer Mfg. Co., 1208-09.

*C-H*, 1208-09.

**Sockets, Electric: Key, Keyless, Pull, Chain or Turn.**

Benjamin Electric Mfg. Co., 1206.

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

General Electric Co., 1153-67.

Hubbell, Inc., Harvey, 1216-17.

*Benco*, 1206.

*Benjamin*, 1206.

*Bryant*, 1207.

*C-H*, 1208-09.

*G-E*, 1153-67.

*Hubbell*, 1216-17.

*New Wrinkle*, 1207.

**Sockets, Electric, Plug, Cluster.**

Benjamin Electric Mfg. Co., 1206.

*Benjamin*, 1206.

**Sockets, Electric, Porcelain.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208.

General Electric Co., 1153-67.

Hart & Hegeman Mfg. Co., 1214-15.

*Bryant*, 1207.

*C-H*, 1208.

*G-E*, 1153-67.

*H & H*, 1214-15.

*Paiste*, 1214-15.

**Sockets, Electric, Push Button.**

Cutler-Hammer Mfg. Co., 1208-09.

*C-H*, 1208-09.

**Sockets, Electric, Wall, Angle or Ceiling.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208.

Hubbell, Inc., Harvey, 1216-17.

*Bryant*, 1207.

*C-H*, 1208.

*Hubbell*, 1216-17.

**Sockets, Studding.**

Berger Mfg. Co., 176-82.

Sterling Foundry Co., 274.

Wagner Mfg. Co., 638-39.

*Best*, 274.

*Metal Lumber*, 176-82.

**Sockets, Wire Rope.**

American Steel & Wire Co., 30-33.

**Soda Fountain Bases**, see Bases, Soda Fountain.

**Soda Fountain Fixtures, Nickel.**

American Brass Co., 1071.

*Benedict Nickel*, 1071.

**Soda Kettles**, see Kettles, Soda.

**Softeners, Water.**

Compound Injector & Specialty Co., 872-73.

International Filter Co., 1124.

Permutit Co., 1130.

*Dehn's*, 872-73.

*International*, 1124.

*Kompost*, 872-73.

*Peerless*, 872-73.

*Permutit*, 1130.

**Solder.**

Merchant & Evans Co., 420.

Wheeling Corrugating Department, 242-43.

*M & E Co.*, 420.

**Sound Deadening Materials.**

Armstrong Cork Co., 1390-92.

Armstrong Cork & Insulation Co., 349-51.

Banner Rock Products Co., 352.

Barrell Co., William L., 410.

Barrett Co., 394-97.

Bird & Son, 390-91.

Cabot, Inc., Samuel, 1382-85.

Carey Co., Philip, 172.

Flexner-Taylor Co., 320.

Ford Mfg. Co., 239.

Garrett & Son Corp., C. S., 392.

Hydrex Felt & Engineering Co., 44.

International Insulation Co., 174.

Mende, Paul, 321.

Niagara Gypsum Co., 156.

Reeb Corporation, M. A., 157.

United Cork Companies, 356.

United States Mineral Wool Co., 357.

*Armstrong's*, 1390-92.

*Barrett Specification*, 394-97.

*Barrett's Tomb Brand*, 394-97.

*C. S. G.*, 392.

*Ceil-Board*, 172.

*Con-Ser-Tex*, 410.

*Flex-or-Crete*, 320.

*Hydrex-Saniflor*, 44.

*Nailcode*, 321.

*Neponset Florian*, 390-91.

*Niagara*, 156.

*Nonpareil*, 349-51.

*Peerless*, 157.

*Pyramid*, 239.

*Quilt*, 1382-85.

*Red Seal*, 394-97.

*Rock Cork*, 352.

*Universal Insulite*, 174.

*Specifications*, 1382-85.

**Sound Deadening Materials and Systems.**

Stevens Partition & Floor Deadener Co., 354-55.

United States Gypsum Co., 162-68.

*Sackett*, 162-68.

*Stevens System*, 354-55.

**Spacers, Bar, Concrete Reinforcing.**

Concrete Reinforcing and Engineering Co., 186-87.

Concrete Steel Co., 188-89.

Tucker Co., Edward A., 194.

*Havemeyer*, 188-89.

**Spacers, Chair.**

United States Gypsum Co., 162-68.

**Spar Varnish**, see Varnish, Spar.

**Specifications.**

Anchors, Window Cleaners Belt, 766-67.

Backing, Stone, 39.

Bars, Reinforcing, Concrete, 190-92.

Bathtubs, 835-42.

Battery Sets, 1246-55.

Beads, Corner, 209.

Beads, Ground, 162-68.

Beds, Ceiling, Invisible, 1398.

Belts, Safety, Window Cleaners, 766-67.

Blackboards, Slate, 376-77.

Blocks, Gypsum, 140-41; 162-68.

Blocks, Partition, Gypsum, 162-68.

Boards, Plaster, 148-49; 158-59; 162-68.

Boilers, Range, 896-99.

Boilers, Range, Copper, 892-93.

Boxes, Outlet, 1153-67.

Building Inspection, 8.

Cabinets, Hose, 1131-33.

Cables, Switchboard, 1182-87.

Calking Compounds and Materials, 1378-79.

Carpet, Cork, 1390-92.

Ceilings, Soffit, 162-68.

Ceilings, Suspended, Plaster Board, 162-68.

Cells, Prison, 510-11.

Cement, Caen Stone, 145.

Cement, Hydraulic, 130-31.

Cement, Keene's, 140-41; 146-47; 162-68.

Cement, Linoleum, 1393; 1394.

Cement, Mortar, 129.

Cement, Portland, 121-26.

## Specifications—Continued.

Cement, Portland, Colored, 134-37; 291.  
 Cement, Roofing, 443.  
 Cement, Waterproof, 54-55.  
 Chairs, 1400-01.  
 Chimneys, Brick, Radial, Perforated, 90-91; 92-93.  
 Chutes, Coal, 268-69.  
 Chutes, Laundry, Glass Enameled, 1035.  
 Clamps, Column, 183.  
 Clock Systems, 1450.  
 Clocks, Watchman's, 1443.  
 Closets, 835-42.  
 Closets, Waterless, Chemical, 851.  
 Colors, Cement and Mortar, 1380.  
 Colors, Cement and Mortar Enamel, 1378-79.  
 Compressors, Air, 942-46.  
 Concrete Construction, 24-25; 190-92.  
 Concrete Reinforcement, Expanded Metal or Sheet Metal Mesh, 206-08.  
 Concrete Reinforcement, Spiral Column, 190-92.  
 Conductors, Lightning, 94.  
 Conduits, Electric, Rigid, 1180-81.  
 Cord, Electric, Lamp Insulator, 1182-87.  
 Cord, Sash, 755.  
 Cove Base, Slate, 373.  
 Coverings, Pipe and Boiler, 1078-79.  
 Coverings, Wall, 1388-89.  
 Dampers, Fireplace, 280.  
 Doors, Counterbalanced, 684-87.  
 Doors, Fire, 681; 692-93.  
 Doors, Fire, Metal or Metal Covered, 692-93.  
 Doors, Folding and Rolling, Steel, 664-65; 692-93.  
 Doors, Folding and Rolling, Wood, 692-93.  
 Doors, Refrigerator and Cold Storage, 1066-69.  
 Doors, Revolving, 586-87.  
 Doors, Revolving, Automatic Collapsible, 588-89.  
 Doors, 'Sidewalk, Illuminating, 827.  
 Doors, Vault, 1432.  
 Doors and Gates, Elevator, 684-87.  
 Door and Gates, Elevator, Counterbalanced, 684-87.  
 Drainers, Cellar, 882-83.  
 Drains, Floor, 872-73.  
 Dumbwaiters, Hand, 1265-67.  
 Ejectors, Sewage, 112-13; 1110-11.  
 Elevators, Hand, 1265-67.  
 Enamel Undercoats, 1336-37; 1350-51.  
 Enamels, 89; 52-53; 1320-21; 1340-41; 1342-43; 1344-45; 1346; 1347-48; 1350-51; 1354-55; 1364.  
 Extinguishers, Fire, 1131-33.  
 Fans, Ceiling, 1153-67.  
 Fans, Desk or Bracket, 1153-67.  
 Fans, Ventilating or Exhaust, 1153-67.  
 Felt, Asphalt, 408-09.  
 Fencing, Factory, 534-36.  
 Fencing, Wire or Woven Wire, 534-36; 546-48.  
 Fillers, Wood, 342.  
 Fillers, Wood, Paste, 1352-53; 1356-63.  
 Filters, Water, 1125.  
 Fire Exit Devices, 593-97.  
 Floor Construction, Fireproof, 100-05; 190-92; 354-55.  
 Floor Construction, Sound Deadening Systems, 354-55.  
 Flooring, Asphalt, Mastic, 309.  
 Flooring, Composition, 335.  
 Flooring, Composition, Cork, 325; 327.  
 Flooring, Wood Block, 312-13.  
 Flooring, Wood Block, Creosoted, 310.  
 Fountains, Drinking, Sanitary, 835-42.  
 Furring, Metal, 210-13.  
 Glass, Wire: Plain, Rough, Ribbed, Polished or Figured, 812-15; 816-17.  
 Glass Concrete Construction, 824-26.  
 Glazing Compounds, 1378-79.  
 Granite, Structural or Monumental, 63.  
 Greenhouses and Conservatories, 1458-61; 1464-65.

## Specifications—Continued.

Guards, Snow, Roof, 358.  
 Guides, Door and Floor, Combination Weatherstrip, 618-20.  
 Hangers, Door, 626-29; 630-35; 638-39.  
 Hangers, Door, Accordion or Folding, 618-20.  
 Hangers, Door, Barn, 618-20.  
 Hangers, Door, Elevator, 618-20; 630-35.  
 Hangers, Door, Parlor, etc., 618-20.  
 Hardeners and Densifiers, Cement and Concrete, 39; 41; 52-53; 337; 339; 340-41; 342; 1316-17; 1332-33.  
 Hardware, Door, Fire, 593-97.  
 Heads, Air Controlling, 1004.  
 Heaters, Water, Instantaneous, 1023; 1024-27.  
 Heaters, Water, Storage, 975-77; 1024-27.  
 Heaters, Water, Storage, Gas, 1024-27.  
 Heaters, Water and Range Boiler, Combination, 1015-17.  
 Heating Systems, Hot Water, 1024-27.  
 Heating Systems, Steam, 916-21; 922-23.  
 Heating Systems, Underground, 911.  
 Heating and Cooking Appliances, Electric, 1145-52; 1153-67.  
 Hinges, Ball Bearing, 608-13.  
 Hoists, Cellar and Ash, 1299-1305.  
 Hoists, Electric, 1299-1305.  
 Hoists, Hand, 1299-1305.  
 Hoists, Telescopic, 1299-1305.  
 Humidostats, 942-46.  
 Incinerators, Water Heating, 975-77.  
 Japans, 1356-63.  
 Kalamein Work, 726-27.  
 Lath, Metal, 209; 220-21; 236-38.  
 Lath, Metal Composite, 236-38.  
 Lavatories, Dental, 835-42.  
 Lavatories, Earthenware, Porcelain or Vitreous China, 835-42.  
 Lavatories, Enameled, 847.  
 Lavatories, Pedestal, 835-42.  
 Lime, Hydrated, 150-51.  
 Linoleum, 1390-92.  
 Lintels, Gypsum, 140-41.  
 Lockers, Metal, 1420-21; 1423.  
 Locks, Bar, 618-20.  
 Lumber, Metal, 176-82.  
 Lumber, Pine, 562-63.  
 Mortar, Wood, 148-49.  
 Mortar Facings, Waterproof, 48-49.  
 Nailing Base or Grounds, Composition, 321.  
 Netting, Wire, 546-48.  
 Oil Storage and Distributing Systems, 1474-75.  
 Paging Systems, Electric, 1236.  
 Paint, Boiler, Stack and Gas Holder, 1374.  
 Paint: Brick, Cement, Concrete, Plaster, Stone, 1316-17; 1326-27; 1336-37; 1338-39; 1344-45; 1356-63.  
 Paint, Exterior, 41; 340-41; 1326-27; 1332-33; 1347-48.  
 Paint, Floor, Concrete, 1320-21; 1336-37; 1338-39.  
 Paint, Interior, 340-41; 1320-21; 1326-27; 1332-33; 1338-39; 1342-43; 1344-45; 1347-48.  
 Paint, Metal Protective, 52-53; 1316-17; 1320-21; 1326-27; 1332-33.  
 Paint, Mill White, 1320-21; 1326-27; 1336-37; 1378-79.  
 Paint, Oilproof, 1374.  
 Paint, Wall and Ceiling, 1347-48.  
 Panelboards, 1153-67.  
 Pans, Bidet, 835-42.  
 Partitions, Folding or Rolling, Wood or Steel, 769; 774-77.  
 Partitions, Plaster Board, 162-68.  
 Piles, Concrete, 12-13.  
 Piles, Concrete, Pedestal, 10-11.  
 Pipe, Iron, 1074-75.  
 Pipe, Steel, 1074-75.  
 Plaster Bonds, 39; 52-53; 142-44; 162-68.  
 Plasters, 152; 162-68.  
 Plasters, Cement, 140-41; 142-44; 154-55; 158-59; 161; 162-68.  
 Plasters, Cement, Hair Fibered, 142-44.

## Specifications—Continued.

Plasters, Finishing, 142-44; 154-55; 158-59; 161; 162-68.  
 Plasters, Gaging, 162-68.  
 Plasters, Hair Fibered, 148-49.  
 Plasters, Wall, 142-44; 148-49; 162-68.  
 Plasters, Wall, Cement, 158-59.  
 Plasters, Wood Fiber, 140-41; 142-44; 162-68.  
 Plasters, Wood Fiber, Gypsum, 162-68.  
 Preservatives, Wood, 1386; 1387.  
 Pumping Outfits, Booster, 1110-11.  
 Pumps, Boiler Feed, 1104-07.  
 Pumps, Deep Well, 1104-07.  
 Pumps, Elevator, 1104-07.  
 Pumps, Power, 1108-09.  
 Pumps, Triplex, 1108-09.  
 Pumps, Triplex, Power, 1104-07.  
 Pumps, Vacuum, Valveless, 1102-03.  
 Pumps, Water Works, 1104-07.  
 Radiator Covers, Temperature Controlling, 937-38.  
 Radiators, Gas, Ventilating, 1030.  
 Ranges, French, 1010-11.  
 Receivers, Ash, 646-47.  
 Receptacles, Electric, Plug and Lamp, 340-41.  
 Refrigerators and Coolers, 1060-61.  
 Regulators, Temperature, 942-46; 948-49.  
 Roof Construction, Fireproof, 190-92.  
 Roofing, 374-75.  
 Roofing, Built-up, 394-97; 398; 402-05; 406-07; 408-09.  
 Roofing, Canvas, 410; 411.  
 Roofing: Gravel, Sand, Slag or Crushed Stone, 392; 408-09.  
 Roofing, Slate, 360-61; 366-67; 368-69.  
 Roofing, Tin, 426-28.  
 Rustproofing, Iron or Steel, 1372.  
 Screens, Door and Window, 730-31.  
 Scuppers, 276.  
 Scuppers, Hooded, 275.  
 Sewage Disposal Plants, 880.  
 Shingles, Asbestos, 385; 386-87.  
 Shingles, Asphalt, Self-spacing, 406-07.  
 Shingles, Wood, Stained, 381; 382-83; 384.  
 Shutters, Metal or Metal Covered, 681.  
 Shutters, Rolling or Coiling, Wood or Steel, 692-93.  
 Sinks and Sink Fixtures, Porcelain or Vitreous China, 835-42.  
 Skylights, 446-47.  
 Skylights, Puttyless, 450-51.  
 Skylights, Puttyless, Multiunit, 454-56.  
 Slate, 374-75.  
 Slate, Asbestos, 385.  
 Sound Deadening Materials, 1382-85.  
 Stains, Shingle, 381; 1381; 1382-85.  
 Stains, Wood, 1319; 1344-45; 1352-53; 1356-63.  
 Stairs, Concrete, Reinforced, 722-25.  
 Stairs, Metal, 722-25.  
 Stairways, Emergency, 266.  
 Stalls, Shower, Toilet or Urinal, 373; 870-71.  
 Standpipes, Interior, Fire Fighting, 1131-33.  
 Store Fronts, Metal, 482-83.  
 Structural Steel, Pressed, 176-82.  
 Stucco, Waterproof, 48-49.  
 Stucco Work, 121-26.  
 Studding, Metal, 210-13.  
 Subsills, Casement, Stormproof, 742-45.  
 Switches, Electric, 1153-67.  
 Switches, Electric, Knife, 1218-21.  
 Tables, Drawing, 2-4.  
 Tanks, Air, 896-99.  
 Tanks, Pressure, 975-77.  
 Tanks, Storage, 896-99.  
 Tanks, Storage, Water, 975-77.  
 Tanks, Wood, 1093.  
 Telephones, 1237.  
 Testing: Cement, Concrete, Sand, etc., 8; 9.  
 Testing, Steel, 9.  
 Thermostats, 942-46.  
 Throats, Fireplace, Iron, 280.  
 Tile, Floor and Wall, 284-87; 440-41.



**Specifications—Continued.**

Tile, Floor and Wall, Cement, 291.  
 Tile, Floor and Wall, Cork, 326.  
 Tile, Floor and Wall, Cork Composition, 327.  
 Tile, Floor and Wall, Gypsum, 162-68.  
 Tile, Floor and Wall, Slate, 373.  
 Tile, Floor and Wall, Terra Cotta, 440-41.  
 Tile, Floor and Wall, Vitrified, 440-41.  
 Tile, Furring, Gypsum, 162-68.  
 Tile, Hollow, Fireproof, 95.  
 Tile, Roofing, Cement, 432-33.  
 Tile, Roofing, Gypsum, 162-68.  
 Traps, Air, 916-21.  
 Traps, Refrigerator, 852-55.  
 Traps, Steam, Radiator, 916-21.  
 Traps, Steam, Radiator, Thermostatic, 916-21.  
 Treads, Stair, Slate, 373.  
 Tubs and Trays, Laundry, 835-42.  
 Urinals, 835-42.  
 Urinals, Chemical, 851.  
 Vacuum Cleaners, Stationary, 1256-57.  
 Valves, 1086-87.  
 Valves, Air, Automatic, 926-29.  
 Valves, Air Line, Thermostatic, 916-21.  
 Valves, Pump, 916-21.  
 Valves, Radiator, Diaphragm, 942-46.  
 Valves, Radiator, Packless, 916-21.  
 Valves, Reducing, Pressure, 916-21.  
 Valves, Return Line, 926-29.  
 Varnish, 1342-43; 1347-48; 1350-51.  
 Varnish, Exterior, 1342-43; 1344-45; 1346; 1350-51; 1352-53; 1354-55; 1356-63; 1365; 1366-67.  
 Varnish, Floor, 1342-43; 1344-45; 1346; 1350-51; 1352-53; 1354-55; 1356-63; 1365; 1366-67.  
 Varnish, Interior, 1342-43; 1344-45; 1346; 1350-51; 1352-53; 1354-55; 1356-63; 1365; 1366-67.  
 Varnish, Rubbing, 1356-63; 1365.  
 Varnish, Spar, 1350-51; 1365.  
 Varnish, Wax, 1356-63.  
 Ventilators, 472-74.  
 Ventilators, Roof, 472-74; 476.  
 Ventilators, Roof, Glass Top, 459-61; 472-74.  
 Ventilators, Roof, Revolving, 472-74.  
 Ventilators, Toilet, 472-74.  
 Wall Construction, Hollow Tile, 100-05.  
 Waterproofing and Dampproofing, 47.  
 Waterproofing and Dampproofing Paint and Compounds, 38; 39; 41; 52-53; 1316-17; 1344-45.  
 White Lead, 1315.  
 Windows, Detachable, Safety, 730-31.  
 Windows, Reversible, Double Hung, 742-45.  
 Windows, Reversible, Plank Frame, 742-45.  
 Windows, Reversible, Revolving, Pivoted or Swinging, Fixtures for, 742-45.  
 Wire and Cables, Electric, 1153-67; 1190-91.

**Spelter.**

Eagle-Picher Lead Co., 875.

**Spindles, Wood.**

Morgan Co., 584-85.  
 Southern Pine Association, 561.

**Spiral Stairs, see Stairs, Spiral.****Spirals, Collapsible, see Spirals, Column.****Spirals, Column.**

Concrete Steel Co., 188-89.  
 Kalman Co., Paul J., 193.  
 Witherow Steel Co., 195.  
 Havemeyer, 188-89.

**Spirals, Factory Built.**

Concrete Reinforcing and Engineering Co., 186-87.

**Splash Pans, see Pans, Splash.****Spot Lights, see Lights, Spot.****Spouts, Grain, Elevator.**

Saino Fire Door & Shutter Co., 669.  
 Saino, 669.

**Spouts, Stoker.**

Link-Belt Co., 1310.

**Spray Outfits.**

Carbolineum Wood Preserving Co., 1386.

**Springs, Door, see Checks and Springs, Door.****Sprinkler Heads.**

General Fire Extinguisher Co., 1136-39.  
 Grinnell, 1136-39.

**Sprinkler Systems, Automatic.**

General Fire Extinguisher Co., 1136-39.  
 Grinnell, 1136-39.

**Spun Metal Work.**

(See also Sheet Metal Work.)  
 Friedley-Voshardt Co., 501.

**Stable Fittings and Fixtures.**

(See also Barn Equipment.)  
 Badger Wire & Iron Works, 494-95.  
 Barnum, E. T., 496-97.  
 Fiske Iron Works, J. W., 552-53.  
 James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
 Mack Iron and Wire Works Co., 510-11.  
 Meyers Mfg. Co., Fred J., 516.  
 Mott Iron Works, J. L., 514-15.  
 Price-Evans Foundry Co., 518-19.  
 Schouler Cement Construction Co., 789.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Wagner Architectural Iron Works, A. F., 530-31.  
 Wisconsin Iron & Wire Works, 533.  
 Wright Wire Co., 234-35.  
 James, 1466-70.

**Stacks, Book.**

(See also Shelving, Metal; Racks, Storage, Metal.)  
 Darby & Sons Co., Inc., Edward, 1409.  
 Library Bureau, 1418-19.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Watson Mfg. Co., Inc., 1429.  
 Green-Snead, 1424-25.  
 Library Bureau, 1418-19.  
 Snead, 1424-25.

**Stacks, Library, see Stacks, Book.****Stacks, Newspaper.**

Library Bureau, 1418-19.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Library Bureau, 1418-19.  
 Snead, 1424-25.

**Stage Fittings, Electric.**

Universal Electric Stage Lighting Co., 1235.  
 Kliegl, 1235.

**Stage Lighting Apparatus, see Lighting Fixtures and Systems, Stage.****Stage Pockets, see Pockets, Stage, Electric.****Stained Shingles, see Shingles, Wood, Stained.****Stains, Acid.**

Pratt & Lambert, Inc., 1354-55.  
 Standard Varnish Works, 1356-63.  
 Kleartone, 1356-63.  
 Tonic, 1354-55.

**Stains, Brick, see Paint: Brick, Cement, Concrete, Plaster, Stone.****Stains, Mortar, see Colors, Cement and Mortar.****Stains, Oil, see Stains, Wood.****Stains, Shingle.**

Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Barrett Co., 394-97.  
 Berry Brothers, 1346.  
 Billings-Chapin Co., 1318.  
 Bridgeport Wood Finishing Works, 1369.  
 Cabot, Inc., Samuel, 1382-85.  
 Carbolineum Wood Preserving Co., 1386.  
 Certain-teed Products Corporation, 399-401.  
 Creo-Dipt Co., Inc., 382-83.  
 De Soto Paint Mfg. Co., 1319.  
 Dexter Brothers Co., 1381.  
 Ford Mfg. Co., 239.  
 Harrison Works, 1322-25.

**Stains, Shingle—Continued.**

Lowe Brothers Co., 1328-29.  
 Natroco Paint & Varnish Works, 1334.  
 Patton Paint Co., 1332-33.  
 Barrett's Velvex, 394-97.  
 Bridgeport Standard, 1369.  
 Cabot's Creosote, 1382-85.  
 Certain-teed, 399-401.  
 Cre-Sote, 381.  
 Creo-Dipt, 382-83.  
 Creo-Dipt Dixie White, 382-83.  
 Dexter, 1381.  
 H. S. Barber's Crest, 381.  
 Harrisons, 1322-25.  
 High Standard, 1328-29.  
 Memphis, 1319.  
 National, 1334.  
 Rich-Tone, 1328-29.  
 Shingletint, 1346.  
 Tor-on, 1332-33.  
 Specifications, 381; 1381; 1382-85.  
**Stains, Stucco, Waterproof.**  
 Cabot, Inc., Samuel, 1382-85.  
 Cabot's, 1382-85.

**Stains, Water.**

Marietta Paint & Color Co., 1330.  
 Marietta, 1330.

**Stains, Wood.**

Berry Brothers, 1346.  
 Billings-Chapin Co., 1318.  
 Bridgeport Wood Finishing Works, 1369.  
 Cabot, Inc., John, 1382-85.  
 Carbolineum Wood Preserving Co., 1386.  
 Certain-teed Products Corporation, 399-401.  
 Chicago Varnish Co., 1342-43.  
 Creo-Dipt Co., Inc., 382-83.  
 De Soto Paint Mfg. Co., 1319.  
 Dexter Brothers Co., 1381.  
 Glidden Co., 1344-45.  
 Harrison Works, 1322-25.  
 Louisville Varnish Co., Inc., 1349.  
 Lowe Brothers Co., 1328-29.  
 Marietta Paint & Color Co., 1330.  
 Natroco Paint & Varnish Works, 1334.  
 Patton Paint Co., 1332-33.  
 Pitcairn Varnish Co., 1352-53.  
 Pratt & Lambert, Inc., 1354-55.  
 Standard Varnish Works, 1356-63.  
 Bridgeport Standard, 1369.  
 Cabot's Creosote, 1382-85.  
 Certain-teed, 399-401.  
 Creo-Dipt, 382-83.  
 Dexter, 1381.  
 Glidden, 1344-45.  
 Harrisons, 1322-25.  
 High Standard, 1328-29.  
 Kleartone, 1356-63.  
 Lowarco, 1349.  
 Marietta, 1330.  
 Marietta Spartan, 1330.  
 Memphis, 1319.  
 National, 1334.  
 Old Virginia White, 1382-85.  
 Pitcairn, 1352-53.  
 Rich-Tone, 1328-29.  
 Shingletint, 1346.  
 Tonic, 1354-55.  
 Tor-on, 1332-33.  
 Vernicol, 1328-29.  
 Wheeler's, 1369.  
 Wood-Tints, 1342-43.  
 Specifications, 1319; 1344-45; 1352-53; 1356-63.

**Stair Railings, see Railings, Stair.****Stair Treads, see Treads.****Stairs, Bronze.**

(See also Stairs, Metal.)  
 Gorham Co Architectural Bronze, 502-03.  
 Smith Wire and Iron Works, F. P., 524-25.

**Stairs, Circular, see Stairs, Spiral.****Stairs, Concrete, Reinforced.**

Brown Hoisting Machinery Co., 184-85.  
 Mesker Brothers Iron Co., 722-25.  
 Ferroinclave, 184-85.



**Stairs, Concrete, Reinforced—Continued.***Mesker, 722-25.*

Specifications, 722-25.

**Stairs, Metal.**

Badger Wire &amp; Iron Works, 494-95.

Barnum, E. T., 496-97.

Brook Iron Works, A. T., 544-45.

Central Architectural Iron Works, 261.

Chattanooga Roofing &amp; Foundry Co., 499.

Creswell Iron Works, Samuel J., 258-59.

Duvinage, Pierre, 260.

Eastern Bridge &amp; Structural Co., 18-19.

Fiske Iron Works, J. W., 552-53.

Gorham Co Architectural Bronze, 502-03.

Hughes-Keenan Co., 262-65.

Johnson Mfg. Co., Geo. W., 668.

Lasar Mfg. Co., 506-07.

Mack Iron and Wire Works Co., 510-11.

Manhattan Brass Co., 513.

Mesker Brothers Iron Co., 722-25.

Meyers Mfg. Co., Fred J., 516.

Polachek Bronze &amp; Iron Co., John, 522.

Price-Evans Foundry Co., 518-19.

St. Louis Wire &amp; Iron Co., 523.

Sexauer &amp; Lemke, Inc., 262-65.

Smith Wire and Iron Works, F. P., 524-

25.

Smyser-Royer Co., 528.

Snow Iron Works, Inc., W. A., 554-55.

Tyler Co., W. S., 529.

Wagner Architectural Iron Works, A. F.,

530-31.

Watson Mfg. Co., Inc., 1429.

Williams, Inc., Jno., 532.

Wisconsin Iron &amp; Wire Works, 267.

Wright Wire Co., 234-35.

*Duvinage, 260.**Mesker, 722-25.**S & L, 262-65.*

Specifications, 722-25.

**Stairs, Spiral.**

Barnum, E. T., 496-97.

Brook Iron Works, A. T., 544-45.

Chattanooga Roofing &amp; Foundry Co., 499.

Creswell Iron Works, Samuel J., 258-59.

Duvinage, Pierre, 260.

Fiske Iron Works, J. W., 552-53.

Mack Iron and Wire Works Co., 510-11.

Mott Iron Works, J. L., 514-15.

Pitt Composite Iron Works, William R.,

558-59.

Snow Iron Works, Inc., W. A., 554-55.

*Duvinage, 260.***Stairs, Wood, see Trim, Wood.****Stairways, Emergency.**

(See also Fire Escapes.)

Standard Fire Escape Co., 266.

Specifications, 266.

**Stairways, Folding.**

Bessler Movable Stairway Co., 257.

*Bessler, 257.***Stairways, Moving, see Escalators.****Stairways, Suspended, Ceiling.**

Bessler Movable Stairway Co., 257.

*Bessler, 257.***Stall Drains, see Drains, Floor.****Stall Floors, see Flooring, Stable.****Stall Guards, see Guards, Stall.****Stall Partitions, see Stable Fittings and Fixtures; Barn Equipment.****Stall Posts, see Posts, Stall.****Stalls, Box, Sanitary, Steel.**

James Mfg. Co., 1466-70.

Louden Machinery Co., 1471-73.

*James, 1466-70.***Stalls, Cow, see Stalls, Horse and Cattle.****Stalls, Horse and Cattle.**

Fiske Iron Works, J. W., 552-53.

James Mfg. Co., 1466-70.

Louden Machinery Co., 1471-73.

*James, 1466-70.**Louden, 1471-73.***Stalls, Shower, Toilet or Urinal.**

Alberene Stone Co., 890-91.

Carpenter Mfg. Co., R. F., 868-69.

**Stalls, Shower, Toilet or Urinal—Continued.**

continued.

Hauserman Co., E. F., 1415.

Maddocks Sons Co., Thomas, 835-42.

Manufacturing Equipment &amp; Engineering Co., 847.

Monument Pottery Co., 843-46.

Penrhyn Slate Co., 365.

Vermont Structural Slate Co., 373.

Vitrolite Co., 870-71.

Wisconsin Iron &amp; Wire Works, 533.

*Alberene Stone, 890-91.**Benefactor, 843-46.**Carpenter's, 868-69.**Conservor, 843-46.**Hauserman, 1415.**Monument, 843-46.**Sanymetal, 868-69.**Vitrolite, 870-71.*

Specifications, 373; 870-71.

**Stamped Metal Work.**

(See also Sheet Metal Work.)

Friedley-Voshardt Co., 501.

**Stamping.**

Benjamin Electric Mfg. Co., 1206.

*Benjamin, 1206.***Stampings, Pressed Metal.**

Youngstown Pressed Steel Co., 224-26.

**Stamps, Time.**

Time-Systems Co., 1448-49.

*Hahl, 1448-49.***Stanchions, Steel.**

James Mfg. Co., 1466-70.

Louden Machinery Co., 1471-73.

*James, 1466-70.**Louden, 1471-73.***Stanchions, Wood Lined.**

James Mfg. Co., 1466-70.

Louden Machinery Co., 1471-73.

*James, 1466-70.**Louden, 1471-73.***Standards, Traffic, see Traffic Standards.****Standards and Brackets, Lamp.**

Anchor Post Iron Works, 537-43.

Bureau Brothers, 498.

Creswell Iron Works, Samuel J., 258-59.

Fiske Iron Works, J. W., 552-53.

Friedley-Voshardt Co., 501.

General Electric Co., 1153-67.

Gorham Co Architectural Bronze, 502-03.

Lasar Mfg. Co., 506-07.

McGann &amp; Sons Co., T. F., 508-09.

Manhattan Brass Co., 513.

Meyers Mfg. Co., Fred J., 516.

Miller &amp; Co., Edward, 1230.

Mott Iron Works, J. L., 514-15.

Penn Brass &amp; Bronze Works, 517.

Polachek Bronze &amp; Iron Co., John, 522.

Price-Evans Foundry Co., 518-19.

Reed &amp; Barton, 520-21.

Smith Wire and Iron Works, F. P., 524-

25.

Smyser-Royer Co., 528.

Snow Iron Works, Inc., W. A., 554-55.

Stewart Iron Works Co., 556-57.

Tiffany Studios, 526-27.

Trusswall Mfg. Co., 303.

Tyler Co., W. S., 529.

Union Metal Mfg. Co., 304.

Wagner Architectural Iron Works, A. F.,

530-31.

Westinghouse Electric &amp; Mfg. Co., 1169-

76.

Williams, Inc., Jno., 532.

Wisconsin Iron &amp; Wire Works, 533.

*G-E, 1153-67.**Miller, 1230.**Union, 304.***Standpipes.**

Allen Mfg. Co., W. D., 1131-33.

Chattanooga Boiler &amp; Tank Co., 1094.

Chicago Bridge &amp; Iron Works, 1095.

Smith Wire and Iron Works, F. P., 524-

25.

Wagner Architectural Iron Works, A.

F., 530-31.

Whitaker-Glessner Co., 241.

*Portsmouth Iron, 241.***Standpipes, Fire Escape.**

Wagner Architectural Iron Works, A. F., 530-31.

**Standpipes, Interior, Fire Fighting.**

Allen Mfg. Co., W. D., 1131-33.

Smith Wire and Iron Works, F. P., 524-

25.

Specifications, 1131-33.

**Stands, Boiler.**

Hugo Mfg. Co., 1030.

*Hawks, 1030.***Stands, Floor, Valve.**

(See also Posts, Indicator, Valve.)

Pratt &amp; Cady Co., Inc., 1090-91.

Sterling Foundry Co., 274.

**Stands, Music.**

Universal Electric Stage Lighting Co.,

1235.

**Stands, Shoe Shining.**

Koken Barbers' Supply Co., 1395.

*Koken, 1395.***Staples, Wire.**

National Mfg. Co., 621-25.

Youngstown Sheet &amp; Tube Co., 1074-75.

**Starters, Electric, Automobile.**

Westinghouse Electric &amp; Mfg. Co., 1169-

76.

**Starters, Motor.**

Cutler-Hammer Mfg. Co., 1208-09.

*C-H, 1208-09.***Statuary, Caen Stone.**

Fischer &amp; Jirouch Co., 1404.

**Statuary, Marble, see Marble, Structural or Monumental.****Statuary, Metal.**

Bureau Brothers, 498.

Harsch &amp; Sons Co., John, 504.

McGann &amp; Sons Co., T. F., 508-09.

Mott Iron Works, J. L., 514-15.

Reed &amp; Barton, 520-21.

Tiffany Studios, 526-27.

Williams, Inc., Jno., 532.

**Statuary, Sheet Metal.**

Friedley-Voshardt Co., 501.

**Steam Heating Systems, see Heating Systems, Steam.****Steam Specialties, see Specific Headings.****Steam Traps, see Traps, Steam.****Steel Ceilings, see Ceilings, Metal.****Steel Lockers, see Lockers, Metal.****Steel Plate Construction.**

Caldwell Co., Inc., W. E., 1093.

Chattanooga Boiler &amp; Tank Co., 1094.

Chicago Bridge &amp; Iron Works, 1095.

Clark Co., W. J., 252.

Walsh &amp; Weidner Boiler Co., 1096.

**Steel Prints.**

New York Blue Print Paper Co., 6.

*NYB, 6.***Steel Reinforcement, see Concrete Reinforcement.****Steel Rustproofing, see Rustproofing, Iron or Steel.****Steel Sheets, see Sheets, Iron or Steel, Galvanized or Painted.****Steel Skelp, see Skelp, Iron or Steel.****Steel Work, Structural, see Structural Steel or Iron Work.****Step Ladder Stools.**

Sterling Foundry Co., 274.

**Steps, Pole, Concrete.**

Richmond Screw Anchor Co., 249.

**Stereopticons.**

Universal Electric Stage Lighting Co.,

1235.

**Sterilizers, Instrument.**

Bramhall, Deane Co., 1010-11.

**Sterilizers, Laundry.**

American Laundry Machinery Co., 1036.

Bramhall, Deane Co., 1010-11.

*American, 1036.*



**Sterilizers, Water.**

International Filter Co., 1124.

**Stirrup Units, Fabricated.**

Tucker Co., Edward A., 194.

**Stock Room Partitions, see Enclosures, Stock and Tool Room.****Stoker Gates, see Gates, Stoker.****Stoker Spouts, see Spouts, Stoker.****Stone.**

Tompkins-Kiel Marble Co., 70.

**Stone, Bridge.**

Woodbury Granite Co., 65.

**Stone, Dimension.**

Trusswall Mfg. Co., 303.

**Stone, Imitation, Sheet Metal.**

(See also Siding, Iron or Steel, Galvanized or Painted.)

American Sheet and Tin Plate Co., 412-13.

Edwards Mfg. Co., 418-19.

Stark Rolling Mill Co., 424-25.

Toncan Metal, 424-25.

**Stone Backing, see Backing, Stone.****Stones, Stepping.**

Hood Brick Co., B. Miffln, 80-81.

Pottery, 80-81.

**Stools, see Furniture; Bathroom Accessories; Step Ladder Stools.****Stops, Door, see Strikes, Door and Gate.****Stops, Tile, see Tile, Floor and Wall.****Storage Shelving, see Shelving, Metal.****Store Fixtures.**

"Bilt-Well" Service Bureau, 574-75.

Indiana Lumber & Mfg. Co., 580-81.

Bilt-Well, 574-75.

**Store Fronts, Metal.**

American Brass Co., 492-93.

Brasco Mfg. Co., 481.

Chattanooga Roofing & Foundry Co., 499.

Coulson & Co., J. W., 482-83.

Dahlstrom Metallic Door Co., 649-51.

Detroit Show Case Co., 477-80.

Hughes-Keenan Co., 262-65.

Kawneer Mfg. Co., 488-90.

Lasar Mfg. Co., 506-07.

Manhattan Brass Co., 513.

Newark Cornice and Skylight Works, 726-27.

Pittsburgh Plate Glass Co., 484-85.

Polachek Bronze & Iron Co., John, 522.

Price-Evans Foundry Co., 518-19.

Sexauer & Lemke, Inc., 262-65.

Smith Wire and Iron Works, F. P., 524-25.

Smyser-Royer Co., 528.

Tyler Co., W. S., 529.

Wagner Architectural Iron Works, A. F., 530-31.

Zouri Drawn Metals Co., 486-87.

Brasco, 481.

Coulson, 482-83.

Desco, 477-80.

Easyset, 484-85.

Hester, 481.

Kawneer, 488-90.

Petz, 477-80.

Zouri, 486-87.

Specifications, 482-83.

**Store Fronts, Wood.**

Morgan Co., 584-85.

**Storm Sash, see Sash, Storm.****Stoves, Electric.**

General Electric Co., 1153-67.

Western Electric Co., 1202-03.

G-E, 1153-67.

Western Electric, 1202-03.

**Stoves, Kitchen, see Ranges.****Stoves, Laundry.**

(See also Boilers, Heating, Steam and Hot Water.)

Bramhall, Deane Co., 1010-11.

Chicago Dryer Co., 1038-41.

Cox Stove Co., Abram, 960-64.

Hill Clothes Dryer Co., 1037.

McCain Co., W. W., 1044.

**Stoves, Laundry—Continued.**

Mannen Co., John E., 1045.

Thatcher Furnace Co., 982-84.

Chicago-Francis, 1038-41.

J. E. Mannen, 1045.

Novelty, 960-64.

Thatcher, 982-84.

**Stoves, Laundry, Coal.**

Bramhall, Deane Co., 1010-11.

**Stoves, Laundry, Gas.**

Bramhall, Deane Co., 1010-11.

Chicago Dryer Co., 1038-41.

Mannen Co., John E., 1045.

Chicago-Francis, 1038-41.

J. E. Mannen, 1045.

**Stoves, Laundry, Water Heating.**

International Heater Co., 968-73.

Thatcher Furnace Co., 982-84.

International, 968-73.

Thatcher, 982-84.

**Straightedges.**

Hamilton Mfg. Co., 5.

**Strainers, Air.**

Dunham Co., C. A., 916-21.

United Pump & Power Co., 1116-19.

Dunham, 916-21.

**Strainers, Conductors and Eaves Trough.**

Barrett Co., 442.

Lee, Thomas, 467.

Wheeling Corrugating Department, 242-43.

Holt, 442.

**Strainers, Rain Water, see Strainers, Conductor and Eaves Trough.****Strainers, Suction.**

Haines & Co., William S., 924-25.

**Strikes, Door and Gate.**

Bommer Brothers, 600-01.

Chicago Spring Butt Co., 602-03.

Lawson Mfg. Co., 604-05.

Reliance-Grant Elevator Equipment Corp., 626-29.

Stanley Works, 608-13.

Vonnegut Hardware Co., 593-97.

Wagner Mfg. Co., 638-39.

Bommer, 600-01.

Chicago, 602-03.

Katz, 604-05.

Stanley, 608-13.

Von Duprin, 593-97.

**Strings, Stair, Slate, see Slate, Structural.****Strip Lights, see Lights, Proscenium.****Strips, Weather, see Weatherstrips.****Structural Granite, see Granite, Structural or Monumental.****Structural Iron Work, see Structural Steel or Iron Work.****Structural Slate, see Slate, Structural.****Structural Steel.**

Chattanooga Boiler & Tank Co., 1094.

Duvinage, Pierre, 260.

Kenwood Bridge Co., 17.

Merchant & Evans Co., 420.

Price-Evans Foundry Co., 518-19.

Truscon Steel Co., 217-19.

Wagner Architectural Iron Works, A. F., 530-31.

M & E Co., 420.

Truscon, 217-19.

**Structural Steel, Pressed, see Lumber, Metal.****Structural Steel Inspection.**

Hunt & Co., Robert W., 8.

Pittsburgh Testing Laboratory, 9.

**Structural Steel or Iron Work.**

Carpenter & Co., Inc., Davis, 827.

Central Architectural Iron Works, 261.

Chattanooga Roofing & Foundry Co., 499.

Chicago Bridge & Iron Works, 1095.

Creswell Iron Works, Samuel J., 258-59.

Duvinage, Pierre, 260.

Eastern Bridge & Structural Co., 18-19.

Edwards Mfg. Co., 418-19.

Irving Iron Works Co., 348.

**Structural Steel or Iron Work—Continued.**

Kenwood Bridge Co., 17.

Mesker Brothers Iron Co., 722-25.

Price-Evans Foundry Co., 518-19.

Truscon Steel Co., 217-19.

Variety Mfg. Co., 688-91.

Wagner Architectural Iron Works, A. F., 530-31.

Walsh & Weidner Boiler Co., 1096.

Truscon, 217-19.

**Struts, Girder.**

Duvinage, Pierre, 260.

**Stucco.**

American Materials Co., Inc., 133.

Empire Gypsum Co., 152.

Garden City Sand Co., 134-37.

Kelley Island Lime & Transport Co., 150-51.

National Kellastone Co., 138-39.

Plymouth Gypsum Co., 154-55.

United States Gypsum Co., 162-68.

Zibell Damp Resisting Paint Co., 57.

Adamant, 162-68.

Alkacene, 57.

Elastica, 133.

Empire, 152.

Kellastone, 138-39.

Stonekote, 134-37.

**Stucco, Fireproof.**

American Materials Co., Inc., 133.

United States Gypsum Co., 162-68.

Adamant, 162-68.

**Stucco, Information on.**

Associated Metal Lath Manufacturers, 196-201.

**Stucco, Magnesite.**

American Materials Co., Inc., 133.

Elastica, 133.

**Stucco, Waterproof.**

American Materials Co., Inc., 133.

Plymouth Gypsum Co., 154-55.

Standard Paint Co., 48-49.

United States Gypsum Co., 162-68.

Zibell Damp Resisting Paint Co., 57.

Adamant, 162-68.

Alkacene, 57.

Impervite, 48-49.

Plymouth, 154-55.

Specifications, 48-49.

**Stucco Base, see Boards, Plaster.****Stucco Ornaments, see Ornaments: Caen**

Stone, Cement, Composition, Papier-

mache, Plaster, Staff, Stucco, Wood.

**Stucco Work.**

Atlas Portland Cement Co., 121-26.

Atlas, 121-26.

Specifications, 121-26.

**Studding, Metal.**

Berger Mfg. Co., 176-82.

Concrete Engineering Co., 24-25.

General Fireproofing Co., 210-13.

Penn Metal Co., 216.

Truscon Steel Co., 217-19.

Youngstown Pressed Steel Co., 224-26.

Ceco, 24-25.

GF, 210-13.

Kahn, 217-19.

Metal Lumber, 176-82.

Penco, 216.

Truscon, 217-19.

Youngstown, 224-26.

Specifications, 210-13.

**Studding Sockets, see Sockets, Studding****Studios, Motion Picture.**

Lord & Burnham Co., 1458-61.

Lutton Co., William H., 1462-63.

**Subfloor Construction.**

Barrett Co., 394-97.

Tar-Rok, 394-97.

**Subsills, Casement, Stormproof.**

Williams Pivot Sash Co., 742-45.

Williams, 742-45.

Specifications, 742-45.

**Subveyors.**

Olson &amp; Co., Samuel, 1312-13.

**Sugar Crystallizers**, see Crystallizers, Sugar.**Sulphite, Bleached and Unbleached.**  
Brown Co., 573.**Sun Parlors**, see Greenhouses and Conservatories.**Sundials.**

(See also Furniture, Garden and Park.)

Fiske Iron Works, J. W., 552-53.

Gorham Co Architectural Bronze, 502-03.

Hartmann-Sanders Co., 298-99.

McGann &amp; Sons Co., T. F., 508-09.

Mott Iron Works, J. L., 514-15.

Reed &amp; Barton, 520-21.

Williams, Inc., Jno., 532.

**Supports, Bar, Reinforcing**, see Chairs, Bar, Concrete Reinforcing.**Supports, Bar-tie.**

Symons Clamp Co., 183.

Symons, 183.

**Supports, Insulator.**

Steel City Electric Co., 1222.

Universal, 1222.

**Supports, Pipe.**

Bannon Pipe Co., P., 110.

Johns-Manville Co., H. W., 910.

Johns-Manville, 910.

**Supports, Pipe, Underground.**

Johns-Manville Co., H. W., 910.

Tyler Underground Heating System, 911.

Johns-Manville, 910.

Tyler, 911.

**Supports, Shelf, Adjustable.**

Knappe Machine Co., John, 1399.

**Surveying Instruments.**

New York Blue Print Paper Co., 6.

NYB, 6.

**Sweating Pans**, see Pans, Sweating.**Swimming Pool Construction.**

Booraem, J. Francis, 288.

Jackson Co., Wm. H., 289.

**Swimming Pool Equipment.**

Booraem, J. Francis, 288.

Fiske Iron Works, J. W., 552-53.

Jackson Co., Wm. H., 289.

**Swimming Pool Filters**, see Filters, Water.**Swimming Pool Heaters**, see Heaters, Water, Swimming Pool.**Swimming Pool Linings**, see Linings, Swimming Pool.**Swimming Pools, Glass Enclosed.**

Pierson U-Bar Co., 1464-65.

**Swimming Pools, Tile or Terra Cotta**, see Swimming Pool Construction.**Switch Boxes, Electric**, see Boxes, Switch, Electric.**Switchboard Bases, Electric.**

Alberene Stone Co., 890-91.

Penrhyn Slate Co., 365.

Vermont Structural Slate Co., 373.

Alberene Stone, 890-91.

**Switchboard Cable**, see Wire and Cable, Electric.**Switchboard Instruments.**

Crouse-Hinds Co., 1178.

General Electric Co., 1153-67.

Westinghouse Electric &amp; Mfg. Co., 1169-76.

G-E, 1153-67.

**Switchboards, Electric Power.**

Crouse-Hinds Co., 1178.

General Electric Co., 1153-67.

Mutual Electric &amp; Machine Co., 1179.

Sprague Electric Works, 1168.

Stanley &amp; Patterson, Inc., 1246-55.

Trumbull Electric Mfg. Co., 1218-21.

Universal Electric Stage Lighting Co., 1235.

Westinghouse Electric &amp; Mfg. Co., 1030.

Bull Dog, 1179.

Dead Face, 1179.

**Switchboards, Electric Power—Continued.**

G-E, 1153-67.

Safety First, 1179.

Standard Unit, 1153-67.

**Switchboards, Information on.**

Society for Electrical Development, Inc., 1145-52.

**Switchboards, Telephone.**

Connecticut Telephone &amp; Electric Co., Inc., 1240-41.

Stanley &amp; Patterson, Inc., 1246-55.

Connecticut, 1240-41.

**Switchboards, Theater.**

Mutual Electric &amp; Machine Co., 1179.

Universal Electric Stage Lighting Co., 1235.

Bull Dog, 1179.

Dead Face, 1179.

**Switches, Electric.**

Bryant Electric Co., 1207.

Crouse-Hinds Co., 1178.

General Electric Co., 1153-67.

Hart Mfg. Co., 1212-13.

Hart &amp; Hegeman Mfg. Co., 1214-15.

Mutual Electric &amp; Machine Co., 1179.

Trumbull Electric Mfg. Co., 1218-21.

Western Electric Co., 1202-03.

Bryant, 1207.

Bull Dog, 1179.

Diamond H., 1212-13.

G-E, 1153-67.

H &amp; H, 1214-15.

Straight Through, 1207.

Western Electric, 1202-03.

Specifications, 1153-67.

**Switches, Electric, Automobile.**

Cutler-Hammer Mfg. Co., 1208-09.

C-H, 1208-09.

**Switches, Electric, Battery.**

Crouse-Hinds Co., 1178.

General Electric Co., 1153-67.

Hart &amp; Hegeman Mfg. Co., 1214-15.

G-E, 1153-67.

H &amp; H, 1214-15.

**Switches, Electric, Candelabra**, see Switches, Electric, Push Button.**Switches, Electric, Ceiling.**

Bryant Electric Co., 1207.

General Electric Co., 1153-67.

Bryant, 1207.

G-E, 1153-67.

**Switches, Electric, Door.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

Hart Mfg. Co., 1212-13.

Hart &amp; Hegeman Mfg. Co., 1214-15.

Bryant, 1207.

C-H, 1208-09.

Diamond H., 1212-13.

H &amp; H, 1214-15.

**Switches, Electric, Externally Operated.**

Trumbull Electric Mfg. Co., 1218-21.

Circle T Safety Service, 1218-21.

**Switches, Electric, Heating Appliances.**

Cutler-Hammer Mfg. Co., 1208-09.

Hart &amp; Hegeman Mfg. Co., 1214-15.

C-H, 1208-09.

H &amp; H, 1214-15.

**Switches, Electric, Knife.**

Bryant Electric Co., 1207.

Crouse-Hinds Co., 1178.

General Electric Co., 1153-67.

Mutual Electric &amp; Machine Co., 1179.

Trumbull Electric Mfg. Co., 1218-21.

Bryant, 1207.

Bull Dog, 1179.

Circle T Safety Service, 1218-21.

G-E, 1153-67.

Specifications, 1218-21.

**Switches, Electric, Momentary Contact**, see Switches, Electric, Push Button; Switches, Electric, Remote Control.**Switches, Electric, Pendant.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

**Switches, Electric, Pendant—Continued.**

General Electric Co., 1153-67.

Hart Mfg. Co., 1212-13.

Hart &amp; Hegeman Mfg. Co., 1214-15.

Bryant, 1207.

C-H, 1208-09.

Diamond H., 1212-13.

G-E, 1153-67.

H &amp; H, 1214-15.

**Switches, Electric, Pull.**

Cutler-Hammer Mfg. Co., 1208-09.

C-H, 1208-09.

**Switches, Electric, Push Button.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

General Electric Co., 1153-67.

Hart Mfg. Co., 1212-13.

Hart &amp; Hegeman Mfg. Co., 1214-15.

Trumbull Electric Mfg. Co., 1218-21.

Bryant, 1207.

C-H, 1208-09.

Diamond H., 1212-13.

Fewpart, 1218-21.

G-E, 1153-67.

H &amp; H, 1214-15.

**Switches, Electric, Remote Control.**

Cutler-Hammer Mfg. Co., 1208-09.

General Electric Co., 1153-67.

Hart Mfg. Co., 1212-13.

C-H, 1208-09.

Diamond H., 1212-13.

G-E, 1153-67.

**Switches, Electric: Rotary or Snap, Flush, Indicating or Non-indicating.**

Bryant Electric Co., 1207.

Cutler-Hammer Mfg. Co., 1208-09.

General Electric Co., 1153-67.

Hart Mfg. Co., 1212-13.

Hart &amp; Hegeman Mfg. Co., 1214-15.

Trumbull Electric Mfg. Co., 1218-21.

Bryant, 1207.

C-H, 1208-09.

Diamond H., 1212-13.

G-E, 1153-67.

H &amp; H, 1214-15.

Hart, 1214-15.

**Switches, Electric, Tool Handle.**

Cutler-Hammer Mfg. Co., 1208-09.

C-H, 1208-09.

**Switches, Electric Fixture, Canopy.**

Cutler-Hammer Mfg. Co., 1208-09.

C-H, 1208-09.

**Switches, Electrolier**, see Switches, Electric: Rotary or Snap, Flush, Indicating or Non-indicating.**Switches, Motor Starting, Externally Operated.**

General Electric Co., 1153-67.

Trumbull Electric Mfg. Co., 1218-21.

G-E, 1153-67.

Safety Service, 1218-21.

**Synchronizers, Clock, Electric.**

Standard Electric Time Co., 1450.

Standard, 1450.

**Synchronizers, Time Recorder.**

Time-Systems Co., 1448-49.

Hahl, 1448-49.

**T****T-squares.**

Hamilton Mfg. Co., 5.

**Tabernacle Safes.**

Hall's Safe Co., 1431.

**Table Tops, Cork.**

Kennedy, Inc., David E., 326.

United Cork Flooring Co., 328.

Crescent, 328.

Nonpareil, 326.

Unico, 328.

**Table Tops, Glass.**

Bramhall, Deane Co., 1010-11.

Vitrolite Co., 870-71.

Vitrolite, 870-71.



**Table Tops, Kitchen.**

Bramhall, Deane Co., 1010-11.  
Penrhyn Slate Co., 365.

**Table Tops, Laboratory.**

Alberene Stone Co., 890-91.  
Penrhyn Slate Co., 365.  
*Alberene Stone*, 890-91.

**Table Tops, Slate.**

Penrhyn Slate Co., 365.

**Table Tops, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Tables, Artists.**

Hamilton Mfg. Co., 5.

**Tables, Cooks, Steel.**

Bramhall, Deane Co., 1010-11.

**Tables, Drawing.**

American Drafting Furniture Co., 1.  
Economy Drawing Table Co., 2-4.  
Hamilton Mfg. Co., 5.  
Manufacturing Equipment & Engineering Co., 1422.  
New York Blue Print Paper Co., 6.  
*American*, 1.  
*Economy*, 2-4.  
*Monroe*, 1; 6.  
*NYB*, 6.  
*Simplex*, 6.  
Specifications, 2-4.

**Tables, Garden, see Furniture, Garden and Park; Tables, Greenhouse and Conservatory.****Tables, Greenhouse and Conservatory.**

(See also Greenhouses and Conservatories.)  
Hitchings & Co., 1454-55.  
Lord & Burnham Co., 1458-61.  
Pierson U-Bar Co., 1464-65.

**Tables, Jail.**

Pauly Jail Building Co., 1488.

**Tables, Kitchen.**

Bramhall, Deane Co., 1010-11.

**Tables, Laboratory.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Tables, Machinshop.**

Hauserman Co., E. F., 1415.  
*Hauserman*, 1415.

**Tables, Manicure.**

Koken Barbers' Supply Co., 1395.  
*Koken*, 1395.

**Tables, Metal.**

(See also Furniture, Metal.)  
Bramhall, Deane Co., 1010-11.  
Darby & Sons Co., Inc., Edward, 1409.  
Economy Drawing Table Co., 2-4.  
Edwards Mfg. Co., 1410-11.  
Federal Steel Fixture Co., 1412-13.  
Fiske Iron Works, J. W., 552-53.  
General Fireproofing Co., 1414.  
Hauserman Co., E. F., 1415.  
Lyon Metallic Mfg. Co., 1420-21.  
Manufacturing Equipment & Engineering Co., 1422.  
Watson Mfg. Co., Inc., 1429.  
*Economy*, 2-4.  
*GF Allsteel*, 1414.  
*Hauserman*, 1415.  
*Lyon*, 1420-21.

**Tables, Typewriter.**

Hamilton Mfg. Co., 5.

**Tables, Valeting.**

Domestic Laundry Equipment Corporation, 1042-43.  
*Laundryette*, 1042-43.

**Tables, Water.**

Campfield Raggle Block Co., 108-09.  
*Campfield*, 108-09.

**Tables, Wood, see Furniture.****Tables, Memorial.**

Bureau Brothers, 498.  
Detroit Mausoleum Equipment Works, 500.  
Fiske Iron Works, J. W., 552-53.  
Gorham Co Architectural Bronze, 502-03.  
Harsch & Sons Co., John, 504.

**Tablets, Memorial—Continued.**

Highton & Sons Co., Wm., 992-93.  
Jackson Co., Wm. H., 512.  
Lasar Mfg. Co., 506-07.  
McGann & Sons Co., T. F., 508-09.  
Manhattan Brass Co., 513.  
Mott Iron Works, J. L., 514-15.  
Penn Brass & Bronze Works, 517.  
Polachek Bronze & Iron Co., John, 522.  
Reed & Barton, 520-21.  
Smith Wire and Iron Works, F. P., 524-25.  
Tiffany Studios, 526-27.  
Tuttle & Bailey Mfg. Co., 985-87.  
Tyler Co., W. S., 529.  
Wagner Architectural Iron Works, A. F., 530-31.  
Williams, Inc., Jno., 532.  
Wisconsin Iron & Wire Works, 533.  
*Bureau*, 498.  
*Highton*, 992-93.

**Tableware, Silverplated.**

Reed & Barton, 520-21.

**Tank Agitators, see Agitators.****Tank Structures, Steel.**

(See also Structural Steel or Iron Work.)  
Caldwell Co., Inc., W. E., 1093.  
Chattanooga Boiler & Tank Co., 1094.  
Church, Stephen B., 1100.  
Kenwood Bridge Co., 17.  
Walsh & Weidner Boiler Co., 1096.

**Tank Towers, see Structural Steel or Iron Work; Tank Structures, Steel.****Tanks, Acid, see Tanks, Chemical and Acid.****Tanks, Air.**

Riverside Boiler Works, Inc., 896-99.  
*Riverside*, 896-99.  
Specifications, 896-99.

**Tanks, Air Separating, Automatic.**

Haines & Co., William S., 924-25.

**Tanks, Brine.**

Walsh & Weidner Boiler Co., 1096.

**Tanks, Chemical and Acid.**

Alberene Stone Co., 890-91.  
Caldwell Co., Inc., W. E., 1093.  
Chicago Bridge & Iron Works, 1095.  
Penrhyn Slate Co., 365.  
*Alberene Stone*, 890-91.  
*Caldwell*, 1093.

**Tanks, Closet.**

Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
*Monument*, 843-46.

**Tanks, Concrete.**

Brown Hoisting Machinery Co., 184-85.  
Mensch, L. J., 302.  
*Ferrocinclave*, 184-85.

**Tanks, Electrolytic.**

Penrhyn Slate Co., 365.

**Tanks, Elevator.**

Walsh & Weidner Boiler Co., 1096.

**Tanks, Elevator Pit.**

Chattanooga Boiler & Tank Co., 1094.

**Tanks, Expansion.**

Riverside Boiler Works, Inc., 896-99.  
*Riverside*, 896-99.

**Tanks, Fire Bucket.**

Safety Fire Extinguisher Co., 1141.  
Wheeling Corrugating Department, 242-43.  
*Safety*, 1141.

**Tanks, Flushing, Closet.**

Maddock's Sons Co., Thomas, 835-42.  
Monument Pottery Co., 843-46.  
*Monument*, 843-46.

**Tanks, Galvanized.**

Caldwell Co., Inc., W. E., 1093.  
Riverside Boiler Works, Inc., 896-99.  
*Caldwell*, 1093.  
*Riverside*, 896-99.

**Tanks, Gasoline or Oil.**

(See also Tanks, Storage, Steel.)  
Allen Pressure System Co., Inc., 1474-75.  
Bowser & Co., Inc., S. F., 1476-77.  
Chattanooga Boiler & Tank Co., 1094.

**Tanks, Gasoline or Oil—Continued.**

Chicago Steel Tank Co., 1482.  
Gilbert & Barker Mfg. Co., 1478-79.  
Riverside Boiler Works, Inc., 896-99.  
Stephenson, C. H., 277.  
Walsh & Weidner Boiler Co., 1096.  
Wayne Oil Tank & Pump Co., 1480-81.  
*Apsco*, 1474-75.  
*Bowser*, 1476-77.  
*G & B*, 1478-79.  
*Riverside*, 896-99.  
*The Stephenson*, 277.

**Tanks, Gravity, see Tanks, Storage, Steel.****Tanks, House, see Tanks, Storage, Steel; Tanks, Wood.****Tanks, Hydro-pneumatic, see Tanks, Storage, Steel.****Tanks, Ice, Drinking Water.**

Manufacturing Equipment & Engineering Co., 847.

**Tanks, Molasses, see Tanks, Storage, Steel.****Tanks, Oil, see Tanks, Gasoline or Oil; Tanks, Storage, Steel.****Tanks, Photographic, see Tanks, Chemical or Acid.****Tanks, Pressure, see Tanks, Storage, Steel.****Tanks, Railway, see Water Towers and Tanks.****Tanks, Receiving, Automatic, see Traps, Steam.****Tanks, Rendering.**

Brecht Co., 1050-52.

**Tanks, Septic or Sewage.**

Aten Sewage Disposal Co., 879.  
Kaustine Co., Inc., 851.

**Tanks, Ship, see Tanks, Storage, Steel.****Tanks, Slate.**

Penrhyn Slate Co., 365.

**Tanks, Slush.**

Brecht Co., 1050-52.

**Tanks, Soap.**

Domestic Laundry Equipment Corporation, 1042-43.

**Tanks, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Tanks, Steel, Glass Enameled.**

Pfaudler Co., 1035.

**Tanks, Storage, Steel.**

Allen Pressure System Co., Inc., 1474-75.  
Bowser & Co., Inc., S. F., 1476-77.  
Brecht Co., 1050-52.  
Burnett-Larsh Mfg. Co., 1098-99.  
Caldwell Co., Inc., W. E., 1093.  
Chattanooga Boiler & Tank Co., 1094.  
Chicago Bridge & Iron Works, 1095.  
Chicago Steel Tank Co., 1482.  
Church, Stephen B., 1100.  
Gilbert & Barker Mfg. Co., 1478-79.  
Kenwood Bridge Co., 17.  
Kerr Machinery & Supply Co., 1110-11.  
Kewanee Boiler Co., 975-77.  
Kewanee Private Utilities Co., 1112-13.  
National Pipe Bending Co., 902-03.  
Pfaudler Co., 1035.  
Riverside Boiler Works, Inc., 896-99.  
Stark Rolling Mill Co., 424-25.  
Trageser Steam Copper Works, John, 900.  
Walsh & Weidner Boiler Co., 1096.  
Wayne Oil Tank & Pump Co., 1480-81.  
Whitaker-Glessner Co., 241.  
*Apsco*, 1474-75.  
*Bowser*, 1476-77.  
*Caldwell*, 1093.  
*Church*, 1100.  
*Duro*, 1098-99.  
*G & B*, 1478-79.  
*Kerr*, 1110-11.  
*Kewanee*, 975-77.  
*National*, 902-03.  
*Portsmouth Iron*, 241.  
*Riverside*, 896-99.  
*Tabasco*, 975-77.

**Tanks, Storage, Steel—Continued.**

*Falcon Metal*, 424-25.  
Specifications, 896-99; 975-77.

**Tanks, Storage, Underground, see Tanks, Storage, Steel.****Tanks, Storage, Water, see Tanks, Storage, Steel.****Tanks, Sugar, see Tanks, Storage, Steel.****Tanks, Water, see Tanks, Storage, Steel.****Tanks, Wood.**

Caldwell Co., Inc., W. E., 1093.  
Church, Stephen B., 1100.  
Caldwell, 1093.  
Church, 1100.  
Specifications, 1093.

**Tape, Bar Wire.**

Eagle-Picher Lead Co., 875.

**Tape, Insulating.**

Electric Cable Co., 1190-91.  
Standard Paint Co., 393.  
Ecco, 1190-91.  
P & B, 393.

**Tapes, Surveyors.**

New York Blue Print Paper Co., 6.  
NYB, 6.

**Tea Houses, see Houses, Garden.****Tees, Clean-out.**

Compound Injector & Specialty Co., 872-73.  
Dehn's, 872-73.

**Tees, Metal, see Angles, Beams, Channels and Tees, Metal; Structural Steel; Lumber, Metal.****Tees, Pipe, see Fittings, Pipe.****Telephone Cables, see Wire and Cables, Electric.****Telephone Layouts, Data on.**

American Telephone and Telegraph Co., 1237.

**Telephone Switchboards, see Switchboards, Telephone.****Telephone Systems, Automatic.**

Automatic Electric Co., 1238-39.  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Telephones.**

American Telephone and Telegraph Co., 1237.  
Automatic Electric Co., 1238-39.  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Holtzer-Cabot Electric Co., 1242-45.  
Stanley & Patterson, Inc., 1246-55.  
Winkler-Reichmann Co., 1236.  
Connecticut, 1240-41.  
De Veau, 1246-55.

**Telephones, Automatic.**

Automatic Electric Co., 1238-39.  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Telephones, Cordless.**

Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Telephones, Information on.**

American Telephone and Telegraph Co., 1237.

**Telephones, Intercommunicating.**

Automatic Electric Co., 1238-39.  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Holtzer-Cabot Electric Co., 1242-45.  
Stanley & Patterson, Inc., 1246-55.  
Western Electric Co., 1202-03.  
Winkler-Reichmann Co., 1236.  
Connecticut, 1240-41.  
De Veau, 1246-55.  
Intertalk, 1246-55.  
Western Electric, 1202-03.

**Telephones, Loud Speaking.**

Winkler-Reichmann Co., 1236.

**Telephones, Mine.**

Automatic Electric Co., 1238-39.  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Telephones, Portable.**

Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Telephones, Private Exchange, see Telephones, Intercommunicating.****Telephones, Vestibule.**

Connecticut Telephone & Electric Co., Inc., 1240-41.  
Stanley & Patterson, Inc., 1246-55.  
Connecticut, 1240-41.  
De Veau, 1246-55.

**Telephones, Weatherproof.**

Connecticut Telephone & Electric Co., Inc., 1240-41.  
Connecticut, 1240-41.

**Tellerwaiters.**

Chelsea Elevator Co., 1265-67.  
Chelsea, 1265-67.

**Telpherage Systems.**

(See also Elevating and Conveying Machinery.)

Allith-Prouty Co., 614-15.  
Coburn Trolley Track Mfg. Co., 640-43.  
James Mfg. Co., 1466-70.  
Link-Belt Co., 1310.  
Louden Machinery Co., 1471-73.  
McCabe Hanger Mfg. Co., 618-20.  
Richards-Wilcox Mfg. Co., 630-35.  
Allith-Prouty, 614-15.  
James, 1466-70.  
R-W, 630-35.

**Temperature Controlling Systems, see Regulators, Temperature; Thermostats.****Terminal Developments.**

Foundation Co., 14.

**Terne Plates, see Tin and Terne Plate.****Terra Alba.**

King & Co., J. B., 153.  
United States Gypsum Co., 162-68.  
King's, 153.  
U.S.G., 162-68.

**Terra Cotta, Architectural.**

Atlantic Terra Cotta Co., 112-13.  
Conkling-Armstrong Terra Cotta Co., 114.  
Federal Terra Cotta Co., 115.  
Hood Brick Co., B. Mifflin, 80-81.  
Ketcham, O. W., 118.  
Northwestern Terra Cotta Co., 116-17.  
Rookwood Pottery Co., 294-95.  
Atlantic, 112-13.  
Federal, 115.  
Pottery, 80-81.

**Terra Cotta, Hollow, Fireproof.**

Burchartz Fireproofing Co., Inc., 26.  
Denison Fireproofing Co., 95.  
Denison Interlocking Tile Corporation, 96-97.  
Humphrey Brick & Tile Co., 106.  
Maurer & Son, Henry, 98-99.  
National Fire Proofing Co., 100-05.  
Denison, 95.  
Humphrey, 106.  
Interlocking Tile, 96-97.  
Natco, 100-05.

**Terrazzo.**

Davis Marble Co., 283.

**Testing, Cement, Concrete, Sand, etc.**

Hunt & Co., Robert W., 8.  
Pittsburgh Testing Laboratory, 9.  
Specifications, 8; 9.

**Testing, Steel.**

Hunt & Co., Robert W., 8.  
Pittsburgh Testing Laboratory, 9.  
Specifications, 9.

**Testing Engineers, see Engineers, Testing.****Thatched Roofs, see Roofs, Thatched.****Theater Dimmers.**

(See also Lighting Fixtures.)

Cutler-Hammer Mfg. Co., 1208-09.  
Universal Electric Stage Lighting Co., 1235.  
C-H, 1208-09.

**Theater Work, see Specific Headings.****Thermostat Covers.**

Fulton Co., 937-38.  
Ja-Nar, 937-38.

**Thermostats.**

Atlas Valve Co., 940-41.  
Automatic Refrigerating Co., 1048-49.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Fulton Co., 937-38.  
General Electric Co., 1153-67.  
Johnson Service Co., 942-46.  
Minneapolis Heat Regulator Co., 948-49.  
Powers Regulator Co., 947; 950-51.  
Dunham, 916-21.  
G-E, 1153-67.  
Johnson, 942-46.  
Minneapolis, 948-49.  
Powers, 947; 950-51.  
Sylphon, 937-38.  
Specifications, 942-46.

**Thermostats, Extension Tube, see Thermostats.****Thermostats, Hot Water, see Thermostats.****Thermostats, Hydraulic, see Thermostats.****Thermostats, Multiple Insertion, see Thermostats.****Thermostats, Perforated Tube, see Thermostats.****Thermostats, Positive, see Thermostats.****Thermostats, Refrigeration.**

Automatic Refrigerating Co., 1048-49.  
Johnson Service Co., 42-46.  
New York Brass Foundry Co., 1134-35.  
Johnson, 942-46.

**Thimbles, Flue, Cast Iron.**

Majestic Co., 271-73.

**Thimbles, Wire Rope.**

American Steel & Wire Co., 30-33.

**Thresholds.**

(See also Sills.)

Brasco Mfg. Co., 481.  
Chattanooga Roofing & Foundry Co., 499.  
Coulson Co., J. W., 482-83.  
Detroit Show Case Co., 477-80.  
Kawneer Mfg. Co., 488-90.  
Mack Iron and Wire Works Co., 510-11.  
Niagara Metal Weather Strip Co., 788.  
Pittsburgh Plate Glass Co., 484-85.  
Vermont Structural Slate Co., 373.  
Wisconsin Iron & Wire Works, 533.  
Kawneer, 488-90.

**Throats, Fireplace, Iron.**

Colonial Fireplace Co., 279.  
Covert Co., H. W., 280.  
Colonial, 279.  
Covert, 280.  
Specifications, 280.

**Ties, Bar, Concrete Reinforcing.**

Concrete Steel Co., 188-89.  
Symons Clamp Co., 183.  
Havemeyer, 188-89.  
Symons, 183.

**Ties, Wall.**

Duplex Hanger Co., 253.  
General Fireproofing Co., 210-13.  
Ideal Hanger Co., 256.  
Irving Iron Works Co., 348.  
Ketcham, O. W., 118.  
Smith Wire and Iron Works, F. P., 524-25.  
Sykes Metal Lath and Roofing Co., 220-21.  
Wagner Architectural Iron Works, A. F., 350-31.  
Cleveland, 253.  
GF, 210-13.  
Sykes, 220-21.



**Ties, Wood, Creosoted.**

Ayer & Lord Tie Co., 310.  
Central Creosoting Co., 311.  
Southern Pine Association, 561.

**Tile, Acoustical.**

Guastavino Co., R., 34-35.  
Rumford, 34-35.

**Tile, African.**

African Ceramic and Tile Co. of Tunis, Inc., 290.  
African, 290.

**Tile, Boiler.**

Bannon Pipe Co., P., 110.

**Tile, Building, see Blocks, Building, Hollow, Fireproof.****Tile, Clay, Decorative or Sanitary.**

African Ceramic and Tile Co. of Tunis, Inc., 290.  
Associated Tile Manufacturers, 284-87.  
Davis Marble Co., 283.  
Denison Fireproofing Co., 95.  
Grueby Faience & Tile Co., 292.  
Hood Brick Co., B. Mifflin, 80-81.  
Huntington Roofing Tile Co., 434-35.  
Jackson Co., Wm. H., 289.  
Ketcham, O. W., 118.  
Maurer & Son, Henry, 98-99.  
Mueller Mosaic Co., 293.  
Pennsylvania Fireproofing Co., 107.  
Rookwood Pottery Co., 294-95.  
African, 290.  
Denison, 95.  
Grueby, 292.  
Grueby Opus Sectile, 292.  
Huntington, 434-35.  
Pottery, 80-81.

**Tile, Cork, see Tile, Floor and Wall, Cork.****Tile, Drain.**

Bannon Pipe Co., P., 110.  
Humphrey Brick & Tile Co., 106.  
Humphrey, 106.

**Tile, Faience, see Tile, Clay, Decorative or Sanitary.****Tile, Fireplace and Mantel, see Tile, Clay, Decorative or Sanitary.****Tile, Flemish.**

Mueller Mosaic Co., 293.

**Tile, Floor and Wall, Cement.**

De Smet Quartz Tile Co., 291.  
De Smet Carbotile, 291.  
De Smet Quartztile, 291.  
Specifications, 291.

**Tile, Floor and Wall, Ceramic and Mosaic Ceramic, see Tile, Clay, Decorative or Sanitary.****Tile, Floor and Wall, Composition.**

Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.  
Cheney & Co., Inc., 329.  
Marbleloid Co., 332-33.  
United Cork Flooring Co., 328.  
Be-ver, 324.  
Crescent, 328.  
Linotile, 323.  
Tredlite, 332-33.  
Troegerlith, 329.  
Unico, 328.

**Tile, Floor and Wall, Cork.**

Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.  
Hasbrouck Flooring Co., 315.  
Kennedy, Inc., David E., 326.  
Marbleloid Co., 332-33.  
United Cork Companies, 356.  
United Cork Flooring Co., 328.  
Be-ver, 324.  
Crescent, 328; 356.  
Linotile, 323.  
Marbleloid, 332-33.  
Nonpareil, 326.  
Tredlite, 332-33.  
Unico, 328.  
Specifications, 326.

**Tile, Floor and Wall, Cork Composition.**

Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.

**Tile, Floor and Wall, Cork Composition—Continued.**

Dreadnought Flooring Co., 325.  
Kennedy, Inc., David E., 327.  
Marbleloid Co., 332-33.  
United Cork Companies, 356.  
United Cork Flooring Co., 328.  
Be-ver, 324.  
Crescent, 328; 356.  
Dreadnought, 325.  
Everlastic, 327.  
Linotile, 323.  
Marbleloid, 332-33.  
Tredlite, 332-33.  
Unico, 328.  
Specifications, 327.

**Tile, Floor and Wall, Enameled, see Tile, Clay, Decorative or Sanitary.****Tile, Floor and Wall, Encaustic, see Tile, Clay, Decorative or Sanitary.****Tile, Floor and Wall, Faience, see Tile, Clay, Decorative or Sanitary.****Tile, Fountain, see Tile, Clay, Decorative or Sanitary.****Tile, Floor and Wall, Rubber.**

Beaver Tile & Specialty Co., Inc., 324.  
Mas-Oleum Floor Mfg. Co., 334.  
New York Belting & Packing Co., 322.  
Be-ver, 324.

**Tile, Floor and Wall, Slate.**

General Slate Co., 362-64.  
Vermont Structural Slate Co., 373.  
Specifications, 373.

**Tile, Floor and Wall, Vitrified, see Tile, Clay, Decorative or Sanitary; Tile, Promenade or Quarry.****Tile Fountain, see Tile, Clay, Decorative or Sanitary.****Tile, Furring, see Furring, Hollow Tile; Tile, Gypsum.****Tile, Glazed, see Tile, Clay, Decorative or Sanitary; Faience.****Tile, Grate.**

Bannon Pipe Co., P., 110.

**Tile, Gypsum.**

American Gypsum Co., 142-44.  
Plymouth Gypsum Co., 154-55.  
United States Gypsum Co., 162-68; 438-39.  
Anchor, 142-44.  
Plymouth, 154-55.  
Pyrobar, 162-68; 438-39.  
Specifications, 162-68.

**Tile, Hollow, Fireproof.**

Bannon Pipe Co., P., 110.  
Bradford Pressed Brick Co., 78-79.  
Burchartz Fireproofing Co., Inc., 26.  
Denison Fireproofing Co., 95.  
Denison Interlocking Tile Corporation, 96-97.  
Humphrey Brick & Tile Co., 106.  
Ketcham, O. W., 118.  
Maurer & Son, Henry, 98-99.  
National Fire Proofing Co., 100-05.  
Pennsylvania Fireproofing Co., 107.  
Truscon Steel Co., 217-19.  
Western Brick Co., 86-87.  
Burchartz, 26.  
Denison, 95.  
Haverstraw, 100-05.  
Humphrey, 106.  
Interlocking Tile, 96-97.  
Natco, 100-05.  
Natco Backup, 100-05.  
Natco XXX, 100-05.  
Pentex, 107.  
Pentex Splits, 107.  
Tex-Tile, 100-05.  
Truscon, 217-19.  
Specifications, 95.

**Tile, Hollow, Interlocking.**

(See also Slabs, Hollow, Interlocking.)  
American Cement Tile Mfg. Co., 432-33.  
Beaver Tile & Specialty Co., Inc., 324.  
Denison Interlocking Tile Corporation, 96-97.

**Tile, Hollow, Interlocking—Continued.**

Federal Cement Tile Co., 429-31.  
Pennsylvania Fireproofing Co., 107.  
Be-ver, 324.  
Bonanza, 432-33.  
Denison, 107.  
Interlocking Tile, 96-97.  
Pentex Splits, 107.

**Tile, Imitation, Sheet Metal.**

(See also Siding, Iron or Steel, Galvanized or Painted.)

American Sheet and Tin Plate Co., 412-13.

Edwards Mfg. Co., 418-19.  
Merchant & Evans Co., 420.  
Meurer Bros. Co., Inc., 422-23.  
Stark Rolling Mill Co., 424-25.  
Edwards, 418-19.  
M & E Co., 420.  
Meurer, 422-23.  
Toncan Metal, 424-25.

**Tile, Inlaid, see Tile, Clay Decorative or Sanitary.****Tile, Load Bearing, Hollow, see Floor Construction, Fireproof; Blocks, Building, Hollow, Fireproof; Tile, Hollow, Fireproof.****Tile, Mantel, see Tile, Clay, Decorative or Sanitary.****Tile, Metal.**

Edwards Mfg. Co., 418-19.  
Merchant & Evans Co., 420.  
Meurer Bros. Co., Inc., 422-23.  
Milwaukee Corrugating Co., 421.  
Wheeling Corrugating Department, 242-43.  
Edwards, 418-19.  
M & E Co., 420.  
Titelock, 421.

**Tile, Mosaic.**

(See also Mosaics.)

Associated Tile Manufacturers, 284-87.  
Grueby Faience & Tile Co., 292.  
Jackson Co., Wm. H., 289.  
Ketcham, O. W., 118.  
Grueby, 292.  
Jackson, 289.

**Tile, Natural Rock.**

Ridgway & Son, B., 296.  
Protectile, 296.

**Tile, Non-slip, see Tile, Swimming Pool.****Tile, Partition, see Blocks, Building, Hollow, Fireproof; Tile, Hollow, Fireproof; Tile, Gypsum.****Tile, Perforated.**

Mueller Mosaic Co., 293.

**Tile, Promenade or Quarry.**

African Ceramic and Tile Co. of Tunis, Inc., 290.  
Grueby Faience & Tile Co., 292.  
Hastings Pavement Co., 308.  
Hood Brick Co., B. Mifflin, 80-81.  
Huntington Roofing Tile Co., 434-35.  
Hydraulic-Press Brick Co., 82-83.  
Ketcham, O. W., 118.  
Kushequa Brick Co., 84-85.  
Kushequa Ceramic Co., 436-37.  
Ridgway & Son, B., 296.  
United States Roofing Tile Co., 440-41.  
Warren Chemical & Mfg. Division, 408-09.  
Battery Room, 84-85.  
Grueby, 292.  
Huntington, 434-35.  
Kushequa, 436-37.  
Ox-blood, 436-37.  
Pottery, 80-81.  
Protectile, 296.  
Warren's, 408-09.  
Specifications, 440-41.

**Tile, Refractory.**

Grueby Faience & Tile Co., 292.  
Grueby, 292.

**Tile, Roofing, Cement.**

American Cement Tile Mfg. Co., 432-33.  
Bonanza, 432-33.  
Specifications, 432-33.

**Tile, Roofing, Clay.**

Hood Brick Co., B. Mifflin, 80-81.  
Huntington Roofing Tile Co., 434-35.  
Ketcham, O. W., 118.  
Kushequa Ceramic Co., 436-37.  
Maurer & Son, Henry, 98-99.  
United States Roofing Tile Co., 440-41.  
*Ageart*, 118.  
*Huntington*, 434-35.  
*Kushequa*, 436-37.  
*Ox-blood*, 436-37.  
*Pottery*, 80-81.

**Tile, Roofing, Gypsum.**

American Gypsum Co., 142-44.  
United States Gypsum Co., 438-39.  
*Anchor*, 142-44.  
*Pyrobar*, 438-39.

**Tile, Roofing, Metal.**

Consolidated Sheet Metal Works, 712-13.  
Edwards Mfg. Co., 418-19.  
Jeter & Co., Inc., A. H., 446-47.  
McFarland-Hyde Co., 720-21.  
Merchant & Evans Co., 420.  
Meurer Bros. Co., Inc., 422-23.  
Milwaukee Corrugating Co., 421.  
*M & E Co.*, 420.  
*Meurer's*, 422-23.  
*The Edwards*, 418-19.  
*Titelock*, 421.

**Tile, Roofing, Terra Cotta, see Tile, Roofing, Clay.****Tile, Sewage Disposal, Porous.**

Aten Sewage Disposal Co., 879.

**Tile, Sewer.**

Bannon Pipe Co., P., 110.  
National Fire Proofing Co., 100-05.  
*Natco*, 100-05.

**Tile, Sewer, Lock Joint.**

National Fire Proofing Co., 100-05.  
*Natco*, 100-05.

**Tile, Shingle, see Tile, Roofing, Clay; Tile, Roofing, Metal.****Tile, Sidewalk, Asphalt.**

Hastings Pavement Co., 308.

**Tile, Spanish, see Tile, Roofing, Clay; Tile, Roofing, Metal.****Tile, Swimming Pool.**

(See also Tile, Clay, Decorative or Sanitary.)  
Associated Tile Manufacturers, 284-87.  
Booraem, J. Francis, 288.  
Davis Marble Co., 283.  
De Smet Quartz Tile Co., 291.  
Grueby Faience & Tile Co., 292.  
Hastings Pavement Co., 308.  
Jackson Co., Wm. H., 289.  
Mueller Mosaic Co., 293.  
*De Smet*, 291.  
*Grueby*, 292.

**Tile, Terra Cotta, see Tile, Roofing, Clay; Terra Cotta, Architectural or Ornamental; Tile, Hollow, Fireproof.****Tile, Vitrified, see Tile, Clay, Decorative or Sanitary.****Tile, Wall, see Tile, Floor and Wall.****Timber, see Lumber.****Timber Hangers, see Hangers: Beam Joist, Timber, Wall.****Timber Inspection, see Engineers, Inspection.****Time Recorders, see Recorders, Time.****Time Stamps, see Recorders, Time; Stamps, Time.****Time Systems, see Clock Systems.****Tin, Bar.**

Eagle-Picher Lead Co., 875.

**Tin, Roofing, see Tin and Terne Plate.****Tin Plate, Dairy.**

American Sheet and Tin Plate Co., 412-13.

**Tin and Terne Plate.**

American Sheet and Tin Plate Co., 412-13.

**Tin and Terne Plate—Continued.**

Merchant & Evans Co., 420.  
Meurer Bros. Co., Inc., 422-23.  
Taylor Co., N. & G., 426-28.  
Wheeling Corrugating Department, 242-43.  
*American*, 412-13.  
*American Numethodd*, 412-13.  
*American Old Style*, 412-13.  
*Franklin Old Style*, 420.  
*M & E Co.*, 420.  
*MF*, 412-13.  
*Merchant's Old Method*, 420.  
*Meurer*, 422-23.  
*Meurer Fire Door Terns*, 422-23.  
*Target and Arrow*, 426-28.  
*Taylor's Old Style*, 426-28.  
*Whitaker*, 242-43.

**Tinners Supplies.**

Friedley-Voshardt Co., 501.  
Merchant & Evans Co., 420.  
*M & E Co.*, 420.

**Tipplers, Coal.**

Link-Belt Co., 1310.

**Toasters, see Heating and Cooking Appliances.****Toilet Systems, Waterless.**

Dail Steel Products Co., 850.  
Kaustine Co., Inc., 851.  
*Kaustine*, 851.

**Toilets, see Closets.****Tool Room Enclosures, see Enclosures, Stock and Tool Room.****Tools, Hay.**

Hunt, Helm, Ferris & Co., 644.  
*Harvester*, 644.

**Tools, Ice.**

Gifford-Wood Co., 1298.  
*G-W*, 1298.

**Tools, Packing House, see Packing House Equipment.****Tools, Roofers.**

Merchant & Evans Co., 420.  
*M & E Co.*, 420.

**Tools, Slaters.**

Auld & Conger Co., 359.  
Johnson, Inc., E. J., 366-67.  
Sheldon Slate Co., F. C., 370-72.  
*Sheldon's*, 370-72.

**Tools, Tanners.**

Merchant & Evans Co., 420.  
*M & E Co.*, 240.

**Tools, Vacuum Cleaning.**

Spencer Turbine Cleaner Co., 1256-57.  
United Electric Co., 1258-59.  
*Spencer*, 1256-57.  
*Tuac*, 1258-59.

**Tops, Chimney, see Caps and Tops, Chimney.****Torchères, Entrance, see Lighting Fixtures.****Tougheners, Concrete, see Hardeners and Densifiers, Cement and Concrete.****Tower Ornaments, see Ornaments, Tower.****Toys, Electric.**

Western Electric Co., 1202-03.  
*Western Electric*, 1202-03.

**Tracing Cloth, see Cloth, Tracing.****Track, Door.**

(See also Hangers, Door.)  
Allith-Prouty Co., 614-15.  
Coburn Trolley Track Mfg. Co., 640-43.  
Diamond Door Hanger Co., 616-17.  
Grant Pulley and Hardware Co., 760-61.  
Hunt, Helm, Ferris & Co., 644.  
James Mfg. Co., 1466-70.  
Kinnear Mfg. Co., 670-79.  
Louden Machinery Co., 1471-73.  
McCabe Hanger Mfg. Co., 618-20.  
Merchant & Evans Co., 680.  
National Mfg. Co., 621-25.  
Ogden Co., J. Edward, 682-83.  
Richards-Wilcox Mfg. Co., 630-35.  
Stowell Co., 636-37.

**Track, Door—Continued.**

Wagner Mfg. Co., 638-39.  
*Allith-Prouty*, 614-15.  
*Braced*, 621-25.  
*Coburn*, 640-43.  
*Diamond*, 616-17.  
*Grant*, 760-61.  
*James*, 1466-70.  
*Kinnear*, 670-79.  
*McCabe*, 618-20.  
*Monarch*, 630-35.  
*Ogden*, 682-83.  
*R-W*, 630-35.  
*Slidetite*, 630-35.  
*Star*, 644.  
*Stormproof*, 621-25.  
*Wagner*, 638-39.  
*Wilbern*, 636-37.

**Track, Door, Barn, see Track, Door.****Track, Door, Fire, see Track, Door.****Track Door, Sliding, see Track, Door.****Track Door, Trolley, see Track, Door.****Track, Feed, see Carriers, Feed and Litter.****Traffic Standards.**

Fiske Iron Works, J. W., 552-53.

**Transformers, Bell Ringing, see Transformers, Electric.****Transformers, Electric.**

General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*All-nite-light*, 1153-67.  
*G-E*, 1153-67.  
*Wayne*, 1153-67.

**Transformers, Miniature, see Transformers, Electric.****Transom Bars, see Store Fronts.****Transom Fixtures, Reversible, see Windows, Reversible, Revolving, Pivoted or Swinging, Fixtures for.****Transom Lifters and Operators.**

(See also Sash Operators and Gearing.)  
Grant Pulley and Hardware Co., 760-61.  
Lord & Burnham Co., 747.  
Payson Mfg. Co., 750-53.  
*Grant*, 760-61.  
*Harris*, 750-53.  
*Simplex*, 750-53.

**Transom Ventilators, see Ventilators, Window.****Traps, Air, see Valves, Air; Valves, Radiator, Return Line, Automatic.****Traps, Alternating Receiver.**

Thermograde Valve Co., 913.  
*Van Auker*, 913.

**Traps, Ammonia.**

Automatic Refrigerating Co., 1048-49.

**Traps, Ash, see Dumps, Ash.****Traps, Backwater.**

Josam Mfg. Co., 876-78.

**Traps, Bath and Floor Drain, Combination.**

Josam Mfg. Co., 876-78.

**Traps, Blast, Coil.**

(See also Traps, Steam; Valves, Radiator, Return Line, Automatic.)  
Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
Thermograde Valve Co., 913.  
*Coenco*, 913.  
*Dunham*, 916-21.  
*Haines*, 924-25.

**Traps, Drain.**

Hugo Mfg. Co., 1030.

**Traps, Float, see Traps, Steam; Valves, Radiator, Return Line, Automatic.****Traps, Grease.**

Compound Injector & Specialty Co., 872-73.  
*Dehn's Acme*, 872-73.

**Traps, Gutter, Stable.**

Louden Machinery Co., 1471-73.  
Schouler Cement Construction Co., 789.  
*Duplex*, 789.



**Traps, Iron Drum**, see Traps, Plumbing.

**Traps, Lavatory.**

Central Brass Mfg. Co., 852-55.  
Glauber Brass Mfg. Co., 856-61.  
*Glauber*, 856-61.  
*Quick-pressure*, 852-55.

**Traps, Oil**, see Traps, Steam.

**Traps, Plumbing.**

Central Brass Mfg. Co., 852-55.  
Crane Co., 1084-85.  
Compound Injector & Specialty Co., 872-73.  
Eagle-Picher Lead Co., 875.  
Glauber Brass Mfg. Co., 856-61.  
Josam Mfg. Co., 876-78.  
*Crane*, 1084-85.  
*Eagle*, 875.  
*Glauber*, 856-61.  
*Josam Double Drainage*, 876-78.  
*Quick-pressure*, 852-55.

**Traps, Radiator**, see Traps, Steam, Radiator, Thermostatic and Vacuum.

**Traps, Refrigerator.**

Automatic Refrigerating Co., 1048-49.  
Central Brass Mfg. Co., 852-55.  
*Central Cleveland*, 852-55.  
Specifications, 852-55.

**Traps, Return Line**, see Traps, Steam, Radiator, Thermostatic and Vacuum.

**Traps, Steam.**

American Blower Co., 996-99.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
Hoffman Specialty Co., 926-29.  
Jenkins Bros., 1086-87.  
Johns-Manville Co., H. W., 930.  
Ohio Blower Co., 472-74.  
Pratt & Cady Co., Inc., 1090-91.  
Sarco Co., Inc., 931.  
Sturtevant Co., B. F., 1006-07.  
Thermograde Valve Co., 913.  
Tyler Underground Heating System, 911.  
*Coenco*, 913.  
*Detroit*, 996-99.  
*Dunham*, 916-21.  
*Flinn*, 1006-07.  
*Haines*, 924-25.  
*Hoffman*, 926-29.  
*Jenkins Bros.*, 1086-87.  
*Johns-Manville*, 930.  
*Marck Therm.*, 914-15.  
*Sarco*, 931.  
*Sturtevant*, 1006-07.  
*Swartwout*, 472-74.  
*Tyler*, 911.

**Traps, Steam, Radiator, Thermostatic and Vacuum.**

Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Haines & Co., William S., 924-25.  
Hoffman Specialty Co., 926-29.  
Johns-Manville Co., H. W., 930.  
Pratt & Cady Co., Inc., 1090-91.  
Sarco Co., Inc., 931.  
Thermograde Valve Co., 913.  
Webster & Co., Warren, 932-34.  
*Belvac Thermofier*, 913.  
*Dunham*, 916-21.  
*Haines*, 924-25.  
*Hoffman*, 926-29.  
*Johns-Manville*, 930.  
*Pratt*, 1090-91.  
*Sarco*, 931.  
*Vacu-Traps*, 914-15.  
*Webster*, 932-34.  
Specifications, 916-21.

**Traps, Waste**, see Traps, Plumbing.

**Traps, Water Seal**, see Valves, Radiator, Return Line, Automatic.

**Traps and Drains, Combination.**

Josam Mfg. Co., 876-78.  
*Josam Double Drainage*, 876-78.

**Trays, Laundry**, see Tubs and Trays, Laundry.

**Trays, Letter, Metal.**

(See also Furniture.)  
Darby & Sons Co., Inc., Edward, 1409.  
General Fireproofing Co., 1414.  
*GF Allsteel*, 1414.

**Treads, Antislip**, see Treads, Safety.

**Treads, Composition.**

American Mason Safety Tread Co., 344-45.  
Beaver Tile & Specialty Co., Inc., 324.  
Cheney & Co., Inc., 329.  
General Kompolite Co., 330.  
Marbleloid Co., 332-33.  
Special Service Flooring Corporation, 336.  
United Cork Flooring Co., 328.  
Universal Safety Tread Co., 347.  
Warren Chemical & Mfg. Division, 309.  
*Anchor*, 309.  
*Be-ver*, 324.  
*Crescent*, 328.  
*Kompolite*, 330.  
*Linotile*, 323.  
*Marbleloid*, 332-33.  
*Mason*, 344-45.  
*Mastolith*, 330.  
*Special Service*, 336.  
*Troegerlith*, 329.  
*Unico*, 328.  
*Universal*, 347.

**Treads, Composition, Cork.**

American Mason Safety Tread Co., 344-45.  
Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.  
Dreadnought Flooring Co., 325.  
Kennedy, Inc., David E., 327.  
United Cork Flooring Co., 328.  
*Be-ver*, 324.  
*Crescent*, 328.  
*Dreadnought*, 325.  
*Everlastic*, 327.  
*Linotile*, 323.  
*Mason*, 344-45.  
*Unico*, 328.

**Treads, Cork.**

Armstrong Cork & Insulation Co., 323.  
Beaver Tile & Specialty Co., Inc., 324.  
Kennedy, Inc., David E., 326.  
United Cork Flooring Co., 328.  
*Be-ver*, 324.  
*Crescent*, 328.  
*Linotile*, 323.  
*Nonpareil*, 326.  
*Unico*, 328.

**Treads, Metal.**

American Abrasive Metals Co., 346.  
American Mason Safety Tread Co., 344-45.  
Concrete Steel Co., 188-89.  
Mesker Brothers Iron Co., 722-25.  
Truscon Steel Co., 217-19.  
Universal Safety Tread Co., 347.  
Wisconsin Iron & Wire Works, 267.  
*Feralun*, 346.  
*Havemeyer*, 188-89.  
*Mason*, 344-45.  
*Sanitread*, 188-89.  
*Stanwood*, 344-45.  
*Truscon*, 217-19.  
*Universal*, 347.

**Treads, Rubber.**

New York Belting & Packing Co., 322.

**Treads, Safety.**

American Abrasive Metals Co., 346.  
American Mason Safety Tread Co., 344-45.  
Concrete Steel Co., 188-89.  
Universal Safety Tread Co., 347.  
*Feralun*, 346.  
*Havemeyer*, 188-89.  
*Mason Black Diamond*, 344-45.  
*Sanitread*, 188-89.  
*Universal*, 347.

**Treads, Slate.**

Johnson, Inc., E. J., 366-67.  
Penrhyn Slate Co., 365.

**Treads, Slate—Continued.**

Vermont Structural Slate Co., 373.  
Specifications, 373.

**Treads, Soapstone.**

Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Treads and Risers, Metal Stair.**

Central Architectural Iron Works, 261.  
Hughes-Keenan Co., 262-65.  
Mesker Brothers Iron Co., 722-25.  
Penn Metal Co., 216.  
Sexauer & Lemke, Inc., 262-65.  
Wisconsin Iron & Wire Works, 267.  
*Centrals*, 261.  
*Penco*, 216.

**Trellis Seats**, see Furniture, Garden and Park.

**Trellises, Iron and Wire.**

Anchor Post Iron Works, 537-43.  
Brook Iron Works, A. T., 544-45.  
Fiske Iron Works, J. W., 552-53.

**Trellises, Wood.**

Mathews Mfg. Co., 1402-03.

**Trestles.**

Raymond Concrete Pile Co., 12-13.

**Trestles, Wood.**

Brown Co., 573.  
Southern Pine Association, 561.

**Trim, Composition**, see Flooring, Composition.

**Trim, Kalamein**, see Trim, Metal or Metal Covered.

**Trim, Metal or Metal Covered.**

Alignum Fireproof Products Co., Inc., 646-47.  
Barnum, E. T., 496-97.  
Central Metallic Door Co., 648.  
Chesley Co., Inc., A. C., 710-11.  
Coburn Trolley Track Mfg. Co., 640-43.  
Coulson & Co., J. W., 482-83.  
Dahlstrom Metallic Door Co., 649-51.  
Detroit Mausoleum Equipment Works, 500.  
Edwards Mfg. Co., 418-19.  
Howell, Field & Goddard, Inc., 652-53.  
Hughes-Keenan Co., 262-65.  
Interior Metal Mfg. Co., 654-55.  
McFarland-Hyde Co., 720-21.  
Manhattan Brass Co., 513.  
Mesker Brothers Iron Co., 722-25.  
National Automatic Door Co., 660.  
National Skylight and Ventilator Co., 448-49.  
Newark Cornice and Skylight Works, 726-27.

Reliance Fireproof Door Co., 656-57.  
Richards-Wilcox Mfg. Co., 630-35.  
Riester & Thesmacher Co., 658-59.  
Sexauer & Lemke, Inc., 262-65.  
Smyser-Royer Co., 528.  
Solar Metal Products Co., Inc., 645.  
Stark Rolling Mill Co., 424-25.  
Thorp Fire Proof Door Co., 661-63.  
Van Dorn Iron Works Co., 1428.  
Variety Mfg. Co., 688-91.  
Wagner's Sons Co., J. F., 732-33.  
Watson Mfg. Co., Inc., 1429.  
Whitaker-Glessner Co., 241.  
*Acme*, 652-53.  
*Alignum*, 646-47.  
*Chesley*, 710-11.  
*Interior*, 654-55.  
*National*, 640-43.  
*Portsmouth Iron*, 241.  
*R-W*, 630-35.  
*Toncan Metal*, 424-25.  
*Van Dorn*, 1428.

**Trim, Wood.**

Arkansas Soft Pine Bureau, 560.  
"Bilt-Well" Service Bureau, 574-75.  
Brown Co., 573.  
Carnahan Mfg. Co., 576-77.  
Curtis Service Bureau, 578-79.  
Indiana Lumber & Mfg. Co., 580-81.  
Matthews Bros. Mfg. Co., 582-83.  
Morgan Co., 584-85.

**Trim, Wood—Continued.**

- North Carolina Pine Association, 562-63.  
 Northern Hemlock and Hardwood Manufacturers Association, 564-65.  
 Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
 Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.  
 Southern Cypress Manufacturers' Association, 570-71.  
 Southern Pine Association, 561.  
 Tiffany Studios, 526-27.  
 White Pine Bureau, 572.  
*Arkansas Soft Pine*, 560.  
*Bilt-Well*, 574-75.  
*Curtis*, 578-79.

**Trimming Machines, Slate**, see Tools, Slaters.**Tripods, Bronze**, see Ornamental Metal Work.**Trolley Cord**, see Cord, Trolley, Bell and Arc Lamp.**Troughs, Chalk**, see Rails, Chalk.**Troughs, Water.**

(See also Barn Equipment; Stable Fittings and Fixtures.)

- Price-Evans Foundry Co., 518-19.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Sterling Foundry Co., 274.

**Truck Loaders**, see Loaders and Unloaders, Car or Wagon.**Truckover Elevator Doors**, see Doors and Gates, Elevator, Counterbalanced.**Trucks, Ash Can.**

- Stephenson, C. H., 277.  
*The Stephenson*, 277.

**Trucks, Bankers and Card Record** see Omnibuses, Vault and Office.**Trucks, Electric, Storage Battery.**

Sprague Electric Works, 1168.

**Trucks, Feed.**

- Fiske Iron Works, J. W., 552-53.  
 James Mfg. Co., 1466-70.  
 Loudon Machinery Co., 1471-73.  
*James*, 1466-70.

**Truss Rods**, see Rods, Tie or Truss.**Trusses, Roof.**

- Chattanooga Boiler & Tank Co., 1094.  
 Duvinage, Pierre, 260.  
 Lupton's Sons Co., David, 704-08.  
*Duvinage*, 260.  
*Pond*, 704-08.

**Tubes, Fiber.**

Brown Co., 573.

**Tubes, Nickel, Steel Lined.**

- American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Tubes, Pneumatic.**

Lamson Co., 1307.

**Tubing: Brass, Copper, German Silver and Nickel.**

- American Brass Co., 1071.  
 Whitlock Coil Pipe Co., 904-06.  
*Benedict Nickel*, 1071.

**Tubing, Gas**, see Tubing, Metal.**Tubing, Metal.**

- American Brass Co., 1071.  
 Crane Co., William M., 1012-13.  
 Manhattan Brass Co., 513.  
 National Pipe Bending Co., 902-03.  
 Whitlock Coil Pipe Co., 904-06.  
 Youngstown Sheet & Tube Co., 1074-75.  
*Benedict Nickel*, 1071.  
*Vulcan*, 1012-13.  
*Youngstown*, 1074-75.

**Tubing, Seamless.**

- American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Tubs and Sinks, Combination.**

- Alberene Stone Co., 890-91.  
*Alberene Stone*, 890-91.

**Tubs and Trays, Laundry.**

- Alberene Stone Co., 890-91.  
 Maddock's Sons Co., Thomas, 835-42.  
 Monument Pottery Co., 843-46.  
 Penrhyn Slate Co., 365.  
*Alberene Stone*, 890-91.  
*Monument*, 843-46.  
*Portray*, 835-42.  
 Specifications, 835-42.

**Tunnel Construction.**

Foundation Co., 14.

**Turbines, Steam.**

- General Electric Co., 1153-67.  
 Sturtevant Co., B. F., 1006-07.  
*Curtis*, 1153-67.  
*G-E*, 1153-67.  
*Sturtevant*, 1006-07.

**Turnbuckles.**

American Steel & Wire Co., 30-33.

**Turnstiles.**

- Brook Iron Works, A. T., 544-45.  
 Fiske Iron Works, J. W., 552-53.  
 Revolving Door & Fixture Co., 590.

**Turntables, Automobile.**

- Beach Garage Equipment Co., Inc., T. C., 1483.  
 Canton Foundry & Machine Co., 1486.  
 Ernst's Sons, C. F., 1484-85.  
*Ernst*, 1484-85.  
*Ideal*, 1483.  
*Perfection*, 1483.  
*Universal*, 1486.

**Turntable and Wash Rack, Combined, Automobile.**

- Ernst's Sons, C. F., 1484-85.  
*Ernst*, 1484-85.

**Turrets**, see Skylights; Ventilators, Roof; Sash, Monitor or Sawtooth Roof.**Type Metal.**

Eagle-Picher Lead Co., 875.

## U

**Umbrella Holders**, see Holders, Umbrella.**Underground Construction**, see Shoring and Underpinning.**Underwriters Laboratories.**

Society for Electrical Development, Inc., 1145-52.

**Union Elbows**, see Fittings, Pipe.**United States Bureau of Standards.**

Society for Electrical Development, Inc., 1145-52.

**Urinal Stalls**, see Stalls, Shower, Toilet or Urinal.**Urinals.**

- Alberene Stone Co., 890-91.  
 Kaustine Co., Inc., 851.  
 Kenney Mfg. Co., 834.  
 Maddock's Sons Co., Thomas, 835-42.  
 Manufacturing Equipment & Engineering Co., 847.  
 Monument Pottery Co., 843-46.  
*Alberene Stone*, 890-91.  
*Ionia*, 834.  
*Madesta*, 835-42.  
*Madstone*, 835-42.  
*Monument*, 843-46.  
*Vitrico*, 843-46.  
 Specifications, 835-42.

**Urinals, Chemical.**

- Detail Steel Products Co., 850.  
 Kaustine Co., Inc., 851.  
 Specifications, 851.

**Urns, Cinerary, Bronze or Metal.**

- Gorham Co Architectural Bronze, 502-03.  
 McGann & Sons Co., T. F., 508-09.  
 Wisconsin Iron & Wire Works, 533.

**Urns, Flower**, see Furniture, Garden and Park.**Urns, Heating**, see Heating and Cooking Appliances.

## V

**Vacuum Cleaner Accessories**, see Vacuum Cleaners, Portable or Stationary.**Vacuum Cleaners, Portable or Stationary.**

- Connersville Blower Co., 1102-03.  
 Invincible Vacuum Cleaner Mfg. Co., 1260.  
 Kewanee Private Utilities Co., 1112-13.  
 Society for Electrical Development, Inc., 1145-52.  
 Spencer Turbine Cleaner Co., 1256-57.  
 Sturtevant Co., B. F., 1006-07.  
 United Electric Co., 1258-59.  
 Western Electric Co., 1202-03.  
*Connersville*, 1102-03.  
*Invincible*, 1260.  
*Spencer*, 1256-57.  
*Sturtevant*, 1006-07.  
*Tuec*, 1258-59.  
*Western Electric*, 1202-03.  
 Specifications, 1256-57.

**Vacuum Cleaning Systems**, see Vacuum Cleaners, Portable or Stationary.**Vacuum Heating Systems**, see Heating Systems, Steam.**Valleys, Roof**, see Roof Trimmings, Metal.**Valve Boxes**, see Boxes, Valve.**Valve Disks, Composition.**

- Chapman Valve Mfg. Co., 1080-81.  
 Jenkins Bros., 1086-87.  
*Chapman*, 1080-81.  
*Jenkins Bros.*, 1086-87.

**Valves, Acid.**

- United Lined Tube & Valve Co., 1072-73.  
*United*, 1072-73.

**Valves, Air.**

- Beaton & Corbin Mfg. Co., 935.  
 Bishop-Babcock-Becker Co., 914-15.  
 Dunham Co., C. A., 916-21.  
 Haines & Co., William S., 924-25.  
 Hoffman Specialty Co., 926-29.  
 Jenkins Bros., 1086-87.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Sarco Co., Inc., 931.  
*B. & C.*, 935.  
*Dunham*, 916-21.  
*Hoffman*, 926-29.  
*Jenkins Bros.*, 1086-87.  
*Quick Vent*, 926-29.  
*Quick Vent Float*, 926-29.  
*Sarco*, 931.  
*Vacu-Vapor*, 914-15.  
 Specifications, 926-29.

**Valves, Air, Automatic**, see Valves, Air.**Valves, Air Line**, see Valves, Radiator, Air Line Return.**Valves, Air Line, Thermostatic**, see Valves, Radiator, Air Line Return, Automatic.**Valves, Ammonia.**

York Mfg. Co., 1055.

**Valves, Angle**, see Valves: Globe, Angle, Check and Cross.**Valves, Back Pressure**, see Valves: Globe, Angle, Check and Cross.**Valves, Backwater.**

- Compound Injector & Specialty Co., 872-73.  
*Dehn's*, 872-73.

**Valves, Blow-off.**

- Jenkins Bros., 1086-87.  
 Pratt & Cady Co., Inc., 1090-91.  
 United Lined Tube & Valve Co., 1072-73.  
*Jenkins Bros.*, 1086-87.

**Valves, Check**, see Valves: Globe, Angle, Check and Cross.**Valves, Check, Diaphragm.**

- Haines & Co., William S., 924-25.  
*Haines*, 924-25.

**Valves, Control, Water Level**, see Valves, Float or Tank.



**Valves, Corrosionproof.**

United Lined Tube & Valve Co., 1072-73.

**Valves, Cross, see Valves: Globe, Angle, Check and Cross.****Valves, Diaphragm.**

Atlas Valve Co., 940-41.

Bishop-Babcock-Becker Co., 914-15.

Dunham Co., C. A., 916-21.

Fulton Co., 937-38.

Haines & Co., William S., 924-25.

Johnson Service Co., 942-46.

Powers Regulator Co., 947; 950-51.

United Lined Tube & Valve Co., 1072-73.

*Air Line*, 926-29.

*Atlas*, 940-41.

*Dunham*, 916-21.

*Haines*, 924-25.

*Johnson Sylphon*, 942-46.

*Sylphon*, 937-38.

*VacUstat*, 914-15.

Specifications, 942-46.

**Valves, Exhaust, see Valves, Relief.****Valves, Expansion, Ammonia.**

Automatic Refrigerating Co., 1048-49.

**Valves, Float or Tank.**

Atlas Valve Co., 940-41.

Ohio Blower Co., 472-74.

*Atlas*, 940-41.

*Stewart*, 472-74.

**Valves, Flushing, Closet.**

Kennedy Mfg. Co., 834.

*Flushometer*, 834.

**Valves, Fractional, see Valves, Radiator, Graduated.****Valves, Gas, see Valves: Globe, Angle, Check and Cross.****Valves, Gate.**

Allen Mfg. Co., W. D., 1131-33.

Chapman Valve Mfg. Co., 1080-81.

Crane Co., 1084-85.

Jenkins Bros., 1086-87.

Kennedy Valve Mfg. Co., 1088-89.

Pratt & Cady Co., Inc., 1090-91.

Simmons Co., John, 1142-43.

United Lined Tube & Valve Co., 1072-73.

*Chapman*, 1080-81.

*Crane*, 1084-85.

*Jenkins Bros.*, 1086-87.

**Valves: Globe, Angle, Check and Cross.**

Allen Mfg. Co., W. D., 1131-33.

American District Steam Co., 912.

Bishop-Babcock-Becker Co., 914-15.

Central Brass Mfg. Co., 852-55.

Chapman Valve Mfg. Co., 1080-81.

Commonwealth Brass Corporation, 1082.

Crane Co., 1084-85.

Glauber Brass Mfg. Co., 856-61.

Gorton & Lidgerwood Co., 1083.

Jenkins Bros., 1086-87.

Johnson Service Co., 942-46.

Kennedy Valve Mfg. Co., 1088-89.

Penberthy Injector Co., 882-83.

Pratt & Cady Co., Inc., 1090-91.

Simmons Co., John, 1142-43.

Thermograde Valve Co., 913.

United Lined Tube & Valve Co., 1072-73.

*Adscos*, 912.

*Central Cleveland*, 852-55.

*Chapman*, 1080-81.

*Crane*, 1084-85.

*Glauber*, 856-61.

*Gorton*, 1083.

*Jenkins Bros.*, 1086-87.

*Johnson*, 942-46.

*Penberthy*, 882-83.

*Pratt*, 1090-91.

*Thermo-Grade*, 914-15.

*Vacu-Check*, 914-15.

**Valves, High Pressure, see Valves: Globe, Angle, Check and Cross.****Valves, Hopper.**

Crampton-Farley Brass Co., 874.

*Star*, 874.

**Valves, Hose.**

Allen Mfg. Co., W. D., 1131-33.

Chapman Valve Mfg. Co., 1080-81.

Jenkins Bros., 1086-87.

New York Brass Foundry Co., 1134-35.

Simmons Co., John, 1142-43.

*Alenco*, 1131-33.

*Chapman*, 1080-81.

*Jenkins Bros.*, 1086-87.

*Stillbeck*, 1134-35.

**Valves, Hydraulic.**

Pratt & Cady Co., Inc., 1090-91.

**Valves, Mixing, see Mixers, Shower Bath.****Valves, Pump.**

Bishop-Babcock-Becker Co., 914-15.

Dunham Co., C. A., 916-21.

Jenkins Bros., 1086-87.

*Dunham*, 916-21.

*Jenkins Bros.*, 1086-87.

Specifications, 916-21.

**Valves, Quarter Turn.**

Gorton & Lidgerwood Co., 1083.

**Valves, Radiator.**

American District Steam Co., 912.

Bishop-Babcock-Becker Co., 914-15.

Chapman Valve Mfg. Co., 1080-81.

Commonwealth Brass Corporation, 1082.

Crane Co., 1084-85.

Dunham Co., C. A., 916-21.

Eddy Engineering Co., 922-23.

Fulton Co., 937-38.

Gorton & Lidgerwood Co., 1083.

Haines & Co., William S., 924-25.

Hoffman Specialty Co., 926-29.

Jenkins Bros., 1086-87.

Johnson Service Co., 942-46.

Kennedy Valve Mfg. Co., 1088-89.

Powers Regulator Co., 947.

Pratt & Cady Co., Inc., 1090-91.

Thermograde Valve Co., 913.

Webster & Co., Warren, 932-34.

*Adscos*, 912.

*Chapman*, 1080-81.

*Crane*, 1084-85.

*Dunham*, 916-21.

*Eddy*, 922-23.

*Gorton*, 1083.

*Haines*, 924-25.

*Hoffman*, 926-29.

*Jenkins Bros.*, 1086-87.

*Johnson*, 942-46.

*Sylphon*, 937-38.

*Thermo*, 913.

*Vacu-Graduate*, 914-15.

*Webster*, 932-34.

**Valves, Radiator, Air Line Return.**

Bishop-Babcock-Becker Co., 914-15.

Dunham Co., C. A., 916-21.

Eddy Engineering Co., 922-23.

Haines & Co., William S., 924-25.

Hoffman Specialty Co., 926-29.

Jenkins Bros., 1086-87.

*Dunham*, 916-21.

*Haines*, 924-25.

*Hoffman*, 926-29.

*Jenkins Bros.*, 1086-87.

*VacuUstat*, 914-15.

Specifications, 916-21.

**Valves, Radiator, Diaphragm, see Valves, Diaphragm.****Valves, Radiator, Graduated.**

American District Steam Co., 912.

Bishop-Babcock-Becker Co., 914-15.

Commonwealth Brass Corporation, 1082.

Crane Co., 1084-85.

Dunham Co., C. A., 916-21.

Haines & Co., William S., 924-25.

Jenkins Bros., 1086-87.

Powers Regulator Co., 947.

Thermograde Valve Co., 913.

Webster & Co., Warren, 932-34.

*Adscos*, 912.

*Crane*, 1084-85.

*Dunham*, 916-21.

*Haines Vento*, 924-25.

*Jenkins Bros.*, 1086-87.

*Powers*, 947.

**Valves, Radiator, Graduated—Continued.**

*Thermo*, 913.

*Vacu-Graduate*, 914-15.

*Webster*, 932-34.

**Valves, Radiator, Modulation, see Valves, Radiator, Graduated.****Valves, Radiator, Packless.**

Bishop-Babcock-Becker Co., 914-15.

Commonwealth Brass Corporation, 1082.

Dunham Co., C. A., 916-21.

Fulton Co., 937-38.

Gorton & Lidgerwood Co., 1083.

*Dunham*, 916-21.

*Gorton*, 1083.

*Lavigne*, 1082.

*Sylphon*, 937-38.

*Vacu-Graduate*, 914-15.

Specifications, 916-21.

**Valves, Radiator, Return Line, Automatic.**

(See also Traps, Steam, Radiator.)

Bishop-Babcock-Becker Co., 914-15.

Commonwealth Brass Corporation, 1082.

Crane Co., 1084-85.

Dunham Co., C. A., 916-21.

Eddy Engineering Co., 922-23.

Fulton Co., 937-38.

Gorton & Lidgerwood Co., 1083.

Haines & Co., William S., 924-25.

Hoffman Specialty Co., 926-29.

Jenkins Bros., 1086-87.

Johns-Manville Co., H. W., 930.

Webster & Co., Warren, 932-34.

*Crane*, 1084-85.

*Dunham*, 916-21.

*Eddy*, 922-23.

*Gorton*, 1083.

*Haines*, 924-25.

*Hoffman*, 926-29.

*Jenkins Bros.*, 1086-87.

*Johns-Manville*, 930.

*Quick Vent Float*, 926-29.

*Sylphon*, 937-38.

*Vento*, 924-25.

Specifications, 926-29.

**Valves, Reducing, Pressure, see Valves, Regulating, Pressure.****Valves, Regrinding.**

Chapman Valve Mfg. Co., 1080-81.

Penberthy Injector Co., 882-83.

Pratt & Cady Co., Inc., 1090-91.

*Chapman*, 1080-81.

*Penberthy*, 882-83.

**Valves, Regulating, Pressure.**

(See also Valves, Radiator, Graduated.)

American District Steam Co., 912.

Atlas Valve Co., 940-41.

Bishop-Babcock-Becker Co., 914-15.

Dunham Co., C. A., 916-21.

Minneapolis Heat Regulating Co., 948-49.

*Adscos*, 912.

*Atlas*, 940-41.

*Dunham*, 916-21.

*Perfection*, 912.

*VacuUstat*, 914-15.

Specifications, 916-21.

**Valves, Regulating, Stop and Check, see Mixers, Shower Baths.****Valves, Regulating, Temperature, see Valves, Thermostatic; Valves, Diaphragm; Valves, Regulating, Pressure.****Valves, Relief.**

American District Steam Co., 912.

Eddy Engineering Co., 922-23.

Jenkins Bros., 1086-87.

*Adscos*, 912.

*Eddy*, 922-23.

*Jenkins Bros.*, 1086-87.

**Valves, Renewable Disk.**

Jenkins Bros., 1086-87.

Pratt & Cady Co., Inc., 1090-91.

*Jenkins Bros.*, 1086-87.

**Valves, Return, Water.**

(See also Traps, Steam.)

Eddy Engineering Co., 922-23.

*Eddy*, 922-23.

**Valves, Return Line**, see Valves, Radiator, Return Line, Automatic.

**Valves, Safety.**

Haines & Co., William S., 924-25.  
Jenkins Bros., 1086-87.  
Pratt & Cady Co., Inc., 1090-91.  
Jenkins Bros., 1086-87.

**Valves, Shower**, see Baths, Shower or Needle.

**Valves, Shut-off, Gas, Automatic.**

New York Brass Foundry Co., 1134-35.  
Stillbech, 1134-35.

**Valves, Steam or Hot Water**, see Valves: Globe, Angle, Check and Cross.

**Valves, Stop and Check, Non-return Automatic.**

Jenkins Bros., 1086-87.  
Jenkins Bros., 1086-87.

**Valves, Stop and Waste.**

Central Brass Mfg. Co., 852-55.  
Quick-pressure, 852-55.

**Valves, Thermostatic.**

Atlas Valve Co., 940-41.  
Bishop-Babcock-Becker Co., 914-15.  
Dunham Co., C. A., 916-21.  
Fulton Co., 937-38.  
Haines & Co., William S., 924-25.  
Hoffman Heater Co., 1020-22.  
Hoffman Specialty Co., 926-29.  
Johnson Service Co., 942-46.  
Minneapolis Heat Regulator Co., 948-49.  
Powers Regulator Co., 947.  
Thermograde Valve Co., 913.  
Webster & Co., Warren, 932-34.  
Atlas, 940-41.  
Dunham, 916-21.  
Hoffman, 926-29.  
Houghton Therm, 914-15.  
Johnson, 942-46.  
Johnson Sylphon, 942-46.  
Minneapolis, 948-49.  
Sylphon, 937-38.  
Thermo, 913.  
VacUstat, 914-15.  
Webster's Sylphon, 932-34.  
Specifications, 942-46.

**Valves, Throttle.**

Pratt & Cady Co., Inc., 1090-91.

**Valves, Vacuum**, see Valves, Radiator, Return Line, Automatic.

**Valves, Vent**, see Valves, Air.

**Valves, Y**, see Valves, Blow-off.

**Vapor Heating Systems**, see Heating Systems, Steam.

**Varnish, Asphalt.**

Natroco Paint & Varnish Works, 1334.  
National, 1334.

**Varnish, Coach**, see Varnish, Interior and Exterior.

**Varnish, Floor.**

Arco Co., 1316-17.  
Berry Brothers, 1346.  
Boston Varnish Co., 1340-41.  
Certain-teed Products Corporation, 399-401.  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Keystone Varnish Co., 1347-48.  
Louisville Varnish Co., Inc., 1349.  
Lowe Brothers Co., 1328-29.  
Murphy Varnish Co., 1350-51.  
Pitcairn Varnish Co., 1352-53.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
Tropical Paint & Oil Co., 1335.  
Twin City Varnish Co., 1365.  
Valentine & Co., 1366-67.  
Arco, 1316-17.  
Certain-teed, 399-401.  
Degrah, 1347-48.  
Elastica, 1356-63.

**Varnish, Floor—Continued.**

Floorette, 1365.  
Florsatin, 1342-43.  
Glidden, 1344-45.  
Hampden, 1320-21.  
Harrisons, 1322-25.  
High Standard, 1328-29.  
Kyanize, 1340-41.  
Liquid Granite, 1346.  
Louwarco, 1349.  
M. P., 1344-45.  
Memphi, 1319.  
Murphy, 1350-51.  
Pitcairn Aged Floor Spar, 1352-53.  
Premier Satine, 1349.  
6r, 1354-55.  
Stanvar, 1356-63.  
Supremis, 1342-43.  
Univernish, 1350-51.  
Valspar, 1366-67.  
Vernicol, 1328-29.  
Vitrolac, 1322-25.  
Zanzibolio, 1364.  
Specifications, 1342-43; 1344-45; 1346; 1350-51; 1352-53; 1354-55; 1356-63; 1365; 1366-67.

**Varnish, Insulating.**

Electric Cable Co., 1190-91.  
Standard Paint Co., 393.  
Standard Varnish Works, 1356-63.  
Ecco, 1190-91.  
P & B, 393.

**Varnish, Interior and Exterior.**

Arco Co., 1316-17.  
Berry Brothers, 1346.  
Billings-Chapin Co., 1318.  
Boston Varnish Co., 1340-41.  
Bridgeport Wood Finishing Works, 1369.  
Certain-teed Products Corporation, 399-401.  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
Glidden Co., 1344-45.  
Hampden Paint & Chemical Co., 1320-21.  
Harrison Works, 1322-25.  
Johnson & Co., Inc., Oliver, 1326-27.  
Keystone Varnish Co., 1347-48.  
Louisville Varnish Co., Inc., 1349.  
Lowe Brothers Co., 1328-29.  
Marietta Paint & Color Co., 1330.  
Murphy Varnish Co., 1350-51.  
Pitcairn Varnish Co., 1352-53.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
Toch Brothers, 50-51.  
Tropical Paint & Oil Co., 1335.  
Twin City Varnish Co., 1365.  
Valentine & Co., 1366-67.  
Wadsworth, Howland & Co., Inc., 1338-39.  
Alcolac, 1354-55.  
Architectural Coach, 1342-43.  
Arco, 1316-17.  
Bay State, 1338-39.  
Certain-teed, 399-401.  
Chi-Vo, 1342-43.  
Damar, 1322-25.  
Dead-Lac, 1342-43.  
Degrah, 1347-48.  
Dulgloss, 1346.  
Dulkote, 1354-55.  
Elastica, 1356-63.  
Elastica Nos. 1 and 2, 1356-63.  
Elastica Interior Finish, 1346.  
Exterior Oak, 1342-43.  
Flatline, 1356-63.  
Floorette, 1365.  
Florsatin, 1342-43.  
French Wax Finish, 1322-25.  
Glidden, 1344-45.  
Government Interior, 1365.  
Hampden, 1320-21.  
Harrisons, 1322-25.  
High Standard, 1328-29.  
Hygienic, 1354-55.  
Hyperion Finish, 1342-43.  
Impermalin, 1354-55.  
JapSpar, 1344-45.

**Varnish, Interior and Exterior—Continued.**

Kleartone, 1356-63.  
Kopalac, 1330.  
Kwik-Lac, 1322-25.  
Kyanize, 1340-41.  
Lacklustre, 1346.  
Liquid Granite, 1346.  
Little Blue Flag, 1328-29.  
Louwarco, 1349.  
Luxeberry, 1346.  
M. P., 1344-45.  
Marietta, 1330.  
Memphi, 1319.  
Murphy, 1350-51.  
Murphy Konkreto, 1350-51.  
Murphy Nogloss and Semi-gloss, 1350-51.  
National, 1334.  
Natroco, 1334.  
Navalite, 1342-43.  
No. 6 Rubbing, 1342-43.  
O. M. F., 1365.  
Ojaco, 1326-27.  
110, 1354-55.  
P & B, 393.  
P. & L. Spar, 1354-55.  
Palest, 1354-55.  
Pitcairn Aged, 1352-53.  
Pitcairn Aged Finishing Spar, 1352-53.  
Pitcairn Aged Floor Spar, 1352-53.  
Pitcairn Aged Mast Spar, 1352-53.  
Premier, 1349.  
Premier Satine, 1349.  
R. I. W., 50-51.  
Rubeffect, 1318.  
Shipoleum, 1342-43.  
6r, 1354-55.  
Spar, 1365.  
Stanvar, 1356-63.  
Supremis, 1342-43.  
38, 1354-55.  
Tropical, 1335.  
Twin City, 1365.  
Twin City Spar, 1365.  
Univernish, 1350-51.  
Valentine's, 1366-67.  
Valspar, 1366-67.  
Varnall, 1349.  
Velvette, 1365.  
Velvo, 1349.  
Vernicol, 1328-29.  
Vitrolac, 1322-25.  
Wearette, 1365.  
Wheeler's 1369.  
Zanzibolio, 1364.  
Specifications, 1342-43; 1344-45; 1346; 1347-48; 1350-51; 1352-53; 1354-55; 1356-63; 1365; 1366-67.

**Varnish, Marine**, see Varnish, Spar.

**Varnish, Rubbing.**

Billings-Chapin Co., 1318.  
Boston Varnish Co., 1340-41.  
Chicago Varnish Co., 1342-43.  
De Soto Paint Mfg. Co., 1319.  
Glidden Co., 1344-45.  
Harrison Works, 1322-25.  
Keystone Varnish Co., 1347-48.  
Louisville Varnish Co., Inc., 1349.  
Lowe Brothers Co., 1328-29.  
Murphy Varnish Co., 1350-51.  
Pitcairn Varnish Co., 1352-53.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Thomson Wood Finishing Co., 1364.  
Tropical Paint & Oil Co., 1335.  
Twin City Varnish Co., 1365.  
Chi-Vo, 1342-43.  
Dead-Lac, 1342-43.  
Degrah, 1347-48.  
Dulkote, 1354-55.  
Flatline, 1356-63.  
Harrisons, 1322-25.  
High Standard, 1328-29.  
Kleartone, 1356-63.  
Kyanize, 1340-41.  
Louwarco, 1349.  
M. P., 1344-45.  
Memphi, 1319.  
Murphy Nogloss, 1350-51.



**Varnish, Rubbing**—Continued.

*No. 6 Rubbing*, 1342-43.  
*Pitcairn Aged*, 1352-53.  
*Rubfect*, 1318.  
*Velvette*, 1365.  
*Velvo*, 1349.  
*Zanzibolio*, 1364.  
 Specifications, 1356-63; 1365.

**Varnish, Spar.**

Berry Brothers, 1346.  
 Boston Varnish Co., 1340-41.  
 Glidden Co., 1344-45.  
 Harrison Works, 1322-25.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Lowe Brothers Co., 1328-29.  
 Murphy Varnish Co., 1350-51.  
 Pitcairn Varnish Co., 1352-53.  
 Pratt & Lambert, Inc., 1354-55.  
 Standard Varnish Works, 1356-63.  
 Twin City Varnish Co., 1365.  
 Valentine & Co., 1366-67.  
*Elastica No. 1*, 1356-63.  
 Harrisons, 1322-25.  
*High Standard*, 1328-29.  
*JapSpar*, 1344-45.  
 Kyanize, 1340-41.  
 Luxeberry, 1346.  
 Murphy, 1350-51.  
*Ojaco*, 1326-27.  
*P. & L.*, 1354-55.  
*Pitcairn*, 1352-53.  
*Pitcairn Aged Mast Spar*, 1352-53.  
*Twin City*, 1365.  
*Valentine's Valspar*, 1366-67.  
 Specifications, 1350-51; 1365.

**Varnish, Waterproof**, see Varnish, Interior and Exterior.**Varnish, Wax.**

Harrison Works, 1322-25.  
 Murphy Varnish Co., 1350-51.  
 Standard Varnish Works, 1356-63.  
 Harrisons, 1322-25.  
 Murphy, 1350-51.  
*Stanvar*, 1356-63.  
 Specifications, 1356-63.

**Vases**, see Furniture, Garden and Park.**Vault Construction.**

Guastavino Co., R., 34-35.

**Vault Construction, Wine.**

Soellner, Herman, 1070.

**Vault Equipment and Fittings.**

(See also Furniture, Office, Bank and Library; Bank and Office Fixtures; Filing Equipment; Shelving, Metal.)  
 General Fireproofing Co., 1414.  
 Hall's Safe Co., 1431.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Library Bureau, 1418-19.  
 Watson Mfg. Co., Inc., 1429.  
 York Safe and Lock Co., 1433.  
 Library Bureau, 1418-19.

**Vault Fronts**, see Doors, Vault.**Vault Light Glass**, see Glass, Vault Light.**Vault Lights**, see Lights, Vault and Sidewalk.**Vault Plates and Frames**, see Castings, Iron.**Vault Shelving**, see Shelving, Metal.**Vaults, Safe Deposit and Bank.**

Hall's Safe Co., 1431.  
 Herring-Hall-Marvin Safe Co., 1432.  
 York Safe and Lock Co., 1433.

**Veneer.**

Northern Hemlock and Hardwood Manufacturers' Association, 564-65.  
 Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
 Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.

**Venetian Blinds**, see Blinds, Venetian.**Vent Connections, Roof.**

Barrett Co., 442.  
 Josam Mfg. Co., 876-78.  
 Holt, 442.

**Vent Doors**, see Doors, Vent.**Ventilating Apparatus**, see Heating and Ventilating Apparatus; Ventilators; Fans; Blowers and Exhausters.**Ventilating Ducts**, see Pipe, Heating and Ventilating.**Ventilating Engineers**, see Engineers, Heating and Ventilating.**Ventilating Sets**, see Heating and Ventilating Apparatus; Ventilators; Fans; Blowers and Exhausters.**Ventilating Systems, Barn and Creamery.**

King Ventilating Co., 468.

**Ventilating Systems, Greenhouse and Conservatory.**

Hitchings & Co., 1454-55.  
 King Construction Co., 1456-57.  
 Lord & Burnham Co., 1458-61.  
 Lutton Co., William H., 1462-63.  
 National Skylight and Ventilator Co., 448-49.  
 Pierson U-Bar Co., 1464-65.  
*King*, 1456-57.  
*National*, 448-49.

**Ventilating Systems, Toilet.**

Ohio Blower Co., 472-74.  
*Swartwout*, 472-74.

**Ventilation.**

King Ventilating Co., 468-69.  
 Moline Heat, 939.  
 Society for Electrical Development, Inc., 1145-52.  
*King Aerator*, 468-69.

**Ventilator Bases**, see Ventilators, Roof; Sheet Metal Work.**Ventilators, Barn**, see Ventilators, Roof.**Ventilators, Car.**

Arex Co., 457.  
 Auto Utilities Mfg. Co., 458.  
 Gerdes, Theodore R. N., 462.  
 Globe Ventilator Co., 463.  
 Kernchen Company, 466.  
 Milwaukee Corrugating Co., 471.  
 National Skylight and Ventilator Co., 448-49.  
*Arex*, 457.  
*Globe*, 463.  
*K-S-V*, 466.  
*Kernchen*, 466.  
*National*, 448-49.  
*Nu-Air*, 471.  
*Peerless*, 458.

**Ventilators, Ceiling.**

Gerdes, Theodore R. N., 462.  
 Hackney Ventilating Co., 1001.  
 Gerdes, 462.  
 Hackney, 1001.

**Ventilators, Fan**, see Ventilators, Roof, Fan.**Ventilators, Glass Top**, see Ventilators, Roof.**Ventilators, Greenhouse**, see Ventilating Systems, Greenhouse and Conservatory.**Ventilators, Jail.**

Pauly Jail Building Co., 1488.

**Ventilators, Mausoleum.**

Detroit Mausoleum Equipment Works, 500.

**Ventilators, Mushroom.**

American Blower Co., 996-99.  
 Best Register Co., 988-89.  
 Knowles Mushroom Ventilator Co., 1004.  
*ABC*, 996-99.  
*Best*, 988-89.

**Ventilators, Ridging.**

(See also Roof Trimmings.)  
 Globe Ventilator Co., 463.  
*Globe*, 463.

**Ventilators, Roof.**

(See also Sheet Metal Work.)  
 Arex Co., 457.  
 Aspromet Co., 414-16.  
 Auto Utilities Mfg. Co., 458.

**Ventilators, Roof**—Continued.

Bicalky Fan Co., 1000.  
 Burt Mfg. Co., 459-61.  
 Chattanooga Roofing & Foundry Co., 499.  
 Clason Architectural Metal Works, 358.  
 Gerdes, Theodore R. N., 462.  
 Globe Ventilator Co., 463.  
 James Mfg. Co., 1466-70.  
 Jordan & Co., Paul R., 464-65.  
 Kernchen Company, 466.  
 King Ventilating Co., 468-69.  
 Lee, Thomas, 467.  
 Louden Machinery Co., 1471-73.  
 Merchant & Evans Co., 470.  
 Messenger & Parks Mfg. Co., 681.  
 Meurer Bros. Co., Inc., 422-23.  
 Milwaukee Corrugating Co., 471.  
 Mott Iron Works, J. L., 514-15.  
 National Skylight and Ventilator Co., 448-49.  
 Ohio Blower Co., 472-74.  
 Royal Ventilator Co., 475.  
 Sturtevant Co., B. F., 476.  
 Van Noorden & Co., E., 452-53.  
 Whitaker-Glessner Co., 241.  
*Acorn*, 681.  
*Aeroplane*, 464-65.  
*Anchor*, 422-23.  
*APM McAllister*, 414-16.  
*Arex*, 457.  
*Autoforce*, 476.  
*Bicalky*, 1000.  
*Burt*, 459-61.  
*Gerdes*, 462.  
*Globe*, 463.  
*James*, 1466-70.  
*K-S-V*, 466.  
*Kernchen*, 466.  
*King Aerator*, 468-69.  
*Lee*, 467.  
*Louden*, 1471-73.  
*M & E Co.*, 470.  
*National*, 448-49.  
*Nooga*, 499.  
*Nu-Air*, 471.  
*Peerless*, 458.  
*Portsmouth Iron*, 241.  
*Royal*, 475.  
*Simplex*, 452-53.  
*Star*, 470.  
*Storm King*, 452-53.  
*Suretite*, 452-53.  
*Swartwout*, 472-74.  
*Swartwout Air-tight*, 472-74.  
 Specifications, 459-61; 472-74; 476.

**Ventilators, Roof, Dampered**, see Ventilators, Roof.**Ventilators, Roof, Fan.**

Bicalky Fan Co., 1000.  
 Burt Mfg. Co., 459-61.  
 Bicalky, 1000.  
 Burt, 459-61.

**Ventilators, Roof, Fire Retarding**, see Ventilators, Roof.**Ventilators, Roof, Glass Top**, see Ventilators, Roof.**Ventilators, Roof, Revolving.**

Burt Mfg. Co., 459-61.  
 Gerdes, Theodore R. N., 462.  
 Jordan & Co., Paul R., 464-65.  
 Lee, Thomas, 467.  
 Milwaukee Corrugating Co., 471.  
 National Skylight and Ventilator Co., 448-49.  
 Ohio Blower Co., 472-74.  
 Sturtevant Co., B. F., 476.  
 Van Noorden & Co., E., 452-53.  
*Aeroplane*, 464-65.  
*Autoforce*, 476.  
*Burt*, 459-61.  
*Lee*, 467.  
*National*, 448-49.  
*Nu-Air*, 471.  
*Storm King*, 452-53.  
*Swartwout*, 472-74.  
 Specifications, 472-74.  
**Ventilators, Ship**, see Ventilators, Mushroom.

- Ventilators. Sidewalk.**  
 American 3-Way Prism Co., 821.  
 Brooklyn Vault Light Co., 822-23.  
 Canton Foundry & Machine Co., 270.  
 Columbia Iron & Wire Works Co., 268-69.  
 Irving Iron Works Co., 348.  
*Duplex*, 822-23.
- Ventilators. Siphonage.**  
 (See also Ventilators, Roof.)  
 Arex Co., 457.  
 Gerdes, Theodore R. N., 462.  
 Kernchen Company, 466.  
 King Ventilating Co., 468-69.  
 Merchant & Evans Co., 470.  
 Milwaukee Corrugating Co., 471.  
*Arex*, 457.  
*K-S-V*, 466.  
*Kernchen*, 466.  
*King Aerator*, 468-69.  
*M & E Co.*, 470.  
*Nu-Air*, 471.  
*Star*, 470.
- Ventilators. Skylight**, see Ventilators, Roof.
- Ventilators. Smoke Jack**, see Caps and Tops, Chimney.
- Ventilators. Store Front**, see Store Fronts.
- Ventilators. Wall.**  
 (See also Louvers.)  
 Brooklyn Vault Light Co., 822-23.  
 Gerdes, Theodore R. N., 462.  
 Highton & Sons Co., Wm., 992-93.  
 Price-Evans Foundry Co., 518-19.  
 Tuttle & Bailey Mfg. Co., 985-87.  
*Highton*, 992-93.
- Ventilators. Wall, Exterior**, see Louvers.
- Ventilators. Window.**  
 American 3-Way Prism Co., 821.  
 Arex Co., 457.  
 Bayley Co., William, 698-99.  
 Brasco Mfg. Co., 481.  
 Consolidated Sheet Metal Works, 712-13.  
 Detroit Steel Products Co., 700-01.  
 Gerdes, Theodore R. N., 462.  
 Kawneer Mfg. Co., 488-90.  
 Lord & Burnham Co., 747.  
 Loudon Machinery Co., 1471-73.  
 Lupton's Sons Co., David, 704-08.  
 Mesker Brothers Iron Co., 722-25.  
 National Skylight and Ventilator Co., 448-49.  
*Arin*, 457.  
*Bayley-Springfield*, 698-99.  
*Fenestra*, 700-01.  
*Kawneer*, 488-90.  
*Loudon*, 1471-73.  
*Lupton*, 704-08.  
*National*, 448-49.
- Ventilators. Window, Electric.**  
 Gerdes, Theodore R. N., 462.  
*Gerdes*, 462.
- Vents, Air**, see Valves, Air.
- Vents, Radiator**, see Valves, Air.
- Vents, Sewage.**  
 Aten Sewage Disposal Co., 879.
- Veranda Screens**, see Screens, Door and Window.
- Viaducts, Steel**, see Structural Steel or Iron Work.
- Voltmeters.**  
 Crouse-Hinds Co., 1178.  
 General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.
- Vulcanizers, Electric.**  
 Westinghouse Electric & Mfg. Co., 1169-76.
- W**
- Wagon Loaders**, see Loaders and Unloaders, Car or Wagon.
- Wagons, Convict, Portable.**  
 Barnum Iron Works, E. T., 1487.
- Wainscoting, Composition**, see Flooring, Composition.
- Wainscoting, Cork**, see Tile, Floor and Wall, Cork.
- Wainscoting, Glass.**  
 Vitrolite Co., 870-71.  
*Vitrolite*, 870-71.
- Wainscoting, Metal**, see Ceilings, Metal; Trim, Metal or Metal Covered.
- Wainscoting, Slate**, see Slate, Structural.
- Wainscoting, Tile**, see Tile, Clay, Decorative or Sanitary.
- Wainscoting, Wood**, see Trim, Wood.
- Wainscoting, Wood Fiber**, see Boards, Wall or Ceiling.
- Wall Anchors**, see Anchors, Building: Ashlar, Terra Cotta, Wall Plate.
- Wall Backs, Lighting**, see Lighting Fixtures.
- Wall Beds**, see Beds, Wall.
- Wall Boards**, see Boards, Wall or Ceiling.
- Wall Boxes**, see Boxes, Wall.
- Wall Brackets**, see Brackets, Wall, Pipe.
- Wall Cases**, see Cabinets, Metal.
- Wall Coping**, see Coping, Wall.
- Wall Hangers**, see Hangers, Beam, Joist, Timber, Wall.
- Wall Papers.**  
 (See also Coverings, Wall.)  
 Tiffany Studios, 526-27.
- Wall Plasters**, see Plasters, Gypsum.
- Wall Plates**, see Plates, Wall.
- Wall Plugs**, see Plugs, Floor and Wall.
- Wall Sizing**, see Paint, Priming and Sizing.
- Wall Ties**, see Ties, Wall.
- Wall Ventilators**, see Ventilators, Wall.
- Walls, Glass**, see Glass Concrete Construction.
- Walls, Retaining or Sea, Concrete.**  
 Raymond Concrete Pile Co., 12-13.
- Wardrobe Fronts, Rolling or Coiling.**  
 Dodge & Co., H. B., 768.  
 Grant Pulley and Hardware Co., 770.  
 Union Blind & Ladder Co., Inc., 778.  
 Wilson Corporation, J. G., 774-77.  
*Acme*, 778.  
*Grant*, 770.  
*Wilson*, 774-77.  
*Wilson's*, 768.
- Wardrobes, Metal.**  
 (See also Lockers, Metal.)  
 Berger Mfg. Co., 1406-08.  
 Darby & Sons Co., Inc., Edward, 1409.  
 Edwards Mfg. Co., 1410-11.  
 Federal Steel Fixture Co., 1412-13.  
 Lyon Metallic Mfg. Co., 1420-21.  
 Manufacturing Equipment & Engineering Co., 1422.  
 Terrell's Equipment Co., 1426-27.  
 Watson Mfg. Co., Inc., 1429.  
*Lyon*, 1420-21.  
*Terrell's*, 1426-27.
- Wardrobes, School, Sanitary.**  
 Dodge & Co., H. B., 768.  
 Folding Partition Co., 769.  
 Grant Pulley & Hardware Co., 770.  
 Wilson Corporation, J. G., 774-77.  
*Grant*, 770.  
*Sectionfold*, 769.  
*Wilson*, 774-77.  
*Wilson's*, 768.
- Wardrobes, Wood.**  
 "Bilt-Well" Service Bureau, 574-75.  
 Dodge & Co., H. B., 768.  
 Folding Partition Co., 769.  
 Grant Pulley and Hardware Co., 770.  
 Wilson Corporation, J. G., 774-77.  
*Bilt-Well*, 574-75.  
*Sectionfold*, 769.
- Wardrobes, Wood—Continued.**  
*Wilson*, 774-77.  
*Wilson's*, 768.
- Warmers, Plate.**  
 Bramhall, Deane Co., 1010-11.
- Wash Boilers.**  
 Domestic Laundry Equipment Corporation, 1042-43.
- Washbowls**, see Lavatories.
- Washers, Air.**  
 (See also Air Conditioning Apparatus.)  
 American Blower Co., 996-99.  
 Bicalky Fan Co., 1000.  
 Hackney Ventilating Co., 1001.  
 Massachusetts Blower Co., 1005.  
 Sturtevant Co., B. F., 1006-07.  
*Bicalky*, 1000.  
*Hackney*, 1001.  
*Massachusetts*, 1005.  
*Sirocco*, 996-99.  
*Sturtevant*, 1006-07.
- Washers, Automobile**, see Washers, Vehicle.
- Washers, Clothes**, see Washing Machines, Laundry.
- Washers, Dish.**  
 Bramhall, Deane Co., 1010-11.  
 Fearless Dishwasher Co., Inc., 1034.  
*Fearless*, 1034.
- Washers, Lead.**  
 Wheeling Corrugating Department, 242-43.
- Washers, Vehicle.**  
 Fiske Iron Works, J. W., 552-53.  
 Mott Iron Works, J. L., 514-15.  
*Mott*, 514-15.
- Washing Machines, Laundry.**  
 (See also Laundry Equipment and Machinery.)  
 American Laundry Machinery Co., 1036.  
 Chicago Dryer Co., 1038-41.  
 Domestic Laundry Equipment Corporation, 1042-43.  
 Western Electric Co., 1202-03.  
*American*, 1036.  
*Chicago*, 1038-41; 1042-43.  
*Laundryette*, 1042-43.  
*Western Electric*, 1202-03.
- Washracks, Automobile.**  
 Canton Foundry & Machine Co., 1486.  
 Ernst's Sons, C. F., 1484-85.  
*Ernst*, 1484-85.
- Waste Baskets**, see Baskets, Waste.
- Waste Cans**, see Cans, Waste.
- Wastes**, see Plumbing Fixtures; Traps, Plumbing.
- Wastes and Overflows**, see Plumbing Fixtures; Traps, Lavatory.
- Watchmans Clocks**, see Clocks, Watchmans.
- Water Closets**, see Closets.
- Water Coolers**, see Refrigerators and Coolers.
- Water Filters**, see Filters, Water.
- Water Gages**, see Gages, Water.
- Water Heaters**, see Heaters, Water.
- Water Intake Screens**, see Screens, Water Intake.
- Water Softeners**, see Softeners, Water.
- Water Supply Systems.**  
 Artesian Well and Supply Co., 1092.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Caldwell Co., Inc., W. E., 1093.  
 Chicago Pump Co., 1097.  
 Church, Stephen B., 1100.  
 Deming Co., 1104-07.  
 Economy Pumping Machinery Co., 1101.  
 Kerr Machinery & Supply Co., 1110-11.  
 Kewanee Private Utilities Co., 1112-13.  
 Milwaukee Air Power Pump Co., 1114-15.  
 New York Sewage Disposal Co., 881.  
 United Pump & Power Co., 1116-19.  
 Vaile-Kimes Co., 1120-21.  
*Atlas*, 1104-07.



**Water Supply Systems—Continued.**

*Church*, 1100.  
*Deming*, 1104-07.  
*Duro*, 1098-99.  
*Economy*, 1101.  
*Kerr*, 1110-11.  
*Marvel*, 1104-07.  
*Milwaukee*, 1114-15.  
*National*, 1116-19.  
*Straight Line*, 1104-07.  
*V & K*, 1120-21.

**Water Supply Systems, Artesian.**

(See also Artesian Wells.)

Artesian Well and Supply Co., 1092.  
 United Pump & Power Co., 1116-19.

**Water Supply Systems, Electric, Automatic,** see Water Supply Systems, Hydro-pneumatic or Storage; Water Supply Systems, Non-storage.**Water Supply Systems, Hydro-pneumatic or Storage.**

Burnett-Larsh Mfg. Co., 1098-99.  
*Church*, Stephen B., 1100.  
*Deming* Co., 1104-07.  
 Economy Pumping Machinery Co., 1101.  
 Kerr Machinery & Supply Co., 1110-11.  
 Kewanee Private Utilities Co., 1112-13.  
 Milwaukee Air Power Pump Co., 1114-15.  
 Vaile-Kimes Co., 1120-21.  
*Atlas*, 1104-07.  
*Church*, 1100.  
*Deming*, 1104-07.  
*Duro*, 1098-99.  
*Economy*, 1101.  
*Kerr*, 1110-11.  
*Milwaukee*, 1114-15.  
*Straight-Line*, 1104-07.  
*V & K*, 1120-21.

**Water Supply Systems, Non-storage.**

Milwaukee Air Power Pump Co., 1114-15.  
 United Pump & Power Co., 1116-19.  
*Milwaukee*, 1114-15.  
*National Fresh Water*, 1116-19.

**Water Supply Systems, Open Tank,** see Water Supply Systems.**Water Supply Systems, Private or Isolated,** see Water Supply Systems.**Water Tables,** see Tables, Water.**Water Towers and Tanks.**

(See also Standpipes.)

Caldwell Co., Inc., W. E., 1093.  
 Chattanooga Boiler & Tank Co., 1094.  
 Chicago Bridge & Iron Works, 1095.  
*Church*, Stephen B., 1100.  
 Walsh & Weidner Boiler Co., 1096.  
*Caldwell*, 1093.  
*Church*, 1100.

**Water Troughs,** see Troughs, Water.**Water Weighing Machines,** see Weighing Machines, Water.**Waterless Toilets,** see Closets, Waterless, Chemical.**Waterproof Cement,** see Cement, Waterproof.**Waterproof Cloth,** see Waterproofing and Dampproofing Felt, Cloth and Fabric.**Waterproof Felt,** see Waterproofing and Dampproofing Felt, Cloth and Fabric.**Waterproof Paper,** see Building Papers.**Waterproofing Compounds,** see Waterproofing and Dampproofing Paint and Compounds.**Waterproofing Contractors,** see Engineers or Contractors, Waterproofing and Dampproofing.**Waterproofing Engineers,** see Engineers or Contractors, Waterproofing and Dampproofing.**Waterproofing Paste,** see Waterproofing and Dampproofing Paint and Compounds.**Waterproofing and Dampproofing Felt, Cloth and Fabric.**

Asphalt Ready Roofing Co., 388.  
 Barrell Co., William L., 410.  
 Barrett Co., 394-97.  
 Bird & Son, 390-91.  
 Boyle & Co., Inc., John, 411.  
 Cabot, Inc., Samuel, 1382-85.  
 Carey Co., Philip, 398.  
 Certain-teed Products Corporation, 399-401.  
 General Fireproofing Co., 42.  
 Horn Co., A. C., 43.  
 Hydrolithic Waterproofing Co., Inc., 45.  
 Johns-Manville Co., H. W., 36; 386-87.  
 Standard Paint Co., 393.  
 Warren Chemical & Mfg. Division, 408-09.  
*Anchor*, 408-09.  
*Aquanon*, 408-09.  
*Bayonne*, 411.  
*Carey*, 398.  
*Certain-teed*, 399-401.  
*GF Nos. 18 and 21*, 42.  
*Hudson*, 388.  
*Hydrex*, 44.  
*Johns-Manville*, 386-87.  
*Johns-Manville Asbestos Duck*, 36.  
*Neponset*, 390-91.  
*New York Subway Brand*, 44.  
*Penna Special*, 44.  
*Quilt*, 1382-85.  
*Ru-ber-oid*, 393.  
*SPC*, 393.  
*Tartex*, 394-97.  
*Tripleflex*, 43.

**Waterproofing and Dampproofing Paint and Compounds.**

American Bitumastic Enamels Co., 1373.  
 Antakwa Co., 37.  
 Anti-Hydro Waterproofing Co., 38.  
 Arco Co., 1316-17.  
 Armstrong Cork Co., 1390-92.  
 Asphalt Ready Roofing Co., 388.  
 Bailey Co., C. C., 1393.  
 Barrett Co., 394-97.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Biegler Mfg. Co., E. N., 39.  
 Billings-Chapin Co., 1318.  
 Bird & Son, 390-91.  
 Bitu-Mortar Waterproofing Co., Inc., 40.  
 Cabot, Inc., Samuel, 1382-85.  
 Carey Co., Philip, 172.  
 Ceresit Waterproofing Co., 41.  
 Certain-teed Products Corporation, 399-401.  
 Concrete Hardening Co., Inc., 338.  
 De Soto Paint Mfg. Co., 1319.  
 Dexter Brothers Co., 1381.  
 Flexner-Taylor Co., 320.  
 Ford Mfg. Co., 239.  
 Garrett & Son Corp., C. S., 392.  
 General Fireproofing Co., 42.  
 Glidden Co., 1344-45.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Hetzel, Estate of J. G., 443.  
 Horn Co., A. C., 43.  
 Hydrex Felt & Engineering Co., 44.  
 Hydrolithic Waterproofing Co., Inc., 45.  
 Johns-Manville Co., H. W., 36.  
 Johnson & Co., Inc., Oliver, 1326-27.  
 Kelley Island Lime & Transport Co., 150-51.  
 Lowe Brothers Co., 1328-29.  
 Master Builders Co., 339.  
 Natroco Paint & Varnish Works, 1334.  
 Obelisk Waterproofing Co., 46.  
 Permanent Ironite Waterproofing Co., 47.  
 Sandusky Cement Co., 56.  
 Sonneborn Sons Co., Inc., L., 340-41.  
 Standard Paint Co., 48-49; 392.  
 Toch Brothers, 50-51.  
 Tropical Paint & Oil Co., 1335.  
 Trus-Con Laboratories, 52-53.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 Vitrifix Co., 343.  
 Wadsworth, Howland & Co., Inc., 1338-39.

**Waterproofing and Dampproofing Paint and Compounds—Continued.**

Warren Chemical & Mfg. Division, 408-09.  
 Waterproofing Co., 54-55.  
 Zibell Damp Resisting Paint Co., 57.  
*Alkacene*, 57.  
*Anchor*, 408-09.  
*Antakwa*, 37.  
*Antakwa Colorless*, 37.  
*Antakwa Heavy*, 37.  
*Anti-Hydro*, 38.  
*Aquanon*, 408-09.  
*Arco*, 1316-17.  
*Arco Vitrograin*, 1316-17.  
*B-M Nos. 78, 123, 208 and 212*, 40.  
*Bay State*, 1338-39.  
*Biegler's*, 39.  
*C. S. G.*, 392.  
*C. W. Co.*, 41.  
*Cabot's* 1382-85.  
*Caffall Process*, 46.  
*Cem-bric*, 41.  
*Cementkote*, 1335.  
*Certain-teed*, 399-401.  
*Ceresit*, 41.  
*Ceresitol*, 41.  
*Daylight*, 1344-45.  
*Dehydratine*, 43.  
*Drival*, 1318.  
*Everjet*, 394-97.  
*Everlast*, 338.  
*GF Nos. 10, 11, 15, 16, 17, 18, 21, 100 and 200*, 42.  
*Glidden*, 1344-45.  
*Hampden*, 1320-21.  
*Harrisons*, 1322-25.  
*Hermastic*, 1373.  
*Hetzel's*, 443.  
*High Standard*, 1328-29.  
*Hudson*, 388.  
*Hydratite*, 43.  
*Hydrex*, 44.  
*Hydrocide*, 340-41.  
*Hydrolox*, 1334.  
*Hydro-Lytic*, 320.  
*Hydronon*, 394-97.  
*Impervite*, 48-49; 393.  
*Ironite*, 47.  
*Johns-Manville*, 36.  
*Konkreto*, 1375.  
*Lapidolith*, 340-41.  
*Liberty*, 37.  
*Master Builders Method*, 339.  
*Medusa*, 56.  
*Memphi*, 1319.  
*Minrubite Proofing*, 1334.  
*National Bondkote*, 1334.  
*Neponset*, 390-91.  
*New York Subway Brand*, 44.  
*Ojaco*, 1326-27.  
*Ojaco Kon-Krete-Kote*, 1326-27.  
*P & B*, 393.  
*Peacock*, 393.  
*Penna Special*, 44.  
*Percoproof*, 172.  
*Petrifax*, 1381.  
*Por-Seal*, 52-53.  
*Protectorine*, 57.  
*Quilt*, 1382-85.  
*R. I. W.*, 50-51.  
*R. I. W. Toxement*, 50-51.  
*Retaw Proofing*, 1334.  
*Rubercoat*, 1320-21.  
*SPC*, 393.  
*Stonetex*, 52-53.  
*Stuckote*, 1334.  
*Stucolor*, 1344-45.  
*Symmentrex*, 43.  
*Tartex*, 394-97.  
*Tripleflex*, 43.  
*Tropical*, 1335.  
*Trus-Con*, 52-53.  
*Vitrifix*, 343.  
*Warren's*, 408-09.  
*Winslow's Hydrolithic*, 45.  
 Specifications, 38; 39; 47; 52-53; 145; 1316-17; 1344-45.

**Wattmeters.**

General Electric Co., 1153-67.  
Westinghouse Electric & Mfg. Co., 1169-76.  
*G-E*, 1153-67.

**Wax, Finishing, see Wax, Floor.****Wax, Floor.**

Butcher Polish Co., 1368.  
Certain-teed Products Corporation, 399-401.  
Minwax Co., Inc., 342.  
Patton Paint Co., 1332-33.  
*Butcher's Boston*, 1368.  
*Certain-teed*, 399-401.  
*Minwax*, 342.  
*17th Century*, 1332-33.

**Weatherboarding, see Siding.****Weatherproofing.**

Weatherproof Calking Co., 1377.  
*Hennen's*, 1377.

**Weatherstrips, Metal.**

American Metal Weather Strip Co., 779.  
Athey Co., 780.  
Chamberlin Metal Weather Strip Co., 781.  
Diamond Metal Weather Strip Co., 784.  
Gerdes, Theodore R. N., 462.  
Higgin Mfg. Co., 782-83.  
Monarch Metal Weatherstrip Co., 786-87.  
National Metal Weather Strip Co., 785.  
Niagara Metal Weather Strip Co., 788.  
Williams Pivot Sash Co., 742-45.  
*Athey*, 780.  
*Chamberlin*, 781.  
*Diamond Flexible*, 784.  
*Higgin*, 782-83.  
*Monarch*, 786-87.  
*National*, 785.  
*Peace*, 788.  
*Williams*, 742-45.  
*Windustite*, 779.

**Weatherstrips, Metal, Cloth Lined.**

Athey Co., 780.  
*Athey*, 780.

**Weatherstrips and Door Guide, Combination.**

McCabe Hanger Mfg. Co., 618-20.  
Schouler Cement Construction Co., 789.  
*McCabe*, 618-20.  
*Schouler*, 789.

**Weatherstrips and Parting Bead, Combination.**

National Metal Weather Strip Co., 785.  
*National*, 785.

**Weathervanes.**

Fiske Iron Works, J. W., 552-53.  
King Ventilating Co., 468-69.  
Mott Iron Works, J. L., 514-15.  
Smith Wire and Iron Works, F. P., 524-25.  
Wagner Architectural Iron Works, A. F., 530-31.  
Walworth Mfg. Co., 1144.  
*Walworth*, 1144.

**Wedges, Steel.**

Irving Iron Works Co., 348.

**Weighing Machines, Water.**

Tyler Underground Heating System, 911.  
*Tyler*, 911.

**Weights, Hitching.**

Price-Evans Foundry Co., 518-19.

**Welding and Cutting Outfits, Electric Arc.**

Westinghouse Electric & Mfg. Co., 1169-76.

**Well Drilling, see Artesian Wells.****Wheel Guards, see Guards, Wheel.****Wheels, Hoist.**

Chelsea Elevator Co., 1265-67.  
*Chelsea*, 1265-67.

**Wheels, Pressed Steel.**

Clark Co., W. J., 252.

**Wheels, Sprocket.**

Link-Belt Co., 1310.

**Whip Hoists, see Hoists, Whip.****White Lead.**

Carter White Lead Co., 1315.  
Eagle-Picher Lead Co., 875.  
Harrison Works, 1322-25.  
*Carter*, 1315.  
*Eagle*, 875.  
*Harrisons*, 1322-25.  
Specifications, 1315.

**White Oak, see Lumber, Oak.****Wickets, Iron or Brass, see Screens, Bank and Counter; Grilles; Wire Work.****Winches, Electric.**

Sprague Electric Works, 1168.

**Winding Drums, see Drums, Winding.****Windmills.**

Church, Stephen B., 1100.  
*Church*, 1100.

**Window Apparatus, see Sash Operators and Gearing.****Window Cleaners Safety Belts, see Belts, Safety, Window Cleaners.****Window Cord, see Cord, Sash.****Window Guards, see Guards, Door and Window.****Window Hardware, see Hardware, Window.****Window Shades, see Shades, Window.****Windows, Airtight and Dustproof.**

Crittall Casement Window Co., 714-15.  
Jackson Co., Wm. H., 512.  
Pomeroy Co., Inc., S. H., 728-29.  
Williams Pivot Sash Co., 742-45.  
*Crittall*, 714-15.  
*Pomeroy*, 728-29.  
*Williams*, 742-45.

**Windows, Balanced, see Windows, Reversible, Revolving, Pivoted or Swinging.****Windows, Basement, Burglarproof.**

Majestic Co., 271-73.

**Windows, Bronze.**

Angle Window and Door Co., 709.  
Gorham Co Architectural Bronze, 502-03.  
Hope & Sons, Henry, 716-17.  
Jackson Co., Wm. H., 512.  
McFarland-Hyde Co., 720-21.  
McGann & Sons Co., T. F., 508-09.  
Penn Brass & Bronze Works, 517.  
Polachek Bronze & Iron Co., John, 522.  
Pomeroy Co., Inc., S. H., 728-29.  
Williams Pivot Sash Co., 742-45.  
*Pomeroy*, 728-29.  
*Williams*, 742-45.  
*Wilson Reverso*, 720-21.

**Windows, Casement.**

American Steel Window Co., 694-97.  
Consolidated Sheet Metal Works, 712-13.  
Crittall Casement Window Co., 714-15.  
Curtis Service Bureau, 578-79.  
Detroit Steel Products Co., 700-01.  
Grant Pulley and Hardware Co., 760-61.  
Hope & Sons, Henry, 716-17.  
International Casement Co., Inc., 718.  
Jackson Co., Wm. H., 512.  
Kawneer Mfg. Co., 488-90.  
Lee, Thomas, 719.  
McFarland-Hyde Co., 720-21.  
Mesker Brothers Iron Co., 722-25.  
Pomeroy Co., Inc., S. H., 728-29.  
Reliance Fireproof Door Co., 656-57.  
Riester & Thesmacher Co., 658-59.  
Wagner's Sons Co., J. F., 732-33.  
Winslow Bros. Co., 735.  
*American*, 694-97.  
*Consol*, 712-13.  
*Crittall*, 714-15.  
*Curtis*, 578-79.  
*Fenestra*, 700-01.  
*Grant*, 760-61.  
*International*, 718.  
*Kawneer*, 488-90.  
*Lee*, 719.  
*Pomeroy*, 728-29.

**Windows, Casement—Continued.**

*R & T*, 658-59.  
*Reliance*, 656-57.  
*Wilson Reverso*, 720-21.  
*Winslow*, 735.

**Windows, Casement, Metal or Metal Covered.**

American Steel Window Co., 694-97.  
Bayley Co., William, 698-99.  
Consolidated Sheet Metal Works, 712-13.  
Crittall Casement Window Co., 714-15.  
Detroit Steel Products Co., 700-01.  
Hope & Sons, Henry, 716-17.  
International Casement Co., Inc., 718.  
Jackson Co., Wm. H., 512.  
McFarland-Hyde Co., 720-21.  
Mesker Brothers Iron Co., 722-25.  
National Skylight and Ventilator Co., 448-49.  
Pomeroy Co., Inc., S. H., 728-29.  
Reliance Fireproof Door Co., 656-57.  
Riester & Thesmacher Co., 658-59.  
Wagner's Sons Co., J. F., 732-33.  
Winslow Bros. Co., 735.  
*American*, 694-97.  
*Bayley-Springfield*, 698-99.  
*Consol*, 712-13.  
*Crittall*, 714-15.  
*Fenestra*, 700-01.  
*International*, 718.  
*Pomeroy*, 728-29.  
*R & T*, 658-59.  
*Reliance*, 656-57.  
*Winslow*, 735.

**Windows, Casement, Steel, see Windows, Casement, Metal or Metal Covered.****Windows, Casement and Double Hung, Combination.**

McFarland-Hyde Co., 720-21.  
Mesker Brothers Iron Co., 722-25.  
*Wilson Reverso*, 720-21.

**Windows, Coal, see Chutes, Coal.****Windows, Cold Storage.**

Jamison Cold Storage Door Co., 1064-65.  
Stevenson Cold Storage Door Co., 1066-69.  
*Stevenson's*, 1066-69.

**Windows, Copper, see Windows, Fireproof, Metal or Metal Covered.****Windows, Counterbalanced.**

Angle Window and Door Co., 709.  
Bayley Co., William, 698-99.  
Consolidated Sheet Metal Works, 712-13.  
Howell, Field & Goddard, Inc., 652-53.  
Lupton's Sons Co., David, 704-08.  
Mesker Brothers Iron Co., 722-25.  
National Skylight and Ventilator Co., 448-49.  
Pomeroy Co., Inc., S. H., 728-29.  
Riester & Thesmacher Co., 658-59.  
Safety Detachable Window Corporation, 730-31.  
Wagner's Sons Co., J. F., 732-33.  
Winslow Bros. Co., 735.  
*Bayley-Springfield*, 698-99.  
*Consol*, 712-13.  
*Lupton*, 704-08.  
*Pomeroy*, 728-29.  
*R & T*, 658-59.  
*Winslow*, 735.

**Windows, Detachable, Safety.**

Safety Detachable Window Corporation, 730-31.  
Specifications, 730-31.

**Windows, Double Hung.**

Angle Window and Door Co., 709.  
Chesley Co., Inc., A. C., 710-11.  
Consolidated Sheet Metal Works, 712-13.  
Lee, Thomas, 719.  
McFarland-Hyde Co., 720-21.  
Mesker Brothers Iron Co., 722-25.  
National Skylight and Ventilator Co., 448-49.  
Newark Cornice and Skylight Works, 726-27.  
Penn Metal Co., 734.  
Pomeroy Co., Inc., S. H., 728-29.



**Windows, Double Hung**—Continued.  
 Reliance Fireproof Door Co., 656-57.  
 Riestler & Thesmacher Co., 658-59.  
 Wagner's Sons Co., J. F., 732-33.  
 Williams Pivot Sash Co., 742-45.  
*Chesley*, 710-11.  
*Consol*, 712-13.  
*Lee*, 719.  
*Penco*, 734.  
*Pomeroy*, 728-29.  
*R & T*, 658-59.  
*Reliance*, 656-57.  
*Williams*, 742-45.  
*Wilson Reverso*, 720-21.

**Windows, Fire, see Windows, Fireproof, Metal or Metal Covered.**

**Windows, Fireproof, Glass.**  
 Angle Window and Door Co., 709.  
 Chesley Co., Inc., A. C., 710-11.  
 Keppler Glass Constructors, Inc., 831-33.  
 Mesker Brothers Iron Co., 722-25.  
 Mississippi Wire Glass Co., 812-15.  
 Pennsylvania Wire Glass Co., 816-17.  
 Riestler & Thesmacher Co., 658-59.  
 Tiffany Studios, 526-27.  
*Chesley*, 710-11.  
*Keppler*, 831-33.  
*Mesker*, 722-25.  
*R & T*, 658-59.

**Windows, Fireproof, Metal or Metal Covered.**  
 Angle Window and Door Co., 709.  
 Austral Window Co., 736.  
 Bayley Co., William, 698-99.  
 Chesley Co., Inc., A. C., 710-11.  
 Clason Architectural Metal Works, 358.  
 Consolidated Sheet Metal Works, 712-13.  
 Crittall Casement Window Co., 714-15.  
 Dahlstrom Metallic Door Co., 649-51.  
 Detroit Steel Products Co., 700-01.  
 Edwards Mfg. Co., 418-19.  
 Jackson Co., Wm. H., 512.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Manhattan Brass Co., 513.  
 Mesker Brothers Iron Co., 722-25.  
 National Skylight and Ventilator Co., 448-49.  
 Newark Cornice and Skylight Works, 726-27.  
 Penn Metal Co., 734.  
 Polachek Bronze & Iron Co., John, 522.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Reed & Barton, 520-21.  
 Reliance Fireproof Door Co., 656-57.  
 Riestler & Thesmacher Co., 658-59.  
 Smyser-Royer Co., 528.  
 Stark Rolling Mill Co., 424-25.  
 Stevenson Cold Storage Door Co., 1066-69.  
 Truscon Steel Co., 702-03.  
 Van Noorden & Co., E., 452-53.  
 Wagner's Sons Co., J. F., 732-33.  
 Whitaker-Glessner Co., 241.  
 Winslow Bros. Co., 735.  
*Austral*, 736.  
*Bayley-Springfield*, 698-99.  
*Chesley*, 710-11.  
*Consol*, 712-13.  
*Crittall*, 714-15.  
*Fenestra*, 700-01.  
*Lee*, 719.  
*Lupton*, 704-08.  
*Mesker*, 722-25.  
*National*, 448-49.  
*Penco*, 734.  
*Pomeroy*, 728-29.  
*Portsmouth Iron*, 241.  
*R & T*, 658-59.  
*Stevenson's*, 1066-69.  
*Toncan Metal*, 424-25.  
*Truscon*, 702-03.  
*Wilson Reverso*, 720-21.  
*Winslow*, 735.

**Windows, Hinged, see Windows, Case-**  
**ment.**

**Windows, Hollow Metal, see Windows, Fireproof, Metal or Metal Covered.**

**Windows, Interlocking.**  
 Penn Brass & Bronze Works, 517.

**Windows, Mausoleum.**  
 Detroit Mausoleum Equipment Works, 500.

**Windows, Memorial, see Glass, Ornamental; Glass, Stained or Leaded.**

**Windows, Metal, see Windows, Fireproof, Metal or Metal Covered.**

**Windows, Pantry, Revolving.**  
 Van Kannel Revolving Door Co., 588-89.  
*Van Kannel*, 588-89.

**Windows, Pivoted, see Windows, Reversible, Revolving, Pivoted or Swinging.**

**Windows, Reversible, Double Hung.**  
 McFarland-Hyde Co., 720-21.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Williams Pivot Sash Co., 742-45.  
*Pomeroy*, 728-29.  
*Williams*, 742-45.  
 Specifications, 742-45.

**Windows, Reversible, Plank Frame.**  
 Williams Pivot Sash Co., 742-45.  
*Williams*, 742-45.  
 Specifications, 742-45.

**Windows, Reversible, Revolving, Pivoted or Swinging.**  
 Angle Window and Door Co., 709.  
 Austral Window Co., 736.  
 Bayley Co., William, 698-99.  
 Chesley Co., Inc., A. C., 710-11.  
 Detroit Steel Products Co., 700-01.  
 Kawneer Mfg. Co., 488-90.  
 Lee, Thomas, 719.  
 Lupton's Sons Co., David, 704-08.  
 McFarland-Hyde Co., 720-21.  
 Mesker Brothers Iron Co., 722-25.  
 National Skylight and Ventilator Co., 448-49.  
 Newark Cornice and Skylight Works, 726-27.  
 Penn Metal Co., 734.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Riestler & Thesmacher Co., 658-59.  
 Wagner's Sons Co., J. F., 732-33.  
 Williams Pivot Sash Co., 742-45.  
 Winslow Bros. Co., 735.  
*Austral*, 736.  
*Chesley*, 710-11.  
*Fenestra*, 700-01.  
*Kawneer*, 488-90.  
*Lee*, 719.  
*Lupton*, 704-08.  
*Penco*, 734.  
*Pomeroy*, 728-29.  
*R & T*, 658-59.  
*Williams*, 742-45.  
*Wilson Reverso*, 720-21.  
*Winslow*, 735.  
 Specifications, 742-45.

**Windows, Reversible, Revolving, Pivoted or Swinging, Fixtures for.**  
 Austral Window Co., 736.  
 Consolidated Sheet Metal Works, 712-13.  
 Grant Pulley and Hardware Co., 739.  
 Williams Pivot Sash Co., 742-45.  
*Austral*, 736.  
*Consol*, 712-13.  
*Tabor*, 739.  
*Williams*, 742-45.  
 Specifications, 742-45.

**Windows, Steel, see Sash, Steel.**

**Windows, Watertight.**  
 Jackson Co., Wm. H., 512.

**Windows, Wood.**  
 "Bilt-Well" Service Bureau, 574-75.  
 Brown Co., 573.  
 Curtis Service Bureau, 578-79.  
 Morgan Co., 584-85.  
 North Carolina Pine Association, 562-63.  
 Southern Pine Association, 561.  
*Bilt-Well*, 574-75.  
*Curtis*, 578-79.

**Wire, Barbed.**  
 Page Steel and Wire Co., 549-51.  
 Youngstown Sheet & Tube Co., 1074-75.

**Wire, Black or Galvanized.**  
 Page Steel and Wire Co., 549-51.  
 Youngstown Sheet & Tube Co., 1074-75.

**Wire, Braided, Electric, see Wire and Cables, Electric.**

**Wire, Electric, see Wire and Cables, Electric.**

**Wire, Electric, Braided, see Wire and Cables, Electric.**

**Wire, Electric, Car.**  
 (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Boston Insulated Wire & Cable Co., 1192.  
 Electric Cable Co., 1190-91.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Atlantic*, 1188-89.  
*Ecco*, 1190-91.  
*Habirshaw*, 1193-1201.

**Wire, Electric, Copper, see Wires and Cables, Electric.**

**Wire, Electric, Ignition.**  
 (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Boston Insulated Wire & Cable Co., 1192.  
 Electric Cable Co., 1190-91.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Atlantic*, 1188-89.  
*Ecco*, 1190-91.  
*Habirshaw*, 1193-1201.

**Wire, Electric, Installation of.**  
 Society for Electrical Development, Inc., 1145-52.

**Wire, Electric, Insulated and Weatherproof.**  
 (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Boston Insulated Wire & Cable Co., 1192.  
 Electric Cable Co., 1190-91.  
 General Electric Co., 1153-67.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
*Americore*, 1182-87.  
*Amerite*, 1182-87.  
*Atlantic*, 1188-89.  
*Dolphin*, 1188-89.  
*Ecco*, 1190-91.  
*G-E*, 1153-67.  
*Habirshaw*, 1193-1201.  
*Neptune*, 1188-89.  
*Reliance*, 1182-87.  
*Triton*, 1188-89.

**Wire, Electric, Magnet, Office and Annunciator.**  
 American Steel & Wire Co., 1182-87.

**Wire, Electric, Signal.**  
 American Steel & Wire Co., 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Boston Insulated Wire & Cable Co., 1192.  
 Electric Cable Co., 1190-91.  
*Amerite*, 1182-87.  
*Atlantic*, 1188-89.  
*Ecco*, 1190-91.

**Wire, Electric, Slow Burning.**  
 (See also Wire and Cables, Electric.)  
 American Steel & Wire Co., 1182-87.  
 Electric Cable Co., 1190-91.  
 General Electric Co., 1153-67.  
*Ecco*, 1190-91.  
*G-E*, 1153-67.  
*Reliance*, 1182-87.

**Wire, Iron and Steel.**  
 American Steel & Wire Co., 1182-87.  
 Page Steel and Wire Co., 549-51.  
*Armco*, 549-51.  
*Copperweld*, 549-51.

**Wire, Motor Boat,** see Wire and Cables, Electric.

**Wire, Nickel.**  
American Brass Co., 1071.  
*Benedict Nickel*, 1071.

**Wire, Rope.**  
Page Steel and Wire Co., 549-51.

**Wire, Rubber Covered,** see Wire, Electric, Insulated and Weatherproof.

**Wire, Special Analysis.**  
Page Steel and Wire Co., 549-51.

**Wire, Telephone and Telegraph,** see Wire and Cables, Electric.

**Wire, Tree,** see Wire and Cables, Electric.

**Wire, Welding.**  
Page Steel and Wire Co., 549-51.

**Wire Cloth,** see Cloth, Wire.

**Wire Enclosures,** see Wire Work.

**Wire Fabric,** see Cloth, Wire.

**Wire Glass,** see Glass, Wire: Plain, Rough, Ribbed, Polished or Figured.

**Wire Guards,** see Guards, Wire.

**Wire Hooks,** see Hooks, Wire.

**Wire Lath,** see Lath, Metal.

**Wire Nails,** see Nails.

**Wire Partitions,** see Partitions, Wire.

**Wire Rods,** see Rods, Wire.

**Wire Rope,** see Rope, Wire.

**Wire Rope Fittings,** see Fittings, Wire Rope.

**Wire Signs,** see Signs, Wire.

**Wire Terminology.**  
Society for Electrical Development, Inc., 1145-52.

**Wire Work.**  
Anchor Post Iron Works, 537-43.  
Badger Wire & Iron Works, 494-95.  
Barnum, E. T., 496-97.  
Bigelow Wire Works, Cheney, 491.  
Brook Iron Works, A. T., 544-45.  
Columbia Iron & Wire Works Co., 268-69.  
Darby & Sons Co., Inc., Edward, 1409.  
Fiske Iron Works, J. W., 552-53.  
Guaranty Iron & Wire Co., 667.  
Lasar Mfg. Co., 506-07.  
Mack Iron and Wire Works Co., 510-11.  
Meyers Mfg. Co., Fred J., 516.  
Page Steel and Wire Co., 549-51.  
Price-Evans Foundry Co., 518-19.  
St. Louis Wire & Iron Co., 523.  
Smith Wire and Iron Works, F. P., 524-25.  
Steelite Co., 1293.  
Stewart Iron Works Co., 556-57.  
Williams, Inc., Jno., 532.  
Wisconsin Iron & Wire Works, 267; 533.

**Wire and Cables, Electric.**  
American Steel & Wire Co., 1182-87.  
Atlantic Insulated Wire & Cable Co., 1188-89.  
Boston Insulated Wire & Cable Co., 1192.  
Electric Cable Co., 1190-91.  
General Electric Co., 1153-67.  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Sprague Electric Works, 1168.

**Wire and Cables, Electric—Continued.**  
Western Electric Co., 1202-03.  
Youngstown Sheet & Tube Co., 1180-81.  
*Americore*, 1182-87.  
*BM*, 1168.  
*BX*, 1168.  
*BXL*, 1168.  
*Dolphin*, 1188-89.  
*Duplex*, 1193-1201.  
*Ecco*, 1190-91.  
*Ecco Engineers*, 1190-91.  
*Ecco Invincible*, 1190-91.  
*Ecco Security*, 1190-91.  
*G-E*, 1153-67.  
*Habirshaw*, 1193-1201.  
*Habirshaw Black Core*, 1193-1201.  
*Habirshaw Red Core*, 1193-1201.  
*Habirshaw 30%*, 1193-1201.  
*Neptune*, 1188-89.  
*Pot Head*, 1182-87.  
*Realflex*, 1180-81.  
*Red Core*, 1153-67.  
*Reliance*, 1182-87.  
*30% Para*, 1153-67.  
*Tico*, 1182-87.  
*Tricoat*, 1153-67.  
*Triton*, 1188-89.  
*W. & M.*, 1182-87.  
Specifications, 1153-67; 1190-91.

**Wire and Cables, Telephone, Information on.**  
American Telephone and Telegraph Co., 1237.

**Wiring Data, Electric.**  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Society for Electrical Development, Inc., 1145-52.

**Wiring Devices.**  
American Steel & Wire Co., 1182-87.  
Benjamin Electric Mfg. Co., 1206.  
Bryant Electric Co., 1207.  
Crouse-Hinds Co., 1178.  
General Electric Co., 1153-67.  
Gillette-Vibber Co., 1211.  
Hart Mfg. Co., 1212-13.  
Hart & Hegeman Mfg. Co., 1214-15.  
Hubbell, Inc., Harvey, 1216-17.  
Steel City Electric Co., 1222.  
Trumbull Electric Mfg. Co., 1218-21.  
Western Electric Co., 1202-03.  
*Benjamin*, 1206.  
*Bryant*, 1207.  
*Diamond H.*, 1212-13.  
*G-E*, 1153-67.  
*Gee-Vee*, 1211.  
*H & H*, 1214-15.  
*Hubbell*, 1216-17.

**Wiring Diagrams.**  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Society for Electrical Development, Inc., 1145-52.

**Wiring Materials.**  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Western Electric Co., 1202-03.  
*Habirshaw*, 1193-1201.

**Wiring Notes.**  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Society for Electrical Development, Inc., 1145-52.

**Wiring Symbols, Standard.**  
Habirshaw Electric Cable Co., Inc., 1193-1201.  
Society for Electrical Development, Inc., 1145-52.

**Wood Block Floors,** see Flooring, Wood Block.

**Wood Blocks,** see Blocks, Wood.

**Wood Carving,** see Cabinet Work.

**Wood Dressers and Finishers,** see Cabinet Work; Trim, Wood.

**Wood Fillers,** see Fillers, Wood.

**Wood Finishes,** see Varnish; Paint.

**Wood Preservatives,** see Preservatives, Wood.

**Wood Stains,** see Stains, Wood.

**Wood Trim,** see Trim, Wood.

**Woodwork, Exterior.**  
"Bilt-Well" Service Bureau, 574-75.  
Carnahan Mfg. Co., 576-77.  
Curtis Service Bureau, 578-79.  
Indiana Lumber & Mfg. Co., 580-81.  
Mathews Mfg. Co., 1402-03.  
Morgan Co., 584-85.  
Southern Pine Association, 561.  
*Bilt-Well*, 574-75.  
*Curtis*, 578-79.

**Woodwork, Interior,** see Cabinet Work; Trim.

**Wool, Mineral.**  
Banner Rock Products Co., 352.  
United States Mineral Wool Co., 357.  
*Rock Cork*, 352.

**Working Heads, Deep Well,** see Pumps, Deep Well.

**Wrappings, Beam.**  
Consolidated Expanded Metal Companies, 206-08.  
*Steelcrete*, 206-08.

**Wrenches, Spanner.**  
Allen Mfg. Co., W. D., 1131-33.

**Wringers, Clothes, Electric.**  
Chicago Dryer Co., 1038-41.  
Western Electric Co., 1202-03.  
*Chicago*, 1038-41.  
*Western Electric*, 1202-03.

**Wrought Iron Work.**  
(See also Ornamental Metal Work.)  
Chattanooga Roofing & Foundry Co., 278; 499.  
Colonial Fireplace Co., 279.  
Creswell Iron Works, Samuel J., 258-59.  
Irving Forge, W., 505.  
Page Steel and Wire Co., 549-51.  
Pitt Composite Iron Works, William R., 558-59.  
Smyser-Royer Co., 528.  
Tiffany Studios, 526-27.  
*Variety Mfg. Co.*, 688-91.  
*W. Irving*, 505.

## Z

**Zinc.**  
Merchant & Evans Co., 420.  
*M & E Co.*, 420.

**Zinc Work.**  
Fiske Iron Works, J. W., 552-53.



## Part III—Geographical

An index of the Firms catalogued in this volume, arranged alphabetically by cities, including main and branch offices, agencies and factories.

### A

- Aberdeen, S. Dak.**  
Crane Co., 1084-85.
- Acme, New Mex.**  
Acme Cement Plaster Co., 140-41.
- Acme, Okla.**  
Acme Cement Plaster Co., 140-41.
- Acme, Tex.**  
Acme Cement Plaster Co., 140-41.
- Addyston, Ohio.**  
United States Cast Iron Pipe and Foundry Co., 305-07.
- Adrian, Mich.**  
Economy Drawing Table Co., 2-4.  
Page Steel and Wire Co., 549-51.
- Akron, Ohio.**  
Bessler Movable Stairway Co., 257.  
Bruner Granitoid Co., P. M. (Flower Mantel Co., Agts.), 337; 824-26.  
Burt Mfg. Co., 459-61.  
Grauer & Co., Albert (Flower Mantel Co., Agts.), 337; 824-26.  
Johns-Manville Co., H. W., 910.  
Sewer Pipe Manufacturers Association, 111.  
Stark Brick Co. (W. E. Wright Co., Reps.), 88.
- Albany, N. Y.**  
Bowser & Co., Inc., S. F., 1476-77.  
Burrowes Co., E. T., 790-92.  
Carter White Lead Co., 1315.  
Certain-teed Products Corporation, 399-401.  
Dunham Co., C. A., 916-21.  
General Fire Extinguisher Co., 1136-39.  
Johns-Manville Co., H. W., 910.  
Jordan & Co., Paul R. (C. M. Ward, Agt.), 464-65.  
Patent Vulcanite Roofing Co., 406-07.  
Spalt & Sons, Inc., Geo., 1058.
- Alexandria, Ind.**  
Banner Rock Products Co., 352.
- Allentown, Pa.**  
Hydraulic-Press Brick Co. (George K. Halteman, Agt.), 82-83.  
Lehigh Portland Cement Co., 127.
- Alliance, Ohio.**  
Alliance Brick Co., 71-72.
- Alpena, Mich.**  
Eddy Engineering Co., 922-23.
- Alpha, N. J.**  
Alpha Portland Cement Co., 119.
- Ambler, Pa.**  
Magnesia Association of America (Kearney & Mattison Co.), 1078-79.
- Amsterdam, Holland.**  
Master Builders Co., 339.
- Anderson, Ind.**  
National Tile Co. (Associated Tile Manufacturers), 284-87.  
Patent Vulcanite Roofing Co., 406-07.
- Anniston, Ala.**  
United States Cast Iron Pipe and Foundry Co., 305-07.
- Ansonia, Conn.**  
American Brass Co., 492-93.
- Argo, Ill.**  
National Kellastone Co., 138-39.
- Arlington, Minn.**  
Garden City Sand Co. (Arlington Cement Stone Works, Agts.), 134-37.
- Astoria, L. I., N. Y.**  
Tompkins-Kiel Marble Co., 70.
- Atlanta, Ga.**  
American Blower Co., 996-99.  
American Mailing Device Corporation, 1439.  
American Pressweld Radiator Corporation (Geo. B. Findlay, Agt.), 952-53.  
Anchor Post Iron Works, 537-43.  
Atlantic Terra Cotta Co. (Atlantic Terra Cotta Co., Agts.), 112-113.  
Automatic Refrigerating Co., 1048-49.  
Bishop-Babcock-Becker Co., 914-15.  
Bowser & Co., Inc., S. F., 1476-77.  
Bruner Granitoid Co., P. M. (Strafford R. Hewitt, Agt.), 337; 824-26.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Sciple Sons, Agts.), 1382-85.  
Certain-teed Products Corporation, 399-401.  
Chapman Valve Mfg. Co. (W. J. Neville, Rep.), 1080-81.  
Clinton Wire Cloth Co. (Southern G. F. Co., Agts.), 227-31.  
Corrugated Bar Co., 22; 190-92.  
Crane Co., 1084-85.  
Custodis Chimney Construction Co., Al-  
phons, 89.  
Dayton Malleable Iron Co. (Strafford R. Hewitt, Agt.), 246.  
Dreadnought Flooring Co. (Jos. F. Gardner, Agt.), 325.  
Edison Lamp Works, 1224.  
Edwards Mfg. Co., 664-65; 1410-11.  
Ford Mfg. Co., 239.  
Garden City Sand Co. (V. H. Kriegshaber & Son, Agts.), 134-37.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
General Fireproofing Co., 42; 210-13; 1414.  
Gillis & Geoghegan (Hill R. Huffman, Inc., Agts.), 1299-1305.  
Goulds Mfg. Co., 1108-09.  
Grauer & Co., Albert (Strafford R. Hewitt, Agt.), 337; 824-26.  
Hart & Crouse Co., 965-67.  
Hood Brick Co., B. Mifflin, 80-81.  
Huntington Roofing Tile Co., 434-35.  
Hydraulic-Press Brick Co. (Sciple Sons, Agts.), 82-83.  
Johns-Manville Co., H. W., 910.  
Josam Mfg. Co., 876-78.  
Kawneer Mfg. Co., 488-90.  
Kinnear Mfg. Co., 670-79.  
Lamson Co., 1307.  
Luminous Unit Co., 1227.  
MacArthur Concrete Pile & Foundation Co., 10-11.  
Massachusetts Blower Co., 1005.  
Merchant & Evans Co., 420; 470; 680.  
Murphy Wall Bed Co. (Murphy Door Bed Co. of Atlanta, Agts.), 1396-97.  
Ohio Blower Co., 472-74.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pittsburgh Plate Glass Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Reliance Fireproof Door Co. (Beaulieu & Applewhite, Reps.), 656-57.  
Sprague Electric Works, 1168.  
Sturtevant Co., B. F., 1006-07.  
Terrell's Equipment Co. (J. M. Van Harlingen, Rep.), 1426-27.

- Atlanta, Ga.—Continued.**  
Trus-Con Laboratories, 52-53.  
Truscon Steel Co., 217-19; 702-03.  
United Cork Companies, 356.  
Van Kannel Revolving Door Co., 588-89.  
Vonnegut Hardware Co. (Beaulieu & Applewhite, Agts.), 593-97.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Westinghouse Lamp Co., 1225.  
Wilson Corporation, J. G. (J. M. Van Harlingen, Agt.), 692-93; 804-05.  
York Mfg. Co., 1055.  
Youngstown Sheet & Tube Co., 1074-75; 1180-81.
- Atlantic, Iowa.**  
Garden City Sand Co. (Green Bay Lumber Co., Agts.), 134-37.
- Auburn, R. I.**  
General Fire Extinguisher Co., 1136-39.
- Auckland, New Zealand.**  
General Electric Co. (National Electrical & Engineering Co., Ltd., Reps.), 1153-67.
- Aurora, Ill.**  
Lyon Metallic Mfg. Co., 1420-21.  
Messenger & Parks Mfg. Co., 681.  
Richards-Wilcox Mfg. Co., 630-35.
- Austin, Texas.**  
Solar Metal Products Co., Inc. (Nalle & Co., Agts.), 645.
- Avondale, N. J.**  
Sonneborn Sons, Inc., L., 340-41.
- Avondale, N. S., Can.**  
King & Co., J. B., 153.

### B

- Baltimore, Md.**  
A. B. See Electric Elevator Co., 1262-63.  
Alpha Portland Cement Co., 119.  
American Steel & Wire Co., 30-33; 232-33; 1182-87.  
Aspromet Co., 414-16.  
Atlantic Insulated Wire & Cable Co., 1188-89.  
Beaver Board Companies, 170-71.  
Best Register Co., 988-89.  
Bowser & Co., Inc., S. F., 1476-77.  
Cabot, Inc., Samuel (National Building Supply Co., Agts.), 1382-85.  
Carbondale Machine Co., 1053.  
Chamberlin Metal Weather Strip Co., 781.  
Columbian Hardware Co. (Edwin Cugle, Agt.), 762.  
Conkling-Armstrong Terra Cotta Co. (W. T. Carson, Agt.), 114.  
Crane Co., 1084-85.  
Dayton Malleable Iron Co. (Marshall & Biedler, Agts.), 246.  
Dreadnought Flooring Co. (J. M. Adams, Agt.), 325.  
Edwards Mfg. Co., 418-19; 664-65.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
Gillis & Geoghegan (Eastern Sales Co., Agts.), 1299-1305.  
Glidden Co., 1344-45.  
Hart & Crouse Co., 965-67.  
Haslett Spiral Chute Co., 1306.  
Holtzer-Cabot Electric Co., 1242-45.  
Huntington Roofing Tile Co., 434-35.  
International Insulation Co., 174.

**Baltimore, Md.—Continued.**

Johns-Manville Co., H. W., 910.  
 Ketcham, O. W., 118.  
 Lamson Co., 1307.  
 Loomis-Manning Filter Distributing Co., 1125.  
 Lupton's Sons Co., David (Walter S. Brauns, Agt.), 704-08.  
 McShane Bell Foundry Co., 1451.  
 Marbleloid Co., 332-23.  
 Massachusetts Blower Co., 1005.  
 Merchant & Evans Co., 420; 470; 680.  
 Minwax Co., Inc., 342.  
 Morgan Co. (Morgan Millwork Co., Agts.), 584-85.  
 National Roofing Co. (Clarke Asphalt Roofing & Paint Co., Agts.), 389.  
 Natroco Paint & Varnish Works (Clarke Asphalt Roofing & Paint Co., Agts.), 1334.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Payson Mfg. Co. (Henry Keidel Co., Reps.), 750-53.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pratt & Cady Co., Inc. (McArdle & Cooney, Agts.), 1090-91.  
 Scientific Heater Co. (Consolidated Gas & Electric Co., Agts.), 1046-47.  
 Smyser-Royer Co. (Jas. P. Lynch, Rep.), 528.  
 Sprague Electric Works, 1168.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 United Lined Tube & Valve Co. (James Robertson Lead Co., Agts.), 1072-73.  
 Vonnegut Hardware Co. (T. B. & H. S. Hendrickson, Agts.), 593-97.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Lee Electric Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Yeomans Brothers Co. (DeWitt W. Smith, Rep.), 1122-23.

**Bangor, Me.**

Burnett-Larsh Mfg. Co. (R. E. Savage, Agt.), 098-99.  
 Certain-teed Products Corporation, 399-401.

**Bangor, Pa.**

Auld & Conger Co., 359.  
 Johnson, Inc., E. J., 366-67.  
 Natural Slate Blackboard Co., 376-77.  
 Vendor Slate Co., 374-75.

**Barranquilla, Colombia, S. A.**

General Electric Co. (Wesselhoeft & Wisner, Reps.), 1153-67.

**Bay City, Mich.**

Burnett-Larsh Mfg. Co., 1098-99.  
 Pittsburg Water Heater Co., 1024-27.

**Bay Ridge, Ohio.**

Sandusky Cement Co., 56; 128.

**Bay View, Mass.**

Rockport Granite Co., 60-61.

**Bayonne, N. J.**

Ogden Co., J. Edward, 682-83.

**Beatrice, Nebr.**

Kees Mfg. Co., F. D., 240; 799.

**Beaver Falls, Pa.**

Associated Tile Manufacturers, 284-87.  
 Beaver Falls Art Tile Co. (Associated Tile Manufacturers), 284-87.

**Beaverdale, Ont., Can.**

Beaver Board Companies, 170-71.

**Bedford, Ind.**

Shea & Donnelly Co., 67.

**Beech Bottom, W. Va.**

Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.

**Belleville, Ont., Can.**

Vonnegut Hardware Co. (Springer Lock Mfg. Co., Agts.), 593-97.

**Berkeley, Cal.**

Kawneer Mfg. Co., 488-90.

**Berlin, Germany.**

Standard Varnish Works, 1356-63.

**Berlin Mills, N. H.**

Brown Co., 573.

**Bessemer, Ala.**

United States Cast Iron Pipe and Foundry Co., 305-07.

**Bethel, Vt.**

Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.

**Bethlehem, Pa.**

Chapman Slate Co., 360-61.

**Binghamton, N. Y.**

Hydraulic-Press Brick Co. (Pratt Lumber Co., Agts.), 82-83.  
 National Roofing Co. (Gillett-Barnes Co., Agts.), 389.  
 Natroco Paint & Varnish Works (Gillett-Barnes Co., Agts.), 1334.  
 Sharp Rotary Ash Receiver Co., Inc., 954-55.

**Birmingham, Ala.**

American Cement Tile Mfg. Co., 432-33.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Moore-Handley Hardware Co., Agts.), 1382-85.  
 Certain-teed Products Corporation, 399-401.  
 Concrete Steel Co., 188-89.  
 Crane Co., 1084-85.  
 Deming Co. (Moore & Handley Hardware Co., Agts.), 1104-07.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 664-65.  
 General Electric Co., 1153-67.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Johns-Manville Co., H. W., 910.  
 Patent Vulcanite Roofing Co., 406-07.  
 Permutit Co., 1130.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Standard Electric Time Co., 1450.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Wagner Mfg. Co. (Brewer Fire Retardants Co., Agts.), 638-39.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Moore-Handley Hardware Co., Agts.), 1169-76.  
 Yeomans Brothers Co. (General Machinery Co., Reps.), 1122-23.

**Bloomfield, N. J.**

Westinghouse Lamp Co., 1225.  
 Wiggins Sons Co., H. B., 1388-89.

**Bloomington, Ind.**

Matthews Brothers Co., 66.

**Bluefield, W. Va.**

Westinghouse Electric & Mfg. Co. (Superior Supply Co., Agts.), 1169-76.

**Boston, Mass.**

A. B. See Electric Elevator Co., 1262-63.  
 Alberene Stone Co., 890-91.  
 Allen Pressure System Co., Inc., 1474-75.  
 Allith-Prouty Co., 614-15.  
 Alpha Portland Cement Co., 119.  
 American Blower Co., 996-99.  
 American Brass Co., 1071.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co., 344-45.  
 American Pulley Co., 757.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Anchor Post Iron Works, 537-43.  
 Artesian Well and Supply Co., 1092.  
 Aspromet Co., 414-16.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Atlas Portland Cement Co., 121-26.  
 Automatic Electric Co., 1238-39.  
 Automatic Refrigerating Co., 1048-49.  
 Badger & Sons Co., E. B., 892-93.

**Boston, Mass.—Continued.**

Bailey Co., C. C., 1393.  
 Barrell Co., William L., 410.  
 Barrett Co., 394-97.  
 Bayley Co., William, 698-99.  
 Beaver Board Companies, 170-71.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Billings-Chapin Co., 1318.  
 Bishop-Babcock-Becker Co., 914-15.  
 Boston Insulated Wire & Cable Co., 1192.  
 Boston Varnish Co., 1340-41.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Bridgeport Wood Finishing Works, 1369.  
 Burnett-Larsh Mfg. Co. (F. W. Goldthwait, Agt.), 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Butcher Polish Co., 1368.  
 Cabot, Inc., Samuel, 1382-85.  
 Canton Foundry & Machine Co. (Zenas R. Taylor, Inc., Reps.), 1486.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlain Metal Weather Strip Co., 781.  
 Chapman Valve Mfg. Co., 1080-81.  
 Chesley Co., Inc., A. C., 710-11.  
 Church, Stephen B., 1100.  
 Clinton Wire Cloth Co. (Dillaby Fireproofing Co., Agts.), 227-31; 990-91.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Concrete Steel Co., 188-89.  
 Consolidated Expanded Metal Companies (Penn Metal Co., Reps.), 206-08.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Crouse-Hinds Co., 1178.  
 Custodis Chimney Construction Co., Al-  
 phons, 89.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Dayton Malleable Iron Co. (Robert B. Campbell Co., Agts.), 246.  
 Deming Co. (Chas. J. Jager Co., Agts.), 1104-07.  
 Dexter Brothers Co., 1381.  
 Drednought Flooring Co. (Boston Floor Co., Agts.), 325.  
 Dunham Co., C. A., 916-21.  
 Duplex Hanger Co., 253.  
 Eco Clock Co., 1442.  
 Edison Lamp Works, 1224.  
 Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
 Electric Cable Co., 1190-91.  
 Eustis Mfg. Co., J. P., 885.  
 Ferdinand & Co., L. W., 1394.  
 Fletcher Co., H. E. (National Building Granite Quarries Association), 58-59.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 1414.  
 General Slate Co., 362-64.  
 Gifford-Wood Co., 1298.  
 Goss Corp., John L. (National Building Granite Quarries Association), 58-59.  
 Goulds Mfg. Co., 1108-09.  
 Grueby Faience & Tile Co., 292; see also Associated Tile Manufacturers, 284-87.  
 Guastavino Co., R., 34-35.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Hart Mfg. Co., 1212-13.  
 Hart & Crouse Co., 965-67.  
 Hart & Hutchinson Co., 1416-17.  
 Heinicke, Inc., H. R., 90-91.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Highton & Sons Co., Wm., 992-93.  
 Hill Clothes Dryer Co., 1037.  
 Hitchings & Co., 1454-55.  
 Hodgson Co., E. F., 1453.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Howard Clock Co., E., 1444-45.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (Waldo Bros., Agts.), 82-83.  
 Ilg Electric Ventilating Co. (Tompkins-Stoddard Co., Agts.), 1002-03.  
 International Insulation Co., 174.  
 James Mfg. Co. (P. R. Ziegler Co., Agts.), 1466-70.  
 Jenkins Bros., 1086-87.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.



**Boston, Mass.—Continued.**

Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W., 92-93.  
 Kelsey Heating Co., 958-59.  
 Kennedy, Inc., David E., 326; 327.  
 Kennedy Valve Mfg. Co., 1088-89.  
 King Construction Co., 1456-57.  
 King & Co., J. B., 153.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Lehigh Portland Cement Co., 127.  
 Library Bureau, 1418-19.  
 Link-Belt Co., 1310.  
 Loomis-Manning Filter Distributing Co., 1125.  
 Lord & Burnham Co., 978-79; 1458-61.  
 Lowe Brothers Co., 1328-29.  
 Luminous Unit Co., 1227.  
 Lupton's Sons Co., David, 704-08.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 McGann & Sons Co., T. F., 508-09.  
 Majestic Co. (Waldo Bros., Agts.), 271-73.  
 Manufacturing Equipment & Engineering Co., 847; 1422.  
 Marbleoid Co., 332-33.  
 Massachusetts Blower Co., 1005.  
 Miller & Co., Edward, 1230.  
 Minneapolis Heat Regulator Co., 948-49.  
 Murphy Wall Bed Co. (Murphy Door Bed Co. of New England, Agts.), 1396-97.  
 National Building Granite Quarries Association, 58-59.  
 National Pipe Bending Co. (W. G. Ruggles Co., Agts.), 902-03.  
 National X-Ray Reflector Co. (Pettingell-Andrews Co., Agts.), 1231.  
 New York Belting & Packing Co., 322.  
 Northeastern Co., 1387.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Peelle Co., 684-87.  
 Penn Metal Co., 216; 734; see also Associated Metal Lath Manufacturers, 196-201.  
 Permutit Co., 1130.  
 Pfaudler Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Powers Regulator Co., 947.  
 Pratt & Cady Co., Inc., 1090-91.  
 Reed & Barton, 520-21.  
 Reliance Fireproof Door Co. (James Glass Co., Reps.), 656-57.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Rising & Nelson Slate Co., 368-69.  
 Rockport Granite Co., 60-61; see also National Building Granite Quarries Association, 58-59.  
 S-M-I Engineering Co., 23.  
 Samson Cordage Works, 755.  
 Scientific Heater Co. (Stack Heater Co., Agts.), 1046-47.  
 Seeger Refrigerator Co., 1063.  
 Shea & Donnelly Co., 67.  
 Snow Iron Works, Inc., W. A., 554-55.  
 Solar Metal Products Co., Inc. (Greenbough-Heddinger Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Paint Co., 48-49; 393.  
 Stark Brick Co. (Fiske & Co., Inc., Reps.), 88.  
 Sturtevant Co., B. F., 1006-07.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Tucker Co., Edward A., 194.  
 Turner Construction Co., 15.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Tyler Co., W. S., 529.  
 Uni-Form Co., 27-29.  
 Union Metal Corner Co., 222-23.  
 United Cork Companies, 356.  
 United Lined Tube & Valve Co. (Chadwick-Boston Lead Co., Agts.), 1072-73.  
 Valentine & Co., 1366-67.

**Boston, Mass.—Continued.**

Van Kannel Revolving Door Co., 588-89.  
 Van Noorden & Co., E., 452-53.  
 Vonnegut Hardware Co. (Robert J. Gilkie, Agt.), 593-97.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Walworth Mfg. Co., 1144.  
 Warren Chemical & Mfg. Division, 309; 408-09.  
 Waterproofing Co., 54-55.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Stuart-Howland Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Williams Pivot Sash Co. (Skillman & Sunderland Co., Agts.), 742-45.  
 Witherow Steel Co., 195.  
 Wright Wire Co., 234-35.  
 Yeomans Brothers Co. (Power Equipment Co., Reps.), 1122-23.  
 York Mfg. Co., 1055.  
 Youngtown Sheet & Tube Co., 1074-75; 1180-81.

**Braddock, Pa.**

American Chain Co., Inc., 754.  
 Consolidated Expanded Metal Companies, 206-08; see also Associated Metal Lath Manufacturers, 196-201.

**Bradford, Pa.**

Bradford Pressed Brick Co., 78-79.

**Bridgeburg, Ont., Can.**

Chicago Bridge & Iron Works, 1095.  
 Pratt & Lambert, Inc., 1354-55.  
 Tuttle & Bailey Mfg. Co., 985-87.

**Bridgeport, Conn.**

American Chain Co., Inc., 754.  
 Bryant Electric Co., 1207.  
 Crane Co., 1084-85.  
 Drouvé Co., G., 444-45.  
 Electric Cable Co., 1190-91.  
 Hart & Crouse Co., 965-67.  
 Hubbell, Inc., Harvey, 1216-17.

**Bridgewater, Mass.**

Stanley Works, 608-13.

**Brockville, Ont., Can.**

Kelsey Heating Co. (Canada Foundry and Forgings, Ltd., Agts.), 958-59.

**Brookline, Mass.**

Wadsworth, Howland & Co., Inc., 1338-39.

**Brooklyn, N. Y.**

American Mailing Device Corporation, 1439.  
 Belknap-Moran-Allen Co., Inc., 1375.  
 Bommer Brothers, 600-01.  
 Brooklyn Vault Light Co., 822-23.  
 Brooklyn Vitrified Tile Works (Associated Tile Manufacturers), 284-87.  
 Crane Co., 1084-85.  
 Diamond Door Hanger Co., Inc., 616-17.  
 Jackson Co., Wm. H., 289; 512.  
 Keystone Varnish Co., 1347-48.  
 Kuhls, H. B. Fred, 1376.  
 Meurer Bros. Co., Inc., 422-23.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Peelle Co., 684-87.  
 Penn Brass & Bronze Works, 517.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Plate Glass Co., 484-85.  
 Reliance Fireproof Door Co., 656-57.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 York Mfg. Co., 1055.

**Brookville, Pa.**

Humphrey Brick & Tile Co., 106.

**Brussels, Belgium.**

Standard Varnish Works, 1356-63.

**Buenos Aires, Argentine Republic, South America.**

Brecht Co., 1050-52.  
 General Electric Co. (Cia. General Electric Sudamericana, Inc., Reps.), 1153-67.  
 Yeomans Brothers Co. (Buxton, Olditch & Co., Reps.), 1122-23.

**Buffalo, N. Y.**

Alberger Heater Co., 901.  
 American Laundry Machinery Co., 1036.

**Buffalo, N. Y.—Continued.**

American Pressweld Radiator Corporation (J. A. Sullivan, Agt.), 952-53.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Angle Window and Door Co., 709.  
 Aspromet Co., 414-16.  
 Beaver Board Companies, 170-71.  
 Bicalky Fan Co., 1000.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Bruner Granitoid Co., P. M. (Albert Grauer & Co., Agts.), 337; 824-26.  
 Cabot, Inc., Samuel (M. A. Reeb (Quilt); Schuele & Co., (Stains) (Agts.)), 1382-85.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Columbian Hardware Co. (E. B. Lawson, Agt.), 762.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Dayton Malleable Iron Co. (Buffalo Builders Supply Co., Agts.), 246.  
 Deming Co. (Root, Neal & Co., Agts.), 1104-07.  
 Dreadnought Flooring Co. (Stevens Floor Co., Agts.), 325.  
 Ernst Specialty Co., C. K., 1294-97.  
 Ernst's Sons, C. F., 1484-85.  
 Ford Mfg. Co., 239.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 42; 210-13.  
 Gillis & Geoghegan (Farrar Iron & Steel Co., Agts.), 1299-1305.  
 Grauer & Co., Albert, 337; 824-26.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (John H. Black Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Kaustine Co., Inc., 851.  
 Kawneer Mfg. Co., 488-90.  
 King & Co., J. B., 153.  
 Lehigh Portland Cement Co., 127.  
 Minnesota Manufacturers' Association, 1311.  
 National Roofing Co. (Cordes, Ayrault & Co., Inc., Agts.), 389.  
 Natroco Paint & Varnish Works (Cordes, Ayrault & Co., Inc., Agts.), 1334.  
 Niagara Gypsum Co., 156.  
 Niagara Metal Weather Strip Co., 788.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Permutit Co., 1130.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Pratt & Lambert, Inc., 1354-55.  
 Reeb Corporation, M. A., 157.  
 Sarco Co., Inc., 931.  
 Scientific Heater Co. (Martin Fisher & Sons, Agts.), 1046-47.  
 Solar Metal Products Co., Inc. (Monarch Bldrs. Supply Co., Agts.), 645.  
 Stark Brick Co. (Buffalo Clay Products Co., Reps.), 88.  
 Sturtevant Co., B. F., 1006-07.  
 Terrell's Equipment Co. (Neal Co., Reps.), 1426-27.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Turner Construction Co., 15.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Variety Mfg. Co., 688-91.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Windshield Scupper Co. (E. B. Lawson, Agt.), 276.



**Burlington, N. J.**

United States Cast Iron Pipe and Foundry Co., 305-07.

**Burlington, Vt.**

Burlington Venetian Blind Co., 802-03.

**Butte, Mont.**

American Blower Co. (Anaconda Copper Mining Co., Agts.), 996-99.  
Aspromet Co., 414-16.  
General Electric Co., 1153-67.  
Murphy Wall Bed Co. (Archibald J. Mahan, Agt.), 1396-97.  
Solar Metal Products Co., Inc. (D. E. Fryer Co., Agts.), 645.  
Westinghouse Electric & Mfg. Co. (Montana Electric Co., Agts.), 1169-76.

**C****Calcutta, Bengal, India.**

General Electric Co. (of New York), 1153-67.  
Penberthy Injector Co., 882-83.

**Calgary, Alta., Can.**

Dayton Malleable Iron Co. (Gorman, Clancey & Grindley, Ltd., Agts.), 246.  
Johnson Service Co. (Johnson Temperature Regulating Co. of Canada, Ltd., Reps.), 942-46.  
Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
Powers Regulator Co. (Canadian Powers Regulator Co., Ltd.), 947.  
Variety Mfg. Co., 688-91.  
Wilson Corporation, J. G., 692-93; 804-05.  
Yeomans Brothers Co. (Darling Brothers Ltd., Reps.), 1122-23.

**Cambridge, Mass.**

Eustis Mfg. Co., J. P., 885.  
Library Bureau, 1418-19.  
North Western Expanded Metal Co., 214-15.  
Payne Co., F. S., 1290-91.  
Riverside Boiler Works, Inc., 896-99.

**Camden, N. J.**

Crane Co., 1084-85.  
Webster & Co., Warren, 932-34.

**Canton, Ohio.**

Berger Mfg. Co., 176-82; 202-05; 417; 1406-08; see also Associated Metal Lath Manufacturers, 196-201.  
Canton Foundry & Machine Co., 270; 1486.  
Columbia Iron & Wire Works Co., 268-69.  
Stark Brick Co., 88.  
Stark Rolling Mill Co., 424-25.  
Union Metal Mfg. Co., 304.  
United Electric Co., 1258-59.

**Canton, S. Dak.**

Garden City Sand Co. (Bragstead Concrete Machinery Co., Agts.), 134-37.

**Cape Town, United South Africa, Africa.**

General Electric Co. (South African General Electric Co., Reps.), 1153-67.

**Carbondale, Pa.**

Carbondale Machine Co., 1053.

**Carlisle, Pa.**

American Chain Co., Inc., 754.

**Casper, Wyo.**

Burrowes Co., E. T., 790-92.

**Cedar Falls, Iowa.**

Garden City Sand Co. (C. A. Wise & Sons Co., Agts.), 134-37.  
Wagner Mfg. Co., 638-39.

**Cedar Rapids, Iowa.**

Burnett-Larsh Mfg. Co., (J. F. Weir, Agt.), 1098-99.

**Cement, Okla.**

Acme Cement Plaster Co., 140-41.

**Cementon, N. Y.**

Alpha Portland Cement Co., 119.

**Charleston, S. C.**

King & Co., J. B., 153.

**Charleston, W. Va.**

General Electric Co., 1153-67.  
Kanawha Mfg. Co., 974.  
Westinghouse Electric & Mfg. Co., 1169-76.

**Charlotte, Mich.**

Garden City Sand Co. (Colburn-Fulton Lumber Co., Agts.), 134-37.

**Charlotte, N. C.**

American Blower Co. (Isaac Hardeman, Agt.), 996-99.  
Burrowes Co., E. T., 790-92.  
Chicago Bridge & Iron Works, 1095.  
Deming Co., 1104-07.  
General Electric Co., 1153-67.  
Gillis & Geoghegan (General Mill Supply Co., Agts.), 1299-1305.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Williams Pivot Sash Co. (D. F. Hoover, Agt.), 742-45.  
Yeomans Brothers Co. (J. R. Purser, Rep.), 1122-23.

**Chattanooga, Tenn.**

Chattanooga Boiler & Tank Co., 1094.  
Chattanooga Roofing & Foundry Co., 278; 499.  
General Electric Co., 1153-67.  
Jordan & Co., Paul R. (Webster Co., Agts.), 464-65.  
Majestic Co. (Price-Evans Foundry Co., Agts.), 271-73.  
Price-Evans Foundry Co., 518-19.  
United States Cast Iron Pipe and Foundry Co., 305-07.  
Walsh & Weidner Boiler Co., 1096.  
Westinghouse Electric & Mfg. Co., 1169-76.  
Wheeling Corrugating Department, 242-43.

**Chelsea, Mass.**

Snow Iron Works, Inc., W. A., 554-55.

**Chester, Pa.**

Stevenson Cold Storage Door Co., 1066-69.

**Cheyenne, Wyo.**

Dunham Co., C. A., 916-21.

**Chicago, Ill.**

Alberene Stone Co., 890-91.  
Allen Mfg. Co., W. D., 1131-33.  
Allen Pressure System Co., Inc. (H. K. Allen, Agt.), 1474-75.  
Allith-Prouty Co., 614-15.  
American Blower Co., 996-99.  
American Brass Co., 1071.  
American District Steam Co., 912.  
American Laundry Machinery Co., 1036.  
American Mailing Device Corporation, 1439.  
American Mason Safety Tread Co. (Joseph T. Ryerson & Son, Agts.), 344-45.  
American Materials Co. (U. S. Materials Co., Agts.), 133.  
American Pressweld Radiator Corporation (Edward P. Lomasney, Agt.), 952-53.  
American Pulley Co., 757.  
American Sheet and Tin Plate Co., 412-13.  
American Steel & Wire Co., 30-33; 232-33; 1182-87.  
American 3-Way Prism Co., 821.  
Antakwa Co., 37.  
Arex Co., 457.  
Arrow Conductor & Mfg. Co., 94.  
Aspromet Co., 414-16.  
Athey Co., 780.  
Atlantic Insulated Wire & Cable Co., 1188-89.  
Atlas Portland Cement Co., 121-26.  
Auto Utilities Mfg. Co., 458.  
Automatic Electric Co., 1238-39.  
Automatic Refrigerator Co., 1048-49.  
Ayer & Lord Tie Co., 310.  
Barrell Co., William L. (Geo. B. Carpenter Co., Agts.), 410.  
Barrett Co., 394-97.  
Barton Spider-Web System, 20-21.  
Bayley Co., William, 698-99.  
Beardslee Chandelier Mfg. Co., 1226.  
Beaton & Corbin Mfg. Co. (H. Ludwig, Rep.), 935.  
Beaver Board Companies, 170-71.  
Beaver Falls Art Tile Co. (Associated Tile Manufacturers), 284-87.

**Chicago, Ill.—Continued.**

Benjamin Electric Mfg. Co., 1177; 1206.  
Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
Best Bros. Keene's Cement Co., 146-47.  
Biegler Mfg. Co., E. N., 39.  
Bird & Son, 390-91.  
Bishop-Babcock-Becker Co., 914-15.  
Boston Varnish Co., 1340-41.  
Bowser & Co., Inc., S. F., 1476-77.  
Brasco Mfg. Co., 481.  
Bridgeport Wood Finishing Works, 1369.  
Brown Co., 573.  
Brown Hoisting Machinery Co., 184-85.  
Bryant Electric Co., 1207.  
Burnett-Larsh Mfg. Co. (E. C. Wendell, Agt.), 1098-99.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel, 1382-85.  
Caldwell Mfg. Co., 758-59.  
Carbondale Machine Co., 1053.  
Carney's Cement Co. (Builders-Sales Co., Reps.), 129.  
Carter White Lead Co., 1315.  
Casement Hardware Co., 737.  
Central Architectural Iron Works, 261.  
Central Creosoting Co., 311.  
Central Metallic Door Co., 648.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
Chamberlin Metal Weather Strip Co., 781.  
Chapman Valve Mfg. Co., 1080-81.  
Chesley Co., Inc., A. C., 710-11.  
Chicago Bridge & Iron Works, 1095.  
Chicago Dryer Co., 1038-41.  
Chicago Pump Co., 1097.  
Chicago Spring Butt Co., 602-603.  
Chicago Steel Tank Co., 1482.  
Chicago Varnish Co., 1342-43.  
Clinton Wire Cloth Co., 227-31; 990-91.  
Coburn Trolley Track Mfg. Co., 640-43.  
Colonial Fireplace Co., 279.  
Columbian Hardware Co., 762.  
Compound Injector & Specialty Co., 872-73.  
Concrete Engineering Co., 24-25.  
Concrete Steel Co., 188-89.  
Connelly Co., Thomas, 130-31.  
Connorsville Blower Co., 1102-03.  
Consolidated Expanded Metal Companies, 206-08.  
Cornell Wood Products Co., 173.  
Corrugated Bar Co., 22; 190-92.  
Crane Co., 1084-85.  
Creo-Dipt Co., Inc., 382-83.  
Crouse-Hinds Co., 1178.  
Curtis Door & Sash Co. (Curtis Service Bureau), 578-79.  
Custodis Chimney Construction Co., Al-  
phons, 89.  
Cutler-Hammer Mfg. Co., 1208-09.  
Cyclone Fence Co., 546-48.  
Dahlstrom Metallic Door Co., 649-51.  
Davis Marble Co., 283.  
Dayton Malleable Iron Co. (Olney J. Dean & Co., Agts), 246.  
Deming Co. (Henion & Hubbell, Agts.), 1104-07.  
De Smet Quartz Tile Co., 291.  
Dodge & Co., H. B., 768.  
Dreadnought Flooring Co. (E. R. Newcomb, Agt.), 325.  
Drouvé Co., G., 444-45.  
Dunham Co., C. A., 916-21.  
Duplex Hanger Co., 253.  
Economy Fuse & Mfg. Co., 1223.  
Economy Heater Co., 1015-17.  
Economy Pumping Machinery Co., 1101.  
Edison Electric Appliance Co., Inc., 1204.  
Edison Lamp Works, 1224.  
Electric Cable Co., 1190-91.  
Federal Cement Tile Co., 429-31.  
Federal Steel Fixture Co., 1412-13.  
Ford Mfg. Co., 239.  
Foundation Co., 14.  
Fowler & Pay (Austin Bricklayers Cement Co., Agts.), 132.  
Friedley-Voshardt Co., 501.  
Garden City Sand Co., 134-37.



**Chicago, Ill.—Continued.**

General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 42; 210-13; 1414.  
 Gifford-Wood Co., 1298.  
 Gillette-Vibber Co. (M. B. Austin & Co., Agts.), 1211.  
 Gillis & Geoghegan (Kaufman & Thomas, Agts.), 1299-1305.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co., 1344-45.  
 Gorham Co Architectural Bronze, 502-03.  
 Gorton & Lidgerwood Co., 1083.  
 Goulds Mfg. Co., 1108-09.  
 Grand Crossing Boiler Works, 907.  
 Guaranty Iron & Wire Co., 667.  
 Harrison Works, 1322-25.  
 Hart Mfg. Co., 1212-13.  
 Hart & Crouse Co., 965-67.  
 Hart & Hutchinson Co., 1416-17.  
 Hartmann-Sanders Co., 298-99.  
 Heinicke, Inc., H. R., 90-91.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Hess Warming & Ventilating Co., 887.  
 Highland Glass Co., 808-09.  
 Hoffman Specialty Co., 926-29.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Howard Clock Co., E., 1444-45.  
 Hubbell, Inc., Harvey, 1216-17.  
 Hunt & Co., Robert W., 8.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co., 82-83.  
 Hydrex Felt & Engineering Co., 44.  
 Ilg Electric Ventilating Co., 1002-03.  
 International Filter Co., 1124.  
 International Heater Co., 968-73.  
 International Insulation Co., 174.  
 Jackson Co., Wm. H., 289; 512.  
 Jenkins Bros., 1086-87.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (J. C. Bold, Agt.), 464-65.  
 Kaestner & Hecht Co., 1276-77.  
 Kalman Co., Paul J., 193.  
 Kanawha Mfg. Co., 974.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W., 92-93.  
 Kelsey Heating Co., 958-59.  
 Kennedy, Inc., David E., 326; 327.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Kenwood Bridge Co., 17.  
 Kernchen Company, 466.  
 Kewanee Boiler Co., 975-77.  
 Kewanee Private Utilities Co., 1112-13.  
 Kinnear Mfg. Co., 670-79.  
 Knappe Machine Co., John, 1399.  
 Lamson Co., 1307.  
 Lawson Mfg. Co., 604-05.  
 Lehigh Portland Cement Co., 127.  
 Library Bureau, 1418-19.  
 Link-Belt Co., 1310.  
 Litterer Bros. Mfg. Co., 894-95.  
 Loomis-Manning Filter Distributing Co. (Anson-Byrne Co., Agts.), 1125.  
 Lord & Burnham Co., 978-79; 1458-61.  
 Louisville Varnish Co., Inc., 1349.  
 Lowe Brothers Co., 1328-29.  
 Luminous Unit Co., 1227.  
 Lupton's Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 McFarland-Hyde Co., 720-21.  
 McShane Bell Foundry Co., 1451.  
 Majestic Co. (Fred Liebrich; Angert Wire & Iron Co., Agts.), 271-73.  
 Maple Flooring Manufacturers' Ass'n, 316-18.  
 Marble & Shattuck Chair Co. (H. G. Hunn, Agt.), 1400-01.  
 Marbleloid Co., 332-33.  
 Mas-Oleum Floor Mfg. Co., 334.  
 Massachusetts Blower Co., 1005.  
 Master Builders Co., 339.  
 Mensch, L. J., 302.  
 Merchant & Evans Co., 420; 470; 680.  
 Metallic Sash-Operator Co. (Universal Steel Products Co., Agts.), 748-49.

**Chicago, Ill.—Continued.**

Minneapolis Heat Regulator Co., 948-49.  
 Minnesota Manufacturers' Association, 1311.  
 Minwax Co., Inc., 342.  
 Mississippi Glass Co., 810-11.  
 Mississippi Wire Glass Co., 812-15.  
 Montgomery Elevator Co., 1279.  
 Morgan Co. (Morgan Sash and Door Co., Agts.), 584-85.  
 Muller & Co., Franklyn R., 335.  
 Murphy Varnish Co., 1350-51.  
 Murphy Wall Bed Co. (Murphy Door Bed Co., of Chicago, Agts.), 1396-97.  
 National Automatic Door Co., 660.  
 National Kellastone Co., 138-39.  
 National Tile Co. (Associated Tile Manufacturers), 284-87.  
 National X-Ray Reflector Co., 1231.  
 New York Belting & Packing Co., 322.  
 New York Continental Jewell Filtration Co., 1126.  
 Newman Clock Co., 1443.  
 North Western Expanded Metal Co., 214-15; see also Associated Metal Lath Manufacturers, 196-201.  
 Northwestern Terra Cotta Co., 116-17.  
 Ohio Blower Co., 472-74.  
 Old Bridge Enamel Brick and Tile Co. (Associated Tile Manufacturers), 284-87.  
 Olson & Co., Samuel, 1312-13.  
 Page Steel and Wire Co., 549-51.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Payson Mfg. Co., 750-53.  
 Peelle Co., 684-87.  
 Peerless Ice Machine Co., 1054.  
 Permutit Co., 1130.  
 Pfauder Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Plymouth Gypsum Co., 154-55.  
 Powell Steel Kitchen Co., 1032-33.  
 Powers Regulator Co., 947; 950-51.  
 Pratt & Cady Co., Inc., 1090-91.  
 Pratt & Lambert, Inc., 1354-55.  
 Pressed Prism Plate Glass Co., 820.  
 Raymond Concrete Pile Co., 12-13.  
 Reed & Barton, 520-21.  
 Reliance Fireproof Door Co. (M. R. Duffy, Rep.), 656-57.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Richards & Kelly Mfg. Co., 830.  
 Richmond Screw Anchor Co. (Sellar Supply Co., Agts.), 249.  
 Rising & Nelson Slate Co., 368-69.  
 Rockport Granite Co., 60-61; see also National Building Granite Quarries Association, 58-59.  
 Royal Safety Anchor Co., 766-67.  
 Saino Fire Door & Shutter Co., 669.  
 Sarco Co., Inc., 931.  
 Scientific Heater Co. (Eureka Water Heater Co., Agts.), 1046-47.  
 Shone Co., 884.  
 Silver Lake Co., 756.  
 Smith Wire and Iron Works, F. P., 524-25.  
 Solar Metal Products Co., Inc. (F. P. Smith Wire & Iron Works, Agts.), 645.  
 Southern Gypsum Co., Inc., 158-59.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Fire Escape Co., 266.  
 Standard Paint Co., 48-49; 393.  
 Standard Varnish Works, 1356-63.  
 Stanley Works, 608-13.  
 Stanley & Patterson, Inc. (Doherty-Hafner Co., Agts.), 1246-55.  
 Stark Brick Co. (S. S. Kimbell Brick Co., Reps.), 88.  
 Stevens Partition & Floor Deadener Co., 354-55.  
 Stone, Junius H., 353.  
 Sturtevant Co., B. F., 1006-07.

**Chicago, Ill.—Continued.**

Swenson Granite Co., John, 63; see also National Building Granite Quarries Association, 58-59.  
 Symons Clamp Co., 183.  
 Tablet & Ticket Co., 1436-37.  
 Taylor Co., N. & G., 426-28.  
 Thatcher Furnace Co., 982-84.  
 Thomas Clock Co., Seth, 1446-47.  
 Time-Systems Co., 1448-49.  
 Tompkins-Kiel Marble Co., 70.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Twin City Varnish Co., 1365.  
 Tyler Co., W. S., 529.  
 United Cork Companies, 356.  
 United Lined Tube & Valve Co. (Raymond Lead Co., Agts.), 1072-73.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 U. S. Encaustic Tile Works (Associated Tile Manufacturers), 284-87.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 Universal Safety Tread Co., 347.  
 Valentine & Co., 1366-67.  
 Van Kannel Revolving Door Co., 588-89; (J. D. Duffy, Agt.), 1438.  
 Variety Mfg. Co., 688-91.  
 Vitri-fyx Co., 343.  
 Vitrolite Co., 870-71.  
 Vonnegut Hardware Co. (Bold & Millen, Agts.), 593-97.  
 Walworth Mfg. Co., 1144.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Illinois Electric Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 Wiggins' Sons Co., H. B., 1388-89.  
 Wilkins, George Lester, 746.  
 Williams Pivot Sash Co. (M. R. Duffy, Agt.), 742-45.  
 Wilson Corporation, J. G. (H. B. Dodge & Co., Agts), 692-93; 774-77; 804-05.  
 Winkler-Reichmann Co., 1236.  
 Winslow Bros. Co., 735.  
 Woodbury Granite Co., 65.  
 Wright Wire Co., 234-35.  
 Yeomans Brothers Co., 1122-23.  
 York Mfg. Co., 1055.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Chicago Heights, Ill.**

American Steel Window Co., 694-97.  
 Weber Costello Co., 379.  
 Zouri Drawn Metals Co., 486-87.

**Christchurch, New Zealand.**

General Electric Co. (National Electrical & Engineering Co., Ltd., Reps.), 1153-67.

**Christiania, Norway.**

Master Builders Co., 339.

**Cicero, Ill.**

American 3-Way Prism Co., 821.

**Cincinnati, Ohio.**

American Laundry Machinery Co., 1036.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bishopric Mfg. Co., 169.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Cabot, Inc., Samuel (L. Mendenhall Co., Agts.), 1382-85.  
 Carter White Lead Co., 1315.  
 Central Creosoting Co., 311.  
 Certain-teed Products Corporation, 399-401.



**Cincinnati, Ohio—Continued.**

Chamberlin Metal Weather Strip Co., 781.  
 Crane Co., 1084-85.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Dayton Malleable Iron Co. (The J. K. Nickerson Co., Agts.), 246.  
 Dunham Co., C. A., 916-21.  
 Eagle-Picher Lead Co., 875.  
 Edison Lamp Works, 1224.  
 Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
 Garden City Sand Co. (Moore-Coney Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Hall's Safe Co., 1431.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (Clay Products and Supply Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Kawneer Mfg. Co., 488-90.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Lee, Thomas, 467; 719.  
 Luminous Unit Co., 1227.  
 Lyon Metallic Mfg. Co., 1420-21.  
 Magnesia Association of America (Philip Carey Co., Rep.), 1078-79.  
 Marbleloid Co., 332-33.  
 Minnesota Manufacturers' Association, 1311.  
 Murdock Mfg. & Supply Co., 866-67.  
 Oak Flooring Manufacturers Association, 319.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Powers Regulator Co., 947.  
 Reliance Fireproof Door Co. (Builders Material Co., Reps.), 656-57.  
 Rookwood Pottery Co., 294-95.  
 Scientific Heater Co. (Ruehrwein & Lawson, Agts.), 1046-47.  
 Solar Metal Products Co., Inc. (Builders Material Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Stark Brick Co. (Pursell-Grand Co., Reps.), 88.  
 Stewart Iron Works, Co., 556-57.  
 Sturtevant Co., B. F., 1006-07.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Van Kannel Revolving Door Co., 588-89.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Johnson Electrical Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (A. F. Scherer, Agt.), 241.  
 Williams Pivot Sash Co. (Geo. C. Ramsey, Agt.), 742-45.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Windshield Scupper Co. (Brick Sales Co., Agts.), 276.

**Clarksburg, W. Va.**

Burrowes Co., E. T., 790-92.

**Cleveland, Ohio.**

A. B. See Electric Elevator Co., 1262-63.  
 American Bitumastic Enamels Co., 1373.  
 American Blower Co., 996-99.  
 American Cement Tile Mfg. Co., 432-33.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Anchor Post Iron Works, 537-43.  
 Arco Co., 1316-17.  
 Aspromet Co., 414-16.  
 Associated Metal Lath Manufacturers, 196-201.  
 Auld & Conger Co., 359.  
 Automatic Refrigerating Co., 1048-49.  
 Ayer & Lord Tie Co., 310.  
 Barrett Co., 394-95.

**Cleveland, Ohio—Continued.**

Beaver Board Companies, 170-71.  
 Best Register Co., 988-89.  
 Billings-Chapin Co., 1318.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Brown Hoisting Machinery Co., 184-85.  
 Bruner-Granitoid Co., P. M. (Albert Grauer & Co., Agts.), 337; 824-26.  
 Burnett-Larsh Mfg. Co. (H. W. Linard, Agt.), 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Cleveland Builders' Supply Co., Agts.), 1382-85.  
 Carney's Cement Co. (Builders' Sales Co., Reps.), 129.  
 Carpenter Mfg. Co., R. F., 868-69.  
 Carter White Lead Co., 1315.  
 Central Brass Mfg. Co., 852-55.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Chesley Co., Inc., A. C., 710-11.  
 Cleveland Builders Supply Co., 145.  
 Columbian Hardware Co., 762.  
 Concrete Reinforcing and Engineering Co., 186-87.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Cyclone Fence Co., 546-48.  
 Dayton Malleable Iron Co. (Joseph W. Loeb Co. Agts.), 246.  
 Denison Interlocking Tile Corporation, 96-97.  
 Donley Brothers Co., 247.  
 Dunham Co., C. A., 916-21.  
 Duplex Hanger Co., 253.  
 Edwards Mfg. Co., 418-19; 1410-11.  
 Fischer & Jirouch Co., 1404; 1405.  
 Fowler & Pay (Austin Bricklayers Co., Agts.), 132.  
 Garden City Sand Co. (Cuyahoga Builders' Supply Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Georgia Marble Co., 68-69.  
 Gillis & Geoghegan (R. L. Queisser Co., Agts.), 1299-1305.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co., 1344-45.  
 Gorham Co Architectural Bronze, 502-03.  
 Grauer & Co., Albert, 337; 824-26.  
 Harsch & Sons Co., John, 504.  
 Hart & Crouse Co., 965-67.  
 Hauserman Co., E. F., 1415.  
 Heinicke, Inc., H. R., 90-91.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic Press Brick Co., 82-83.  
 Ideal Hanger Co., 256.  
 Ilg Electric Ventilating Co., 1002-03.  
 International Insulation Co., 174.  
 Ivanhoe-Regent Works, 1228-29.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (McWaters & Co., Agts.), 464-65.  
 Kelley Island Lime & Transport Co., 150-51.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Lord & Burnham Co., 1458-61.  
 Lupton's Sons Co., David, 704-08.  
 Majestic Co. (Donley Bros., Agts.), 271-73.  
 Mannen Co., John E., 1031; 1045.  
 Marble & Shattuck Chair Co., 1400-01.  
 Marbleloid Co., 332-33.  
 Massachusetts Blower Co., 1005.  
 Master Builders Co., 339.  
 Merchant & Evans Co., 420; 470; 680.  
 Minneapolis Heat Regulator Co., 948-49.  
 Minnesota Manufacturers' Association, 1311.  
 Morgan Co., 584-85.  
 National Paint & Varnish Co., 1331.  
 National Roofing Co. (National Roofing & Supply Co., Agts.), 389.  
 Natroco Paint & Varnish Works (National Roofing & Supply Co., Agts.), 1334.  
 Ohio Blower Co., 472-74.

**Cleveland, Ohio—Continued.**

Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Peele Co., 684-87.  
 Permutit Co., 1130.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Powers Regulator Co., 947.  
 Pratt & Cady Co., Inc. (Tomlinson Steam Specialty Co., Agts.), 1090-91.  
 Reliance Fireproof Door Co. (Wm. H. Geis & Co., Reps.), 656-57.  
 Riester & Thesmacher Co., 658-59.  
 Sandusky Cement Co., 56; 128.  
 Scientific Heater Co., 1046-47.  
 Solar Metal Products Co., Inc. (McWaters & Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Store Service, Inc., 1314.  
 Stark Brick Co. (Cuyahoga Builders' Supply Co., Reps.), 88.  
 Steelite Co., 1293.  
 Sturtevant Co., B. F., 1006-07.  
 Tropical Paint & Oil Co., 1335.  
 Truscon Steel Co., 217-19; 702-03.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Tyler Co., W. S., 529.  
 United Cork Companies, 356.  
 United Lined Tube & Valve Co. (Gibson-Price Co., Agts.), 1072-73.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 Van Dorn Iron Works Co., 254-55; 1428; 1489.  
 Van Kannel Revolving Door Co., 588-89; (R. L. Queisser Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (A. R. Stoeffler Co., Agts.), 593-97.  
 Vortex Mfg. Co., 1374.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (D. O. Rice, Agt.), 241.  
 Williams Pivot Sash Co., 742-45.  
 Witherow Steel Co., 195.  
 Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.  
 Yeomans Brothers Co. (Cleveland Pump & Supply Co., Rep.), 1122-23.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Clinton, Mass.**  
 Clinton Wire Cloth Co., 227-31; 990-91.

**Clinton, N. Y.**  
 Clinton Metallic Paint Co., 1380.

**Clinton, Iowa.**  
 Curtis Bros. & Co. (Curtis Service Bureau), 578-79.  
 Ford Mfg. Co., 239.

**Cohoes, N. Y.**  
 Cohoes Iron Foundry and Machine Co., 1264.

**Colorado Springs, Colo.**  
 Burrowes Co., E. T., 790-92.

**Columbus, Ohio.**  
 American Chain Co., Inc., 754.  
 Automatic Electric Co., 1238-39.  
 Brunt Tile and Porcelain Co. (Associated Tile Manufacturers), 284-87.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Cabot, Inc., Samuel (Onyx Paint Co., Agts.), 1382-85.  
 Coulson & Co., J. W., 482-83.  
 Diamond Metal Weather Strip Co., 784.  
 Garden City Sand Co. (Hamilton-Parker Fuel & Supply Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Gillis & Geoghegan (R. L. Watson, Agt.), 1299-1305.



**Columbus, Ohio—Continued.**

Hart & Crouse Co., 965-67.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (Columbus Builders Supply Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Kinnear Mfg. Co., 670-79.  
 Mack Iron and Wire Works Co. (W. R. Edmister & Co., Reps.), 510-11.  
 Majestic Co. (Seibert-Millburn Co., Agts.), 271-73.  
 Marietta Paint & Color Co., 1330.  
 National X-Ray Reflector Co. (G. F. Evans, Agt.), 1231.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Solar Metal Products Co., Inc., 645.  
 Stark Brick Co. (Ironclay Brick Co., Reps.), 88.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Van Kannel Revolving Door Co., 588-89; (R. L. Watson, Agt.), 1438.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.

**Concord, N. H.**

Swenson Granite Co., John, 63; see also National Building Granite Quarries Association, 58-59.

**Connersville, Ind.**

Connersville Blower Co., 1102-03.

**Council Bluffs, Iowa.**

Kimball Brothers Co., 1275.

**Covington, Ky.**

Cambridge Tile Mfg. Co. (Associated Tile Manufacturers), 284-87.

**Cumberland, Md.**

Taylor Co., N. & G., 426-28.

**D****Dallas, Tex.**

American Elevator & Machine Co. (J. Peyton Hunter, Rep.), 1261.  
 Atlantic Terra Cotta Co., 112-13.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Cabot, Inc., Samuel (Sumner & McCreight Co., Agts.), 1382-85.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chicago Bridge & Iron Works, 1095.  
 Consolidated Expanded Metal Companies (Builders' Metal Products Co., Reps.), 206-08.  
 De Soto Paint Mfg. Co., 1319.  
 Dunham Co., C. A., 916-21.  
 Edison Lamp Works (Southwest General Electric Co., Agts.), 1224.  
 Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
 General Electric Co. (Southwest General Electric Co.), 1153-67.  
 Gillis & Geoghegan (Builders Metal Products Co., Agts.), 1299-1305.  
 Hunt & Co., Robert W., 8.  
 Hydraulic-Press Brick Co. (Fraser Brick Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Kewanee Boiler Co., 975-77.  
 Lamson Co. (Lamson Co. of Texas), 1307.  
 Majestic Co. (Gaines & Dewees, Agts.), 271-73.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Sturtevant Co., B. F., 1006-07.  
 Truscon Steel Co., 217-19; 702-03.  
 Variety Mfg. Co., 688-91.

**Dallas, Tex.—Continued.**

Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (I. G. Thompson, Agt.), 241.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Danville, Ill.**

Allith-Prouty Co., 614-15.  
 Stark Brick Co. (Western Brick Co., Reps.), 88.  
 Western Brick Co., 86-87.

**Danville, Va.**

Dayton Malleable Iron Co. (Plumer Wiseman, Agt.), 246.

**Darby, Pa.**

Roberts Filter Mfg. Co., 1128-29.

**Davenport, Iowa.**

Burrowes Co., E. T., 790-92.  
 Crane Co., 1084-85.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 1410-11.  
 Garden City Sand Co. (John Benedict, Agt.), 134-37.  
 Hydraulic-Press Brick Co., 82-83.  
 Kawneer Mfg. Co., 488-90.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Plate Glass Co., 484-85.

**Dayton, Ohio.**

Atlas Portland Cement Co., 121-26.  
 Bruner Granitoid Co., P. M. (John G. Pool Co., Agts.), 337; 824-26.  
 Burnett-Larsh Mfg. Co. (C. F. Kroner, Agt. for Alabama and Florida; R. A. Scheffel, Agt. for Indiana), 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Delscamp & Roemhildt Co., Agts.), 1382-85.  
 Curtis Door & Sash Co. (Curtis Service Bureau), 578-79.  
 Dayton Malleable Iron Co. (John G. Pool Co., Agts.), 246.  
 General Electric Co., 1153-67.  
 Grauer & Co., Albert (John G. Pool Co., Agts.), 337; 824-26.  
 Huntington Roofing Tile Co., 434-35.  
 Johns-Manville Co., H. W., 910.  
 Lowe Brothers Co., 1328-29.  
 Mack Iron and Wire Works Co. (J. G. Pool Co., Reps.), 510-11.  
 Pittsburg Water Heater Co., 1024-27.  
 Solar Metal Products Co., Inc. (Gem City Brick Sales Co., Agts.), 645.  
 Truscon Steel Co., 702-03.  
 Vaile-Kimes Co., 1120-21.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Yeomans Brothers Co. (Charles M. Kelso Co., Reps.), 1122-23.

**Decatur, Ill.**

Burnett-Larsh Mfg. Co. (J. Hinton, Agt.), 1098-99.  
 Garden City Sand Co. (V. H. Parke & Son Co., Agts.), 134-37.

**Dekalb, Ill.**

Kohler Die & Specialty Co., 248.

**Denver, Colo.**

Allen Mfg. Co., W. D., 1131-33.  
 American Blower Co. (Hendrie & Bolthoff Mfg. & Supply Co.; Howard H. Fielding, Agts.), 996-99.  
 American Mailing Device Corporation, 1439.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 American Steel Window Co., 694-97.  
 Aspromet Co., 414-16.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Cabot, Inc., Samuel (Colorado Builders Supply Co., Agts.), 1382-85.  
 Dayton Malleable Iron Co. (Colorado Builders Supply Co., Agts.), 246.

**Denver, Colo.—Continued.**

Deming Co. (Hendrie & Bolthoff Mfg. & Supply Co., Agts.), 1104-07.  
 Dreadnought Flooring Co. (Geo. W. Summers & Co., Agts.), 325.  
 Dunham Co., C. A., 916-21.  
 Edison Lamp Works, 1224.  
 General Electric Co., 1153-67.  
 Hart Mfg. Co., 1212-13.  
 Hubbell, Inc., Harvey, 1216-17.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Kimball Brothers Co. (Western Engineering & Specialties Co., Agts.), 1275.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Link-Belt Co. (Lindrooth, Schubart & Co., Agts.), 1310.  
 Majestic Co. (Queen City Wire & Iron Works, Agts.), 271-73.  
 Murphy Wall Bed Co. (Colorado Builders Supply Co., Agts.), 1396-97.  
 Patton Paint Co. (Midland Glass & Paint Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Scientific Heater Co. (Colorado Range Co., Agts.), 1046-47.  
 Solar Metal Products Co., Inc. (G. P. Heinz & Co., Agts.), 645.  
 Taylor Co., N. & G., 426-28.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Van Kannel Revolving Door Co., 588-89.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (W. H. Clark, Agt.), 593-97.  
 Wagner Mfg. Co. (R. J. O'Connor, Agt.), 638-39.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (John S. Worthington Co., Agts.), 241.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Yeomans Brothers Co. (Hendrie & Bolthoff Mfg. & Supply Co., Reps.), 1122-23.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Des Moines, Iowa.**

American Pressweld Radiator Corporation (H. D. Phelps, Agt.), 952-53.  
 American Steel Window Co., 694-97.  
 Atlas Portland Cement Co., 121-26.  
 Carr & Baal ("Bilt-Well" Service Bureau), 574-75.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Crane Co., 1084-85.  
 Dunham Co., C. A., 916-21.  
 Fowler & Pay (Reliance Brick Co., Agts.), 132.  
 Garden City Sand Co. (Contractors' Machinery Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 Gillis & Geoghegan (Des Moines Building Material Co., Agts.), 1299-1305.  
 Hydraulic-Press Brick Co. (C. A. Baker Brick Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Kawneer Mfg. Co., 488-90.  
 Majestic Co. (Century Lumber Co., Agts.), 271-73.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Plate Glass Co., 484-85.  
 Prox Co., Frank, 980-81.  
 Truscon Steel Co., 217-19; 702-03.  
 Weatherproof Calking Co., 1377.  
 Westinghouse Electric & Mfg. Co., 1169-76.

**Desplaines, Ill.**

Lord & Burnham Co., 1458-61.



**Detroit, Mich.**

American Blower Co., 996-99.  
 American Elevator & Machine Co. (John Brennan & Co., Reps.), 1261.  
 American Pressweld Radiator Corporation (F. T. Schreiner, Agt.), 952-53.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Automatic Electric Co., 1238-39.  
 Ayer & Lord Tie Co., 310.  
 Barber Cre-Sote Stained Shingle Co., Inc., H. S., 381.  
 Barnum, E. T., 496-97.  
 Barnum Iron Works, E. T., 1487.  
 Barrett Co., 394-97.  
 Beaver Board Companies, 170-71.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Berry Brothers, 1346.  
 Best Register Co., 988-89.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Burnett-Larsh Mfg. Co., 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (United Fuel & Supply Co., Agts.), 1382-85.  
 Canton Foundry & Machine Co. (Geo. T. Wallace Sales Co., Reps.), 1486.  
 Carney's Cement Co. (James Quinn, Jr., Reps.), 129.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Chapman Valve Mfg. Co. (H. J. Clemens, Rep.), 1080-81.  
 Chicago Bridge & Iron Works, 1095.  
 Commonwealth Brass Corporation, 1082.  
 Conkling-Armstrong Terra Cotta Co. (Dresden Brick Co., Agts.), 114.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Crittall Casement Window Co., 714-15.  
 Curtis Door & Sash Co. (Curtis Service Bureau), 578-79.  
 Custodis Chimney Construction Co., Al-  
 phons, 89.  
 Cyclone Fence Co., 546-48.  
 Deming Co. (Kerr Machinery & Supply Co., Agts.), 1104-07.  
 Detroit Mausoleum Equipment Works, 500.  
 Detroit Show Case Co., 477-80.  
 Detroit Steel Products Co., 700-01.  
 Dreadnought Flooring Co. (George R. Mehling, Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 1410-11.  
 Federal Terra Cotta Co., 115.  
 Fowler & Pay (Austin Bricklayers Cement Co., Agts.), 132.  
 Garden City Sand Co. (A. J. Smith Construction Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Gillis & Geoghegan (Kennedy & Dawson, Agts.), 1299-1305.  
 Gorham Co Architectural Bronze, 502-03.  
 Grauer & Co., Albert, 337; 824-26.  
 Guardian Refrigerator Co., 1056.  
 Hart Mfg. Co., 1212-13.  
 Hart & Crouse Co., 965-67.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (United Fuel & Supply Co., Agts.), 82-83.  
 Ilg Electric Ventilating Co., 1002-03.  
 International Insulation Co., 174.  
 Isko, Inc., 1057.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (Detroit Fire Door Co., Agts.), 464-65.  
 Kaestner & Hecht Co., 1276-77.  
 Kawneer Mfg. Co., 488-90.  
 Kelsey Heating Co., 958-59.  
 Kerr Machinery & Supply Co., 1110-11.  
 Kewanee Boiler Co., 975-77.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Link-Belt Co., 1310.

**Detroit, Mich.—Continued.**

Lord & Burnham Co., 1458-61.  
 Lupton's Sons Co., David (Malcolm J. McLeod, Agt.), 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 Marbleoid Co., 332-33.  
 Master Builders Co., 339.  
 Michigan Engine Valve Co., 740.  
 Minneapolis Heat Regulator Co., 948-49.  
 Morgan Co. (Morgan Sash and Door Co., Agts.), 584-85.  
 Murphy Wall Bed Co. (Murphy Wall Bed of Detroit, Agts.), 1396-97.  
 Mutual Electric & Machine Co., 1179.  
 National Roofing Co. (National Roofing & Paint Co., Agts.), 389.  
 Natroco Paint & Varnish Works (National Roofing & Paint Co., Agts.), 1334.  
 Page Steel and Wire Co., 549-51.  
 Parker Rust-Proof Co. of America, 1370-71.  
 Parrott Heater Co., 1023.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Penberthy Injector Co., 882-83.  
 Permutit Co., 1130.  
 Pfaudler Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Powers Regulator Co., 947.  
 Pratt & Cady Co., Inc., 1090-91.  
 Sarco Co., Inc., 931.  
 Scientific Heater Co. (H. V. Logan, % Builders Exchange, Agt.), 1046-47.  
 Solar Metal Products Co., Inc. (J. W. Rollinson, Agt.), 645.  
 Stark Brick Co. (Frederic B. Stevens, Rep.), 88.  
 Sturtevant Co., B. F., 1006-07.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 United States Gypsum Co., 438-39.  
 Van Kannel Revolving Door Co., 588-89; (John D. Stege & Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Commercial Electric Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (Dean Higgins Co., Agts.), 241.  
 Williams Pivot Sash Co. (T. B. Rayl Co., Agts.), 742-45.  
 Yeomans Brothers Co. (Power Plant Supply Co., Reps.), 1122-23.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Dixon, Ill.**  
 Sandusky Cement Co., 56; 128.

**Dover, Ohio.**  
 Invincible Vacuum Cleaner Mfg. Co., 1260.

**DuBois, Pa.**  
 Hydraulic-Press Brick Co., 82-83.

**Dubuque, Iowa.**  
 Carr, Ryder & Adams Co. ("Bilt-Well" Service Bureau), 574-75.

**Duluth, Minn.**  
 Cabot, Inc., Samuel (Thomson-Williams Co., Agts.), 1382-85.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Crane Co., 1084-85.  
 Fountain Faucet Co., 862.  
 General Electric Co., 1153-67.  
 Glidden Co. (Marshall Wells Hardware Co., Agts.), 1344-45.  
 Hugo Mfg. Co., 1030.  
 Hydraulic-Press Brick Co. (Standard Salt & Cement Co., Agts.), 82-83.  
 International Insulation Co., 174.  
 Johns-Manville Co., H. W., 910.  
 Pittsburgh Water Heater Co., 1024-27.

**Duluth, Minn.—Continued.**

Stark Brick Co. (Paine & Nixon Co., Reps.), 88.  
 Westinghouse Electric & Mfg. Co., 1169-76.

**Dunbar, Pa.**  
 Pennsylvania Wire Glass Co., 816-17.

**Dunedin, New Zealand.**  
 General Electric Co. (National Electrical & Engineering Co., Ltd., Reps.), 1153-67.

**Durban, United South Africa, Africa.**  
 General Electric Co. (South African General Electric Co., Reps.), 1153-67.

**E**

**East Dedham, Mass.**  
 Union Metal Corner Co., 222-23.

**East Pittsburgh, Pa.**  
 Westinghouse Electric & Mfg. Co., 1169-76.

**East Point, Ga.**  
 Atlantic Terra Cotta Co., 112-13.

**East St. Louis, Ill.**  
 Certain-teed Products Corporation, 399-401.

**East Sparta, Ohio.**  
 United States Roofing Tile Co., 440-41.

**East Walpole, Mass.**  
 Bird & Son, 390-91.

**Easton, Pa.**  
 Alpha Portland Cement Co., 119.  
 Aspromet Co., 414-16.  
 Pittsburgh Testing Laboratory, 9.

**Economy, Pa.**  
 Aspromet Co., 414-16.

**Edmonton, Alta., Can.**  
 Murphy Wall Bed Co. (Western Supply & Equipment Co., Agts.), 1396-97.

**Elizabeth, N. J.**  
 Hitchings & Co., 1454-55.  
 Jenkins Bros. (Jenkins Rubber Co.), 1086-87.

**Elmira, N. Y.**  
 General Electric Co., 1153-67.  
 James Mfg. Co., 1466-70.  
 Kennedy Valve Mfg. Co., 1088-89.

**El Paso, Texas.**  
 Aspromet Co., 414-16.  
 Burrowes Co., E. T., 790-92.  
 Dunham Co., C. A., 916-21.  
 General Electric Co. (Southwest General Electric Co.), 1153-67.  
 Johns-Manville Co., H. W., 910.  
 Majestic Co. (The Equipment Co., Agts.), 271-73.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Vonnegut Hardware Co. (C. C. Gaines, Agt.), 593-97.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Wilson Corporation, J. G., 692-93; 804-05.

**Erie, Pa.**  
 General Electric Co., 1153-67.  
 Glidden Co., 1344-45.  
 Hydraulic-Press Brick Co. (Boyd & Shafer, Agts.), 82-83.  
 Pennsylvania Fireproofing Co., 107.

**Evansville, Ind.**  
 Huntington Roofing Tile Co., 434-35.  
 Westinghouse Electric & Mfg. Co. (Varney Electrical Supply Co., Agts.), 1169-76.

**F**

**Fair Haven, Vt.**  
 General Slate Co., 362-64.  
 Penrhyn Slate Co., 365.  
 Vermont Structural Slate Co., 373.

**Fairfield, Ala.**  
 American Cement Tile Mfg. Co., 432-33.

**Fairfield, Iowa.**  
 Loudon Machinery Co., 1471-73.

**Fargo, N. Dak.**  
 Crane Co., 1084-85.



**Flemington, N. J.**  
Mallory Mfg. Co., 741.

**Flint, Mich.**  
Hydraulic-Press Brick Co. (Briggs Co., Agts.), 82-83.

**Florence, Mass.**  
Norwood Engineering Co., 1127.

**Fogelsville, Pa.**  
Lehigh Portland Cement Co., 127.

**Fort Atkinson, Wis.**  
James Mfg. Co., 1466-70.

**Fort Dodge, Iowa.**  
Acme Cement Plaster Co., 140-41.  
Fowler & Pay, 132.  
Plymouth Gypsum Co., 154-55.

**Fort Frances, Ont.,**  
International Insulation Co., 174.

**Fort Recovery, Ohio.**  
Garden City Sand Co. (Emil Wagner, Agt.), 134-37.

**Fort Wayne, Ind.**  
Bowser & Co., Inc., S. F., 1476-77.  
Bruner Granitoid Co., P. M. (Jocquel-Schulz Co., Agts.), 337; 824-26.  
General Electric Co., 1153-67.  
Grauer & Co., Albert (Jocquel-Schulz Co., Agts.), 337; 824-26.  
Stark Brick Co. (Wm. Moellering's Sons, Reps.), 88.  
Wayne Oil Tank & Pump Co., 1480-81.  
Western Brick Co., 86-87.  
Whitaker-Glessner Co. (P. G. Olds, Agt.), 241.

**Fort Worth, Tex.**  
Reliance Fireproof Door Co. (J. B. Newhall & Co., Reps.), 656-57.  
Van Kannel Revolving Door Co., 588-89.  
Wilson Corporation, J. G., 692-93; 804-05.

**Framingham, Mass.**  
Manufacturing Equipment & Engineering Co., 847; 1422.

**Frankford, Pa.**  
Roberts Filter Mfg. Co., 1128-29.

**Franklin, Ohio.**  
Patent Vulcanite Roofing Co., 406-07.

**Franklin, Pa.**  
Magnesia Association of America (Franklin Mfg. Co.), 1078-79.

**Freeport, Ill.**  
Stover Mfg. & Engine Co., 282.

## G

**Galt, Ont., Can.**  
Sturtevant Co., B. F. (B. F. Sturtevant Co. of Canada, Ltd.), 1006-07.

**Galveston, Tex.**  
Burrowes Co., E. T., 790-92.

**Garbutt, N. Y.**  
Empire Gypsum Co., 152.

**Garwood, N. J.**  
Anchor Post Iron Works, 537-43.  
Thatcher Furnace Co., 982-84.

**Gary, Ind.**  
Central Metallic Door Co., 648.  
National Automatic Door Co., 660.

**Geneva, Switzerland.**  
Newman Clock Co. (New Cie. Des Montres De Controle, Soc. Anonyme), 1443.

**Gladys, Okla.**  
Acme Cement Plaster Co., 140-41.

**Grand Rapids, Mich.**  
Acme Cement Plaster Co., 140-41.  
American Metal Weather Strip Co., 779.  
American Steel Window Co., 694-97.  
Cabot, Inc., Samuel (W. P. Williams, Agt.), 1382-85.  
Certain-teed Products Corporation, 399-401.  
Crane Co., 1084-85.  
Dexter Brothers Co. (F. H. McDonald, Agt.), 1381.  
Garden City Sand Co. (S. A. Morman & Co., Agts.), 134-37.  
Grand Rapids Plaster Co., 148-49.  
Huntington Roofing Tile Co., 434-35.

**Grand Rapids, Mich.—Continued.**  
Johns-Manville Co., H. W., 910.  
Knappe Machine Co., John, 1399.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Stark Brick Co. (Michigan Face Brick Co., Reps.), 88.  
Terrell's Equipment Co., 1426-27.

**Granville, N. Y.**  
Sheldon Slate Co., F. C., 370-72.

**Great Falls, Mont.**  
Crane Co., 1084-85.  
Johns-Manville Co., H. W., 910.  
Pittsburgh Plate Glass Co., 484-85.  
Solar Metal Products Co., Inc. (D. E. Fryer & Co., Agts.), 645.

**Greenville, Pa.**  
Chicago Bridge & Iron Works, 1095.

**Guelph, Ont., Can.**  
Kawneer Mfg. Co., 488-90.

**Gypsum, Ore.**  
Acme Cement Plaster Co., 140-41.

## H

**Hagerstown, Md.**  
Jamison Cold Storage Door Co., 1064-65.

**Halifax, N. S., Can.**  
Barrett Co., 394-97.  
Burrowes Co., E. T., 790-92.  
Dunham Co., C. A., 916-21.  
General Fire Extinguisher Co. (Canadian General Fire Extinguisher Co., Ltd.), 1136-39.  
Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd.; Agts.), 864-65.

**Hamilton, Ohio.**  
Estate Stove Co., 1205.  
Herring-Hall-Marvin Safe Co., 1432.  
Meyers Mfg. Co., Fred J., 516.

**Hamilton, Ont., Can.**  
Bird & Son, 390-91.  
Boston Insulated Wire & Cable Co., 1192.  
Johns-Manville Co., H. W., 910.  
National Fire Proofing Co., 100-05.  
Permutit Co., 1130.  
Westinghouse Lamp Co. (Canadian Westinghouse Co., Ltd.), 1225.

**Hammond, Ind.**  
Federal Cement Tile Co., 429-31.

**Hannibal, Mo.**  
Atlas Portland Cement Co., 121-26.

**Hardwick, Vt.**  
Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.

**Harrisburg, Pa.**  
Bowser & Co., Inc., S. F., 1476-77.  
Chamberlin Metal Weather Strip Co., 781.

**Harrison, N. J.**  
Edison Lamp Works, 1224.  
General Electric Co., 1153-67.

**Hartford, Conn.**  
A. B. See Electric Elevator Co., 1262-63.  
Anchor Post Iron Works, 537-43.  
Automatic Refrigerating Co., 1048-49.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
Hart & Hegeman Mfg. Co., 1214-15.  
Hart Mfg. Co., 1212-13.  
King & Co., J. B., 153.  
Marble & Shattuck Chair Co. (E. C. Clapp, Agt.), 1400-01.  
Pratt & Cady Co., Inc., 1090-91.  
Presbrey-Coykendall Co., 62.  
Spencer Turbine Cleaner Co., 1256-57.  
Sturtevant Co., B. F., 1006-07.  
Wadsworth, Howland & Co., Inc., 1338-39.  
Whitlock Coil Pipe Co., 904-06.

**Harvard, Ill.**  
Hunt, Helm, Ferris & Co., 644.

**Hastings-on-Hudson, N. Y.**  
Hastings Pavement Co., 308.

**Havana, Cuba.**  
American Elevator & Machine Co. (C. H. Thrall Electrical Contracting Co., Reps.), 1261.  
Certain-teed Products Corporation, 399-401.  
General Electric Co. (Zaldo & Martinez, Reps.), 1153-67.  
Johns-Manville Co., H. W., 910.  
Vonnegut Hardware Co. (La Rosa Commercial Co., Agts.), 593-97.

**Havana, Ill.**  
Burnett-Larsh Mfg. Co. (J. F. Dare, Agt.), 1098-99.

**High Point, N. C.**  
Marietta Paint & Color Co., 1330.  
Pittsburgh Plate Glass Co., 484-85.

**Hillsborough, N. B., Can.**  
King & Co., J. B., 153.

**Hoboken, N. J.**  
New York Silicate Book Slate Co., 378.

**Holland, Mich.**  
Holland Furnace Co., 956-57.

**Holyoke, Mass.**  
Coburn Trolley Track Mfg. Co., 640-43.

**Honolulu, Hawaii.**  
General Electric Co. (Catton, Neill & Co., Ltd.), 1153-67.  
Solar Metal Products Co., Inc. (Lewers & Cook, Agts.), 645.  
Yeomans Brothers Co. (Honolulu Iron Works, Reps.), 1122-23.

**Houghton, Mich.**  
Johns-Manville Co., H. W., 910.

**Houston, Texas.**  
Aspromet Co., 414-16.  
Cabot, Inc., Samuel (W. L. Macatee & Sons, Agts.), 1382-85.  
Certain-teed Products Corporation, 399-401.  
Dayton Malleable Iron Co. (Everett Bradt & Co., Agts.), 246.  
Dreadnought Flooring Co. (Hardesty Flooring Co., Agts.), 325.  
Garden City Sand Co. (Vandaveer Clay Products Co., Agts.), 134-37.  
General Electric Co. (Southwest General Electric Co.), 1153-67.  
Goulds Mfg. Co., 1108-09.  
Johns-Manville Co., H. W., 910.  
Jordan & Co., Paul R. (F. P. Walcott, Agt.), 464-65.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Water Heater Co., 1024-27.  
Pittsburgh Plate Glass Co., 484-85.  
Reliance Fireproof Door Co. (Manufacturers Sales Co., Reps.), 656-57.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (Tel-Electric Co., Agts.), 1169-76.  
Wilson Corporation, J. G., 692-93; 804-05.  
York Mfg. Co., 1055.

**Hudson, N. Y.**  
Atlas Portland Cement Co., 121-26.  
Gifford-Wood Co., 1298.

**Huntington, Ind.**  
Majestic Co., 271-73.

**Huntington, W. Va.**  
Garden City Sand Co. (C. S. Brown, Agt.), 134-37.  
Huntington Roofing Tile Co., 434-35.

**Hyde Park, Boston, Mass.**  
Sturtevant Co., B. F., 476.

**Hydeville, Rutland County, Vt.**  
Penrhyn Slate Co., 365.

## I

**Ilion, N. Y.**  
Library Bureau, 1418-19.

**Independence, Kan.**  
Atchison Revolving Door Co., 586-87.

**Indian Orchard, Mass.**  
Chapman Valve Mfg. Co., 1080-81.

**Indianapolis, Ind.**

American Blower Co., 996-99.  
 Adams-Rogers Co. ("Bilt-Well" Service Bureau), 574-75.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Burrowes Co., E. T., 790-92.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Crane Co., 1084-85.  
 Dayton Malleable Iron Co. (The Fireproofing Co., Agts.), 246.  
 Dunham Co., C. A., 916-21.  
 General Electric Co., 1153-67.  
 Gillis & Geoghegan (Vonnegut Hardware Co., Agts.), 1299-1305.  
 Hydraulic-Press Brick Co., 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R., 464-65.  
 Kawneer Mfg. Co., 488-90.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Link-Belt Co., 1310.  
 McCain Co., W. W., 1044.  
 Majestic Co. (Ewald Over Foundry, Agts.), 271-73.  
 Master Builders Co., 339.  
 Murphy Wall Bed Co. (Murphy Door Bed Co. of Alabama, Agts.), 1396-97.  
 National X-Ray Reflector Co. (J. R. Henry, Agt.), 1231.  
 Pittsburg Water Heater Co., 1024-27.  
 Prox Co., Frank, 980-81.  
 Riverside Boiler Works, Inc., 896-99.  
 Solar Metal Products Co., Inc. (G. E. Moring, Agt.), 645.  
 Stark Brick Co. (A. B. Meyer & Co., Reps.), 88.  
 Truscon Steel Co., 217-19; 702-03.  
 U. S. Encaustic Tile Works (Associated Tile Manufacturers), 284-87.  
 Van Kannel Revolving Door Co., 588-89.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co., 593-97.  
 Western Brick Co., 86-87.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Varney Electrical Supply Co., Agts.), 1169-76.  
 Windshield Scupper Co. (F. O. Duvall Co., Agts.), 276.

**International Falls, Minn.**

International Insulation Co., 174.

**Iola, Kans.**

Lehigh Portland Cement Co., 127.

**Iquique, Chile, S. A.**

General Electric Co. (Nitrate Agencies, Ltd., Reps.), 1153-67.

**Irvington, N. Y.**

Lord & Burnham Co., 747; 978-79; 1458-61.

**J****Jackson, Mich.**

Garden City Sand Co. (I. N. DeLamater, Agt.), 134-37.  
 Hydraulic-Press Brick Co. (I. N. DeLamater, Agt.), 82-83.

**Jacksonville, Fla.**

Best Register Co., 988-89.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Gill & Mulholland, Agts.), 1382-85.  
 Carter White Lead Co., 1315.  
 Chicago Bridge & Iron Works, 1095.  
 General Electric Co., 1153-67.  
 Hydraulic-Press Brick Co. (Baker & Holmes Co., Agts.), 82-83.  
 Lehigh Portland Cement Co., 127.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Permutit Co., 1130.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Reliance Fireproof Door Co. (L. Smith, Rep.), 656-57.  
 Southern Cypress Manufacturers' Association, 570-71.

**Jacksonville, Ill.**

Garden City Sand Co. (D. E. Sweeney, Agt.), 134-37.

**Jamestown, N. Y.**

Dahlstrom Metallic Door Co., 649-51.  
 Interior Metal Mfg. Co., 654-55.  
 International Casement Co., Inc., 718.  
 Watson Mfg. Co., Inc., 798; 1429.

**Jamestown, N. Y.**

Alpha Portland Cement Co., 119.

**Jeannette, Pa.**

Jeannette Glass Co., 829.  
 North Western Expanded Metal Co., 214-15.

**Jersey City, N. J.**

A. B. See Electric Elevator Co., 1262-63.  
 Certain-teed Products Corporation, 399-401.  
 Lowe Brothers Co., 1328-29.  
 Lutton Co., William H., 1462-63.  
 National Asbestos Mfg. Co., 385.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Zibell Damp Resisting Paint Co., 57.

**Johannesburg, United South Africa, Africa.**

General Electric Co. (South African General Electric Co., Reps.), 1153-67.

**Jones Point, N. Y.**

Asphalt Ready Roofing Co., 388.

**Jonesport, Me.**

Rockport Granite Co., 60-61.

**Joplin, Mo.**

General Electric Co., 1153-67.  
 Westinghouse Electric & Mfg. Co., 1169-76.

**K****Kalamazoo, Mich.**

General Gas Light Co., 1029.

**Kane, Pa.**

Kane Mfg. Co., 793.

**Kansas City, Mo.**

American Blower Co., 996-99.  
 American Elevator & Machine Co. (King Supply & Equipment Co.; C. L. Colby, Reps.), 1261.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co., 344-45.  
 American Pressweld Radiator Corporation (P. Winsborough, Agt.), 952-53.  
 American Steel Window Co., 694-97.  
 Aspromet Co., 414-16.  
 Ayer & Lord Tie Co., 310.  
 Barrett Co., 394-97.  
 Beaver Board Companies, 170-71.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Bruner Granitoid Co., P. M. (J. P. Sprague Co., Agts), 337; 824-26.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Day K. Smith, Agt.), 1382-85.  
 Carter Lumber Co., C. J., 314.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Concrete Engineering Co., 24-25.  
 Crampton-Farley Brass Co., 874.  
 Crane Co., 1084-85.  
 Dayton Malleable Iron Co. (J. P. Sprague Co., Agts.), 246.  
 Deming Co. (English Tool & Supply Co., Agts.), 1104-07.  
 Dreadnought Flooring Co. (John B. Ricketts, Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 1410-11.  
 Ford Mfg. Co., 239.  
 Fowler & Pay (Bodwell Brick & Tile Co., Agts.), 132.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 42; 210-13.  
 Gillis & Geoghegan (Day K. Smith, Agt.), 1299-1305.  
 Grauer & Co., Albert (J. P. Sprague Co., Agts.), 337; 824-26.

**Kansas City, Mo.—Continued.**

Harrison Works, 1322-25.  
 Hydraulic-Press Brick Co., 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Mfg. Co., Geo. W., 668.  
 Johnson Service Co., 942-46.  
 Kawneer Mfg. Co., 488-90.  
 Kewanee Boiler Co., 975-77.  
 Kimball Brothers Co. (G. S. Montgomery, Agt.), 1275.  
 Lehigh Portland Cement Co., 127.  
 Lowe Brothers Co., 1328-29.  
 Majestic Co. (Townley Metal & Hardware Co., Agts.), 271-73.  
 Merchant & Evans Co., 420; 470; 680.  
 Milwaukee Corrugating Co., 209; 421; 471.  
 Montgomery Elevator Co., 1279.  
 National X-Ray Reflector Co. (H. B. Wheeler, Agt.), 1231.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Permanent Ironite Waterproofing Co., 47.  
 Permutit Co., 1130.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Powers Regulator Co., 947.  
 Solar Metal Products Co., Inc. (Products Co., Agts.), 645.  
 Standard Electric Time Co., 1450.  
 Sturtevant Co., B. F., 1006-07.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Trusswall Mfg. Co., 303.  
 Union Blind & Ladder Co., Inc. (American Sash & Door Co., Agts.), 778.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 Van Kannel Revolving Door Co., 588-89; (W. A. Andrews Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Satterlee Electric Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co. (W. S. Weyer, Agt.), 241.  
 Yeomans Brothers Co. (H. H. Wright, Rep.), 1122-23.

**Kendallville, Ind.**

McCray Refrigerator Co., 1062.

**Kewanee, Ill.**

Kewanee Boiler Co., 975-77.  
 Kewanee Private Utilities Co., 1112-13.  
 Walworth Mfg. Co., 1144.

**Knoxville, Tenn.**

Cabot, Inc., Samuel (W. W. Woodruff & Sons, Agts.), 1382-85.  
 Crane Co., 1084-85.  
 Fulton Co., 937-38.  
 Garden City Sand Co. (Chandler & Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 Jordan & Co., Paul R. (W. B. Martin Agt.), 464-65.  
 Marbleloid Co., 332-33.

**Kushequa, Pa.**

Kushequa Brick Co., 84-85.  
 Kushequa Ceramic Co., 436-37.

**L****Lake View, Iowa.**

Garden City Sand Co. (Lake View Sand & Gravel Co., Agts.), 134-37.

**Lakewood, Cleveland, Ohio.**

Mathews Mfg. Co., 1402-03.

**Lancaster, Pa.**

Armstrong Cork Co., 1390-92.

**Lansing, Mich.**

Bruner Granitoid Co., P. M. (W. T. Britten, Agt.), 337; 824-26.



**Lansing, Mich.—Continued.**

Dail Steel Products Co., 850.  
Grauer & Co., Albert (W. T. Britten, Agt.), 337; 824-26.  
Hydraulic-Press Brick Co. (Briggs Co., Agts.), 82-83.

**Laramie, Wyo.**

Acme Cement Plaster Co., 140-41.

**Leeds, England.**

Keystone Varnish Co., 1347-48.

**Lexington, Ky.**

Jordan & Co., Paul R. (E. B. Oldham, Agt.), 464-65.

**Liberty, Mo.**

Dudfield Mfg. Co., 380.

**Lima, Ohio.**

Garden City Sand Co. (Fidelity Coal & Supply Co., Agts.), 134-37.  
Monroe Screen, Blind & Partition Co., 772.

**Lima, Peru, S. A.**

General Electric Co. (W. R. Grace & Co., Reps.), 1153-67.

**Lime, Ore.**

Acme Cement Plaster Co., 140-41.

**Lincoln, Nebr.**

Curtis, Towle & Paine Co. (Curtis Service Bureau), 578-79.  
Garden City Sand Co. (Nebraska Material Co., Agts.), 134-37.

**Lincoln, N. J.**

American Cement Tile Mfg. Co., 432-33.

**Lititz, Pa.**

Burnett-Larsh Mfg. Co. (H. E. Sheaffer, Agt.), 1098-99.

**Little Rock, Ark.**

Arkansas Soft Pine Bureau, 560.  
Crane Co., 1084-85.

**Liverpool, England.**

Automatic Electric Co. (Automatic Telephone Mfg. Co., Ltd., Agts.), 1238-39.  
International Casement Co., Inc., 718.

**Lockland, Cincinnati, Ohio.**

Carey Co., Philip, 172; 398.

**Lockport, N. Y.**

National Roofing Co. (Cordes, Ayrault & Co., Agts.), 389.  
Natroco Paint & Varnish Works (Cordes, Ayrault & Co., Agts.), 1334.

**London, England.**

American Chain Co., Inc., 754.  
Beaver Board Companies, 170-71.  
Benjamin Electric Mfg. Co. (Benjamin Electric, Ltd., Agts.), 1177; 1206.  
Certain-teed Products Corporation, 399-401.  
General Electric Co. (of New York), 1153-67.  
Glidden Co., 1344-45.  
Hart Mfg. Co., 1212-13.  
Hunt & Co., Robert W., 8.  
Jenkins Bros., 1086-87.  
Library Bureau, 1418-19.  
Master Builders Co., 339.  
Newman Clock Co., 1443.  
Penberthy Injector Co., 882-83.  
Pratt & Cady Co., Inc. (Edw. Le Bas & Co., Agts.), 1090-91.  
Pratt & Lambert, Inc., 1354-55.  
Standard Varnish Works, 1356-63.  
Sturtevant Co., B. F. (Sturtevant Engineering Co.), 1006-07.  
Thomas Clock Co., Seth, 1446-47.  
Toch Brothers, 50-51.  
Trus-Con Laboratories, 52-53.  
Vonnegut Hardware Co. (H. G. McMicken, Agt.), 593-97.  
Wilson Corporation, J. G., 692-93; 804-05.

**London, Ont., Can.**

Johns-Manville Co., H. W., 910.  
Richards-Wilcox Mfg. Co., 630-35.

**Long Island City, N. Y.**

General Kompolite Co., 330.  
Horn Co., A. C., 43.  
Howell, Field, Goddard, Inc., 652-53.

**Long Island City, N. Y.—Continued.**

Irving Iron Works Co., 348.  
Jeter & Co., Inc., A. H., 446-47.  
Meurer Bros. Co., Inc., 422-23.  
Polachek Bronze & Iron Co., John, 522.  
Sexauer & Lemke, Inc., 262-65.  
Toch Brothers, 50-51.

**Loogootee, Ind.**

Carnahan Mfg. Co., 576-77.

**Lorain, Ohio.**

Hoffman Heater Co., 1020-22.

**Los Angeles, Cal.**

Acme Cement Plaster Co., 140-41.  
Allith-Prouty Co., 614-15.  
American Blower Co., 996-99.  
American Laundry Machinery Co., 1036.  
American Mailing Device Corporation, 1439.  
American Sheet and Tin Plate Co. (United States Steel Products Co., Reps.), 412-13.  
American Steel & Wire Co. (United States Steel Products Co., Reps.), 30-33; 232-33; 1182-87.  
Aspromet Co., 414-16.  
Automatic Refrigerating Co., 1048-49.  
Barrell Co., William L. (Waterhouse & Price Co., Agts.), 410.  
Burnett-Larsh Mfg. Co. (Frank Murphy, Agt.), 1098-99.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Stains, Matthews Paint Co.; Other Goods, Waterhouse & Price Co., Agts.), 1382-85.  
Certain-teed Products Corporation, 399-401.  
Chicago Bridge & Iron Works, 1095.  
Clinton Wire Cloth Co. (L. A. Norris Co., Agts.), 227-31.  
Columbian Hardware Co. (W. H. Steele, Agt.), 762.  
Crane Co., 1084-85.  
Cutler-Hammer Mfg. Co. (H. B. Squires Co., Agts.), 1208-09.  
Dayton Malleable Iron Co. (Waterhouse Co., Agts.), 246.  
Dreadnought Flooring Co. (B. V. Collins, Agt.), 325.  
Dunham Co., C. A., 916-21.  
Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
General Electric Co., 1153-67.  
Glidden Co. (California Glass and Paint Co., Agts.), 1344-45.  
Hart Mfg. Co., 1212-13.  
Hittmann-Sanders Co. (A. J. Koll Planing Mill, Agts.), 298-99.  
Hoffman Specialty Co., 926-29.  
Johns-Manville Co., H. W., 910.  
Johnson Service Co., 942-46.  
Jordan & Co., Paul R. (W. H. Steele, Rep.; California Cornice Works), 464-65.  
Kawneer Mfg. Co., 488-90.  
Kellogg, Co., M. W., 92-93.  
Kewanee Boiler Co., 975-77.  
Kinnear Mfg. Co., 670-79.  
Lamson Co., 1307.  
Link-Belt Co., 1310.  
Murphy Wall Bed Co. (D. Woodhead; Southern California Hardwood & Mfg. Co., Agts.), 1396-97.  
National X-Ray Reflector Co. (F. S. Mills, Agt.), 1231.  
Ogden Co., J. Edward (Waterhouse & Price, Agts.), 682-83.  
Ohio Blower Co. (Waterhouse-Wilcox Co., Agts.), 472-74.  
Patton Paint Co., 1332-33.  
Permutit Co., 1130.  
Pitcairn Varnish Co. (Patton Paint Co., Agts.), 1352-53.  
Pittsburg Water Heater, 1024-27.  
Pittsburgh Testing Laboratory, 9.  
Powers Regulator Co., 947.  
Richards-Wilcox Mfg. Co., 630-35.  
Seeger Refrigerator Co., 1063.  
Sprague Electric Works, 1168.  
Standard Electric Time Co., 1450.  
Stanley & Patterson, Inc. (Ralph B. Clapp, Agt.), 1246-55.

**Los Angeles, Cal.—Continued.**

Taylor Co., N. & G., 426-28.  
Terrell's Equipment Co. (C. F. Weber & Co., Reps.), 1426-27.  
Truscon Steel Co., 217-19; 702-03.  
Twin City Varnish Co., 1365.  
Variety Mfg. Co., 688-91.  
Vonnegut Hardware Co. (W. H. Steele, Agt.), 593-97.  
Wagner Mfg. Co. (Waterhouse-Wilcox Co., Agts.), 638-39.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (Illinois Electric Co., Agts.), 1169-76.  
Westinghouse Lamp Co., 1225.  
Whitaker-Glessner Co. (C. W. Pike Co., Agts.), 241.  
Wilson Corporation, J. G., 692-93; 804-05.  
Yeomans Brothers Co. (F. C. Millard Co., Reps.), 1122-23.  
York Mfg. Co., 1055.  
Youngstown Sheet & Tube Co. (Electric Agencies Co., Reps.), 1180-81.

**Louisville, Ky.**

American Elevator & Machine Co., 1261.  
Atlantic Insulated Wire & Cable Co., 1188-89.  
Automatic Refrigerating Co., 1048-49.  
Bannon Pipe Co., P., 110.  
Bowser & Co., Inc., S. F., 1476-77.  
Cabot, Inc., Samuel (National Roofing & Supply Co., Agts.), 1382-83.  
Caldwell Co., Inc., W. E., 1093.  
Dayton Malleable Iron Co. (Thomas L. Barrett, Agt.), 246.  
Deming Co. (Leib Co., Agts.), 1104-07.  
Dunham Co., C. A., 916-21.  
General Electric Co., 1153-67.  
Huntington Roofing Tile Co., 434-35.  
Hydraulic-Press Brick Co. (Tyler Building Supply Co., Agts.), 82-83.  
Johns-Manville Co., H. W., 910.  
Louisville Varnish Co., Inc., 1349.  
National Roofing Co. (Central Paint & Roofing Co., Agts.), 389.  
Natroco Paint & Varnish Works (Central Paint & Roofing Co., Agts.), 1334.  
Peerless Mfg. Co., Inc., 281.  
Pittsburg Water Heater Co., 1024-27.  
Prox Co., Frank, 980-81.  
Solar Metal Products Co., Inc. (Fireproof Appliances Co., Agts.), 645.  
Stark Brick Co. (R. B. Tyler Co., Reps.), 88.  
Truscon Steel Co., 217-19; 702-03.  
United States Cast Iron Pipe and Foundry Co., 305-07.  
Van Kannel Revolving Door Co., 588-89.  
Wagner's Sons Co., J. F., 732-33.  
Westinghouse Electric & Mfg. Co. (H. C. Tafel Elec. Co., Inc., Agts.), 1169-76.  
Whitaker-Glessner Co. (A. & C. B. Robinson, Agt.), 241.

**Lowell, Mass.**

American Mason Safety Tread Co., 344-45.  
Lamson Co., 1307.

**Lynchburg, W. Va.**

Certain-teed Products Corporation, 399-401.

**Lyndhurst, N. J.**

United Cork Companies, 356.  
United Cork Flooring Co., 328.

**Lynn, Mass.**

General Electric Co., 1153-67.  
Shea & Donnelly Co., 67.  
Stephenson, C. H., 277.

**Lyons, France.**

Sarco Co., Inc. (Richardson Freres, Agts.), 931.

**M****Macon, Ga.**

Aspromet Co., 414-16.

**Madison, Wis.**

Burnett-Larsh Mfg. Co. (H. R. Williams, Agt.), 1098-99.  
Stark Brick Co. (Wisconsin Brick Co., Reps.), 88.

- Malden, Mass.**  
Wadsworth, Howland & Co., Inc., 1338-39.
- Mamaroneck, N. Y.**  
Special Service Flooring Corporation, 336.
- Manchester, N. H.**  
Chamberlin Metal Weather Strip Co., 781.
- Manheim, W. Va.**  
Alpha Portland Cement Co., 119.
- Mankato, Minn.**  
Carney's Cement Co., 129.  
Fowler & Pay, 132.
- Manlius, N. Y.**  
Cheney & Son, S., 297.
- Mansfield, Ohio.**  
American Chain Co., Inc., 754.  
Garden City Sand Co. (Voegel Bros., Agts.), 134-37.  
Hughes-Keenan Co., 262-65.
- Marietta, Ohio.**  
Marietta Paint & Color Co., 1330.  
Safe-Cabinet Co., 1430.
- Marion, Ind.**  
American Chain Co., Inc., 754.
- Marseilles, Ill.**  
Certain-teed Products Corporation, 399-401.
- Marshalltown, Iowa.**  
Dunham Co., C. A., 916-21.
- Martins Creek, Pa.**  
Alpha Portland Cement Co., 119.
- Martins Ferry, Ohio.**  
Wheeling Corrugating Department, 242-43  
Whitaker-Glessner Co., 241.
- Mason City, Iowa.**  
Denison Fireproofing Co., 95.  
Lehigh Portland Cement Co., 127.
- Matawan, N. J.**  
Atlantic Tile Mfg. Co. (Associated Tile Manufacturers), 284-87.  
Matawan Tile Co. (Associated Tile Manufacturers), 284-87.
- Maurer, N. J.**  
American Encaustic Tiling Co., Ltd. (Associated Tile Manufacturers), 284-87.  
Maurer & Son, Henry, 98-99.
- Medicine Lodge, Kan.**  
Best Bros. Keene's Cement Co., 146-47.
- Melbourne, Victoria, Australia.**  
General Electric Co. (Australian General Electric Co., Reps.), 1153-67.  
Standard Varnish Works, 1356-63.
- Memphis, Tenn.**  
Ayer & Lord Tie Co., 310.  
Bowser & Co., Inc., S. F., 1476-77.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Fischer Lime & Cement Co., Agts.), 1382-85.  
Carter White Lead Co., 1315.  
Certain-teed Products Corporation, 399-401.  
Crane Co., 1084-85.  
De Soto Paint Mfg. Co., 1319.  
Dreadnought Flooring Co. (Cheers Floor & Screen Co., Agts.), 325.  
Garden City Sand Co. (John A. Denie's Sons Co., Agts.), 134-37.  
General Electric Co., 1153-67.  
Hydraulic-Press Brick Co. (Memphis Brick Supply Co., Agts.), 82-83.  
Johns-Manville Co., H. W., 910.  
Kinnear Mfg. Co., 670-79.  
Oak Bureau of the American Hardwood Manufacturers' Association, 566-67.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Red Gum Lumber Bureau, American Hardwood Manufacturers' Association, 568-69.
- Memphis, Tenn.—Continued.**  
Wagner Mfg. Co. (D. A. Fisher, Inc., Agt.), 638-39.  
Westinghouse Electric & Mfg. Co., 1169-76.
- Meriden, Conn.**  
Connecticut Telephone & Electric Co., Inc., 1240-41.  
Miller & Co., Edward, 1230.
- Meshoppen, Pa.**  
Ridgway & Son, B., 296.
- Metalline Falls, Wash.**  
Lehigh Portland Cement Co., 127.
- Mexico City, Mexico.**  
General Electric Co. (Mexican General Electric Co., Reps.), 1153-67.  
Hunt & Co., Robert W., 8.
- Middle Granville, N. Y.**  
Penrhyn Slate Co., 365.
- Middletown, Ohio.**  
American Rolling Mill Co. (Associated Metal Lath Manufacturers), 196-201.
- Milford, Mass.**  
Milford Iron Foundry, 300-01.  
Webb Pink Granite Co., 64; see also National Building Granite Quarries Association, 58-59.
- Milford, N. H.**  
Lovejoy Granite Co. (National Building Granite Quarries Association), 58-59.
- Milwaukee, Wis.**  
American Steel Window Co., 694-97.  
Badger Wire & Iron Works, 494-95.  
Best Register Co., 988-89.  
Bishop-Babcock-Becker Co., 914-15.  
Carter White Lead Co., 1315.  
Certain-teed Products Corporation, 399-401.  
Consolidated Sheet Metal Works, 712-13.  
Cutler-Hammer Mfg. Co., 1208-09.  
Dreadnought Flooring Co. (J. Doubrawa & Son, Agts.), 325.  
Dunham Co., C. A., 916-21.  
Ernst's Sons, C. F. (W. F. Mueller, Agt.), 1484-85.  
Erwin Mfg. Co., 1140.  
Garden City Sand Co. (Henry Mayer & Co., Agts.), 134-37.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
Gillis & Geoghegan (Philip Gross Hardware Co., Agts.), 1299-1305.  
Hoffman & Billings Mfg. Co., 863.  
Hydraulic-Press Brick Co. (Ricketson & Schwarz, Agts.), 82-83.  
Johns-Manville Co., H. W., 910.  
Johnson Service Co., 942-46.  
Kaestner & Hecht Co., 1276-77.  
Kalman Co., Paul J., 193.  
Kawneer Mfg. Co., 488-90.  
Kerner Incinerator Co., 908.  
Kewanee Boiler Co., 975-77.  
Matthews Bros. Mfg. Co., 582-83.  
Milwaukee Air Power Pump Co., 1114-15.  
Milwaukee Corrugating Co., 209; 421; 471; see also Associated Metal Lath Manufacturers, 196-201.  
National Roofing Co. (Cream City Roofing & Paint Mfg. Co., Agts.), 389.  
National X-Ray Reflector Co. (L. G. Morgan, Agt.), 1231.  
Natroco Paint & Varnish Works (Cream City Roofing & Paint Mfg. Co., Agts.), 1334.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Phenix Mfg. Co., 800-801.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Pittsburgh Testing Laboratory, 9.  
Pratt & Cady Co., Inc. (Robert Rom Co., Agts.), 1090-91.  
Sengbusch Self-Closing Inkstand Co., 7.
- Milwaukee, Wis.—Continued.**  
Scientific Heater Co. (Milwaukee Gas Light Co., Agts.), 1046-47.  
Solar Metal Products Co., Inc. (C. Colnick Mfg. Co., Agts.), 645.  
Sprague Electric Works, 1168.  
Stark Brick Co. (Wisconsin Face & Fire Brick Co., Reps.), 88.  
Truscon Steel Co., 217-19; 702-03.  
United Pump & Power Co., 1116-19.  
Variety Mfg. Co., 688-91.  
Wagner Architectural Iron Works, A. F., 530-31.  
Weatherproof Calking Co. (Superior Calking Co., Agts.), 1377.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (Julius Andrae & Sons Co., Agts.), 1169-76.  
Westinghouse Lamp Co., 1225.  
Wisconsin Iron & Wire Works, 267; 533.
- Mineola, L. I., N. Y.**  
Anchor Post Iron Works, 537-43.
- Minneapolis, Minn.**  
American Blower Co., 996-99.  
American Mailing Device Corporation, 1439.  
American Pressweld Radiator Corporation (J. G. Roeller, Agt.), 952-53.  
Aspromet Co., 414-16.  
Atlas Portland Cement Co., 121-26.  
Automatic Electric Co., 1238-39.  
Barrett Co., 394-97.  
Beaver Board Companies, 170-71.  
Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
Bitu-Mortar Waterproofing Co., Inc. (K. F. Lott & Co., Agts.), 40.  
Bowser & Co., Inc., S. F., 1476-77.  
Bridgeport Wood Finishing Works, 1369.  
Burnett-Larsh Mfg. Co. (Roberts-Hamilton Co., Agts.), 1098-99.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Johnson, Jackson & Corning Co., Agts.), 1382-85.  
Carr-Cullen Co. ("Bilt-Well" Service Bureau), 574-75.  
Carter White Lead Co., 1315.  
Certain-teed Products Corporation, 399-401.  
Chamberlin Metal Weather Strip Co., 781.  
Columbian Hardware Co. (A. N. Stark, Agt.), 762.  
Crane Co., 1084-85.  
Curtis-Yale-Howard Co. (Curtis Service Bureau), 578-79.  
Dayton Malleable Iron Co. (Chas. Houston, Agt.), 246.  
Dreadnought Flooring Co. (General Equipment Co., Agts.), 325.  
Dunham Co., C. A., 916-21.  
Edwards Mfg. Co., 1410-11.  
Fowler & Pay, 132.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
Gillis & Geoghegan (Morgan-Gerrish Co., Agts.), 1299-1305.  
Harrison Works, 1322-25.  
Hydraulic-Press Brick Co., 82-83.  
Johns-Manville Co., H. W., 910.  
Johnson Service Co., 942-46.  
Kalman Co., Paul J., 193.  
Kawneer Mfg. Co., 488-90.  
Kewanee Boiler Co., 975-77.  
Lamson Co., 1307.  
Lehigh Portland Cement Co., 127.  
Lowe Brothers Co., 1328-29.  
Luminous Unit Co., 1227.  
Lutton Co., William H., 1462-63.  
Majestic Co. (Fowler & Pay, Agts.), 271-73.  
Marbleloid Co., 332-33.  
Minneapolis Heat Regulator Co., 948-49.  
National X-Ray Reflector Co. (I. M. Kirlin, Agt.), 1231.  
New York Belting & Packing Co. (W. S. Nott Co., Agts.), 322.  
Patent Vulcanite Roofing Co., 406-07.



**Minneapolis, Minn.—Continued.**

Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Permutit Co., 1130.  
 Pfaudler Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Plymouth Gypsum Co., 154-55.  
 Reese Mfg. Co., 796-97.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Safety Detachable Window Corporation, 730-31.  
 Scientific Heater Co. (Beecher-Cumming Co., Agts.), 1046-47.  
 Sorlien Ceiling Bed Co., 1398.  
 Sturtevant Co., B. F., 1006-07.  
 Thorp Fire Proof Door Co., 661-63.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Twin City Varnish Co., 1365.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 Wagner Mfg. Co. (Warner Hardware Co., Agts.), 638-39.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Windshield Scupper Co. (Hydraulic-Press Brick Co., Agts.), 276.  
 Yeomans Brothers Co. (Healy-Ruff Co., Reps.), 1122-23.

**Mitchell, Ind.**

Lehigh Portland Cement Co., 127.

**Mitchell, S. Dak.**

Garden City Sand Co. (Robert Burns Lumber Co., Agts.), 134-37.

**Mobile, Ala.**

Burrowes Co., E. T., 790-92.  
 De Soto Paint Mfg. Co., 1319.

**Moline, Ill.**

Garden City Sand Co. (John Benedict, Agt., Davenport, Iowa), 134-37.  
 Moline Heat, 939.  
 Montgomery Elevator Co., 1279.

**Monessen, Pa.**

Page Steel and Wire Co., 549-51.

**Monson, Me.**

General Slate Co., 362-64.

**Montreal, Que., Can.**

A. B. See Electric Elevator Co., 1262-63.  
 American Steel & Wire Co., 1182-87.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Brown Hoisting Machinery Co., 184-85.  
 Bruner Granitoid Co., P. M. (Window Strip & Supply Co., Ltd., Agts.), 337; 824-26.  
 Burrowes Co., E. T., 790-92.  
 Burt Mfg. Co. (Geo. W. Reed & Co.), 459-61.  
 Clinton Wire Cloth Co. (Pedlar People, Ltd., Agts.), 227-31.  
 Custodis Chimney Construction Co., Alphons, 89.  
 Dayton Malleable Iron Co. (Wm. H. Wardwell, Agt.), 246.  
 Deming Co. (Darling Bros., Ltd., Agts.), 1104-07.  
 Dunham Co., C. A., 916-21.  
 General Fire Extinguisher Co. (Canadian General Fire Extinguisher Co., Ltd.), 1136-39.  
 Grauer & Co., Albert (Window Strip & Supply Co., Ltd., Agts.), 337; 824-26.  
 Hubbell, Inc., Harvey (R. E. T. Pringle, Ltd., Agts.), 1216-17.  
 Hunt & Co., Robert W., 8.  
 Hydraulic-Press Brick Co. (Alex. Bremner, Ltd., Agt.), 82-83.  
 Jackson Co., Wm. H., 289.  
 Jenkins Bros., 1086-87.  
 Johns-Manville Co., H. W., 910.

**Montreal, Que., Can.—Continued.**

Johnson Service Co. (Johnson Temperature Regulating Co. of Canada, Ltd., Reps.), 942-46.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W. (Canadian Kellogg Co., Ltd.), 92-93.  
 Kennedy, Inc., David E., 326; 327.  
 Kinnear Mfg. Co., 670-79.  
 Lord & Burnham Co., 1458-61.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 Master Builders Co., 339.  
 Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
 Murphy Varnish Co. (Dougall Varnish Co., Ltd.), 1350-51.  
 New York Continental Jewell Filtration Co., 1126.  
 Newman Clock Co. (Newman-Munderloh Clock Co., Ltd.), 1443.  
 Ogden Co., J. Edward (F. Bacon & Co., Agts.), 682-83.  
 Powers Regulator Co. (Canadian Powers Regulator Co., Ltd.), 947.  
 Pratt & Cady Co., Inc. (Canadian Fairbanks-Morse Co., Ltd., Agts.), 1090-91.  
 Raymond Concrete Pile Co. (Raymond Concrete Pile Co. of Canada, Ltd.), 12-13.  
 Richmond Screw Anchor Co. (J. A. Masters & Co., Agts.), 249.  
 Sarco Co., Inc. (Peacock Bros., Agts.), 931.  
 Standard Paint Co., 48-49; 393.  
 Sturtevant Co., B. F. (B. F. Sturtevant Co. of Canada, Ltd.), 1006-07.  
 Variety Mfg. Co., 688-91.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Yeomans Brothers Co. (Darling Brothers, Ltd., Reps.), 1122-23.

**Moorestown, N. J.**

Burnett-Larsh Mfg. Co. (J. L. Wilson, Agt.), 1098-99.

**Mount Airy, N. C.**

Lemmerman & Hoffman Granite Co. (National Building Granite Quarries Association), 58-59.  
 Mount Airy Granite Cutting Co. (National Building Granite Quarries Association), 58-59.  
 North Carolina Granite Corp. (National Building Granite Quarries Association), 58-59.  
 Sargent Granite Co., Inc., J. D. (National Building Granite Quarries Association), 58-59.

**Muskogee, Okla.**

Crane Co., 1084-85.

## N

**Nashua, N. H.**

Highton & Sons Co., Wm., 992-93.

**Nashville, Tenn.**

American Elevator & Machine Co. (J. Bouchard & Sons Co., Reps.), 1261.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 General Electric Co., 1153-67.  
 Hart & Crouse Co., 965-67.  
 Hydraulic-Press Brick Co. (T. L. Herbert & Son, Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Van Kannel Revolving Door Co., 588-89; (John W. McMurray, Agt.), 1438.  
 Vonnegut Hardware Co. (Geo. W. Ruth, Agt.), 593-97.

**New Brighton, N. Y.**

King & Co., J. B., 153.

**New Britain, Conn.**

Hart & Hutchinson Co., 1416-17.  
 Stanley Works, 608-13.

**New Castle, Pa.**

Lehigh Portland Cement Co., 127.

**New Durham, N. J.**

Marbleloid Co., 332-33.

**New Haven, Conn.**

Chamberlin Metal Weather Strip Co., 781.  
 Eastern Machinery Co., 1268-69.  
 General Electric Co., 1153-67.  
 Gillis & Geoghegan (Warner-Miller Co., Agts.), 1299-1305.  
 National Pipe Bending Co., 902-03.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Western Electric Co., 1202-03.

**New London, Conn.**

Booth Bros. & Hurricane Isle Granite Co. (National Building Granite Quarries Association), 58-59.  
 Gillette-Vibber Co., 1211.

**New Milford, Conn. (Still River).**

Bridgeport Wood Finishing Works, 1369.

**New Orleans, La.**

Allen Mfg. Co., W. D., 1131-33.  
 American Elevator & Machine Co. (American Elevator & Electric Co., Reps.), 1261.  
 American Sheet and Tin Plate Co., 412-13.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Zimmermann's Building Specialties Co.; Fritz Jahncke, Inc., Agts.), 1382-85.  
 Carbondale Machine Co., 1053.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Columbian Hardware Co. (J. C. Brill, Agt.), 762.  
 Garden City Sand Co. (Fritz Jahncke, Agt.), 134-37.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Hydraulic-Press Brick Co. (Fritz Jahncke, Inc., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Kinnear Mfg. Co., 670-79.  
 Link-Belt Co. (C. O. Hinz, Agt.), 1310.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 Majestic Co. (A. Baldwin Co., Agts.), 271-73.  
 National Roofing Co. (Kracke & Flanders Co., Agts.), 389.  
 National X-Ray Reflector Co. (Interstate Electric Co., Agts.), 1231.  
 Natroco Paint & Varnish Works (Kracke & Flanders Co., Agts.), 1334.  
 Ogden Co., J. Edward (Ole K. Olesen, Agts.), 682-83.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Scientific Heater Co. (Hartwell & Co., Agts.), 1046-47.  
 Southern Cypress Manufacturers' Association, 570-71.  
 Southern Pine Association, 561.  
 Van Kannel Revolving Door Co., 588-89; (J. T. Mann & Co., Agts.), 1438.  
 Wagner Mfg. Co. (R. Baldwin & Co., Ltd., Agts.), 638-39.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (John C. Brill Co., Agts.), 241.  
 Wilson Corporation, J. G., 692-93; 804-05.

**New York, N. Y.**

A. B. See Electric Elevator Co., 1262-63.  
 African Ceramic and Tile Co. of Tunis, Inc., 290.  
 Alberene Stone Co., 890-91.



**New York, N. Y.—Continued.**

Alignum Fireproof Products Co., Inc., 646-47.  
 Allen Mfg. Co., W. D., 1131-33.  
 Allen Pressure System Co., Inc., 1474-75.  
 Allith-Prouty Co., 614-15.  
 Alpha Portland Cement Co., 119.  
 Alsen's American Portland Cement Works (W. P. Corbett, Agt.), 120.  
 American Abrasive Metals Co., 346.  
 American Bitumastic Enamels Co., 1373.  
 American Blower Co., 996-99.  
 American Brass Co., 1071.  
 American Cement Tile Mfg. Co., 432-33.  
 American Chemical Paint Co., 1372.  
 American District Steam Co., 912.  
 American Enameled Brick & Tile Co., 74-77.  
 American Encaustic Tiling Co., Ltd. (Associated Tile Manufacturers), 284-87.  
 American Fence Construction Co., 534-36.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co., 344-45.  
 American Materials Co., Inc., 133.  
 American Pressweld Radiator Corporation (J. F. Siegel, Agt.), 952-53.  
 American Pulley Co., 757.  
 American Sheet and Tin Plate Co. (United States Steel Products Co., Reps.), 412-13.  
 American Steel & Wire Co. (United States Steel Products Co., Reps.), 30-33; 232-33; 1182-87.  
 American 3-Way Prism Co., 821.  
 Anchor Post Iron Works, 537-43.  
 Anti-Hydro Waterproofing Co., 38.  
 Arex Co., 457.  
 Artesian Well and Supply Co., 1092.  
 Asphalt Ready Roofing Co., 388.  
 Aspromet Co., 414-16.  
 Aten Sewage Disposal Co., 879.  
 Athey Co., 780.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Atlantic Terra Cotta Co., 112-13.  
 Atlas Portland Cement Co., 121-26.  
 Atlas Valve Co., 940-41.  
 Austral Window Co., 736.  
 Automatic Electric Co., 1238-39.  
 Automatic Refrigerating Co., 1048-49.  
 Ayer & Lord Tie Co., 310.  
 Badger & Sons Co., E. B., 892-93.  
 Barrell Co., William L., 410.  
 Barrett Co., 394-97; 442.  
 Bayley Co., William, 698-99.  
 Beach Garage Equipment Co., Inc., T. C., 1483.  
 Beaton & Corbin Mfg. Co. (Monte F. Jacobs, Rep.), 935.  
 Beaver Board Companies, 170-71.  
 Beaver Falls Art Tile Co. (Associated Tile Manufacturers), 284-87.  
 Beaver Tile & Specialty Co., Inc., 324.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
 Best Bros. Keene's Cement Co., 146-47.  
 Best Register Co., 988-89.  
 Billings-Chapin Co., 1318.  
 Bird & Son, 390-91.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bitu-Mortar Waterproofing Co., Inc., 40.  
 Blackburn-Smith Corporation, 880.  
 Booraem, J. Francis, 288.  
 Booth Bros. & Hurricane Isle Granite Co. (National Building Granite Quarries Association), 58-59.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Boyle & Co., Inc., John, 411.  
 Bramhall, Deane Co., 1010-11.  
 Brecht Co., 1050-52.  
 Bridgeport Wood Finishing Works, 1369.  
 Brook Iron Works, A. T., 544-45.  
 Brown Co., 573.  
 Brown Hoisting Machinery Co., 184-85.  
 Bryant Electric Co., 1207.  
 Building Directories, Bulletin & Sign Co., 1434.

**New York, N. Y.—Continued.**

Burchartz Fireproofing Co., Inc., 26.  
 Burnett-Larsh Mfg. Co. (A. H. Derby, Agt.), 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel, 1382-85.  
 Cambridge Tile Mfg. Co. (Associated Tile Manufacturers), 284-87.  
 Canton Foundry & Machine Co. (Zenas R. Taylor, Inc., Rep.), 1486.  
 Carbolineum Wood Preserving Co., 1386.  
 Carbondale Machine Co., 1053.  
 Carpenter & Co., Inc., Davis, 827.  
 Carter White Lead Co., 1315.  
 Ceresit Waterproofing Co., 41.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Chapman Valve Mfg. Co., 1080-81.  
 Chelsea Elevator Co., 1265-67.  
 Cheney & Co., Inc., 329.  
 Chesley Co., Inc., A. C., 710-11.  
 Chicago Bridge & Iron Works, 1095.  
 Chicago Spring Butt Co., 602-603.  
 Chicago Varnish Co., 1342-43.  
 Clinton Wire Cloth Co. (Albert Oliver & Son, Inc., Agts.), 227-31; 990-91.  
 Coburn Trolley Track Mfg. Co., 640-43.  
 Cold Light Mfg. Co., 1210.  
 Columbian Hardware Co., 762.  
 Composite Metal Lath Co., 236-38.  
 Concrete Hardening Co., Inc., 338.  
 Concrete Steel Co., 188-89.  
 Connersville Blower Co., 1102-03.  
 Consolidated Expanded Metal Companies (Expanded Metal Engineering Co., Reps.), 206-08.  
 Cornell Iron Works, 666.  
 Corrugated Bar Co., 22; 190-92.  
 Covert Co., H. W., 280.  
 Crane Co., 1084-85.  
 Crane Co., William M., 1012-13.  
 Crouse-Hinds Co., 1178.  
 Custodis Chimney Construction Co., Al-  
 phones, 89.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Cutler Mail Chute Co., 1440-41.  
 Cyclone Fence Co., 546-48.  
 Dahlstrom Metallic Door Co., 649-51.  
 Davis Marble Co., 283.  
 Dayton Malleable Iron Co. (International Casement Co., Inc., Agts), 246.  
 Deming Co. (Ralph B. Carter Co., Agts.), 1104-07.  
 Dexter Brothers Co. (Johnston & Oswald Co., Agts.), 1381.  
 Domestic Laundry Equipment Corporation, 1042-43.  
 Dreadnought Flooring Co., 325.  
 Dunham Co., C. A., 916-21.  
 Duplex Hanger Co., 253.  
 Duvinage, Pierre, 260.  
 Eco Clock Co., 1442.  
 Edison Lamp Works, 1224.  
 Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
 Electric Cable Co., 1190-91.  
 Federal Terra Cotta Co., 115.  
 Fiske Iron Works, J. W., 552-53.  
 Folding Partition Co., 769.  
 Foundation Co., 14.  
 Friction Pivot Co., Inc., 738.  
 Fulton Co., 937-38.  
 General Electric Co. (G. Amsinck & Co., Reps. for Central America), 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 42; 210-13; 1414.  
 General Gas Light Co., 1029.  
 Georgia Marble Co., 68-69.  
 Gerdes, Theodore, R. N., 462.  
 Gifford-Wood Co., 1298.  
 Gillis & Geoghegan, 1299-1305.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co., 1344-45.  
 Gorham Co Architectural Bronze, 502-03.  
 Gorton & Lidgerwood Co., 1083.  
 Goulds Mfg. Co., 1108-09.  
 Graf Mfg. Co., Frank H., 886.  
 Grant Pulley and Hardware Co., 739; 760-61; 770.

**New York, N. Y.—Continued.**

Guastavino Co., R., 34-35.  
 Habirshaw Electric Cable Co., Inc., 1193-1201.  
 Hall's Safe Co. (Walker Safe Co., Inc., Agts.), 1431.  
 Hampden Paint & Chemical Co., 1320-21.  
 Harrison Works, 1322-25.  
 Hart Mfg. Co., 1212-13.  
 Hart & Crouse Co., 965-67.  
 Hart & Hutchinson Co., 1416-17.  
 Hartmann-Sanders Co., 298-99.  
 Hasbrouck Flooring Co., 315.  
 Hastings Pavement Co., 308.  
 Heinicke, Inc., H. R., 90-91.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Hitchings & Co., 1454-55.  
 Hodgson Co., E. F., 1453.  
 Hoffman Specialty Co., 926-29.  
 Holtzer-Cabot Electric Co., 1242-45.  
 Hope & Sons, Henry, 716-17.  
 Howard Clock Co., E., 1444-45.  
 Hubbell, Inc., Harvey, 1216-17.  
 Humrad Co., Inc., 936.  
 Hunt & Co., Robert W., 8.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co., 82-83.  
 Hydrex Felt & Engineering Co., 44.  
 Hydrolithic Waterproofing Co., Inc., 45.  
 Ilg Electric Ventilating Co., 1002-03.  
 Improved Office Partition Co., 771.  
 Interior Metal Mfg. Co., 654-55.  
 International Casement Co., Inc., 718.  
 International Filter Co., 1124.  
 International Heater Co., 968-73.  
 Irving Forge, W., 505.  
 Jackson Co., Wm. H., 289; 512.  
 Jenkins Bros., 1086-87.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 36; 331; 386-87; 402-05; 910; 930; 1076-77.  
 Johnson, Inc., E. J., 366-67.  
 Johnson Service Co., 942-46.  
 Josam Mfg. Co., 876-78.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W., 92-93.  
 Kelsey Heating Co., 958-59.  
 Kennedy, Inc., David E., 326; 327.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Kenney Mfg. Co., 834.  
 Keppler Glass Constructions, Inc., 831-33.  
 Kernchen Company, 466.  
 Ketcham, O. W., 118.  
 Kewanee Boiler Co., 975-77.  
 Kewanee Private Utilities Co., 1112-13.  
 King Construction Co., 1456-57.  
 King & Co., J. B., 153.  
 Kinneer Mfg. Co., 670-79.  
 Knape Machine Co., John, 1399.  
 Knowles Mushroom Ventilator Co., 1004.  
 Lamson Co., 1307.  
 Lehigh Portland Cement Co., 127.  
 Library Bureau, 1418-19.  
 Link-Belt Co., 1310.  
 Loomis-Manning Filter Distributing Co., 1125.  
 Lord & Burnham Co., 1458-61.  
 Louisville Varnish Co., Inc., 1349.  
 Lowerator Co., Inc., 1308-09.  
 Luminous Unit Co., 1227.  
 Lupton's Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 McCabe Hanger Mfg. Co., 618-20.  
 McFarland-Hyde Co., 720-21.  
 Majestic Co. (E. A. Jackson & Bro., Agts.), 271-73.  
 Manhattan Brass Co., 513.  
 Marble & Shattuck Chair Co. (A. B. Hunn, Agt.), 1400-01.  
 Marbleoid Co., 332-33.  
 Marietta Paint & Color Co., 1330.  
 Massachusetts Blower Co., 1005.  
 Master Builders Co., 339.  
 Maurer & Son, Henry, 98-99.  
 Mende, Paul, 321.  
 Meneely Bell Co., 1452.  
 Merchant & Evans Co., 420; 470; 680.  
 Miller & Co., Edward, 1230.



**New York, N. Y.—Continued.**

Minnesota Manufacturers' Association, 1311.  
 Minwax Co., Inc., 342.  
 Mississippi Glass Co., 810-11.  
 Mississippi Wire Glass Co., 812-15.  
 Morgan Co., 584-85.  
 Mosaic Tile Co. (Associated Tile Manufacturers), 284-87.  
 Mott Iron Works, J. L., 514-15.  
 Mueller Mosaic Co. (Rossman's, Agt.), 293.  
 National Commercial Gas Association, 1009.  
 National Kellastone Co., 138-39.  
 National Pipe Bending Co. (Stevens Bros., Agts.), 902-03.  
 National Tile Co. (Associated Tile Manufacturers), 284-87.  
 National Ventilating Co., 454-56.  
 National X-Ray Reflector Co., 1231.  
 New England Granite Works (National Building Granite Quarries Association), 58-59.  
 New York Belting & Packing Co., 322.  
 New York Blue Print Paper Co., 6.  
 New York Brass Foundry Co., 1134-35.  
 New York Continental Jewell Filtration Co. (Louis Wheelwright, Agt.), 1126.  
 New York Sewage Disposal Co., 881.  
 New York Silicate Book Slate Co., 378.  
 Newman Clock Co., 1443.  
 Northeastern Co., 1387.  
 Obelisk Waterproofing Co., 46.  
 Ogden Co., J. Edward, 682-83.  
 Ohio Blower Co., 472-74.  
 Otis Elevator Co., 1280-84.  
 Page Steel and Wire Co., 549-51.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pauly Jail Building Co., 1488.  
 Payson Mfg. Co. (Frederick Pfeifer, Rep.), 750-53.  
 Penberthy Injector Co., 882-83.  
 Penn Metal Co., 216; 734.  
 Pennsylvania Wire Glass Co., 816-17.  
 Permutit Co., 1130.  
 Pfaudler Co., 1035.  
 Pierson U-Bar Co., 1464-65.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pitt Composite Iron Works, William R., 558-59.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Pomeroy Co., Inc., S. H., 728-29.  
 Powell Steel Kitchen Co., 1032-33.  
 Powers Regulator Co., 947; 950-51.  
 Pratt & Cady Co., Inc., 1090-91.  
 Pratt & Lambert, Inc., 1354-55.  
 Presbrey-Coykendall Co., 62.  
 Pressed Prism Plate Glass Co., 820.  
 Raymond Concrete Pile Co., 12-13.  
 Reed & Barton, 520-21.  
 Reliance-Grant Elevator Equipment Corp., 626-29.  
 Revolving Door & Fixture Co., 590.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Richmond Screw Anchor Co., 249.  
 Rising & Nelson Slate Co., 368-69.  
 Roberts Filter Mfg. Co., 1128-29.  
 Rock Plaster Mfg. Co., 160.  
 Rockport Granite Co., 60-61; see also National Building Granite Quarries Association, 58-59.  
 Rookwood Pottery Co., 294-95.  
 S-M-I Engineering Co., 23.  
 Safety Fire Extinguisher Co., 1141.  
 Sarco Co., Inc., 931.  
 Sayre & Fisher Co., 73.  
 Scientific Heater Co. (Buerkle Sales Co., Brooklyn, N. Y., Agts.), 1046-47.  
 Sedgwick Machine Works, 1285-89.  
 Seeger Refrigerator Co., 1063.  
 Silver Lake Co., 756.  
 Simmons Co., John, 1142-43.  
 Sneed & Co., Iron Works, Inc., 1424-25.  
 Society for Electrical Development, Inc., 1145-52.

**New York, N. Y.—Continued.**

Soellner, Herman, 1070.  
 Solar Metal Products Co., Inc. (Betz Bros., Inc., Agts.), 645.  
 Sonneborn Sons, Inc., L., 340-41.  
 Special Service Flooring Corporation, 336.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Paint Co., 48-49; 393.  
 Standard Store Service, Inc., 1314.  
 Standard Varnish Works, 1356-63.  
 Stanley Works, 608-13.  
 Stanley & Patterson, Inc., 1246-55.  
 Stark Brick Co. (Pfotenhauer-Nesbit Co., Reps.), 88.  
 Stone, Junius H., 353.  
 Sturtevant Co., B. F., 1006-07.  
 Swedish Venetian Blind Co., 773; 806.  
 Swenson Granite Co., John, 63; see also National Building Granite Quarries Association, 58-59.  
 Tablet & Ticket Co., 1436-37.  
 Taylor Co., N. & G., 426-28.  
 Terrell's Equipment Co., 1426-27.  
 Thatcher Furnace Co., 982-84.  
 Thomas Clock Co., Seth, 1446-47.  
 Tiffany Studios, 526-27.  
 Toch Brothers, 50-51.  
 Tompkins-Kiel Marble Co., 70.  
 Trageser Steam Copper Works, John, 900.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Turner Construction Co., 15.  
 Tuttle & Bailey Mfg. Co., 985-87.  
 Tyler Co., W. S., 529.  
 United Cork Companies, 356.  
 United Cork Flooring Co., 328.  
 United Electric Co. (Berger Mfg. Co., Reps.), 1258-59.  
 United Lined Tube & Valve Co. (United Lead Co., Agts.), 1072-73.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 United States Changeable Sign Co., 1435.  
 U. S. Encaustic Tile Works (Associated Tile Manufacturers), 284-87.  
 U. S. Gutta Percha Paint Co., 1336-37.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 United States Mineral Wool Co., 357.  
 Universal Balance Door, Inc., 591.  
 Universal Electric Stage Lighting Co., 1235.  
 Universal Safety Tread Co., 347.  
 Valentine & Co., 1366-67.  
 Van Dorn Iron Works Co., 1428.  
 Van Kannel Revolving Door Co., 588-89; 1438.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (Grant Pulley and Hardware Co., Agts.), 593-97.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Wagner Mfg. Co. (Wm. A. Daunt, Agt.), 638-39.  
 Walworth Mfg. Co., 1144.  
 Warren Chemical & Mfg. Division, 309; 408-09.  
 Waterproofing Co., 54-55.  
 Watertite Drain & Scupper Co., Inc., 275.  
 Watson Mfg. Co., Inc., 798; 1429.  
 Weatherproof Calking Co., 1377.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Northwestern Elec. Equipment Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co., 241.  
 White Fireproof Construction Co., 16.  
 Williams, Inc., Jno., 532.  
 Wilson Corporation, J. G., 692-93; 774-77; 804-05.  
 Windshield Scupper Co., 276.  
 Wing Mfg. Co., L. J., 1008.  
 Winslow Bros. Co., 735.  
 Witherow Steel Co., 195.  
 Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.

**New York, N. Y.—Continued.**

Wright Wire Co., 234-35.  
 Yeomans Brothers Co. (E. A. Julie, Rep.), 1122-23.  
 Youngstown Sheet & Tube Co., 1074-75; (Bonnell Electric Mfg. Co., Reps.), 1180-81.

**Newark, N. J.**

Alberene Stone Co., 890-91.  
 Anti-Hydro Waterproofing Co., 38.  
 Atlas Valve Co., 940-44.  
 Bridgeport Wood Finishing Works, 1369.  
 Carter White Lead Co., 1315.  
 Crane Co., 1084-85.  
 Friction Pivot Co., Inc., 738.  
 Fritts-Gilbert Refrigerator Co., 1059.  
 General Electric Co., 1153-67.  
 Harrison Works, 1322-25.  
 Hetzel, Estate of J. G., 443.  
 Johns-Manville Co., H. W., 910.  
 Murphy Varnish Co., 1350-51.  
 Newark Cornice and Skylight Works, 726-27.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co., 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Schouler Cement Construction Co., 789.  
 Searls Mfg. Co., 888-89.  
 Smith Metal Window Hardware Co., Frank F., 592.  
 Stark Brick Co. (A. S. Reid & Co., Reps.), 88.  
 Thatcher Furnace Co., 982-84.  
 Western Electric Co., 1202-03.

**Newcomerstown, Ohio.**

Heinicke, Inc., H. R., 90-91.

**Newport, Ky.**

Alhambra Tile Co. (Associated Tile Manufacturers), 284-87.  
 Higgin Mfg. Co., 782-83; 794-95.

**Newtonville, Mass.**

Silver Lake Co., 756.

**Niagara Falls, N. Y.**

Certain-teed Products Corporation, 399-401.  
 General Electric Co., 1153-67.  
 Hydraulic-Press Brick Co. (Mitchell Builders' Supply Co., Agts.), 82-83.  
 National Roofing Co. (Cordes, Ayrault & Co., Agts.), 389.  
 Natroco Paint & Varnish Works (Cordes, Ayrault & Co., Agts.), 1334.

**Niagara Falls, Ont., Can.**

American Chain Co., Inc. (Dominion Chain Co., Ltd., Agts.), 754.

**Niles, Mich.**

Kawneer Mfg. Co., 488-90.

**Niles, Ohio.**

Bostwick Steel Lath Co. (Associated Metal Lath Manufacturers), 196-201.  
 Stanley Works, 608-13.  
 Sykes Metal Lath and Roofing Co., 220-21; see also Associated Metal Lath Manufacturers, 196-201.

**Norfolk, Va.**

Certain-teed Products Corporation, 399-401.  
 Edwards Mfg. Co., 1410-11.  
 Hydraulic-Press Brick Co. (G. S. Friebeus, Agt.), 82-83.  
 Jordan & Co., Paul R. (J. L. Belote, Agt.), 464-65.  
 King & Co., J. B., 153.  
 Marbleloid Co., 332-33.  
 North Carolina Pine Association, 562-63.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Van Kannel Revolving Door Co., 588-89.  
 Variety Mfg. Co., 688-91.  
 Westinghouse Electric & Mfg. Co. (N. M. Reay & Co., Agts.), 1169-76.  
 Wilson Corporation, J. G., 692-93; 774-77; 804-05.

**Northampton, Pa.**

Atlas Portland Cement Co., 121-26.



**North Charlotte, N. C.**

General Fire Extinguisher Co., 1136-39.

**North Chicago, Ill.**

Vonnegut Hardware Co., 593-97.

**Northfield, Vt.**

Woodbury Granite Co., 65; see also National Building Granite Quarries Association, 58-59.

**North Granville, N. Y.**

Johnson, Inc., E. J., 366-67.

**North Hoiston, Va.**

Southern Gypsum Co., Inc., 158-59.

**North Jay, Me.**

Maine &amp; New Hampshire Granite Corp. (National Building Granite Quarries Association), 58-59.

**North Poultney, Vt.**

Johnson, Inc., E. J., 366-67.

**North St. Paul, Minn.**

Minnesota Manufacturers' Association, 1311.

**North Tonawanda, N. Y.**American District Steam Co., 912.  
Creo-Dipt Co., Inc., 382-83.  
King Construction Co., 1456-57.  
Transfer Stained Shingle Co., Inc., 384.**Norwich, Conn.**

Jordan &amp; Co., Paul R. (C. E. Whitaker, Agt.), 464-65.

**Norwood, Mass.**

Bird &amp; Son, 390-91.

**Nutley, N. J.**

New York Continental Jewell Filtration Co., 1126.

**O****Oakfield, N. Y.**Niagara Gypsum Co., 156.  
Reeb Corporation, M. A., 157.**Oakland, Cal.**Best Register Co., 988-89.  
Crane Co., 1084-85.  
Cyclone Fence Co., 546-48.  
Pittsburg Water Heater Co., 1024-27.  
Union Blind & Ladder Co., Inc., 778.  
Western Electric Co., 1202-03.**Ogden, Utah.**Crane Co., 1084-85.  
Patton Paint Co. (Ogden Paint, Oil & Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Ogden Paint, Oil & Glass Co., Agts.), 1352-53.**Oglesby, Ill.**

Lehigh Portland Cement Co., 127.

**Oklahoma City, Okla.**American Steel & Wire Co., 30-33; 232-33; 1182-87.  
Burrowes Co., E. T., 790-92.  
Carter White Lead Co., 1315.  
Certain-teed Products Corporation, 399-401.  
Chamberlin Metal Weather Strip Co., 781.  
Crane Co., 1084-85.  
Curtis, Booth & Bentley Co. (Curtis Service Bureau), 578-79.  
General Electric Co. (Southwest General Electric Co.), 1153-67.  
Hydraulic Press-Brick Co. (Lumbermen's Supply Co., Agts.), 82-83.  
Kimball Brothers Co. (Gus Taliaferro, Agt.), 1275.  
Massachusetts Blower Co., 1005.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Texas Cement Plaster Co., 161.  
Truscon Steel Co., 217-19; 702-03.  
Van Kannel Revolving Door Co. (Hanson Building Specialties, c/o American Brick & Tile Co., Agts.), 1438.  
Western Electric Co., 1202-03.  
Wilson Corporation, J. G., 692-93; 804-05.**Old Bridge, N. J.**

Old Bridge Enamel Brick and Tile Co. (Associated Tile Manufacturers), 284-87.

**Omaha, Nebr.**American Pressweld Radiator Corporation (Omaha Sanitary Supply Co., Agts.), 952-53.  
American Steel Window Co., 694-97.  
Aspromet Co., 414-16.  
Adams & Kelly Co. ("Bilt-Well" Service Bureau), 574-75.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Stains, Pioneer Glass & Paint Co.; Quilt, McCaffrey Bros. Co., Agts.), 1382-85.  
Chamberlin Metal Weather Strip Co., 781.  
Concrete Engineering Co., 24-25.  
Crane Co., 1084-85.  
Edwards Mfg. Co., 1410-11.  
Garden City Sand Co. (Omaha Concrete Stone Co., Agts.), 134-37.  
General Electric Co., 1153-67.  
Gillis & Geoghegan (F. H. Turney & Co., Agts.), 1299-1305.  
Hydraulic-Press Brick Co., 82-83.  
Johns-Manville Co., H. W., 910.  
Kalman Co., Paul J., 193.  
Lamson Co., 1307.  
Lehigh Portland Cement Co., 127.  
Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
Pittsburgh Plate Glass Co., 484-85.  
Solar Metal Products Co., Inc. (C. B. Kraus Co., Agts.), 645.  
Truscon Steel Co., 702-03.  
Van Kannel Revolving Door Co., 588-89.  
Variety Mfg. Co., 688-91.  
Wagner Mfg. Co. (D. B. Marshall, Agt.), 638-39.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (McGraw Co., Agts.), 1169-76.  
Yeomans Brothers Co. (McCulley-Widener Co., Reps.), 1122-23.  
York Mfg. Co., 1055.**Ormsd, Pa.**

Lehigh Portland Cement Co., 127.

**Oshawa, Ont., Can.**

Clinton Wire Cloth Co. (Pedlar People, Ltd., Agts.), 227-31.

**Oshkosh, Wis.**Garden City Sand Co. (Cook & Brown Lime Co., Agts.), 134-37.  
Morgan Co., 584-85.  
Northern Hemlock and Hardwood Manufacturers' Association, 564-65.**Osnaburg, Ohio.**

Stark Brick Co., 88.

**Ottawa, Ont., Can.**Beaver Board Companies, 170-71.  
Dunham Co., C. A., 916-21.  
Library Bureau, 1418-19.  
Murphy Wall Bed Co. (H. Taplin, Agt.), 1396-97.**Owatonna, Minn.**

King Ventilating Co., 468-69.

**P****Paris, France.**Automatic Electric Co. (Thompson-Houston Co., Agts.), 1238-39.  
Brecht Co., 1050-52.  
Penberthy Injector Co., 882-83.  
Pratt & Lambert, Inc., 1354-55.  
Richmond Screw Anchor Co. (Jean Thiollier, Agt.), 249.  
Standard Varnish Works, 1356-63.  
Sturtevant Co., B. F. (Sturtevant Engineering Co.), 1006-07.**Parkersburg, W. Va.**United States Roofing Tile Co., 440-41.  
Vitrolite Co., 870-71.**Pen Argyl, Pa.**

Natural Slate Blackboard Co., 376-77.

**Peoria, Ill.**

American Elevator &amp; Machine Co. (H. F. Kircher &amp; Co., Reps.), 1261.

**Peoria, Ill.—Continued.**Barrett Co., 394-97.  
Carr & Johnston Co. ("Bilt-Well" Service Bureau), 574-75.  
Elevator Locks Co., 1292.  
Hydraulic-Press Brick Co. (Dering & Oliver Co., Agts.), 82-83.  
Vonnegut Hardware Co. (H. F. Kircher & Co., Agts.), 593-97.  
Western Brick Co., 86-87.**Perth Amboy, N. J.**Atlantic Terra Cotta Co., 112-13.  
Pardee Works, C. (Associated Tile Manufacturers), 284-87.  
Perth Amboy Tile Works (Associated Tile Manufacturers), 284-87.**Peru, Ill.**

Chamberlin Metal Weather Strip Co., 781.

**Philadelphia, Pa.**A. B. See Electric Elevator Co., 1262-63.  
Alberene Stone Co., 890-91.  
Allith-Prouty Co., 614-15.  
Alpha Portland Cement Co., 119.  
American Bitumastic Enamels Co., 1373.  
American Blower Co., 996-99.  
American Cement Tile Mfg. Co., 432-33.  
American Chemical Paint Co., 1372.  
American Laundry Machinery Co., 1036.  
American Mason Safety Tread Co., 344-45.  
American Pulley Co., 757.  
American Sheet and Tin Plate Co., 412-13.  
American Steel & Wire Co., 30-33; 232-33; 1182-87.  
Anchor Post Iron Works, 537-43.  
Ankya Mfg. Co., 244-45.  
Aspromet Co., 414-16.  
Atlas Portland Cement Co., 121-26.  
Automatic Electric Co., 1238-39.  
Ayer & Lord Tie Co., 310.  
Barrett Co., 394-97.  
Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
Best Register Co., 988-89.  
Bishop-Babcock-Becker Co., 914-15.  
Bowser & Co., Inc., S. F., 1476-77.  
Bridgeport Wood Finishing Works, 1369.  
Bureau Brothers, 498.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Samuel H. French & Co., Agts.), 1382-85.  
Caldwell Mfg. Co., 758-59.  
Canton Foundry & Machine Co. (Robt. B. Lederle, Rep.), 1486.  
Carbondale Machine Co., 1053.  
Carter White Lead Co., 1315.  
Ceresit Waterproofing Co., 41.  
Certain-teed Products Corporation, 399-401.  
Chamberlin Metal Weather Strip Co., 781.  
Chapman Valve Mfg. Co., 1080-81.  
Chesley Co., Inc., A. C., 710-11.  
Coburn Trolley Track Mfg. Co., 640-43.  
Columbian Hardware Co., 762.  
Concrete Specialties Mfg. Co., 828.  
Concrete Steel Co., 188-89.  
Conkling-Armstrong Terra Cotta Co., 114.  
Consolidated Expanded Metal Companies, 206-08.  
Corrugated Bar Co., 22; 190-92.  
Cox Stove Co., Abram, 960-64.  
Crane Co., 1084-85.  
Creswell Iron Works, Samuel J., 258-59.  
Custodis Chimney Construction Co., Alphons, 89.  
Cutler-Hammer Mfg. Co., 1208-09.  
Cyclone Fence Co., 546-48.  
Darby & Sons Co., Inc., Edward, 1409.  
Dayton Malleable Iron Co. (Janney, Steinmetz & Co., Agts.), 246.  
Deming Co. (W. B. Dallett Co., Agts.), 1104-07.  
Dreadnought Flooring Co. (Heaton & Wood, Agts.), 325.  
Dunham Co., C. A., 916-21.  
Duplex Hanger Co., 253.  
Edison Lamp Works, 1224.  
Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
Electric Cable Co., 1190-91.  
Energy Elevator Co., 1270-73.



**Philadelphia, Pa.—Continued.**

Garrett & Son Corp., C. S., 392.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 General Fireproofing Co., 42; 210-13.  
 Gifford-Wood Co., 1298.  
 Gillis & Geoghegan (W. G. Culbert, Agt.), 1299-1305.  
 Gorham Co Architectural Bronze, 502-03.  
 Goulds Mfg. Co., 1108-09.  
 Haines & Co., William S., 924-25.  
 Harrison Works, 1322-25.  
 Hart & Crouse Co., 965-67.  
 Hart & Hutchinson Co., 1416-17.  
 Haslett Spiral Chute Co., 1306.  
 Heinicke, Inc., H. R., 90-91.  
 Highton & Sons Co., Wm., 992-93.  
 Hitchings & Co., 1454-55.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co., 82-83.  
 Hydrex Felt & Engineering Co., 44.  
 Ilg Electric Ventilating Co., 1002-03.  
 International Insulation Co., 174.  
 Jenkins Bros., 1086-87.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (G. G. Falconer, Jr., Agt.), 464-65.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W., 92-93.  
 Kennedy, Inc., David E., 326; 327.  
 Kennedy Valve Mfg. Co., 1088-89.  
 Ketcham, O. W., 118.  
 King Construction Co., 1456-57.  
 King & Co., J. B., 153.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Lehigh Portland Cement Co., 127.  
 Library Bureau, 1418-19.  
 Link-Belt Co., 1310.  
 Loomis-Manning Filter Distributing Co., 1125.  
 Lord & Burnham Co., 978-79; 1458-61.  
 Luminous Unit Co., 1227.  
 Lupton's Sons Co., David, 704-08.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 Majestic Co. (Murta, Appleton Co., Agts.), 271-73.  
 Marbleloid Co., 332-33.  
 Massa, George, 1278.  
 Master Builders Co., 339.  
 Maurer & Son, Henry, 98-99.  
 Merchant & Evans Co., 420; 470; 680.  
 Miller Lock Co., 598-99.  
 Miller & Co., Edward, 1230.  
 National X-Ray Reflector Co. (Brown-White Co.), 1231.  
 New York Belting & Packing Co., 322.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pecora Paint Co., 1378-79.  
 Pennsylvania Wire Glass Co., 816-17.  
 Permutit Co., 1130.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Pratt & Cady Co., Inc. (McArdle & Cooney, Agts.), 1090-91.  
 Reliance Fireproof Door Co. (F. J. Wilson Co., Reps.), 656-57.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Richmond Screw Anchor Co. (Giles & Ransome, Agts.), 249.  
 Ridgway & Son, B., 296.  
 Royal Ventilator Co., 475.  
 Sarco Co., Inc., 931.  
 Scientific Heater Co. (C. H. Ehrenzeller, Agt.), 1046-47.  
 Security Insert Co., 250.  
 Silver Lake Co., 756.  
 Smyser-Royer Co., 528.  
 Solar Metal Products Co., Inc. (Philadelphia Metal Furniture Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Stanley & Patterson, Inc. (J. A. Vaughan, Agt.), 1246-55.

**Philadelphia, Pa.—Continued.**

Stark Brick Co. (A. S. Reid & Co., Reps.), 88.  
 Stone, Junius H., 353.  
 Sturtevant Co., B. F., 1006-07.  
 Taylor Co., N. & G., 426-28.  
 Terrell's Equipment Co. (Philadelphia Metal Furniture Co., Reps.), 1426-27.  
 Thomas, Roberts, Stevenson Co., 1014.  
 Thomson Wood Finishing Co., 1364.  
 Tompkins-Kiel Marble Co., 70.  
 Trumbull Electric Mfg. Co., 1218-21.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 United Cork Companies, 356.  
 United Lined Tube & Valve Co. (United Lead Co. of Pennsylvania, Agts.), 1072-73.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Universal Safety Tread Co., 347.  
 Van Kannel Revolving Door Co., 588-89; (F. J. Wilson Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (T. B. & H. S. Hendrickson, Agts.), 593-97.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (H. C. Roberts Electric Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Williams Pivot Sash Co. (J. H. Windell, Agt.), 742-45.  
 Wilson Corporation, J. G. (L. H. Myrick, Agt.), 692-93; 804-05.  
 Windshield Scupper Co. (Harry Kahn, Agt.), 276.  
 Wright Wire Co., 234-35.  
 Yeomans Brothers Co. (DeWitt W. Smith, Agt.), 1122-23.  
 York Mfg. Co., 1055.  
 Youngstown Sheet & Tube Co. (Walker Bros. & Haviland, Reps.), 1074-75; 1180-81.

**Phillipsdale, R. I.**

Bird & Son, 390-91.

**Phoenix, Ariz.**

Westinghouse Electric & Mfg. Co., 1169-76.

**Pigeon Cove, Mass.**

Rockport Granite Co., 60-61.

**Pittsburgh, Pa.**

Alberene Stone Co., 890-91.  
 Alpha Portland Cement Co., 119.  
 American Blower Co., 996-99.  
 American Cement Tile Mfg. Co., 432-33.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Pressweld Radiator Corporation (H. P. Cannon, Agt.), 952-53.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Armstrong Cork & Insulation Co., 323; 349-51.  
 Aspromet Co., 414-16.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Automatic Electric Co., 1238-39.  
 Barrett Co., 394-97.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Best Register Co., 988-89.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Brown Hoisting Machinery Co., 184-85.  
 Bruner Granitoid Co., P. M. (J. B. Booth & Co., Agts.), 337; 824-26.  
 Burrows Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Houston Brothers Co., Agts.), 1382-85.  
 Canton Foundry & Machine Co. (Geo. C. Webb, Rep.), 1486.  
 Carbondale Machine Co., 1053.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Conkling-Armstrong Terra Cotta Co. (James R. Pitcairn, Agt.), 114.  
 Consolidated Expanded Metal Companies, 206-08.  
 Curtis & Yale Co. (Curtis Service Bureau), 578-79.  
 Custodis Chimney Construction Co., Alphons, 89.  
 Cutler-Hammer Mfg. Co., 1208-09.  
 Dayton Malleable Iron Co. (Witherow Steel Co., Agts.), 246.  
 Deming Co. (Harris Pump & Supply Co., Agts.), 1104-07.  
 Dreadnought Flooring Co. (Pittsburgh Hardwood Floor Co., Agts.), 325.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 418-19; 664-65.  
 Foundation Co., 14.  
 General Electric Co., 1153-67.  
 Gillis & Geoghegan (James R. Pitcairn, Agt.), 1299-1305.  
 Gorham Co Architectural Bronze, 502-03.  
 Goulds Mfg. Co., 1108-09.  
 Grauer & Co., Albert (J. B. Booth & Co., Agts.), 337; 824-26.  
 Hart & Crouse Co., 965-67.  
 Hunt & Co., Robert W., 8.  
 Huntington Roofing Tile Co., 434-35.  
 Ilg Electric Ventilating Co., 1002-03.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (J. B. Robertson, Agt.), 464-65.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W., 92-93.  
 Kewanee Boiler Co., 975-77.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Lehigh Portland Cement Co., 127.  
 Link-Belt Co., 1310.  
 Lupton's Sons Co., David, 704-08.  
 Lyon Metallic Mfg. Co., 1420-21.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 Marbleloid Co., 332-33.  
 Minwax Co., Inc., 342.  
 National Fire Proofing Co., 100-05.  
 National Metal Weather Strip Co., 785.  
 National Roofing Co., 389.  
 Natroco Paint & Varnish Works, 1334.  
 New York Belting & Packing Co., 322.  
 Page Steel and Wire Co., 549-51.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Permutit Co., 1130.  
 Pfauddler Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Pratt & Cady Co., Inc., 1090-91.  
 Reliance Fireproof Door Co. (All Steel Equipment Co., Reps.), 656-57.  
 Scientific Heater Co. (Heckler Brothers), 1046-47.  
 Sprague Electric Works, 1168.  
 Stark Brick Co. (Martin Brick Co., Reps.), 88.  
 Steel City Electric Co., 1222.  
 Sturtevant Co., B. F., 1006-07.  
 Terrell's Equipment Co. (Simons, Brittain & English, Reps.), 1426-27.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Tyler Underground Heating System, 911.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Van Dorn Iron Works Co., 1428.  
 Van Kannel Revolving Door Co., 588-89; (Jas. R. Pitcairn, Agt.), 1438.  
 Variety Mfg. Co., 688-91.  
 Wagner Mfg. Co., (L. F. Gibson, Agt.), 638-39.  
 Waterproofing Co., 54-55.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.

**Pittsburgh, Pa.—Continued.**

For Index of Firms see page 5

**Pittsburgh, Pa.—Continued.**

Westinghouse Lamp Co., 1225.  
Williams Pivot Sash Co. (J. R. Colclough, Agt.), 742-45.  
Wilson Corporation, J. G. (H. H. Charles, Agt.), 692-93; 804-05.  
Windshield Scupper Co. (Fort Pitt Hardware Co., Agts.), 276.  
Winslow Bros. Co., 735.  
Witherow Steel Co., 195.  
Yeomans Brothers Co. (N. C. Davison Gas Burner & Welding Co., Reps.), 1122-23.  
York Mfg. Co., 1055.  
Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Pittsfield, Mass.**

General Electric Co., 1153-67.

**Plainville, Conn.**

Trumbull Electric Mfg. Co., 1218-21.

**Plantsville, Conn.**

Standard Store Service, Inc., 1314.

**Plasterco, Tex.**

Texas Cement Plaster Co., 161.

**Plymouth Meeting, Pa.**

Carey Co., Philip, 398.

**Pocatello, Idaho.**

Crane Co., 1084-85.  
Murphy Wall Bed Co. (T. C. Martin, Agt.), 1396-97.

**Port Clinton, Ohio.**

American Gypsum Co., 142-44.

**Portland, Me.**

Brown Co., 573.  
Burrowes Co., E. T., 790-92.  
Dunham Co., C. A., 916-21.  
Penn Metal Co., 216.

**Portland, Ore.**

American Mailing Device Corporation, 1439.  
American Sheet and Tin Plate Co. (United States Steel Products Co., Reps.), 412-13.  
American Steel & Wire Co. (United States Steel Products Co., Reps.), 30-33; 232-33; 1182-87.  
Brown Hoisting Machinery Co. (Colby Engineering Co., Agts.), 184-85.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (Timms, Cress & Co., Agts.), 1382-85.  
Certain-teed Products Corporation, 399-401.  
Clinton Wire Cloth Co. (L. A. Norris Co., Agts.), 227-31.  
Crane Co., 1084-85.  
Cyclone Fence Co., 546-48.  
Dayton Malleable Iron Co. (F. T. Crowe & Co., Agts.), 246.  
Dunham Co., C. A., 916-21.  
Edwards Mfg. Co., 418-19; 664-65; 1410-11.  
General Electric Co., 1153-67.  
Glidden Co. (Marshall Wells Hardware Co., Agts.), 1344-45.  
Johns-Manville Co., H. W., 910.  
Johnson Service Co., 942-46.  
Jordan & Co., Paul R. (F. S. Cook Co., Agts.), 464-65.  
Murphy Wall Bed Co. (J. McCracken Co., Agts.), 1396-97.  
Patton Paint Co. (Timms, Cress & Co., Agts.), 1332-33.  
Pitcairn Varnish Co. (Timms, Cress & Co., Agts.), 1352-53.  
Pittsburgh Testing Laboratory, 9.  
Solar Metal Products Co., Inc. (Timms, Cress & Co., Agts.), 645.  
Sprague Electric Works, 1168.  
Sturtevant Co., B. F., 1006-07.  
Taylor Co., N. & G., 426-28.  
Terrell's Equipment Co. (Northwest School Furniture Co., Reps.), 1426-27.  
Truscon Laboratories, 52-53.  
Truscon Steel Co., 217-19; 702-03.  
Twin City Varnish Co., 1365.  
United States Cast Iron Pipe and Foundry Co., 305-07.  
Variety Mfg. Co., 688-91.  
Vonnegut Hardware Co. (A. J. Capron & Co., Agts.), 593-97.

**Portland, Ore.—Continued.**

Wagner Mfg. Co. (Frederick S. Cook & Co., Agts.), 638-39.  
Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (Fobes Supply Co., Agts.), 1169-76.  
Yeomans Brothers Co. (Gordon & Finkbeiner, Reps.), 1122-23.

**Portsmouth, Ohio.**

Garden City Sand Co. (Portsmouth Clay Products Co., Agts.), 134-37.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co., 241.

**Poughkeepsie, N. Y.**

Sedgwick Machine Works, 1285-89.

**Poultney, Vt.**

Auld & Conger Co., 359.  
Penrhyn Slate Co., 365.

**Pringhar, Iowa.**

Garden City Sand Co. (J. C. Rudloff & Sons, Agts.), 134-37.

**Providence, R. I.**

Artesian Well and Supply Co., 1092.  
Clason Architectural Metal Works, 358.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1028; 1136-39.  
Gorham Co Architectural Bronze, 502-03.  
Johnson & Co., Inc., Oliver, 1326-27.  
King & Co., J. B., 153.  
National Roofing Co. (Narragansett Supply Co., Agts.), 389.  
Natroco Paint & Varnish Works (Narragansett Supply Co., Agts.), 1334.  
Stark Brick Co. (P. L. Monroe & Son, Reps.), 88.  
U. S. Gutta Percha Paint Co., 1336-37.

**Pueblo, Cal.**

Jordan & Co., Paul R. (Smedley Roofing & Sales Co., Agts.), 464-65.

**Q****Quebec, Que., Can.**

Hydraulic-Press Brick Co. (Pruneau & Cie, Agts.), 82-83.

**Quincy, Ill.**

Hollister-Whitney Co., 1274.

**R****Rahway, N. J.**

Hydrex Felt & Engineering Co., 44.

**Raleigh, N. C.**

Van Kannel Revolving Door Co., 588-89.

**Regina, Sask., Can.**

Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.

**Reno, Nevada.**

Murphy Wall Bed Co. (Mrs. Bessie Etnier, Agt.), 1396-97.

**Richmond, Cal.**

Certain-teed Products Corporation, 399-401.

**Richmond, Ind.**

Campfield Raggle Block Co., 108-09.

**Richmond, Va.**

American Steel Window Co., 694-97.  
Chamberlin Metal Weather Strip Co., 781.  
Certain-teed Products Corporation, 399-401.  
Columbian Hardware Co. (W. P. Thurston, Agt.), 762.  
Deming Co. (Sydnor Pump & Well Co., Agts.), 1104-07.  
Dexter Brothers Co. (R. McC. Bullington & Co., Agts.), 1381.  
General Electric Co., 1153-67.  
Gillis & Geoghegan (J. S. Archer, Agt.), 1299-1305.  
Hydraulic-Press Brick Co. (R. Massie Nolting, Agt.), 82-83.  
Lehigh Portland Cement Co., 127.  
Marble & Shattuck Chair Co. (T. A. Daffron, Agt.), 1400-01.  
Pittsburgh Testing Laboratory, 9.

**Richmond, Va.—Continued.**

Western Electric Co., 1202-03.  
Westinghouse Electric & Mfg. Co. (Tower-Binford Elec. & Mfg. Co., Agts.), 1169-76.  
Wheeling Corrugating Department, 242-43.  
Whitaker-Glessner Co. (Southern Steel Products Co., Agts.), 241.

**Rio de Janeiro, Brazil, S. A.**

General Electric Co. (Companhia General Electric do Brazil, Reps.), 1153-67.

**Roanoke, Va.**

Jordan & Co., Paul R. (Gravett & Turner, Agts.), 464-65.

**Rochester, Ind.**

Garden City Sand Co. (Marshall Hill, Agt.), 134-37.

**Rochester, N. Y.**

American Blower Co., 996-99.  
American Drafting Furniture Co., 1.  
Automatic Electric Co., 1238-39.  
Automatic Refrigerating Co., 1048-49.  
Bruner Granitoid Co., P. M. (American Clay & Cement Corporation, Agts.), 337; 824-26.  
Burnett-Larsh Mfg. Co., 1098-99.  
Burrowes Co., E. T., 790-92.  
Cabot, Inc., Samuel (W. Stuart Smith Co., Agts.), 1382-85.  
Caldwell Mfg. Co., 758-59.  
Cutler Mail Chute Co., 1440-41.  
Dunham Co., C. A., 916-21.  
Empire Gypsum Co., 152.  
Fearless Dishwasher Co., Inc., 1034.  
General Electric Co., 1153-67.  
General Fire Extinguisher Co., 1136-39.  
Gifford-Wood Co., 1298.  
Grauer & Co., Albert (American Clay & Cement Corporation, Agts.), 337; 824-26.  
Hydraulic-Press Brick Co. (American Clay & Cement Corporation, Agts.), 82-83.  
Johns-Manville Co., H. W., 910.  
Kinnear Mfg. Co., 670-79.  
Lamson Co., 1307.  
Lord & Burnham Co., 1458-61.  
National Skylight and Ventilator Co., 448-49.  
Pfaudler Co., 1035.  
Pittsburgh Plate Glass Co., 484-85.  
Pratt & Cady Co., Inc. (W. R. Hancock, Agt.), 1090-91.  
Pullman Mfg. Co., 764-65.  
Reliance Fireproof Door Co. (Building Specialties Co., Reps.), 656-57.  
Solar Metal Products Co., Inc. (American Clay & Cement Corp., Agts.), 645.  
Sturtevant Co., B. F., 1006-07.  
Westinghouse Electric & Mfg. Co. (Rochester Electrical Supply Co., Agts.), 1169-76.  
Wilson Corporation, J. G., 692-93; 804-05.  
Windshield Scupper Co. (American Clay & Cement Corp., Agts.), 276.  
Wright & Alexander Co., 251.

**Rockford, Ill.**

Garden City Sand Co. (Crumb-Colton Co., Agts.), 134-37.

**Rock Island, Ill.**

Garden City Sand Co. (John Benedict, Agt., Davenport, Iowa), 134-37.  
Rock Island Register Co., 994-95.

**Rockland, Me.**

Bodwell Granite Co. (National Building Granite Quarries Association), 58-59.

**Rockport, Mass.**

Rockport Granite Co., 60-61; see also National Building Granite Quarries Association, 58-59.

**Rocky Hill, N. J.**

Atlantic Terra Cotta Co., 112-13.

**Roswell, N. M.**

Truscon Steel Co., 217-19; 702-03.

**Rugby, England.**

General Electric Co. (British Thomson-Houston Co., Ltd.), 1153-67.

**Rural Hall, N. C.**

Allright Mfg. Co., 848-89.



## S

**Sacramento, Cal.**

Crane Co., 1084-85.  
 Johns-Manville Co., H. W., 910.  
 Murphy Wall Bed Co. (John Breuner Co., Agts.), 1396-97.

**St. Catharines, Ont., Can.**

Lord & Burnham Co., 1458-61.

**St. John, N. B., Can.**

Barrett Co., 394-97.  
 Pratt & Cady Co., Inc. (Canadian Fairbanks-Morse Co., Ltd., Agts.), 1090-91.

**St. Joseph, Mo.**

Collier-Adams Mfg. Co. ("Bilt-Well" Service Bureau), 574-75.  
 Hydraulic-Press Brick Co. (St. Joseph Pressed Brick Co., Agts.), 82-83.  
 Westinghouse Electric & Mfg. Co. (Columbian Electrical Co., Agts.), 1169-76.

**St. Louis, Mo.**

Acme Cement Plaster Co., 140-41.  
 American Blower Co., 996-99.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co. (Joseph T. Ryerson & Son, Agts.), 344-45.  
 American Pressweld Radiator Corporation (W. C. Winsborough, Agt.), 952-53.  
 American Sheet and Tin Plate Co., 412-13.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 American Water Heater Co., Inc., 1018-19.  
 Aspromet Co., 414-16.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Atlas Portland Cement Co., 121-26.  
 Automatic Electric Co., 1238-39.  
 Barrett Co., 394-97.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
 Carr-Trombley Mfg. Co. ("Bilt-Well" Service Bureau), 574-75.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Boyle & Co., Inc., John, 411.  
 Brecht Co., 1050-52.  
 Bruner Granitoid Co., P. M., 337; 824-26.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Hunkins-Willis Lime & Cement Co., Agts.), 1382-85.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Dayton Malleable Iron Co. (Randolph Sales Co., Agts.), 246.  
 Dreadnought Flooring Co. (W. A. Wheeland, Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edison Lamp Works, 1224.  
 Ford Mfg. Co., 239.  
 Fowler & Pay (F. A. Cammann Builders Service Co., Agts.), 132.  
 General Electric Co., 1153-67.  
 General Fire Extinguisher Co., 1136-39.  
 Gillis & Geoghegan (Concrete Steel Fireproofing Co., Agts.), 1299-1305.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co., 1344-45.  
 Hunt & Co., Robert W., 8.  
 Hydraulic-Press Brick Co., 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Mfg. Co., Geo. W., 668.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (C. E. Barrell, Agt.), 464-65.  
 Josam Mfg. Co., 876-78.  
 Kaestner & Hecht Co., 1276-77.  
 Kawneer Mfg. Co., 488-90.  
 Kewanee Boiler Co., 975-77.  
 Kinnear Mfg. Co., 670-79.  
 Knappe Machine Co., John, 1399.  
 Koken Barbers' Supply Co., 1395.

**St. Louis, Mo.—Continued.**

Lamson Co., 1307.  
 Lasar Mfg. Co., 506-07.  
 Link-Belt Co., 1310.  
 Luminous Unit Co., 1227.  
 Majestic Co. (P. A. Haradon; Shapleigh Hardware Co., Agts.), 271-73.  
 Matthews & Brother, Inc., W. N., 864-65.  
 Medart Mfg. Co., Fred, 1423.  
 Merchant & Evans Co., 420; 470; 680.  
 Mesker Brothers Iron Co., 722-25.  
 Metallic Sash-Operator Co., 748-49.  
 Minneapolis Heat Regulator Co., 948-49.  
 Mississippi Glass Co., 810-11.  
 Mississippi Wire Glass Co., 812-15.  
 Monarch Metal Weather Strip Co., 786-87.  
 Murphy Wall Bed Co. (Murphy Door Bed Co. of St. Louis, Agts.), 1396-97.  
 National Tile Co. (Associated Tile Manufacturers), 284-87.  
 New York Belting & Packing Co., 322.  
 Ohio Blower Co., 472-74.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pauly Jail Building Co., 1488.  
 Permutit Co., 1130.  
 Pfauder Co., 1035.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Pittsburgh Testing Laboratory, 9.  
 Pratt & Cady Co., Inc. (J. R. Brockman Mfg. Co., Agts.), 1090-91.  
 Reflectolyte Co., 1232-34.  
 Reliance Fireproof Door Co. (St. Louis Sales Co., Reprs.), 656-57.  
 Richards-Wilcox Mfg. Co., 630-35.  
 St. Louis Wire & Iron Co., 523.  
 Scientific Heater Co. (Pittsburgh-Stewart Heater & Filter Co., Agts.), 1046-47.  
 Solar Metal Products Co., Inc. (Hickens-loop Material Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Stark Brick Co. (Illinois Supply & Construction Co., Reprs.), 88.  
 Sturtevant Co., B. F., 1006-07.  
 Taylor Co., N. & G., 426-28.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 United Lined Tube & Valve Co. (Hoyt Metal Co., Agts.), 1072-73.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 Van Kannel Revolving Door Co., 588-89; (St. Louis Sales Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (W. E. Way, Agt.), 593-97.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Wheeling Corrugating Department, 242-43.  
 Whitaker-Glessner Co. (Sears & Piou, Agts.), 241.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 York Mfg. Co., 1055.  
 Youngtown Sheet & Tube Co., 1074-75; 1180-81.

**St. Marys, Ohio.**

American Chain Co., Inc., 754.

**St. Paul Minn.**

American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Atlantic Insulated Wire & Cable Co., 1188-89.  
 Bishop-Babcock-Becker Co., 914-15.  
 Bitu-Mortar Waterproofing Co., Inc. (K. F. Lott & Co., Agts.), 40.  
 Bruner Granitoid Co., P. M. (Paul J. Kalman Co., Agts.), 337.  
 Burnett-Larsh Mfg. Co. (Crane & Ordway Co., Agts.), 1098-99.  
 Carter White Lead Co., 1315.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Garden City Sand Co. (S. B. Spates & Co., Agts.), 134-37.  
 General Fire Extinguisher Co., 1136-39.

**St. Paul, Minn.—Continued.**

Grauer & Co., Albert (Paul J. Kalman Co., Agts.), 337.  
 Hackney Ventilating Co., 1001.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co. (Corning-Donohue Brick Co., Agts.), 82-83.  
 International Insulation Co., 174.  
 Johns-Manville Co., H. W., 910.  
 Jordan & Co., Paul R. (E. K. Fleischer, Agt.), 464-65.  
 Kalman Co., Paul J., 193.  
 L. P. T. Specialty Co., 763.  
 Massachusetts Blower Co., 1005.  
 Minneapolis Heat Regulator Co., 948-49.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Seeger Refrigerator Co., 1063.  
 Solar Metal Products Co., Inc. (E. V. Walsh, Agt.), 645.  
 Stark Brick Co. (Twin City Brick Co., Reprs.), 88.  
 Truscon Steel Co., 217-19.  
 Twin City Varnish Co., 1365.  
 Van Kannel Revolving Door Co., 588-89; (F. M. Cady, Agt.), 1438.  
 Western Electric Co., 1202-03.  
 White Pine Bureau, 572.  
 Yeomans Brothers Co. (Healy-Ruff Co., Reprs.), 1122-23.

**Salem, Ohio.**

Clark Co., W. J., 252.  
 Deming Co., 1104-07.

**Salt Lake City, Utah.**

Allen Mfg. Co., W. D., 1131-33.  
 American Pressweld Radiator Corporation (E. H. Doherty, Agt.), 952-53.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Barrett Co., 394-97.  
 Burrowes Co., E. T., 790-92.  
 Certain-teed Products Corporation, 399-401.  
 Chicago Bridge & Iron Works, 1095.  
 Concrete Engineering Co., 24-25.  
 Crane Co., 1084-85.  
 Dunham Co., C. A., 916-21.  
 General Electric Co., 1153-67.  
 Johns-Manville Co., H. W., 910.  
 Kewanee Boiler Co., 975-77.  
 Kimball Brothers Co. (Wm. Watrous, Agt.), 1275.  
 Majestic Co. (Salt Lake Hardware Co., Agts.), 271-73.  
 Murphy Wall Bed Co. (J. T. Keith, Agt.), 1396-97.  
 Powers Regulator Co., 947.  
 Sturtevant Co., B. F., 1006-07.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Vonnegut Hardware Co. (Harris Bros., Agts.), 593-97.  
 Wagner Mfg. Co. (Charles F. Porter, Agt.), 638-39.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Inter-Mountain Electric Co., Agts.), 1169-76.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Yeomans Brothers Co. (Thos. A. Williams, Rep.), 1122-23.

**San Antonio, Tex.**

Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (West End Lumber Co., Agts.), 1382-85.  
 Clinton Wire Cloth Co. (W. C. Moody, Agt.), 227-31.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Truscon Steel Co., 217-19; 702-03.



**San Diego, Cal.**

Johns-Manville Co., H. W., 910.  
 Jordan & Co., Paul R. (J. S. Schirm Commercial Co., Agts.), 464-65.  
 Pittsburgh Water Heater Co., 1024-27.  
 Wagner Mfg. Co. (Waterhouse-Wilcox Co., c/o Theo. F. Snyder, Agts.), 638-39.

**San Francisco, Cal.**

Allith-Prouty Co., 614-15.  
 American Bitumastic Enamels Co., 1373.  
 American Blower Co., 996-99.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Pulley Co., 757.  
 American Sheet and Tin Plate Co. (United States Steel Products Co., Reps.), 412-13.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co. (United States Steel Products Co., Reps.), 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Automatic Refrigerating Co., 1048-49.  
 Barrell Co., William L. (Pacific Building Materials Co., Agts.), 410.  
 Beaton & Corbin Mfg. Co. (C. Erwin Gilchrist, Rep.), 935.  
 Beaver Board Companies, 170-71.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
 Berry Brothers, 1346.  
 Bishop-Babcock-Becker Co., 914-15.  
 Boston Varnish Co., 1340-41.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Brown Hoisting Machinery Co., 184-85.  
 Bryant Electric Co., 1207.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Pacific Building Materials Co., Agts.), 1382-85.  
 Canton Foundry & Machine Co. (C. J. Jorgenson Co., Reps.), 1486.  
 Carter White Lead Co., 1315.  
 Certain-teed Products Corporation, 399-401.  
 Chapman Valve Mfg. Co. (H. L. Dickinson, Rep.), 1080-81.  
 Chicago Bridge & Iron Works, 1095.  
 Clinton Wire Cloth Co. (L. A. Norris Co., Agts.), 227-31.  
 Columbian Hardware Co. (Rust-Godfrey Sales Co., Agts.), 762.  
 Consolidated Expanded Metal Companies (Holloway Expanded Metal Co., Reps.), 206-08.  
 Crane Co., 1084-85.  
 Cutler-Hammer Mfg. Co. (H. B. Squires Co., Agts.), 1208-09.  
 Dayton Malleable Iron Co. (Pacific Building Materials Co., Agts.), 246.  
 Deming Co. (Simonds Machinery Co., Agts.), 1104-07.  
 Dreadnought Flooring Co. (James P. Dwan, Inc., Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edison Lamp Works, 1224.  
 Edwards Mfg. Co., 418-19.  
 Electric Cable Co., 1190-91.  
 Foundation Co., 14.  
 General Electric Co., 1153-67.  
 General Gas Light Co., 1029.  
 Glauber Brass Mfg. Co., 856-61.  
 Glidden Co. (Whittier Coburn Co., Agts.), 1344-45.  
 Hart Mfg. Co., 1212-13.  
 Haslett Spiral Chute Co., 1306.  
 Herring-Hall-Marvin Safe Co., 1432.  
 Hubbell, Inc., Harvey, 1216-17.  
 Hunt & Co., Robert W., 8.  
 James Mfg. Co. (De Laval Dairy Supply Co., Agts.), 1466-70.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Jordan & Co., Paul R. (Rolph-Mills Co., Agts.), 464-65.  
 Josam Mfg. Co., 876-78.  
 Kellogg Co., M. W., 92-93.  
 Kennedy, Inc., David E., 326; 327.  
 Kennedy Valve Mfg. Co., 1088-89.

**San Francisco, Cal.—Continued.**

Kinnear Mfg. Co., 670-79.  
 Knape Machine Co., John, 1399.  
 Lamson Co., 1307.  
 Link-Belt Co., 1310.  
 Louisville Varnish Co., Inc., 1349.  
 Luminous Unit Co., 1227.  
 MacArthur Concrete Pile & Foundation Co., 10-11.  
 McShane Bell Foundry Co., 1451.  
 Majestic Co. (W. W. Montague & Co.; Pacific Hardware & Steel Co., Agts.), 271-73.  
 Meurer Bros. Co., Inc. (A. H. McDonald, Rep.), 422-23.  
 Montgomery Elevator Co., 1279.  
 Mosaic Tile Co. (Associated Tile Manufacturers), 284-87.  
 Murphy Wall Bed Co. (Marshall & Stearns, Agts.), 1396-97.  
 National Tile Co. (Associated Tile Manufacturers), 284-87.  
 National X-Ray Reflector Co. (F. S. Mills, Agt.), 1231.  
 New York Belting & Packing Co., 322.  
 New York Continental Jewell Filtration Co. (California Jewell Filter Co., Agts.), 1126.  
 Newman Clock Co., 1443.  
 Ogden Co., J. Edward (C. Roman & Co., Agts.), 682-83.  
 Ohio Blower Co. (Waterhouse-Wilcox Co., Agts.), 472-74.  
 Patent Vulcanite Roofing Co., 406-07.  
 Patton Paint Co., 1332-33.  
 Payson Mfg. Co. (A. V. Morse & Co., Reps.), 750-53.  
 Pfaudler Co., 1035.  
 Pitcairn Varnish Co. (Patton Paint Co., Agts.), 1352-53.  
 Pittsburgh Water Heater Co., 1024-27.  
 Pittsburgh Testing Laboratory, 9.  
 Pratt & Cady Co., Inc. (Paine & Co., Agts.), 1090-91.  
 Reed & Barton, 520-21.  
 Richards-Wilcox Mfg. Co., 630-35.  
 Riverside Boiler Works, Inc., 896-99.  
 Scientific Heater Co. (Jack Martin & Co., Agts.), 1046-47.  
 Silver Lake Co., 756.  
 Solar Metal Products Co., Inc. (C. Jorgensen Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Standard Electric Time Co., 1450.  
 Standard Paint Co., 48-49.  
 Standard Varnish Works, 1356-63.  
 Stanley & Patterson, Inc. (H. B. Squires Co., Agts.), 1246-55.  
 Sturtevant Co., B. F., 1006-07.  
 Tablet & Ticket Co., 1436-37.  
 Taylor Co., N. & G., 426-28.  
 Terrell's Equipment Co. (C. F. Weber & Co., Reps.), 1426-29.  
 Thomas Clock Co., Seth, 1446-47.  
 Trumbull Electric Mfg. Co., 1218-21.  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
 United States Gypsum Co., 162-68; 175; 438-39.  
 Universal Safety Tread Co., 347.  
 Valentine & Co. (W. P. Fuller & Co., Agts.), 1366-67.  
 Van Kannel Revolving Door Co., 588-89; (Waterhouse-Wilcox Co., Agts.), 1438.  
 Variety Mfg. Co., 688-91.  
 Wagner Mfg. Co. (Waterhouse-Wilcox Co., Agts.), 638-39.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Electric Railway & Mfrs. Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (C. W. Pike Co., Agts.), 241.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Wright Wire Co., 234-35.  
 Yeomans Brothers Co. (California Hydraulic Engineering & Supply Co., Reps.), 1122-23.  
 York Mfg. Co., 1055.

**San Francisco, Cal.—Continued.**

Youngstown Sheet & Tube Co., 1074-75; (Electric Agencies Co., Reps.), 1180-81.  
**Sandusky, Ohio.**  
 Mack Iron and Wire Works Co., 510-11.  
**Santiago, Chile, S. A.**  
 General Electric Co. (International Machinery Co., Reps.), 1153-67.  
**Savannah, Ga.**  
 Alpha Portland Cement Co., 119.  
 Atlas Portland Cement Co., 121-26.  
 Burrowes Co., E. T., 790-92.  
 Carter White Lead Co., 1315.  
 Crane Co., 1084-85.  
 Pittsburgh Plate Glass Co., 484-85.  
 Western Electric Co., 1202-03.  
**Schenectady, N. Y.**  
 General Electric Co., 1153-67.  
**Scottsdale, Pa.**  
 United States Cast Iron Pipe and Foundry Co., 305-07.  
**Scranton, Pa.**  
 Aspromet Co., 414-16.  
 Gifford-Wood Co., 1298.  
 Stark Brick Co. (R. N. La Bar, Rep.), 88.  
 Westinghouse Electric & Mfg. Co. (Penn Electrical Engineering Co., Agts.), 1169-76.  
**Seattle, Wash.**  
 American Blower Co., 996-99.  
 American District Steam Co., 912.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Pressweld Radiator Corporation (F. A. LaClercq, Agt.), 952-53.  
 American Pulley Co., 757.  
 American Sheet and Tin Plate Co. (United States Steel Products Co., Reps.), 412-13.  
 American Steel Window Co., 694-97.  
 American Steel & Wire Co. (United States Steel Products Co., Reps.), 30-33; 232-33; 1182-87.  
 Aspromet Co., 414-16.  
 Automatic Refrigerating Co., 1048-49.  
 Barrett Co., 394-97.  
 Cabot, Inc., Samuel (S. W. R. Dally, Agt.), 1382-85.  
 Certain-teed Products Corporation, 399-401.  
 Chicago Bridge & Iron Works, 1095.  
 Clinton Wire Cloth Co. (L. A. Norris Co., Agts.), 227-31.  
 Columbian Hardware Co. (T. D. McLean, Agt.), 762.  
 Crane Co., 1084-85.  
 Custodis Chimney Construction Co., Alphon, 89.  
 Cutler-Hammer Mfg. Co. (H. B. Squires Co., Agts.), 1208-09.  
 Dayton Malleable Iron Co. (F. T. Crowe & Co., Agts.), 246.  
 Dreadnought Flooring Co. (S. W. R. Dally, Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 418-19; 1410-11.  
 General Electric Co., 1153-67.  
 General Fireproofing Co., 1414.  
 Hart Mfg. Co., 1212-13.  
 Hunt & Co., Robert W., 8.  
 Hydraulic-Press Brick Co. (F. T. Crowe & Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co., 942-46.  
 Kawneer Mfg. Co., 488-90.  
 Kinnear Mfg. Co., 670-79.  
 Lamson Co., 1307.  
 Link-Belt Co., 1310.  
 Majestic Co. (Kohler Supply & Tiling Co., Agts.), 271-73.  
 Marble & Shattuck Chair Co. (J. A. Cloney, Agt.), 1400-01.  
 Murphy Wall Bed Co. (F. T. Crowe & Co., Agts.), 1396-97.  
 Ogden Co., J. Edward (Rolph, Mills & Co.), Agts.), 682-83.



**Seattle, Wash.—Continued.**

Ohio Blower Co. (D. E. Fryer & Co., Agts.), 472-74.  
 Patton Paint Co., 1332-33.  
 Pitcairn Varnish Co. (Patton Paint Co., Agts.), 1352-53.  
 Pittsburgh Testing Laboratory, 9.  
 Powers Regulator Co., 947.  
 Solar Metal Products Co., Inc. (D. E. Fryer & Co., Agts.), 645.  
 Sprague Electric Works, 1168.  
 Stanley & Patterson, Inc. (H. B. Squires Co., Agts.), 1246-55.  
 Sturtevant Co., B. F., 1006-07.  
 Taylor Co., N. & G., 426-28.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (F. T. Crowe & Co., Agts.), 593-97.  
 Wagner Mfg. Co. (F. T. Crowe & Co., Agts.), 638-39.  
 Walworth Mfg. Co., 1144.  
 Western Electric Co., 1202-03.  
 Westinghouse Electric & Mfg. Co. (Fobes Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Whitaker-Glessner Co. (Hilton-Pike-Oakley Co., Agts.), 241.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Yeomans Brothers Co. (L. A. Marsch, Rep.), 1122-23.  
 York Mfg. Co., 1055.  
 Youngstown Sheet & Tube Co., 1074-75; (Electric Agencies Co., Reps.), 1180-81.

**Seneca Falls, N. Y.**

Goulds Mfg. Co., 1108-09.

**Seoul, Korea.**

General Electric Co. (Mitsui Bussan Kaisha, Ltd., Reps.), 1153-67.

**Seymour, Conn.**

Church, Stephen B., 1100.

**Shanghai, China.**

General Electric Co. (Anderson, Meyer & Co., Reps.), 1153-67.

**Shelby, Ohio.**

Shelby Spring Hinge Co., 606-07.

**Sheridan, Wyo.**

Jordan & Co., Paul R. (Sheridan Iron Works, Agts.), 464-65.

**Sioux City, Iowa.**

Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Hansen Glass & Paint Co., Agts.), 1382-85.  
 Crane Co., 1084-85.  
 Curtis Sash & Door Co. (Curtis Service Bureau), 578-79.  
 Garden City Sand Co. (H. C. McNeil & Son, Agts.), 134-37.  
 Gillis & Geoghegan (Haakinson & Beaty Co., Agts.), 1299-1305.  
 Westinghouse Electric & Mfg. Co. (McGraw Co., Agts.), 1169-76.

**Sioux Falls, S. Dak.**

Garden City Sand Co. (W. C. Buchanan Lumber Co., Agts.), 134-37.

**Slatington, Pa.**

Natural Slate Blackboard Co., 376-77.

**Somerville, Mass.**

McGann & Sons Co., T. F., 508-09.

**South Bend, Ind.**

Garden City Sand Co. (Staples-Hildebrand Co., Agts.), 134-37.  
 Indiana Lumber & Mfg. Co., 580-81.

**South Boston, Mass.**

Berger Mfg. Co., 176-82; 202-05; 417; 1406-08.  
 Flexner-Taylor Co., 320.

**South Milwaukee, Wis.**

Stowell Co., 636-37.

**South River, N. J.**

Alignum Fireproof Products Co., Inc., 646-47.

**Southington, Conn.**

Beaton & Corbin Mfg. Co. (Charles G. Bodley, Rep.), 935.

**Spiceland, Ind.**

Draper Shade Co., Luther O., 807.

**Spokane, Wash.**

American Mailing Device Corporation, 1439.  
 Burrowes Co., E. T., 790-92.  
 Certain-teed Products Corporation, 399-401.  
 Chamberlin Metal Weather Strip Co., 781.  
 Crane Co., 1084-85.  
 Dayton Malleable Iron Co. (F. T. Crowe & Co., Agts.), 246.  
 Dunham Co., C. A., 916-21.  
 General Electric Co., 1153-67.  
 Glidden Co. (Marshall Wells Hardware Co., Agts.), 1344-45.  
 Kinnear Mfg. Co., 670-79.  
 Lehigh Portland Cement Co., 127.  
 Solar Metal Products Co., Inc. (D. E. Fryer & Co., Agts.), 645.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (Consolidated Supply Co., Agts.), 593-97.  
 Westinghouse Electric & Mfg. Co. (Washington Elec. Supply Co., Agts.), 1169-76.  
 Wilson Corporation, J. G., 692-93; 804-05.

**Springfield, Ill.**

Garden City Sand Co. (Peter Vredenburg Lumber Co., Agts.), 134-37.  
 Jordan & Co., Paul R. (B. B. Cones, Agt.), 464-65.

**Springfield, Mass.**

Bigelow Wire Works, Cheney, 491.  
 Certain-teed Products Corporation, 399-401.

Crane Co., 1084-85.

General Electric Co., 1153-67.

Gilbert & Barker Mfg. Co., 1478-79.

Hampden Paint & Chemical Co., 1320-21.

Minneapolis Heat Regulator Co., 948-49.

Standard Electric Time Co., 1450.

Wadsworth, Howland & Co., Inc., 1338-39.

**Springfield, Mo.**

Hydraulic-Press Brick Co. (Lumbermen's Supply Co., Agts.), 82-83.

**Springfield, Ohio.**

Bayley Co., William, 698-99.

**Stamford, Conn.**

Anchor Post Iron Works, 537-43.  
 Atlantic Insulated Wire & Cable Co., 1188-89.

**Stanhope, N. J.**

United States Mineral Wool Co., 357.

**Sterling, Ill.**

National Mfg. Co., 621-25.  
 Sterling Foundry Co., 274.

**Stockton, Cal.**

Johns-Manville Co., H. W., 910.

**Stonington, Me.**

Goss Corp., John L. (National Building Granite Quarries Association), 58-59.

**Streator, Ill.**

Western Glass Co., 818-19.

**Sturgis, Mich.**

Garden City Sand Co. (R. L. Webb Lumber Co., Agts.), 134-37.

**Superior, Wis.**

United States Cast Iron Pipe and Foundry Co., 305-07.

**Sydney, Australia.**

Automatic Electric Co. (Automatic Telephones (Australasia), Ltd., Agts.), 1238-39.  
 Beaver Board Companies, 170-71.  
 Certain-teed Products Corporation, 399-401.  
 General Electric Co. (Australian General Electric Co., Reps.), 1153-67.  
 Master Builders Co., 339.  
 Pratt & Lambert, Inc., 1354-55.  
 Vonnegut Hardware Co. (F. Lindsay Thompson, Agt.), 593-97.

**Sydney, N. S., Can.**

Barrett Co., 394-97.

**Syracuse, Ind.**

Sandusky Cement Co., 56; 128.

**Syracuse, N. Y.**

Cabot, Inc., Samuel (Alex. Grant's Sons, Agts.), 1382-85.  
 Concrete Steel Co., 188-89.  
 Corrugated Bar Co., 22; 190-92.  
 Crane Co., 1084-85.  
 Crouse-Hinds Co., 1178.  
 Dayton Malleable Iron Co. (Paragon Plaster Co., Agts.), 246.  
 Dexter Brothers Co. (F. P. Collins Paint Co., Agts.), 1381.  
 Dunham Co., C. A., 916-21.  
 General Electric Co., 1153-67.  
 Glidden Co., 1344-45.  
 Hydraulic-Press Brick Co. (Paragon Plaster Co., Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Kelsey Heating Co., 958-59.  
 Minneapolis Heat Regulator Co., 948-49.  
 National Roofing Co. (Onondaga Builders Supply Co., Agts.), 389.  
 Natroco Paint & Varnish Works (Onondaga Builders Supply Co., Agts.), 1334.  
 Solar Metal Products Co., Inc. (Paragon Plaster Co., Agts.), 645.  
 Stark Brick Co. (Fiske & Co., Inc., Reps.), 88.  
 Stearns & Co., E. C., 909.  
 Truscon Steel Co., 217-19; 702-03.  
 Westinghouse Electric & Mfg. Co. (H. C. Roberts Electric Supply Co., Agts.), 1169-76.  
 Westinghouse Lamp Co., 1225.  
 Windshield Scupper Co. (E. H. Goodrich, Agt.), 276.

**T****Tacoma, Wash.**

American Mailing Device Corporation, 1439.  
 Crane Co., 1084-85.  
 Johns-Manville Co., H. W., 910.  
 Jordan & Co., Paul R. (Savage-Scofield Co., Agts.), 464-65.  
 Solar Metal Products Co., Inc. (D. E. Fryer & Co., Agts.), 645.  
 Variety Mfg. Co., 688-91.  
 Vonnegut Hardware Co. (F. T. Crowe & Co., Agts.), 593-97.  
 Yeomans Brothers Co. (L. A. Marsch, Rep.), 1122-23.

**Tampa, Fla.**

Cabot, Inc., Samuel (Knight & Wall Co., Agts.), 1382-85.  
 Hydraulic-Press Brick Co. (I. W. Phillips & Co., Agts.), 82-83.  
 Jordan & Co., Paul R. (G. M. McDonough, Agt.), 464-65.

**Tate, Ga.**

Georgia Marble Co., 68-69.

**Taunton, Mass.**

Reed & Barton, 520-21.

**Terre Haute, Ind.**

Central Creosoting Co., 311.  
 Crane Co., 1084-85.  
 Prox Co., Frank, 980-81.

**Thomaston, Conn.**

Thomas Clock Co., Seth, 1446-47.

**Thorold, Ont., Can.**

Beaver Board Companies, 170-71.

**Tokyo, Japan.**

General Electric Co. (Mitsui Bussan Kaisha, Ltd., Reps.), 1153-67.  
 Vonnegut Hardware Co. (F. W. Horne Co., Agts.), 593-97.

**Toledo, Ohio.**

Alignum Fireproof Products Co., Inc., 646-47.  
 Automatic Electric Co., 1238-39.  
 Collier-Barnett Co. ("Bilt-Well" Service Bureau), 574-75.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Bruner Granitoid Co., P. M. (Building Products Co., Agts.), 337; 824-26.

**Toledo, Ohio.—Continued.**

Burnett-Larsh Mfg. Co., 1098-99.  
 Cabot, Inc., Samuel (Toledo Builders' Supply Co., Agts.), 1382-85.  
 Chamberlin Metal Weather Strip Co., 781.  
 Dreadnought Flooring Co. (Charles F. Heine, Agt.), 325.  
 Garden City Sand Co. (Toledo Builders' Supply Co., Agts.), 134-37.  
 General Electric Co., 1153-67.  
 Gillis & Geoghegan (Building Products Co., Agts.), 1299-1305.  
 Grauer & Co., Albert (Building Products Co., Agts.), 337; 824-26.  
 Hydraulic Press Brick Co., 82-83.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 National X-Ray Reflector Co. (E. R. Gillet, Agt.), 1321.  
 Patton Paint Co. (Pittsburgh Plate Glass Co., Agts.), 1332-33.  
 Pitcairn Varnish Co. (Pittsburgh Plate Glass Co., Agts.), 1352-53.  
 Pittsburg Water Heater Co., 1024-27.  
 Pittsburgh Plate Glass Co., 484-85.  
 Stark Brick Co. (Toledo Pulp Plaster Co., Reps.), 88.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Westinghouse Electric & Mfg. Co., 1169-76.  
 Whitaker-Glessner Co. (Dean Higgins Co., Agts.), 241.

**Tonawanda, N. Y.**

National Roofing Co. (Cordes, Ayrault & Co.), 389.  
 Natroco Paint & Varnish Works (Cordes, Ayrault & Co., Agts.), 1334.

**Topeka, Kans.**

Burrowes Co., E. T., 790-92.  
 Carney's Cement Co. (Lumbermen's Supply Co., Reps.), 129.  
 Curtis, Towle & Paine Co. (Curtis Service Bureau), 578-79.  
 Hydraulic-Press Brick Co. (Lumbermen's Supply Co., Agts.), 82-83.  
 Reliance Fireproof Door Co. (Topeka Foundry & Iron Works, Reps.), 656-57.

**Toronto, Ont., Can.**

A. B. See Electric Elevator Co., 1262-63.  
 American Laundry Machinery Co. (Canadian Laundry Machinery Co., Ltd.), 1036.  
 Barrett Co., 394-97.  
 Beaton & Corbin Mfg. Co. (W. H. Cunningham, Rep.), 935.  
 Benjamin Electric Mfg. Co., 1177; 1206.  
 Best Register Co., 988-89.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Burrowes Co., E. T., 790-92.  
 Clinton Wire Cloth Co. (Pedlar People, Ltd., Agts.), 227-31.  
 Consolidated Expanded Metal Companies (Baines & Peckover, Reps.), 206-08.  
 Custodis Chimney Construction Co., Alphones, 89.  
 Deming Co. (Darling Bros. Ltd., Agts.), 1104-07.  
 Dunham Co., C. A., 916-21.  
 General Electric Co. (Canadian General Electric Co., Ltd.), 1153-67.  
 General Fire Extinguisher Co. (Canadian General Fire Extinguisher Co., Ltd.), 1136-39.  
 Glidden Co. (Glidden Co., Ltd., Agts.), 1344-45.  
 Hart Mfg. Co., 1212-13.  
 Hubbell, Inc., Harvey (R. E. T. Pringle, Ltd., Agts.), 1216-17.  
 Hunt & Co., Robert W., 8.  
 Hydraulic-Press Brick Co. (Drummond & Reeves, Ltd., Agts.), 82-83.  
 Jennison-Wright Co., 312-13.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co. (Johnson Temperature Regulating Co. of Canada, Ltd., Reps.), 942-46.  
 Kawneer Mfg. Co., 488-90.  
 Kellogg Co., M. W. (Canadian Kellogg Co., Ltd.), 92-93.  
 Lamson Co., 1307.

**Toronto Ont., Can.—Continued.**

Lord & Burnham Co., 1458-61.  
 Lowe Brothers Co. (Lowe Brothers, Ltd.), 1328-29.  
 Master Builders Co., 339.  
 Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
 Minneapolis Heat Regulator Co., 948-49.  
 National X-Ray Reflector Co. (Geo. J. Beattie, Agt.), 1231.  
 Pittsburg Water Heater Co., 1024-27.  
 Powers Regulator Co. (Canadian Powers Regulator Co., Ltd.), 947.  
 Pratt & Cady Co., Inc. (Canadian Fairbanks-Morse Co., Ltd., Agts.), 1090-91.  
 Scientific Heater Co. (Consumers Gas Co., Agts.), 1046-47.  
 Snead & Co. Iron Works, Inc., 1424-25.  
 Standard Varnish Works (International Varnish Co., Ltd. Agts.), 1356-63.  
 Toch Brothers, 50-51.  
 United Electric Co., 1258-59.  
 Yeomans Brothers Co. (Darling Brothers, Ltd., Reps.), 1122-23.  
 York Mfg. Co. (Canadian Ice Machine Co., Ltd., Agts.), 1055.

**Tottenville, S. I., N. Y.**

Atlantic Terra Cotta Co., 112-13.

**Trenton, N. J.**

Maddock's Sons Co., Thomas, 835-42.  
 Monument Pottery Co., 843-46.  
 Mueller Mosaic Co., 293.  
 Riverside Boiler Works, Inc., 896-99.  
 Westinghouse Lamp Co., 1225.

**Troy, N. Y.**

American Blower Co., 996-99.  
 Globe Ventilator Co., 463.  
 Meneely Bell Co., 1452.

**Tulsa, Okla.**

Burnett-Larsh Mfg. Co. (E. C. Barnes, Agt.), 1098-99.  
 Johns-Manville Co., H. W., 910.

**Turin, Italy.**

Sturtevant Co., B. F. (Sturtevant Engineering Co.), 1006-07.

**Two Rivers, Wis.**

Hamilton Mfg. Co., 5.

**U****Utica, N. Y.**

Certain-teed Products Corporation, 399-401.  
 Hart & Crouse Co., 965-67.  
 Hydraulic-Press Brick Co. (American Hard Wall Plaster Co., Agts.), 82-83.  
 International Heater Co., 968-73.  
 Jordan & Co., Paul R. (J. E. Bowen, Agt.), 464-65.  
 Solar Metal Products Co., Inc. (American Hardwall Plaster Co., Agts.), 645.

**V****Valhalla, N. Y.**

Presbrey-Coykendall Co., 62.

**Valley Forge, Pa.**

Magnesia Association of America (Ehret Magnesia Co., Rep.), 1078-79.

**Vancouver, B. C., Can.**

Barrett Co., 394-97.  
 Clinton Wire Cloth Co. (L. A. Norris Co., Agts.), 227-31.  
 Crane Co., 1084-85.  
 Dunham Co., C. A., 916-21.  
 General Fire Extinguisher Co. (Canadian General Fire Extinguisher Co., Ltd.), 1136-39.  
 Hubbell, Inc., Harvey (R. E. T. Pringle, Ltd., Agts.), 1216-17.  
 Hunt & Co., Robert W., 8.  
 Johnson Service Co. (Johnson Temperature Regulating Co. of Canada, Ltd., Reps.), 942-46.  
 Johns-Manville Co., H. W., 910.

**Vancouver, B. C., Can.—Continued.**

Kinnear Mfg. Co., 670-79.  
 Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
 Murphy Wall Bed Co. (Leslie-Taylor Co., Ltd., Agts.), 1396-97.  
 Sturtevant Co., B. F. (B. F. Sturtevant Co. of Canada, Ltd.), 1006-07.  
 Variety Mfg. Co., 688-91.  
 Yeomans Brothers Co. (Frank Darling & Co., Reps.), 1122-23.

**Vandalia, Ill.**

Ford Mfg. Co., 239.

**Victoria, B. C., Can.**

Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
 Wilson Corporation, J. G., 692-93; 804-05.

**W****Waco, Texas.**

Cabot, Inc., Samuel (Nash-Robinson Co., Agts.), 1382-85.

**Wakefield, Mass.**

Glidden Co., 1344-45.

**Walkerville, Ont., Can.**

Berry Brothers, 1346.  
 Trus-Con Laboratories (Trus-Con Laboratories of Canada, Ltd., Agts.), 52-53.

**Waltham, Mass.**

Aspromet Co., 414-16.  
 Universal Safety Tread Co., 347.

**Walton, N. S., Can.**

Rock Plaster Mfg. Co., 160.

**Wampum, Pa.**

American Cement Tile Mfg. Co., 432-33.

**Warren, Ohio.**

General Fire Extinguisher Co., 1136-39.  
 Sykes Metal Lath and Roofing Co. (Associated Metal Lath Manufacturers), 196-201.

**Washington, D. C.**

A. B. See Electric Elevator Co., 1262-63.  
 Alberene Stone Co., 890-91.  
 American Laundry Machinery Co., 1036.  
 American Mailing Device Corporation, 1439.  
 American Mason Safety Tread Co., 344-45.  
 American Pressweld Radiator Corporation (M. E. Danforth, Agt.), 952-53.  
 Anchor Post Iron Works, 537-43.  
 Automatic Refrigerating Co., 1048-49.  
 Barrell Co., William L. (Asbestos Covering Co., Agts.), 410.  
 Bird & Son, 390-91.  
 Bowser & Co., Inc., S. F., 1476-77.  
 Bruner Granitoid Co., P. M. (Southern Building Supply Co., Inc., Agts.), 337; 824-26.  
 Burrowes Co., E. T., 790-92.  
 Cabot, Inc., Samuel (Lally & Rohlader, Agts.), 1382-85.  
 Chamberlin Metal Weather Strip Co., 781.  
 Chesley Co., Inc., A. C., 710-11.  
 Conkling-Armstrong Terra Cotta Co. (Lally-Rohlader Co., Agts.), 114.  
 Crane Co., 1084-85.  
 Curtis & Yale Co. (Curtis Service Bureau), 578-79.  
 Dreadnought Flooring Co. (J. M. Adams, Agt.), 325.  
 Dunham Co., C. A., 916-21.  
 Edwards Mfg. Co., 418-19; 1410-11.  
 General Electric Co., 1153-67.  
 General Fireproofing Co., 42; 210-13; 1414.  
 Gorham Co. Architectural Bronze, 502-03.  
 Grauer & Co., Albert (Southern Building Supply Co., Inc., Agts.), 337; 824-26.  
 Hart & Crouse Co., 965-67.  
 Huntington Roofing Tile Co., 434-35.  
 Hydraulic-Press Brick Co., 82-83.  
 Hydrex Felt & Engineering Co., 44.  
 Interior Metal Mfg. Co., 654-55.  
 International Insulation Co., 174.  
 Johns-Manville Co., H. W., 910.  
 Kennedy, Inc., David E., 326; 327.  
 Ketcham, O. W., 118.  
 Lupton's Sons Co., David, 704-08.



**Washington, D. C.—Continued.**

National X-Ray Reflector Co. (H. O. Butler, Agt.), 1231.  
 Nonpareil Skylight Co., 450-51.  
 Penn Metal Co., 216.  
 Pittsburg Water Heater Co., 1024-27.  
 Reliance Fireproof Door Co. (C. A. Hofferberth, Rep.), 656-57.  
 Solar Metal Products Co., Inc. (Lally-Rohlader Co., Agts.), 645.  
 Stark Brick Co. (Hydraulic-Press Brick Co., Reprs.), 88.  
 Sturtevant Co., B. F., 1006-07.  
 Trus-Con Laboratories, 52-53.  
 Truscon Steel Co., 217-19; 702-03.  
 Van Dorn Iron Works, 1428.  
 Van Kannel Revolving Door Co., 588-89.  
 Vonnegut Hardware Co. (T. B. & H. S. Hendrickson, Agts.), 593-97.  
 Westinghouse Electric & Mfg. Co. (Carroll Electric Co., Agts.), 1169-76.  
 Wilson Corporation, J. G., 692-93; 804-05.  
 Witherow Steel Co., 195.  
 Yeomans Brothers Co. (DeWitt W. Smith, Rep.), 1122-23.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Washington, Pa.**

Highland Glass Co., 808-09.

**Waterbury, Conn.**

American Brass Co., 1071.

**Waterloo, Iowa.**

Herrick Refrigerator Co., 1060-61.

**Watertown, Mass.**

Thermograde Valve Co., 913.

**Watertown, N. Y.**

Burrowes Co., E. T., 790-92.

**Watertown, S. Dak.**

Crane Co., 1084-85.

**Watsessing, N. J.**

General Electric Co., 1153-67.

**Waukegan, Ill.**

Cyclone Fence Co., 546-48.  
 Muller & Co., Franklyn R., 335.  
 National Kellastone Co., 138-39.

**Wausau, Wis.**

Curtis & Yale Co. (Curtis Service Bureau), 578-79.

**Webster, N. Y.**

Trus-Con Laboratories, 52-53.

**Wellington, New Zealand.**

General Electric Co. (National Electrical & Engineering Co., Ltd., Reprs.), 1153-67.  
 Wilson Corporation, J. G., 692-93; 804-05.

**West Castleton, Vt.**

Penrhyn Slate Co., 365.

**West Coplay, Pa.**

Lehigh Portland Cement Co., 127.

**West Chelmsford, Mass.**

Fletcher Co., H. E. (National Building Granite Quarries Association), 58-59.

**West Pawlet, Vt.**

Rising & Nelson Slate Co., 368-69.

**Westerly, R. I.**

New England Granite Works (National Building Granite Quarries Association), 58-59.

**Wheeling, W. Va.**

Merchant & Evans Co., 420; 470; 680.  
 Wheeling Corrugating Department, 242-43.  
 Wheeling Tile Co. (Associated Tile Manufacturers), 284-87.  
 Whitaker-Glessner Co., 241.

**Wichita, Kans.**

Burnett-Larsh Mfg. Co. (W. C. Vail, Agt.), 1098-99.  
 Burrowes Co., E. T., 790-92.  
 Carney's Cement Co. (Lumbermen's Supply Co., Reprs.), 129.  
 Certain-teed Products Corporation, 399-401.  
 Crane Co., 1084-85.  
 Hydraulic-Press Brick Co. (Lumbermen's Supply Co., Agts.), 82-83.  
 Westinghouse Electric & Mfg. Co. (United Electric Co., Agts.), 1169-76.

**Wilkes-Barre, Pa.**

American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Chamberlin Metal Weather Strip Co., 781.  
 Johns-Manville Co., H. W., 910.  
 Westinghouse Electric & Mfg. Co., 1169-76.

**Wilmington, N. C.**

King & Co., J. B., 153.

**Wind Gap, Pa.**

Natural Slate Blackboard Co., 376-77.

**Windsor, N. S., Can.**

King & Co., J. B., 153.

**Windsor, Ont., Can.**

American Blower Co. (Canadian Sirocco Co., Agts.), 996-99.  
 Penberthy Injector Co., 882-83.

**Winnipeg, Man., Can.**

Automatic Electric Co. (Automatic Telephone Mfg. Co., Ltd., Agts.), 1238-39.  
 Barrett Co., 394-97.  
 Best Register Co., 988-89.  
 Clinton Wire Cloth Co. (Pedlar People, Ltd., Agts.), 227-31.  
 Crane Co., 1084-85.  
 Deming Co. (Darling Bros. Ltd., Agts.), 1104-07.  
 Dunham Co., C. A., 916-21.  
 Hubbell, Inc., Harvey (R. E. T. Pringle, Ltd., Agts.), 1216-17.  
 Hydraulic-Press Brick Co. (N. J. Dinnen & Co., Ltd. Agts.), 82-83.  
 Johns-Manville Co., H. W., 910.  
 Johnson Service Co. (Johnson Temperature Regulating Co. of Canada, Ltd., Reprs.), 942-46.  
 Kellogg Co., M. W. (Canadian Kellogg Co., Ltd.), 92-93.  
 Kinnear Mfg. Co., 670-79.  
 Matthews & Brother, Inc., W. N. (Northern Electric Co., Ltd., Agts.), 864-65.  
 Powers Regulator Co. (Canadian Powers Regulator Co., Ltd.), 947.

**Winnipeg, Man., Can.—Continued.**

Praff & Cady Co., Inc. (Canadian Fairbanks-Morse Co., Ltd., Agts.), 1090-91.  
 Sturtevant Co., B. F. (B. F. Sturtevant Co. of Canada, Ltd.), 1006-07.  
 Variety Mfg. Co., 688-91.  
 Yeomans Brothers Co. (Darling Brothers, Ltd., Reprs.), 1122-23.

**Winslow, Ariz.**

Acme Cement Plaster Co., 140-41.

**Woburn, Mass.**

Guastavino Co., R., 34-35.

**Woodbridge, N. J.**

Federal Terra Cotta Co., 115.

**Woodbury, Vt.**

Woodbury Granite Co., 65.

**Worcester, Mass.**

American Steel & Wire Co., 30-33; 232-33; 1182-87.  
 Eastern Bridge & Structural Co., 18-19.  
 Hill Clothes Dryer Co., 1037.  
 Wadsworth, Howland & Co., Inc., 1338-39.  
 Wright Wire Co., 234-35.

**Y****Yokohama, Japan.**

General Electric Co. (General Electric Co. and Bagnall & Hilles, Reprs.), 1153-67.

**Yonkers, N. Y.**

Habirshaw Electric Cable Co., Inc., 1193-1201.

**York, Pa.**

American Chain Co., Inc., 754.  
 Certain-teed Products Corporation, 399-401.  
 Sandusky Cement Co., 56; 128.  
 Smyser-Royer Co., 528.  
 York Mfg. Co., 1055.  
 York Safe and Lock Co., 1433.

**Youngstown, Ohio.**

Concrete Steel Co., 188-89.  
 General Electric Co., 1153-67.  
 General Fireproofing Co., 42; 210-13; 1414; see also Associated Metal Lath Manufacturers, 196-201.  
 Johns-Manville Co., H. W., 910.  
 Stark Brick Co. (Youngstown Ice Co., Reprs.), 88.  
 Truscon Steel Co., 217-19; 702-03; see also Associated Metal Lath Manufacturers, 196-201.  
 Youngstown Pressed Steel Co., 224-26.  
 Youngstown Sheet & Tube Co., 1074-75; 1180-81.

**Z****Zanesville, Ohio.**

American Encaustic Tiling Co., Ltd. (Associated Tile Manufacturers), 284-87.  
 Mosaic Tile Co. (Associated Tile Manufacturers), 284-87.





# AMERICAN DRAFTING FURNITURE CO.

22 Railroad Street  
ROCHESTER, N. Y.

## Products.

Manufacturers of DRAWING TABLES; DRAWING BOARDS; FILING CABINETS; BLUE PRINTING MACHINES and DRIERS; SPECIAL EQUIPMENT for DRAFTING ROOMS in factory, school or office.

**AMERICAN**  
DRAFTING FURNITURE CO.

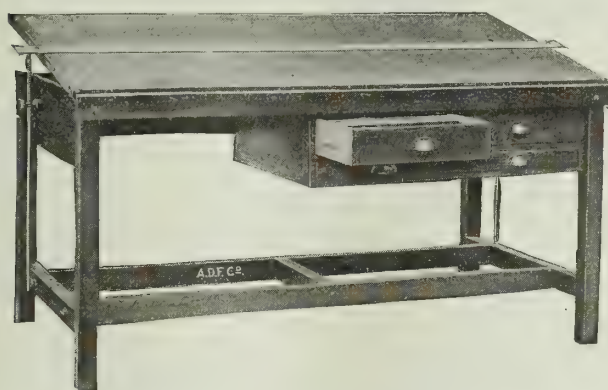
TRADE-MARK

## Specials.

This company manufactures considerable special equipment, of both wood and metal, to customers' specifications, and would appreciate an opportunity to quote on requirements.

## Knocked Down Tables.

Made in nine regular sizes of tops (37 by 60 ins. to 48 by 96 ins.) with various drawer section arrangements to meet all requirements. Tops of soft white pine, either adjustable or fixed. Bases of solid oak.



KNOCKED DOWN TABLE  
Showing adjustable top, parallel rule and filing cabinet

## Monroe Drawing Table.

Unquestionably the most popular and widely used drawing table made. Bases of solid oak, and tops of white pine made in seven regular sizes, 31 by 42 ins. to 43 by 72 ins. Height and tilting adjustments.

Absolutely rigid construction throughout.

The addition of the parallel ruler as illustrated, also the use of the swinging drawer attachment where advisable, will materially increase the efficiency of any drawing table.

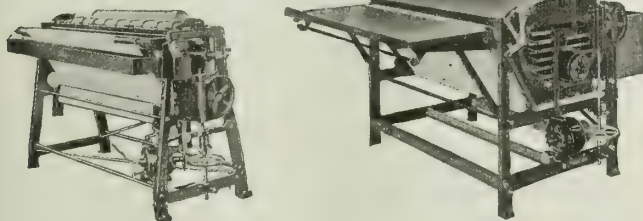


MONROE DRAWING TABLE  
Shown with parallel rule and one drawer only

## Blue Printing Equipment.

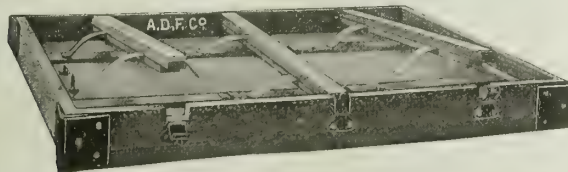
PARAGON BLUE PRINTING MACHINE—By actual test this machine has proved itself the fastest and most efficient on the market for large or small blue prints. Paper cut to any required size can be used, thus eliminating all waste, and saving labor of trimming.

PARAGON PRINT DRIER—Handles photographic prints as well as blue prints. Further information and a list of users will be given on request.



PARAGON PRINT DRIER PARAGON BLUE PRINTING MACHINE

BLUE PRINTING FRAMES AND CARRIAGES—Three styles of frames, in stock sizes from 12 by 16 ins. to 36 by 60 ins., with several styles of carriages, track, etc.



BLUE PRINTING FRAME

## Sectional Filing Cabinets.

"American" cabinets are carried in stock in two styles and three sizes. Various drawer arrangements to meet practically any requirements. High grade construction throughout. Paneled ends and backs. Drawer corners dovetailed. Drawer bottoms of 3-ply veneer. Covers at back to prevent drawings from creeping over.

Catalogue gives complete description.

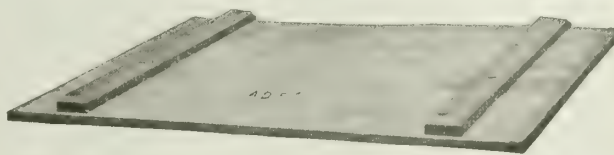
Drawings and prices on special cabinets submitted on receipt of specifications.



STANDARD SECTIONAL FILING CABINET

## Drawing and Layout Boards.

Only the best quality white pine and best construction used in "American" boards. Three styles and any size. Special boards to order.



LAYOUT OR DRAWING BOARD

# ECONOMY DRAWING TABLE CO.

Drawing Tables, Sectional Filing Cases and Special Furniture  
in Steel and Wood

ADRIAN, MICH.

## Products.

Manufacturers of DRAWING TABLES, SECTIONAL FILING CASES and SPECIAL FURNITURE in wood and steel for schools, colleges, drafting rooms.



many other little conveniences—enable the draftsman to work with ease, speed and accuracy. They are the drawing tables for a modern drafting room.

## Facilities.

We operate the largest drawing room furniture factory in the United States, and carry a large variety of styles for immediate shipment. All work is of the highest grade.

Economy tables and cases are used by the leading manufacturers, the Government, State, County and City Departments throughout the country. Also by the leading schools and colleges.

If interested in "Economy," we will be pleased to favor architects with illustrated catalogue and price list upon application.

## Economy Efficiency.

Economy drawing tables and filing cases are used everywhere. For efficiency in the drafting room, use Economy filing cases.

Economy is always wise expenditure. It is not what is spent, but what is gained. Investigate what is gained by the use of Economy drawing tables and filing cases. They are planned by an engineer who knows the needs of a draftsman.

Files drawings and tracings flat.

## Specifications for Standard Wood Tables and Cases.

**MATERIAL**—Drawing boards and tops of tables made of soft white pine. All other exposed parts of standard tables and filing cases, plain oak. Drawers and slides of cherry or other hardwood. Drawer bottoms a single panel of 3-ply veneer. Other unexposed parts of light, soft wood. All material air seasoned, kiln dried and kept at an even temperature during manufacture. Material heated before gluing.

**CONSTRUCTION**—Workmanship is best cabinet work, all joints mortised, tenoned and glued. Drawer sides dovetailed to front and back. Tops fastened to frames with buttons in slots, allowing expansion and contraction. Frame of tables independent of top, firmly constructed and thoroughly braced.

**FINISH**—3-coat, dull rubbed. Unless otherwise requested, work is finished in antique oak, but any kind of finish can be made.

## Standard Drawing Tables.

Standard drawing tables have a frame of braces about 6 ins. from floor, insuring rigidity and providing foot rest for the draftsman. There are wide rails at the ends and back of table tops. Across the front there is a rubbing strip, and a flat rail dovetailed into the top of the legs. A guard  $\frac{1}{4}$  in. high runs along top of table at back to prevent pencils and papers from falling off. Vertical adjustment of tables Nos. 0 to 4 is secured by raising blocks. Tops can be made to tilt if desired, and when so ordered a panel is placed under the top to protect the contents of drawers.

A drawing table, reference table and filing case—all for the price of one good piece of furniture, with

It is more economical to provide plenty of space for a workman than to curtail his efficiency by giving him too little room in which to work.

## Standard Filing Cases.

Standard filing cases are made with same care and class of work as the tables. Drawers are dovetailed together, and not doweled or nailed. Drawers work smoothly, and are provided with a 6-in. cover at the top and back to prevent contents falling out. Sections are held in position in all directions.

## Adjustable Iron Tables.

The distinguishing features of Economy adjustable tables are their stability, the large range of adjustments, and the ease and rapidity with which changes of adjustment are accomplished from drawing position. Stands are made of best gray cast iron, accurately machined and finished with several coats of black enamel.

## Steel Tables and Cabinets.

A complete line of steel tables and cabinets, similar to the wooden designs shown on the following pages, is now carried in stock.

A new method of construction makes it possible to sell the Economy type at prices considerably lower than the prevailing prices for steel tables and cases.

## Extras.

**DRAWING BOARD**—Made of selected soft pine  $\frac{7}{8}$  in. thick, with hardwood ledges, and  $2\frac{1}{2}$ -in. turned raising blocks for inclination.

**TOOL TRAY AND FRAME**—Frame  $7\frac{3}{4}$  by 18 ins. with 4 compartments. Over this slides a tray  $7\frac{3}{4}$  by  $7\frac{3}{4}$  by 1 in., with 5 compartments.

**HOLDING-DOWN WIRES and SPRING COVERS**—They double the file drawer capacity and prevent prints from curling or catching when drawers are opened or closed.

**LOCKS**—Can be furnished either ordinary, or master-keyed when a number of tables are in use. Two keys with each lock.

**ECONOMY PARALLEL RULER ATTACHMENT**—This attachment takes the place of the old style "T" square, and is much more effectual. Can be used on any board or top and will enable the draftsman to work with greater rapidity and accuracy. Gives free use of both hands and insures accurate motion to straightedge.

## Specialties.

A specialty is made of large orders.

Besides a life-long experience in the manufacture of furniture, we have been making a specialty of high grade drawing tables and filing cases for nearly a quarter of a century. The Economy type of tables and cases embraces a range of styles and sizes that is designed to meet every need.



**Special Designs.**

Designs furnished for special work upon receipt of information.

**Catalogue.**

Our catalogues, with full information and illustrations, sent on request.

**DUSTPROOF WOOD SECTIONAL FILING CASE**

Economy dustproof filing sections, equipped with dustproof doors in 7-drawer units. Sizes 26"x38"x1½" inside and 32"x44"x1½" inside. The above illustration shows a 2-section standard dustproof case with plain base and cap.

**DATA**

No.	Standard case	Code word	Weight, lbs.
240	Loose cap.....	Pohew	50
241	Plain base.....	Ponad	35
242	Base with 4" drawer.....	Poimus	90
244	Section of 7 drawers, 32"x44"x1½".....	Polobad	220
245	Loose cap.....	Podos	35
246	Plain base.....	Pofut	30
247	Base with 4" drawer.....	Porig	70
248	Section of 7 drawers, 26"x38"x1½".....	Powemly	200

**STANDARD WOOD SECTIONAL FILING CASE**

The above illustration shows a 2-section standard case with 4-in. deep drawer in base. Each section has 6 drawers—the most drawer space of any sectional case made. Our spring covers will double capacity of drawer.

**DATA**

No.	Standard case	Code word	Weight, lbs.
200	Loose cap.....	Pavda	45
201	Section of 1 drawer, 32"x44"x4".....	Paxpe	80
204	Section of 4 drawers, 32"x44"x3½".....	Palso	175
206	Section of 6 drawers, 32"x44"x2".....	Pagmuch	175
208	Pine drawing board top.....	Paced	45
210	Plain base.....	Papri	30
212	Section of 2 drawers, half-size, 32"x21"x4".....	Papwe	80
214	Base with 4" drawer.....	Pahua	80
218	Sanitary base, 8" high.....	Paweb	40
220	Loose cap.....	Pedan	30
221	Section 1 drawer, 26"x38"x4".....	Peper	60
224	Section of 4 drawers, 26"x38"x3½".....	Pelos	150
226	Section of 6 drawers, 26"x38"x2".....	Pehort	150
228	Pine drawing board top.....	Pecla	30
230	Plain base.....	Pekte	60
232	Section of 2 drawers, half-size, 26"x18½"x4".....	Pepik	60
234	Base with 4" drawer.....	Pench	60
238	Sanitary base, 8" high.....	Pelup	30

**References.**

We have built thousands of tables and cases, as illustrated herewith. Our customers include the largest and most prominent manufacturers, contractors, architects, engineers and colleges in the country.

The testimonials on file from these sources are proof of the fact that the Economy tables and cases are the best and most economical in the market.

**STANDARD STEEL SECTIONAL FILING CASE**

Each section has closed finished top; no cap required; also plain base to correspond with size of sections.

Special sizes made to meet special requirement. An inexpensive steel sectional filing case

**DATA**

No.	Standard case	Code word	Weight, lbs.
350	Section 5 drawers, 26"x38"x2".....	Ufele	200
358	Sanitary base.....	Ubgen	40
355	Plain base.....	Uboer	30
360	Section 5 drawers, 32"x44"x2".....	Ubuap	250
368	Sanitary base.....	Ubfal	50
365	Plain base.....	Ubard	30

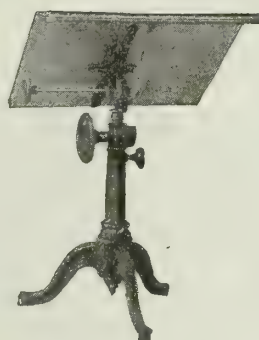
**EXTRAS**

Drawers divided in center making 2 compartments. Drawers divided, making 4 compartments. Wire compressors must be ordered as extras. In stock for prompt shipment

**STEEL DRAWER WITH HINGED COMPRESSOR**

Economy hinged compressors are so constructed that they can be turned back horizontal and flush with top of drawer, giving free access to contents.

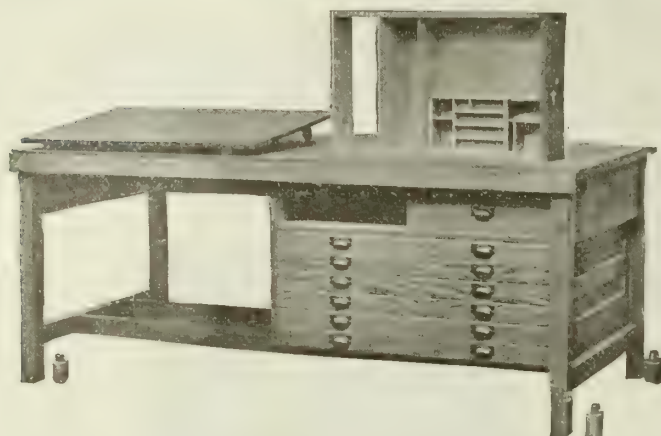
Economy steel compressors or holding-down wire compressors nearly double the filing capacity of a steel drawer. They have the same effect on the filing capacity of a wooden file drawer

**STYLE NO. 21, WITH HORIZONTAL SHELF**

Top, oak, 23"x26". Very heavy and rigid. Rack and pinion raising device can be tilted to any angle

**ADJUSTABLE STEEL STOOL**

Built like a bridge with revolving screw top and simple locking device with solid wood seat. Sizes, 22" adjustable to 26"; 26" adjustable to 30"



STANDARD WOOD DRAWING TABLE, STYLES NOS. 0, 1 AND 2\*  
Showing loose incline drawing board and drawer with sliding tool tray

#### Wood

Style No. 0—Top, soft pine 39"x84"x1 $\frac{3}{8}$ "; table 34" high; 2 small drawers each 21"x24"x5 $\frac{1}{4}$ " inside, in 2 compartments 18"x21" and 6"x21"; 6 large drawers 32"x44"x2" with 6-in. lid on back of drawer to prevent drawings slipping out. Paneled back and sides. Set of 4 raising blocks to adjust height of table. Material, oak, except top; finish 3-coat dull rubbed smooth. Finished antique oak, unless specified otherwise. Code word, *Hapway*.

Style No. 1—Specifications same as No. 0. Top, 39"x84"x1 $\frac{3}{8}$ "; 2 small drawers 18"x24"x5 $\frac{1}{4}$ " with 2 compartments 18"x18" and 6"x18"; six large drawers 26"x38"x2". Code word, *Hepride*.

Style No. 2—Specifications same as No. 1. Top, 34"x72"x1 $\frac{3}{8}$ ". Code word, *Hoper*.

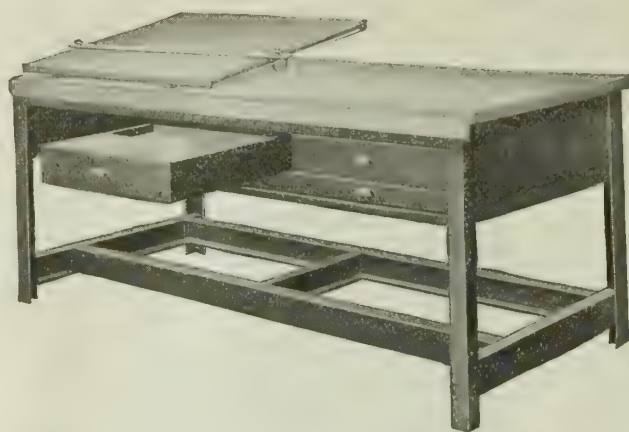
Other sizes made to order.

#### STEEL

Style No. 50—Drawing and reference table and filing case combined. Top, soft pine 39"x84"x1 $\frac{3}{8}$ "; table 35" high; 2 small drawers 21"x24"x4" inside; compartments 18"x21" and 6"x21"; 6 large drawers 32"x44"x2" inside. These drawers have a lid at top and back to prevent drawings from slipping out. Set of 4 raising blocks to adjust height of table. Code word, *Tuband*.

Style No. 51—Top 39"x84"; height, 35"; 2 drawers 18"x24"x4" inside; 6 drawers 26"x38"x2" inside. Code word, *Tupele*.

Style No. 52—Top 34"x72"; height, 35"; 2 drawers 18"x24"x4" inside; 6 drawers 26"x38"x2" inside. Code word, *Turnip*.



STYLES NOS. S-0A, S-1A AND S-2A, STANDARD STEEL TABLES  
Showing loose inclined drawing board with parallel rule attachment

#### Wood

Style No. 0A—Top, soft pine 39"x84"x1 $\frac{3}{8}$ "; table 34" high; 2 small drawers 21"x24"x5 $\frac{1}{4}$ " inside, in 2 compartments 18"x21"; 1 large drawer 32"x44"x2". Set of 4 raising blocks. Material, oak, except top. Finish 3-coat dull rubbed smooth. Code word, *Harwide*.

Style No. 1A—Specifications same as 0A. Top 39"x84"x1 $\frac{3}{8}$ "; 2 small drawers 18"x24"x5 $\frac{1}{4}$ "; 1 large drawer 26"x38"x2". Code word, *Hedric*.

Style No. 2A—Specifications same as 0A. Top 34"x72"x1 $\frac{3}{8}$ "; 2 small drawers 18"x24"x5 $\frac{1}{4}$ "; 1 large drawer 18"x38"x2". Code word, *Hodan*.  
Other sizes made to order.

#### STEEL

Style No. 50A—Top, soft pine 39"x84"x1 $\frac{3}{8}$ "; table 35" high; 2 small drawers 21"x24"x4" inside, in 2 compartments 18"x21"; 1 large drawer 32"x44"x2" inside. Set of 4 raising blocks to adjust height of table. Code word, *Targe*.

Style No. 51A—Top 39"x84"; height 35"; 2 drawers 18"x24"x4"; 1 drawer 26"x38"x2". Code word, *Tempe*.

Style No. 52A—Top 34"x72"; height 35"; 2 drawers 18"x24"x4" inside; 1 drawer 26"x38"x2" inside. Code word, *Tipad*.

NOTE—The "A" type of tables can be converted into a combination drawing table and filing case by adding a standard 5-drawer section.



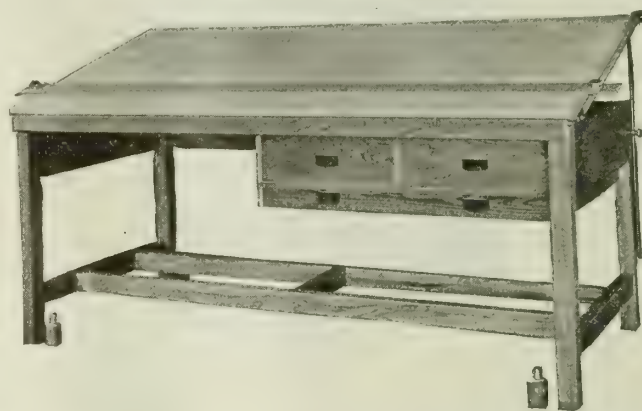
STANDARD WOOD DRAWING TABLE, STYLE NO. 4

The Economy loose inclined board is the most practical device for inclining the drawing board and the most readily adjustable. It can be shifted about on the table to suit the desire of the draftsman.

Made of selected soft pine  $\frac{3}{4}$  in. thick, with 2 hardwood ledges bolted into board to allow of contraction and expansion. Board is inclined by means of turned raising blocks 2 $\frac{1}{2}$  ins. high, which give the proper inclination.

Style No. 4—Top 33"x60"; 1 drawer 13"x26"x4"; 4 drawers 13 $\frac{3}{4}$ "x24 $\frac{1}{4}$ "x3 $\frac{3}{4}$ " and 1 drawer 26"x38"x2 $\frac{1}{4}$ ".

Style No. 3—Top 33"x60"; 1 drawer 13"x26"x4" and 1 drawer 26"x38"x2 $\frac{1}{4}$ ". Standard tables are 34" high. Raising blocks 1", 2" or 3" high.



ECONOMY ADJUSTABLE TOP DRAWING TABLE

The top of these tables is hinged to the rubbing strip at the front and equipped with 2 adjustable metal supports at the back, with patent locking device for holding the top inclined at any angle. A panel is placed over the cabinet to protect the contents of the drawers and forms an extra shelf.

Parallel ruler attachment, for drawing boards 24" to 108", operates easily at any angle of board or table. It saves draftsman's time and secures more accurate results; and is much more convenient than the "T" square method. The attachments can be fitted to drawing board of any size.

Style No. 30A: 39"x84" adjustable top;  
2 small drawers 20"x24"x4" inside  
1 large drawer 32"x44"x2" inside

Style No. 31A: 39"x84" adjustable top;

Style No. 32A: 32"x72" adjustable top;  
2 small drawers 18"x24"x4" inside  
1 large drawer 26"x38"x2" inside



# HAMILTON MANUFACTURING COMPANY

Manufacturers of Drafting Room Furniture

TWO RIVERS, WIS.

## Products.

OAK and STEEL BLUE PRINT SECTIONAL CABINETS;  
ADJUSTABLE DRAWING TABLES; DRAWING BOARDS.

Straightedges; T-squares; Parallel Rule Attachments; Artists' Tables; Typewriter Tables, etc.

## Blue Print Sectional Cabinets in Wood and Steel.

Built on the unit plan—add as requirements demand. Thoroughly well made of either seasoned oak or cold rolled furniture steel.

Each drawer fitted with label holder, substantial pulls, paper weights and hood.



BLUE PRINT CABINET UNITS

## Drawing Tables.

FRY DRAWING TABLE, STYLE C—Hundreds of these tables are in use. Frames made of best quality gray iron.

Tops can be adjusted from a horizontal to a vertical position without stooping or moving from the seat.

Adjustable as to height, and very rigid in any position.

Made in 3 styles, ranging in price from \$15.00 to \$90.00.



FRY DRAWING TABLE, STYLE C

DRAWING TABLE NO. 37-D—Top, 34 by 60 ins., adjustable as to slant. Shipped knocked down. Made of oak with pine top.



DRAWING TABLE NO. 37-D

DRAWING TABLE NO. 40-D—Made in several sizes. Adjustable both as to height and slant of top.

Can be supplied with filing units as illustrated, or without units. Shipped knocked down.

Made of oak and nicely finished.

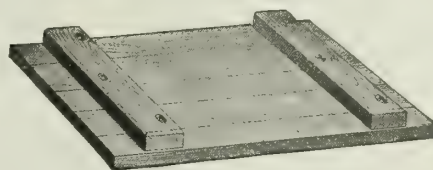


DRAWING TABLE NO. 40-D

## Drawing Boards.

This company manufactures six different styles of drawing boards. The board illustrated is Style D.

Made in pine and basswood, in any size, of properly seasoned material.



DRAWING BOARD

## Facilities and Experience.

Plant is fully equipped with modern labor saving machinery for the manufacture of steel and wood furniture.

About 6,000,000 ft. of lumber are carried in stock to be properly seasoned before going to the dry kilns and tempering sheds.

This company has had 30 years' experience in making business furniture.

The company has a warehouse at Rahway, N. J., just outside of New York City, so as to insure prompt delivery in the East, as well as in the West.

# NEW YORK BLUE PRINT PAPER COMPANY

MAIN OFFICE  
102 Reade Street  
NEW YORK, N. Y.

FACTORY, 96-102 Reade Street, NEW YORK, N. Y.

## Products and Services.

Manufacturers of "SUPERIOR" and "GOLD SEAL" BLUE PRINT PAPER, "SUPERIOR" BROWN PRINT PAPER and SENSITIZED PAPERS.

Manufacturers and importers of DRAWING and TRACING PAPERS; TRACING CLOTH, and DRAWING MATERIALS.

DRAWINGS REPRODUCED by all processes; LYTHO-ZINC REPRODUCTIONS OF STEEL PRINTS on any stock of Paper and Cloth; BLUE, BLACK or BROWN PRINTS on Paper and Cloth; BLUE LINE PRINTS on Paper and Cloth; PHOTO REDUCTIONS of tracings; HECTOGRAPH COLOR COPIES; DRAWINGS and MAPS mounted.

SHAMROCK and CARNATION ERASERS, SIMPLEX and MONROE DRAWING TABLES.

TAPES, LEVELING RODS, SURVEYING INSTRUMENTS.

## Blue Printing Department.

The blue printing departments are fully equipped with modern machinery, and quality work and quick service are guaranteed regardless of the size of the order.

The company has at command 10 vertical printing machines, each having a capacity of 2 prints at one time, size 42 by 72 ins.; 10 continuous blue printing washing and drying machines; 4 continuous blue printing machines 54 ins., 6 steam blue print drying machines.

This company operates the largest and best equipped blue print plant in the country.

Out of town orders, received up to 12 o'clock are shipped the same day. With request for prompt delivery the very large orders are also shipped on day received.

## Lytho-zinc Department.

This department recently enlarged is now equipped to handle any quantity of work and to assure prompt delivery. Any desired number of copies from original tracings can be reproduced.



TRADE-MARK

Reproductions can be made on drawing paper, cardboard, tracing cloth, white cloth, tracing paper, etc., at but a fraction of the cost of copying by hand.

The reproductions are not washed and therefore can not shrink. The lines will not fade. They are of a solid black ink that is permanent and will not smudge or rub off with customary handling. Any data not wanted can be blocked out without defacing or otherwise injuring the original.

This process is especially attractive to concerns desiring to reproduce tracings on tracing cloth so as to be able to file one set as a protection against fire or accident.

Business houses use it for advertising purposes as merchandise can be cheaply and efficiently displayed by reproductions.

Specifications or other typewritten work (carbon backed) can be reproduced by lytho-zinc process.

## Drawing Materials.

The company carries a complete stock of drawing supplies, drafting room equipment, tapes, leveling rods, surveying instruments, etc.

The "Superior Brand" products are well known for their excellent qualities. Some specialties are Shamrock and Carnation erasers, Simplex and Monroe drawing tables.

The assortment in this line is varied and complete.

## Sensitized Paper.

A large department is devoted exclusively to the manufacture of sensitized paper.

Equipped with all modern facilities, the company is able to ship all orders of sensitized papers on the day order is received, and to guarantee absolutely fresh stock.

## Service.

Adequate shipping facilities place us in a position to guarantee prompt attention to any order received. Orders are invariably shipped the same day.



## SENGBUSCH SELF-CLOSING INKSTAND CO.

MILWAUKEE, WIS.

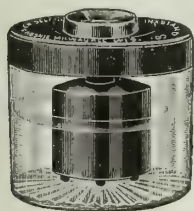
**Products.**

SELF-CLOSING INKSTANDS; "LOCK-WELLS"; MOISTENERS.

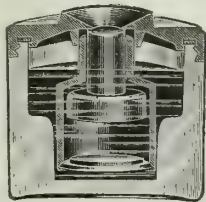
Mucilage Applicators.

**Description of Sengbusch Self-closing Inkstands.**

The Sengbusch self-closing inkstand is more than a mere receptacle for ink. It is an ink preserver and a time saver. An easy, natural dip of the pen depresses the float and brings the ink over the eye of the pen, always giving the same uniform amount of clean, fresh ink. The float, inside the fountain, is of hard rubber and when pushed down by the pen displaces the ink, which rises, washes pen, overflows into well outside of shell, taking along any dust that may have been on top of float so that only fresh clean ink from center of well can stay on the pen.



Exterior View



Sectional View

SENGBUSCH SELF-CLOSING INKSTAND

The entire top of the well is of hard rubber, comes off readily, making a wide mouth which is easy to fill. The self-closing opening is large enough to allow utmost freedom of dip. When pen is removed, the float forms a wet joint, closing the opening airtight so that evaporation is impossible. Any dust or sediment will collect in the bottom of the inkwell, but can not get into the fountain where the pen is inked, as the trap is too high. Cleaning once a year keeps the ink clean and fresh.

Red caps may be had when ordered, otherwise black caps will be supplied.

Bases are furnished in quarter sawed oak and genuine mahogany, finished to match the finish of any desk. Bases are also furnished in plain and cut glass, as well as high grade plate glass, for the various styles of Sengbusch single inkstands. Inkwells are made of pressed glass or cut glass. The Sengbusch self-closing inkstand is made in 115 different designs and sizes.

**SPECIAL FEATURES**—(1) Ink always clean and fresh, because inkstand closes airtight, as a corked bottle, and is dustproof. (2) No evaporation of ink. (3) Uses only 8 oz. of ink during the year, even when used constantly. (4) No funnels above top surface of well; ink never spurts out. (5) Pen is dipped to uniform depth—no overloaded pens, causing ink blots. (6) Requires filling once in 2 to 6 months of actual use. (7) Needs cleaning inside only once a year. (8) Saves pen points—no corroded ink. (9) Prevents evaporation of red ink and works perfectly with copying ink. (10) Saves temper, time and trouble.

**The Sengbusch Self-closing School Inkwell.**

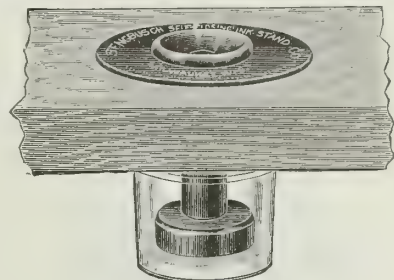
The safest and simplest inkwell for schools. Sets flush with the top of the desk, with no edge to catch papers. Prevents blots on books, papers, desks and

floors. Eliminates necessity of repeated scraping and refinishing of desks. Easy to fill. All parts are interchangeable.

A special set of tools, loaned to schools, makes installation a simple 5-minute operation.

Can be fitted to old desks by making the old hole the required size.

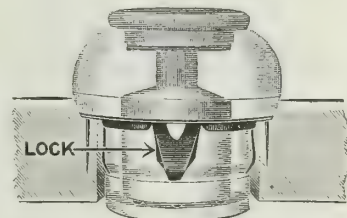
Should be specified as part of the equipment on all new desks.



SCHOOL INKWELL

**"Lock-Well."**

This style of inkwell locks firmly into a desk and can not be removed without the aid of a key. Suitable for banks, postoffices, hotels, schools and any public buildings.



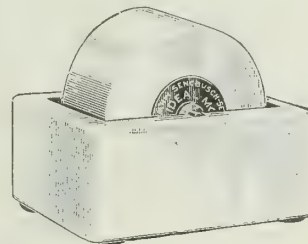
"LOCK-WELL" INKWELL

**PRICES FOR SELF-CLOSING INKWELLS**

Pressed glass.....	No. 62.....	2½ ins., round...	\$1.00
Pressed glass.....	No. 51.....	3 ins., round...	1.50
Cut glass.....	No. 52.....	3 ins., square...	2.00
"Lock-Well".....	Nos. 58 and 60.....		1.60
Cut glass base and No. 52 stand.....	No. 200.....	6½ x 6½ x 1 in.....	6.00
Two cut glass No. 52 stands, sponge cup and cut glass base.....	No. 220.....	6½ x 12¼ x 1 in.....	13.50

**Ideal Sanitary Moistener.**

Made of glazed white porcelain with nickelplated polished metal parts. There is nothing to wear out. No added expense. The sanitary way to moisten fingers, envelope flaps, postage stamps, labels, etc. Price, complete, \$1.50.



IDEAL SANITARY MOISTENER

**References.**

A few of the large users:

Different departments of the United States Government  
State Capitols, City Halls, Courthouses, and thousands of banks, corporations and other concerns  
United States Navy Yard, Brooklyn, N. Y.  
Equitable Life Assurance Soc., New York, N. Y.  
Standard Oil Co. (different Branches)  
United Shoe Machinery Co., Boston, Mass.  
Carnegie Steel Co., Pittsburgh, Pa.  
Baldwin Locomotive Works, Philadelphia, Pa.  
Pierce-Arrow Motor Co., Buffalo, N. Y.  
Prudential Insurance Co., Newark, N. J.  
DuPont Powder Co. of Maryland, Wilmington, Del.  
Western Union Telegraph Co., (throughout United States)  
Bell Telephone System, (throughout United States)  
Ford Motor Co., Detroit, Mich.  
International Harvester Co., Chicago, Ill.  
Swift & Co., Chicago, Ill.  
Southern Express Co., Chattanooga, Tenn.  
American Car & Foundry Co., St. Louis, Mo., (also Branches)  
N. W. Mutual Life Insurance Co., Milwaukee, Wis.  
Pacific Telephone & Telegraph Co., San Francisco, Cal.  
Northern Life Insurance Co., Seattle, Wash.  
Northwestern Insurance Co., Spokane, Wash.  
Oregon Short Line Railway, Salt Lake City, Utah

ROBERT W. HUNT

JOHN J. CONE

JAS. C. HALLSTED

D. W. McNAUGHER

**ROBERT W. HUNT & COMPANY**

Engineers

Bureau of Inspection, Tests and Consultation

90 West Street  
NEW YORK, N. Y.Charleston Building  
SAN FRANCISCO, CAL.Busch Building  
DALLAS, TEX.905 McGill Building  
MONTREAL, QUE.2200 Insurance Exchange  
CHICAGO, ILL.322 White Building  
SEATTLE, WASH.Traders Bank Building  
TORONTO, ONT.Norfolk House, Cannon Street, E. C.  
LONDON, ENG.Monongahela Bank Building  
PITTSBURGH, PA.Syndicate Trust Building  
ST. LOUIS, MO.Standard Bank Building  
VANCOUVER, B. C.5a Calle Tabasco 156  
MEXICO CITY, D. F.**General Engineering.**

CONSULTATION SERVICES in all ENGINEERING FIELDS—MECHANICAL, CIVIL, HYDRAULIC, ELECTRICAL and CHEMICAL.

The SUPERVISION and DETAIL INSPECTION of CONCRETE CONSTRUCTION, including EXAMINATIONS and REPORTS upon the suitability of aggregates.

REPORTS on existing conditions of buildings and other structures.

**Testing, Physical and Chemical.**

Duty and efficiency tests of entire plants—Engines, boilers, pumps, compressors and other machinery.

Strength tests of materials and systems of construction—Steel, iron, cement, brick; columns, beams, floor slabs, partitions and other members.

Chemical tests of all building materials, including steel, iron, cement, paints, oils, slags, limestones, marls and clays.

**Structural Steel Inspection.**

The inspection of structural material at the mills and foundries, including the identification and witnessing of physical tests.

The supervision and inspection of workmanship, checking the sections, dimensions and detail connections during the course of fabrication at the shops, insuring the proper handling of the material, first class workmanship, accurate construction, thorough painting and distinct marking, thus facilitating the erection at the site.

Estimating the weights from detail drawings and checking shipped weights of finished work.

The supervision and detail inspection of the structure during erection.

**Cement Inspection.**

The testing of cement, including the sampling in car load or bin lots at the mills or warehouses, or when delivered on the work.

Complete cement and chemical laboratories at Chicago, New York, Pittsburgh, St. Louis, San Francisco, Cincinnati, Seattle, Los Angeles, Montreal, Vancouver, and London.

**Specification Forms.**

The following is a form for incorporation in specifications for buildings and other structures covering relationship between inspectors and contractors concerning matters of inspection:

GENERAL—All materials of construction shall be subjected to inspection and tests wherever and whenever desired by the architect or engineer.

This inspection service shall be placed in the hands of competent inspectors appointed by the architect or engineer. They shall be the agents of said parties, and they shall report to them the results of inspection and the progress of the work, and otherwise facilitate the prompt and early delivery of satisfactory materials.

The cost of inspection is to be borne by the contractor.

The inspection, acceptance, or failure to inspect shall in no way relieve the contractor from his responsibility to furnish satisfactory materials; and the architect or engineer reserves the right to reject any material, at any time, before the completion and acceptance of the structure, if in his judgment it does not comply with the terms of the specification or of good practice.

**Standard Specifications.**

Booklets containing standard specifications adopted by American Society for Testing Materials include Structural Materials for Buildings, Cement and Concrete, Paving Brick; standard specifications for Creosoted Timbers; also booklet describing facilities of our Engineering Division may be obtained on request at our general office, Chicago.



ESTABLISHED 1881

# PITTSBURGH TESTING LABORATORY

## Engineers and Chemists

### Seventh and Bedford Avenues PITTSBURGH, PA.

NEW YORK  
CHICAGO  
PHILADELPHIA  
ST. LOUIS  
CLEVELAND

CINCINNATI  
BUFFALO  
BIRMINGHAM  
DALLAS  
EASTON, PA.

BOSTON  
RICHMOND  
DETROIT  
MILWAUKEE  
MINNEAPOLIS

SAN FRANCISCO  
LOS ANGELES  
SEATTLE  
PORTLAND

#### Pittsburgh Testing Laboratory Service.

This company offers its services to architects and engineers for special investigation of all engineering and chemical problems, especially concrete and steel failures.

#### Cement Testing and Inspection.

Chemists or samplers are permanently stationed at the cement mills where samples are taken while cement is being run into bins or is being loaded into cars. Our own seals are placed on the bins or cars and complete tests made. Results of tests are in hands of our clients, as a rule, before cement is needed on the job. "Certified Cement," the manufacture of which is watched through all the different stages, is placed in sealed bins and shipped by our orders only. Details of this method of inspection on request. Fourteen cement laboratories located in centers of cement industry.

#### Testing of Aggregates.

Investigations, tests, and analyses of gravel, stone, slag, sand, etc., to determine suitability for use in concrete.

#### Structural Steel Inspection.

**MILL AND FOUNDRY INSPECTION**—The inspection of structural material covers surface examination and the making of the prescribed physical and chemical tests as called for by specifications. Reports covering such inspection and tests furnished with each shipment.

**SHOP INSPECTION**—This includes examination of laying out, punching, riveting, reaming and machining. All rivets are tapped to see that they are tight. Special attention is given to field connections to avoid delays and poor work in field. No paint is permitted to be applied in wet or freezing weather, or unless steel is properly cleaned. Erection marks are checked. Detailed progress reports with shipped weights are made weekly.

**ERECTION INSPECTION**—This consists in seeing that members are erected in their proper places and are not interchanged; that all columns are plumb and that joints meet without excessive use of drift pins. All field connections are examined to see that field rivets are tight. Painting is watched to see that paint is carefully applied. Progress reports are issued weekly.

#### Physical and Chemical Tests.

Fully equipped laboratories for making physical

and chemical tests of all kinds of materials of construction.

#### Inspection Clauses.

These clauses cover the inspection of cement, reinforcement and structural materials and should be incorporated in general specifications where positive results are necessary.

**CEMENT**—All cement shall be tested and inspected by a reliable, disinterested Inspection Bureau, and the selection of such Bureau must be approved by the architect, to whom a copy of all reports must be sent. The contractor shall include in his bid the cost of such cement testing. When possible and where facilities are to be had, the cement shall be sampled at the cement mill by the Inspection Bureau while the cars are being loaded, so that the tests can be made and the results reported before the cars reach their destination, otherwise samples shall be selected from each shipment at destination at the expense of the contractor in a manner satisfactory to the architect.

**REINFORCEMENT STEEL**—All reinforcement steel shall be inspected by a reliable, disinterested Inspection Bureau, and the selection of such Bureau must be approved by the architect, to whom a copy of all reports must be sent. The contractor shall include in his bid the cost of such inspection. The inspection shall be made at the rolling mill prior to shipment to the building site.

**STRUCTURAL MATERIALS**—All structural material shall be inspected by a reliable, disinterested Inspection Bureau, and the selection of such Bureau to be approved by the architect, to whom a copy of all reports must be sent.

**Mill Inspection**—All structural steel shall be tested and inspected at the rolling mill prior to shipment to the fabricating shop.

**Foundry Inspection**—All castings shall be inspected at the foundry before being shipped to the machinshop or to the building site.

**Shop Inspection**—All fabricated material shall be inspected at the structural mills and machinshops prior to shipment to the building site.

The contractor shall include in his bid the cost of the inspection of structural materials.

#### Pamphlet.

Pamphlet containing information of value to architects and engineers will be mailed on application.



PITTSBURGH TESTING LABORATORY  
OFFICE AND LABORATORY BUILDING

# MacARTHUR CONCRETE PILE & FOUNDATION CO.

120 Broadway  
NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, ILL.

SAN FRANCISCO, CAL.

BOSTON, MASS.

PITTSBURGH, PA.

MONTREAL, CAN.

PHILADELPHIA, PA.

DETROIT, MICH.

NEW ORLEANS, LA.

ATLANTA, GA.

## Products and Services.

### PEDESTAL CONCRETE PILES.

This company contracts to install Pedestal Concrete Pile Foundations for buildings and other structures in any part of North America, also to install Pre-moulded Reinforced Concrete Piles and Steel Pipe Concrete Filled Piles where conditions make these types desirable. In fact, it is equipped to handle the complete foundation ready for column bases and brick walls.

The reputation and financial standing of the company insures satisfactory handling and prompt completion of all work, and long experience assures most effective results at minimum cost.

## Co-operative Engineering Service.

This company is prepared to send engineers to any part of the country to investigate conditions and for consultation at its own expense.

On receipt of data on soil conditions and blue prints of any proposed structures, together with loads to be carried, plans for pedestal pile foundations suitable for the requirements, with approximate cost estimates, will be supplied promptly.

## Pedestal Concrete Piles.

The pedestal pile differs from the ordinary wood or concrete pile in that a large carrying capacity, in addition to that due to frictional resistance, is derived from the direct bearing power of a broad base resting in firm and compressed subsoil.

The formation of the enlarged base or foot is simple and direct.

## Advantages of Pedestal Piles.

This pile provides a carrying capacity 50% to 100%

greater than other types of piles of the same length and under the same soil conditions.

Actual experience teaches that under many soil conditions a given load can be carried by fewer and shorter pedestal piles than would be required with other types.

CARRYING CAPACITY OF VARIOUS TYPES OF PILES FOR AVERAGE SOIL CONDITIONS (BASED ON PATTON'S FORMULA)

Size of pile	Surface area, sq. ft.	Frictional carrying capacity at 300 lbs. per sq. ft.	Bearing area at foot or point, sq. ft.	Direct bearing capacity at 5 tons per sq. ft.	Total carrying capacity of pile
		Tons		Tons	Tons
Wooden pile 30 ft. long, diameters 12" and 7"	74.5	11.2	.270	1.35	12.6
Concrete pile 30 ft. long, diameters 18" and 6"	94.3	14.2	.205	1.03	15.2
Concrete pile 30 ft. long, diameters 14" and 14"	110.0	16.5	1.07	5.35	21.9
Concrete pile 30 ft. long, diameters 16" and 16"	125.7	18.8	1.395	6.96	25.8
Pedestal Pile 30 ft. long, diameters 16" and 3'	125.7	18.8	7.10	35.5	54.3

## Specifications for Pedestal Concrete Piles.

Piles to be driven for foundations as shown on drawing.

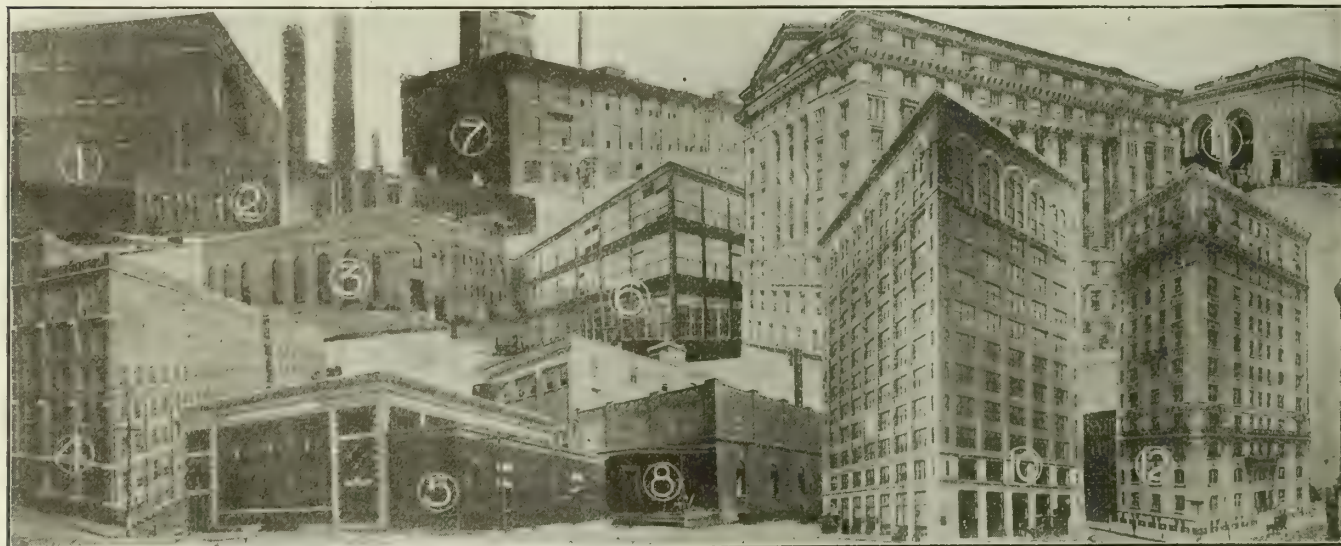
CONCRETE PILES—All piles to be formed in place, and to have a stem or shaft not less than 16 ins. in diameter, with an enlarged foot or base.

CONCRETE—Concrete for piles to consist of 1 part Portland cement, 2½ parts sand and 5 parts broken stone or gravel, thoroughly and properly mixed.

Cement to pass the Standard Tests of the American Society of Civil Engineers.

Sand to be clean, containing not more than 5% of clay or other deleterious matter, and to contain a considerable percentage of coarse grains.

Broken stone or gravel to be some hard stone, free from



ALL THE STRUCTURES SHOWN HERE AND HUNDREDS OF OTHERS ARE SUPPORTED ON PEDESTAL CONCRETE PILES



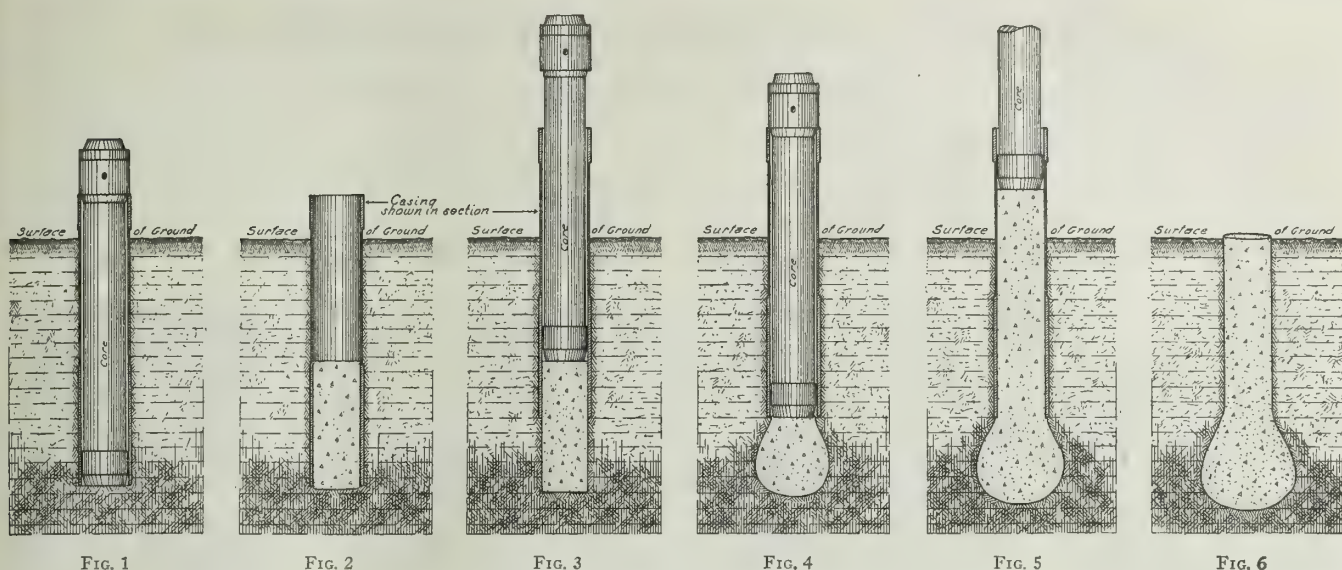


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

Fig. 1. An apparatus consisting of a cylindrical steel core and casing is driven into ground until the required penetration is obtained.

Fig. 2. Core removed and a charge of concrete dumped to bottom of casing.

Fig. 3. Core and hammer placed on charge of concrete and casing raised to permit forming pedestal.

Fig. 4. Core used as a ram to compress surrounding soil until a base or pedestal is formed.

Fig. 5. Pedestal completed and casing filled with concrete, weight of core and hammer resting on newly formed pile, all ready for withdrawal of casing.

Fig. 6. A completed pedestal pile consisting of a monolithic concrete column 16 ins. in diameter surmounting a broad base or pedestal.

NOTE—When necessary owing to high water pressure, or quicksand being encountered, a shoe is used which makes apparatus watertight.

#### FORMATION OF THE PEDESTAL PILE

earth and dust, with a diameter of not more than  $1\frac{1}{2}$  ins. and not less than  $\frac{1}{4}$  in.

**FORMATION**—The pile forming apparatus to be driven into ground until a proper penetration is obtained, as determined by the Engineering News Formula for pile driving. The concrete at bottom of pile to be tamped and rammed out thoroughly into contact with surrounding soil with suitable rammer, until enlarged foot or base is formed. Tops of piles to be brought to elevation as shown on Drawing No. ...., and to project 3 ins. into concrete capping of same.

#### Cost of Pedestal Piles.

Exact figures as to the price of Pedestal Piles depend on the length and number of piles in each job and on surrounding circumstances. The price per foot ton in many instances is lower than the cost per foot ton for wood piles, and the price per linear foot of pedestal pile is as low or lower than any other cast-in-place pile and much lower than the premoulded pile. As the pedestal concrete pile carries from 50% to 100% more load than

piles *without* an enlarged base, less piles or shorter piles are needed for any given foundation load, thus reducing the ultimate cost.

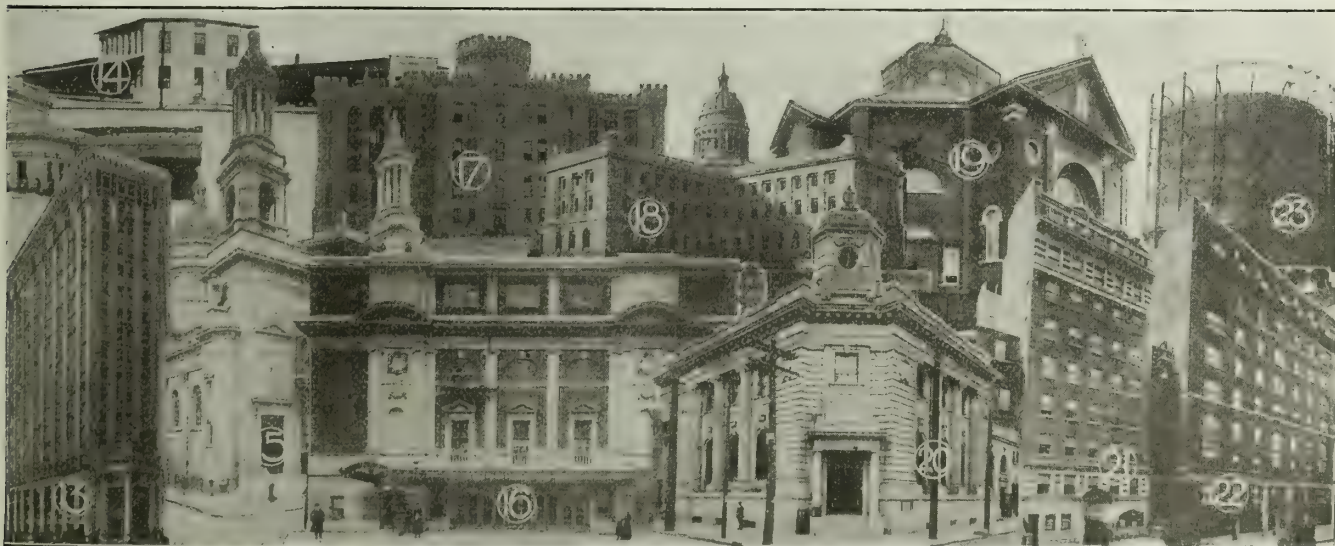
#### Information.

Tables of pile capacities in various soils, and much valuable data in Handbook, sent on request.

Standard drawings showing complete construction details of reinforced concrete pile caps, giving economic number and grouping of piles for all ranges of column and wall loads, are on file. These drawings save much time and labor in the preparation of pile plans and architects will find them of considerable value.

#### References.

Write for names of architects of buildings shown and others for whom work has been performed.



ALL THE STRUCTURES SHOWN HERE AND HUNDREDS OF OTHERS ARE SUPPORTED ON PEDESTAL CONCRETE PILES



# RAYMOND CONCRETE PILE COMPANY

## Cast-in-place Concrete Piles and Special Concrete Work

140 Cedar Street  
NEW YORK, N. Y.

111 W. Monroe Street  
CHICAGO, ILL.

BRANCH OFFICES IN ALL PRINCIPAL CITIES  
RAYMOND CONCRETE PILE CO. OF CANADA, LTD., MONTREAL, CANADA

### Products.

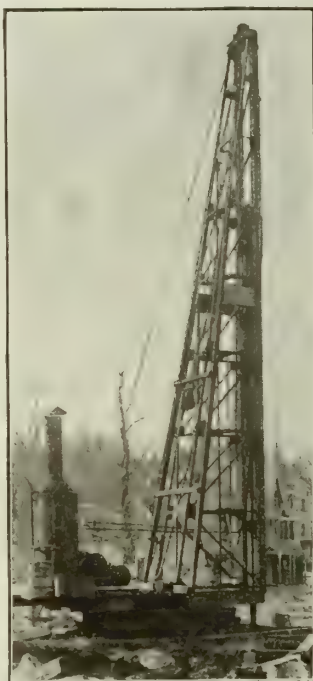
RAYMOND CAST-IN-PLACE, PREMOULDED REINFORCED BEARING, and PLAIN and INTERLOCKING SHEET CONCRETE PILES; CONCRETE WORK of Very Special Nature.



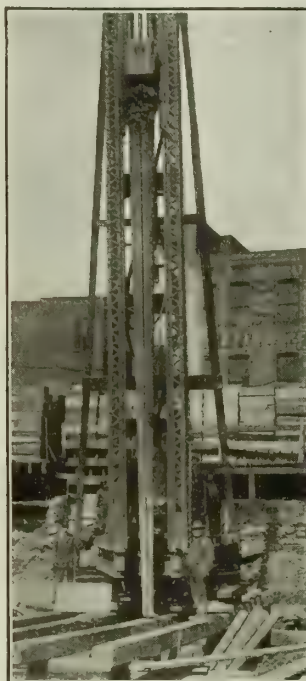
TRADE-MARK

### Illustrations.

Follow the illustrations across the two pages for the correct order in the Raymond method.



1. STANDARD RAYMOND PILE DRIVER  
Made of structural steel



2. EXPANDED PILE CORE  
Ready to receive the shell



3. SPIRALLY REINFORCED METAL SHELL  
Before being placed on the core

### Raymond Service.

In addition to the standard cast-in-place Raymond concrete pile, this company also designs, manufactures and places premoulded reinforced concrete bearing piles; concrete sheet piles, both plain and interlocking, and concrete work of a very special nature.

This special nature concrete work consists in designing and constructing difficult foundations, docks, piers, bulkheads, sea walls, retaining walls, ore bins, trestles, and such structures as require a special knowledge of concrete construction.

This company has on its staff, at the service of architects and contractors, experts in the designing and installation of concrete piling for all purposes and to meet all conditions.

The engineering department is available at all times for investigation work and will gladly submit recommendations, designs and estimates.

### The Raymond Method.

A collapsible steel core, 8 ins. in diameter at the point and increasing in diameter at the rate of .4 in. per lineal ft. of length is incased in a spirally reinforced steel metal shell. The core thus incased is driven to a proper penetration and then is collapsed and withdrawn from the shell; the shell remaining in the ground and maintaining the resistance encountered during the driving. The shell is then inspected and filled with concrete. This makes a complete Raymond concrete pile.

### Working Loads.

In the majority of cases Raymond concrete piles are driven to carry a working load of 30 tons each. In some cases, where it is impossible to secure proper penetration, it is necessary to reduce this to 25 or even 20 tons. In other cases, loads of 35 and 40 tons are safely carried.

In view of the wide variation in soil conditions, a conference is suggested with the nearest Raymond office in order that the site may be investigated and suitable recommendations made.

### Spacing and Speed.

Raymond concrete piles may be spaced as close as 2 ft. 6 ins. on centers and driven as close as 18 ins. from center of pile to a building wall, although where extremely long piles are used, it is sometimes necessary to increase this spacing.

### Speed Records.

This company always endeavors to make good a promise. On April 26th it promised to place 3600 piles for the United States Government at the Brooklyn Navy Yard by June 10th, or in 46 calendar days; 3800 piles were actually placed by May 26th—30 calendar days after the contract was signed.

On April 19th a contract was signed with the Chevrolet Motor Co.; the first pile was driven April 27th and 1535 piles were completed in 32 driving days.



On August 11th this company promised the Austin Company to place 140 piles for a Government contract within 9 days. The contract was completed six hours ahead of schedule.

On April 27, 1915, this company signed a contract with the Crucible Steel Company of Harrison, N. J., for 5533 piles, driving the first pile on the sixth day thereafter and completing the job in 135 working days at the rate of 40 piles per day.

Many other speed records can be shown.

### Representative Raymond Clients.

Bethlehem Steel Company, South Bethlehem, Pa.  
 United States Steel Corporation, New York, N. Y.  
 United States Government, Washington, D. C.  
 Standard Oil Company, New York, N. Y.  
 American Can Company, New York, N. Y.  
 General Electric Company, Schenectady, N. Y.  
 Pennsylvania Railroad Co., Philadelphia, Pa.  
 Chicago, Rock Island & Pacific Railroad Co., Chicago, Ill.  
 Ford Automobile Company, Detroit, Mich.  
 Youngstown Sheet & Tube Co., Youngstown, Ohio



4. EXPANDED CORE  
Fully dressed with spirally reinforced metal shell



5. THE THREE ESSENTIAL STEPS  
In the making of a Raymond pile



6. A COMPLETED PIER OF  
RAYMOND PILES  
Ready for the footings



7. THE RESULT OF A PERFECT  
DEPENDABLE  
PROCESS

### The Cost of a Raymond Pile.

Raymond concrete piles are made in place and not sold by the foot, f. o. b. cars; consequently it is impossible to quote prices without knowing the conditions under which the work is to be done, the probable number of piles required, and the penetration expected. The spacing of the piles, soil conditions, accessibility to the site, cost of concrete materials and labor are governing factors.

### Specifications.

If "Raymond Concrete Piles" are called for it is of course sufficient; on the other hand, if for any reason it is not advisable to name them specifically, the following will cover:

"The concrete piles shall be of a type specially approved by the architect and shall be placed in the following manner:

"A collapsible steel core, 8 ins. in diameter at the small end, increasing .4 in. per linear ft. of length, shall be incased in a spirally reinforced metal shell and driven to proper penetration. The core shall then be collapsed and withdrawn from the shell, which remains permanently in the ground. Each shell shall be carefully inspected and being found perfect shall thereupon be filled with concrete placed in accordance with good engineering practice."

Concrete in the piles shall be composed of 1 part approved Portland cement, 3 parts of clean sharp sand and 5 parts of crushed stone or gravel which will pass a 1½-in. ring.

### Representative Architects.

The following architects have used and are using Raymond Concrete Piles:

Ernest Flagg, New York, N. Y.  
 Palmer, Hornbostle & Jones, New York, N. Y.  
 Wm. Higginson, New York, N. Y.  
 James Gamble Rogers, New York, N. Y.  
 Cass Gilbert, New York, N. Y.  
 Ernest Greene, New York, N. Y.  
 Herbert Kelsey & Paul Cret, Philadelphia, Pa.  
 Ballinger & Perrot, Philadelphia, Pa.  
 Simon & Bassett, Philadelphia, Pa.  
 Alden & Harlow, Pittsburgh, Pa.  
 Henry Boettcher, Armstrong Cork Company, Pittsburgh, Pa.  
 Sturgis & Barton, Chicago, Ill.  
 Jenny, Mundie & Jensen, Chicago, Ill.  
 Geo. C. Nimmons, Chicago, Ill.  
 Jarvis Hunt, Chicago, Ill.  
 Mauran & Russell, St. Louis, Mo.  
 Barnett, Haynes & Barnett, St. Louis, Mo.  
 Eames & Young, St. Louis, Mo.  
 Albert Kahn, Detroit, Mich.  
 J. Knox Taylor, Supervising Architect, Washington, D. C.  
 Richards, McCarthy & Bulford, Columbus, Ohio  
 Samuel Hannaford Sons, Cincinnati, Ohio  
 Theodore W. Pietsch, Baltimore, Md.  
 John Latenser, Omaha, Nebr.  
 Morgan & Dillon, Atlanta, Ga.  
 D. X. Murphy & Bro., Louisville, Ky.



# THE FOUNDATION COMPANY

Woolworth Building, 233 Broadway

NEW YORK, N. Y.

CHICAGO

BRANCH OFFICES

PITTSBURGH

SAN FRANCISCO

## Services.

THE FOUNDATION COMPANY maintains in all parts of the country large and experienced organizations for the construction of INDUSTRIAL PLANTS, BUILDINGS and STRUCTURES of any nature.

This company also makes a specialty of DESIGNING and CONSTRUCTING DIFFICULT UNDERGROUND WORK, where difficulties are caused by great depth, water bearing soil and quicksand, or excessive loads to be supported.

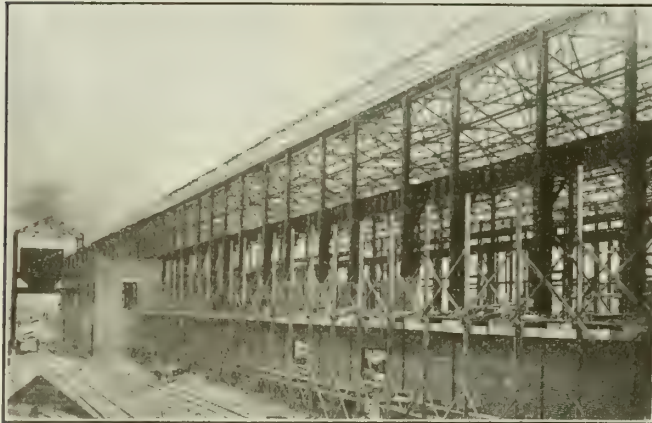
THE FOUNDATION COMPANY has recently added to its activities the installation of shipyards and the con-

struction of ships, and is believed to have set a record, not only in getting the plants into actual operation, but also in speed in getting the vessels overboard.

## Scope.

The company is prepared to furnish the plans, estimates and skilled organization to build Power Plants, Hydro-electric Developments, Chemical Plants with all equipment, Bridge Substructures, Terminal and Industrial Developments, Tunnels and all kinds of difficult Building Foundations.

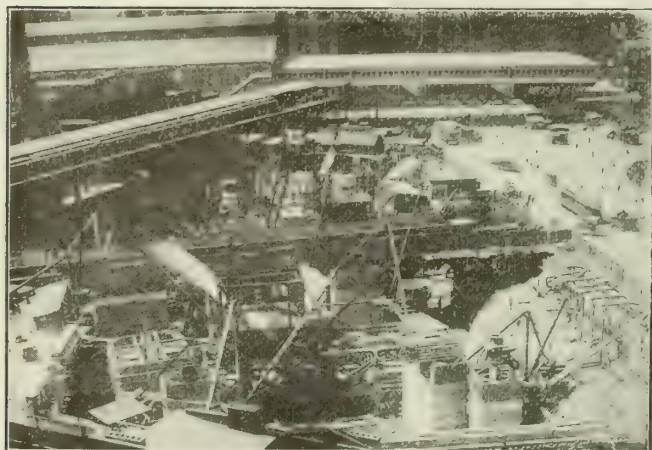
Correspondence solicited.



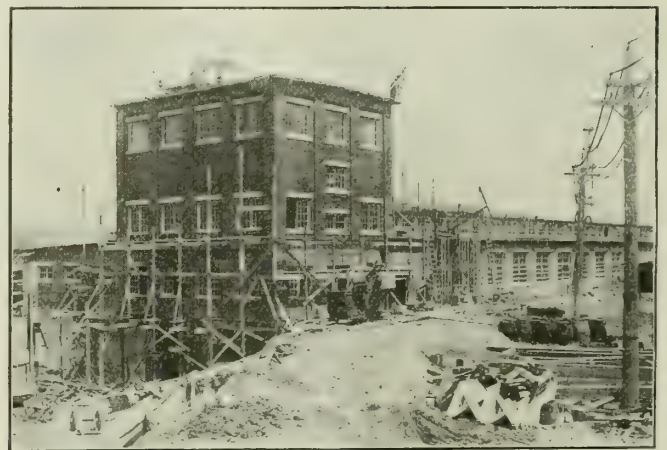
BUILDING NO. 1, NICKEL REFINERY PLANT, PORT COLBORNE, ONTARIO, CAN.



240,000 KW. STEAM ELECTRIC PLANT, WINDSOR, W. VA.



FOUNDATIONS FOR NEW YORK SKYSCRAPER



7-TON BLEACH PLANT, BANGOR, ME.



# TURNER CONSTRUCTION COMPANY

Contractors in Reinforced Concrete Construction

TELEPHONE:  
VANDERBILT 4500

244 Madison Avenue  
NEW YORK, N. Y.

ESTABLISHED 1902

BRANCH OFFICES

BUFFALO, N. Y., 312 Prudential Building

BOSTON, MASS., 45 Milk Street

## Services.

Contractors in REINFORCED CONCRETE BUILDING CONSTRUCTION FOR INDUSTRIAL PURPOSES.

REINFORCED CONCRETE BUILDINGS, either all concrete, or structural concrete combined with brick, tile, terra cotta or stone.

## Experience and Organization.

For 16 years this company has specialized exclusively in industrial concrete construction, and has handled 657 separate contracts to date. Its organization of experienced engineers and concrete experts is not permitted to disintegrate.

## Speed.

On 657 contracts in 16 years, an average of a contract every 9 days, the TURNER CONSTRUCTION COMPANY has not had to pay a single penalty for failure to complete on time.

## Winter Work.

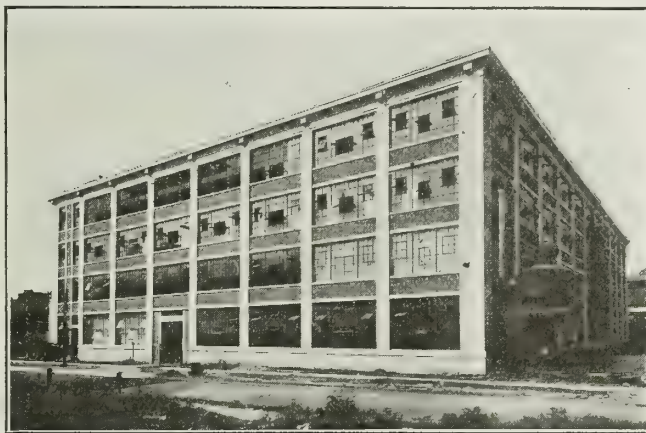
13% of the company's work has included winter weather construction. 29 contracts were carried through to successful completion last winter, in spite of severe weather—all delivered on time.

## Forms of Contract.

The TURNER CONSTRUCTION COMPANY works under any form of contract—lump-sum, cost-plus-fixed-sum or cost-plus-percentage. 48% of its business has been on a cost-plus-percentage basis. The Turner policy to do only good work at the lowest consistent price has resulted in 47% "repeat orders"—most of them without competition.

## Co-operative Service.

The company's engineers and concrete specialists will render any reasonable assistance to architects and engineers in the preparation of plans and the execution of work. Its system of unit costs—based on the successful performance of 657 contracts—enables it to give accurate estimates promptly, even from plans prepared for steel or mill construction.



NEW DEPARTURE MANUFACTURING CO., BRISTOL, CONN.  
LOCKWOOD, GREENE & Co., Architects and Engineers  
4 stories, 222 by 160 ft. Erected by Turner in 20 weeks



U. S. NAVY WAREHOUSE, BROOKLYN NAVY YARD  
Designed by ENGINEER CORPS, U. S. NAVY  
11 stories, 360 by 180 ft., 712,000 sq. ft. of floor space. Floor loads, 150 to 500 lbs. per sq. ft. Erected by Turner in 26 weeks—6 weeks before promised



WAREHOUSE, BELLEVILLE WAREHOUSE COMPANY (WM. WHITMAN CO., OWNERS), NEW BEDFORD, MASS.  
C. R. MAKEPEACE & Co., Architects and Engineers

8 stories, 1000 ft. long, 100 ft. deep. Erected in 4 sections. First 2 sections built in 1916 in 3½ months each. Third and fourth sections built in 1917 in 3½ months each



ESTABLISHED 1895

**WHITE FIREPROOF CONSTRUCTION CO.**

Reinforced Concrete Construction

286 Fifth Avenue  
NEW YORK, N. Y.**Services.**

GENERAL CONTRACTORS for REINFORCED CONCRETE BUILDINGS of every description, specializing in the CONSTRUCTION and EQUIPMENT of INDUSTRIAL PLANTS.

**Organization.**

The execution of contracts for concrete construction for the past 20 years has enabled the WHITE FIRE-PROOF CONSTRUCTION CO. to develop an organization of unusual ability. This organization is so flexible that the company can erect buildings of any size or design with the utmost economy and speed.

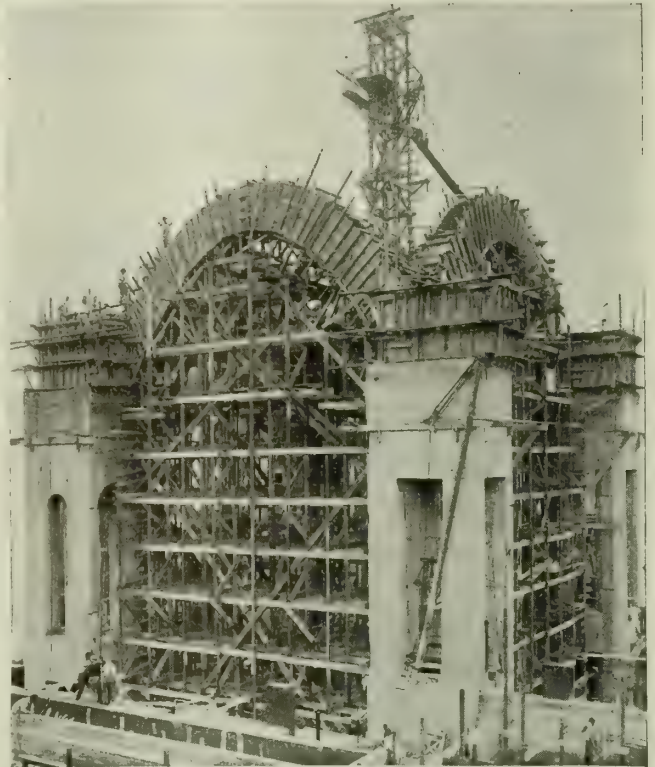
**Engineering Department.**

This company will gladly submit full information in connection with costs and time of erection of any contemplated building, whether designed for concrete or not.

The engineering department is at the disposal of either architect, engineer or owner, without obligation.

**Form of Contract.**

Preference as to form of contract may be exercised—lump sum; cost-plus-fixed-sum; cost-plus-percentage. Where a building is required in the shortest possible time, a "cost-plus" contract has the advantage in that it will enable the company to start excavation and foundation work before the plans for the superstructure are entirely finished. This often results in a time saving of weeks and even of months.



REINFORCED CONCRETE PIERS AND GREAT ARCHES,  
ST. BARTHOLOMEW'S CHURCH, NEW YORK, N. Y.

Clear span of arches, 43 ft. Piers are 85 ft. high. Arches are 6 ft. by 3 ft. 5 3/4 ins.



TERMINAL WAREHOUSE BUILDING, MONTREAL, CAN.  
Built of concrete faced with brick



WORKS: CHICAGO, ILL.  
Telephone, Hyde Park 1743



# EASTERN BRIDGE & STRUCTURAL CO.

Engineers and Builders

WORCESTER, MASS.

## Products and Services.

Engineers; designers, manufacturers and erectors of STEEL STRUCTURES of all classes, particularly BUILDINGS and BRIDGES.

### ORNAMENTAL IRON WORK.

This company maintains an excellent designing and engineering department which is at the service of architects and contractors.

It will execute all the designing and engineering in connection with structural and ornamental iron work on all classes of structures.

### Ornamental Iron Work.

This is the largest structural steel company in New England having an ornamental iron department; thus it is given considerable advantage in dealing with architects, as it can execute not only the structural work, but also the ornamental iron work.

### Facilities.

A large and complete stock of structural shapes is carried on hand at all times for immediate delivery.

The accessibility of the plant to three leading New England railroad lines insures prompt deliveries.

### References.

The following is a partial list of representative structures built by this Company, with names of architects or engineers:

Williams College Infirmary, Allen & Collens  
 Morris Pratt Memorial, Rich & Mathesius  
 Industrial Trust Company Building, Stone, Carpenter & Sheldon  
 Park Building, Cross & Cross  
 Garden Theater, A. H. Bowditch  
 Randall Island Hospital Buildings, Donn Barber  
 Union College Science Building, Geo. B. Post & Son  
 Taunton High School, Kilham & Hopkins  
 Worcester Y. M. C. A., Louis E. Jallade  
 Troy Y. M. C. A., Chas. C. Grant  
 Windsor Print Works Boiler House, John A. Stevens  
 Spring Perch Company Building, Fletcher-Thompson, Inc.  
 Fort Orange Paper Co. Machine Room, Chas. T. Middlebrook  
 Aetna Mills Dye House, H. M. Haven and Wm. W. Crosby  
 Falulah Paper Co. Building, S. M. Green Co.  
 Beacon Mfg. Co. Boiler House, Knight C. Richmond  
 Winchendon Electric Light Co., Charles T. Main  
 Crocker Burbank Machine Room, George F. Hardy



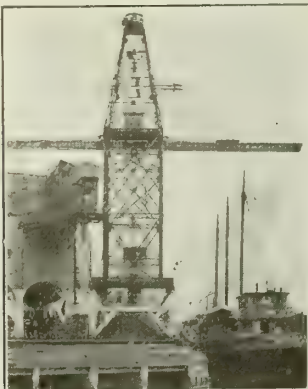
Ford Motor Co. Building, Cambridge, Mass.



Administration Building, Norton Co., Worcester, Mass.



Bridgeport Projectile Co. Building, Bridgeport, Conn.



Coaling Tower, Portsmouth Consolidated Street Railway Co.,  
 Portsmouth, N. H.



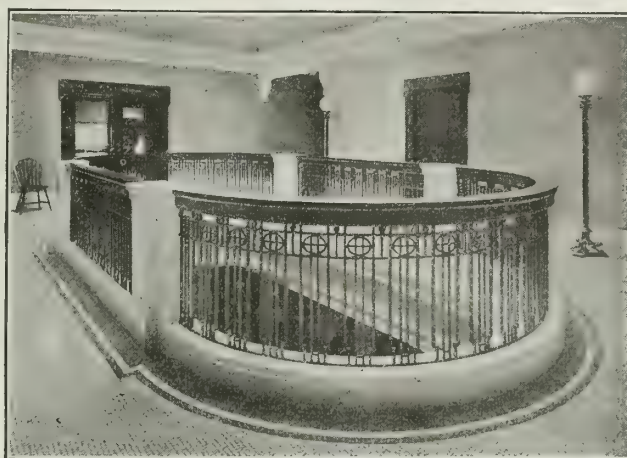
Goffs Falls, Litchfield and Hudson Street Railway Trestle,  
 Goffs Falls, N. H.

STEEL STRUCTURES DESIGNED AND ERECTED BY THE EASTERN BRIDGE & STRUCTURAL CO.





Municipal Building, New London, Conn.



Rotunda Railing, Brockton Public Library, Brockton, Mass.



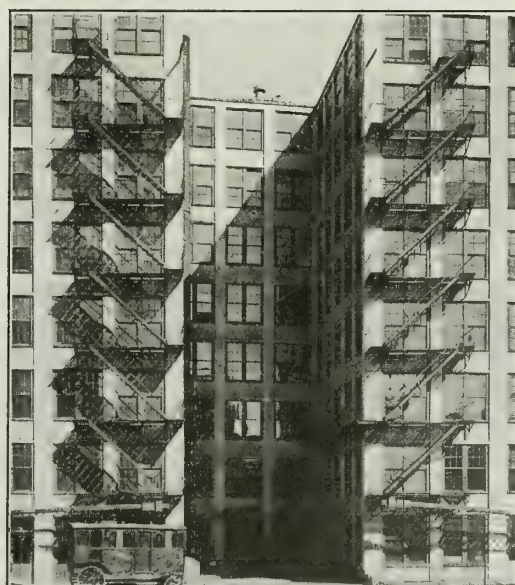
Elevator Enclosure, Sherer's Store, Worcester, Mass.



Stairs, Worcester National Bank, Worcester, Mass.



Greendale Branch Library, Worcester, Mass.



Fire Escape, Graphic Arts Building, Worcester, Mass.

A FEW ORNAMENTAL IRON WORK CONTRACTS EXECUTED BY THE EASTERN BRIDGE & STRUCTURAL CO.



# THE BARTON SPIDER-WEB SYSTEM

## Flat Slab Reinforced Concrete Construction

### TELEPHONES:

WABASH 2188  
2187

### GENERAL OFFICES

1510 Kimball Building  
CHICAGO, ILL.

### Products and Services.

We furnish to owners and contractors complete jobs of CONCRETE REINFORCEMENT for Flat Slab Buildings. In such cases we absorb in our steel cost our entire cost of making all drawings and our royalty costs.

We also furnish to architects, owners and contractors complete ENGINEERING SERVICES on any Reinforced Concrete Structure, Flat Slab or otherwise. In such cases we usually furnish no steel.

We also handle CONCRETE INSERTS and other specialties.

### Patent Protection.

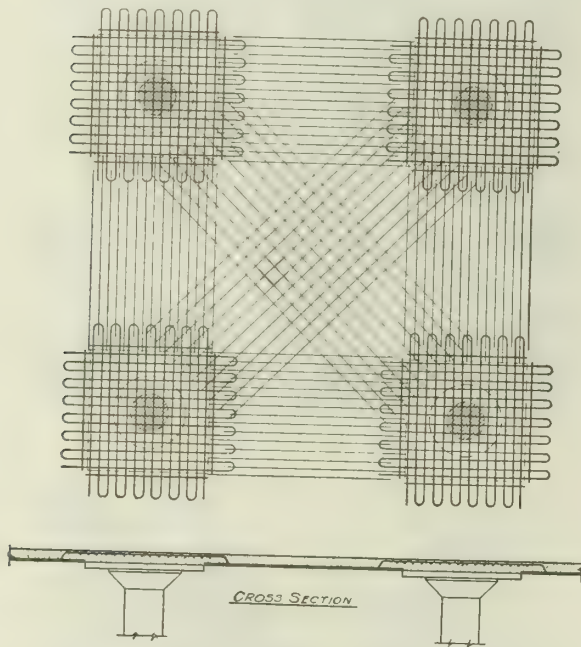
We operate under the basic Norcross patent and

the Barton patents and guarantee our clients protection. Infringers will be prosecuted.

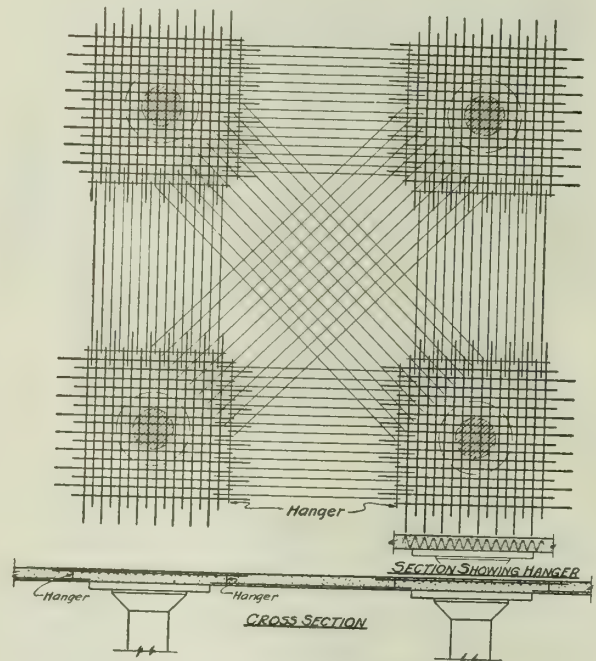
We design a four-way slab of the two general types illustrated below. One of the features of our patent consists of the combination of four-way reinforcement in bottom of slab and two-way reinforcement over supporting columns.

The Patents we control are:

United States, No. 1145462, July 6, 1915; No. 1155461, Oct. 5, 1915; No. 1217645, Feb. 27, 1917. French, No. 480020, July 15, 1916. Cuban, No. 3580, Nov. 4, 1916. British, 100457, May 25, 1916. Canadian, 179882. Other patents pending.

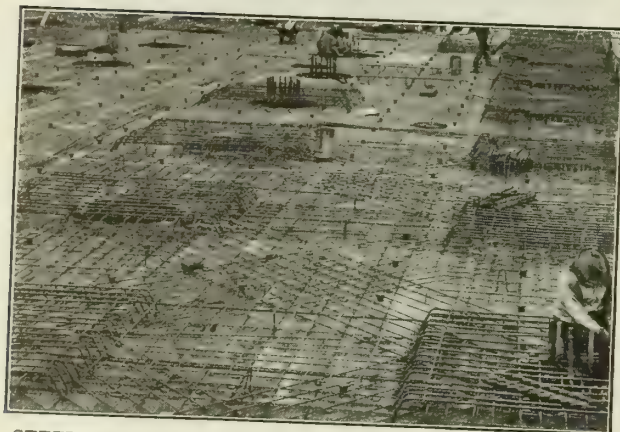


Type "A," Mat (Patented)

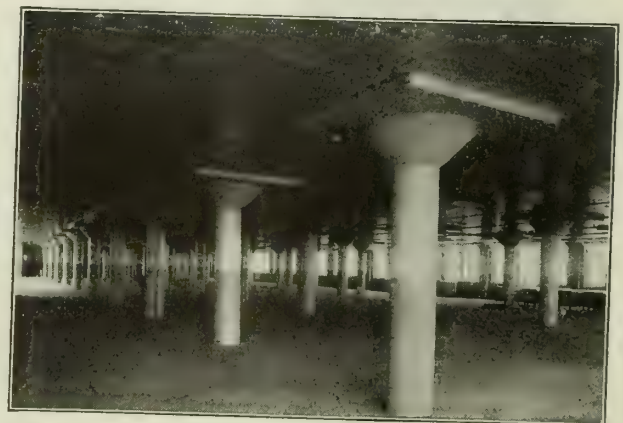


Type "B," Loose Rod (Patented)

PLANS AND CROSS SECTIONS BARTON SPIDER-WEB SYSTEM



STEEL LAYOUT, TYPE A, ILLINOIS COLD STORAGE CO., CHICAGO, ILL.



INTERIOR OF BUILDING, STEWART-WARNER SPEEDOMETER CORP., CHICAGO, ILL.



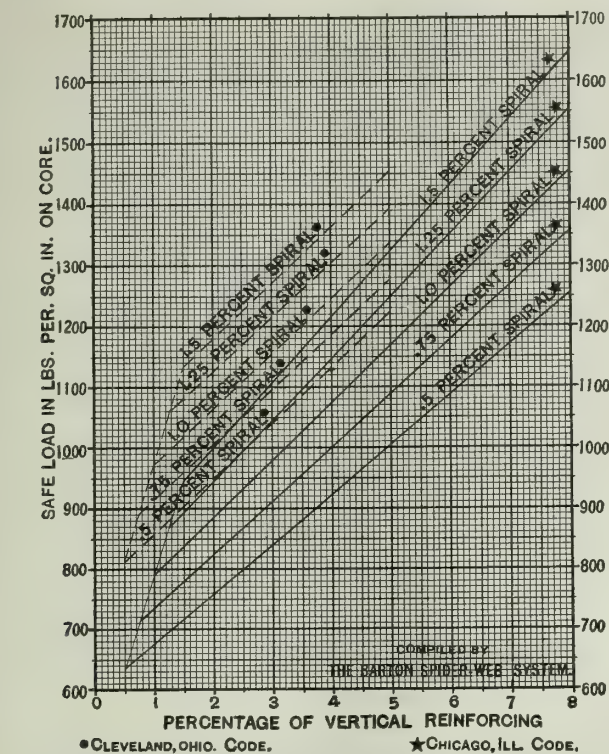


DIAGRAM OF WORKING LOADS

Above diagram gives working loads for column reinforced with both spiral and vertical steel. The two sets of values shown are those required by the Chicago and Cleveland ordinances. The economical stresses in the Chicago ordinance lie between 800 and 1000 lbs. per sq. in. inside of spiral and in the Cleveland ordinance between 1000 and 1200 lbs. per sq. in.

The tables below give slab thickness, etc., for average loading and spans, and may be profitably used by any one laying out a flat slab job. These tables are drawn from the Chicago Building Department Ruling and represent conservative design. Where no building code exists we recommend the use of Cleveland columns and Chicago slabs. One table covers the case where drop panels are used around the column head, and the other where the ceiling is flat. The latter is used principally for cold storage warehouses, where insulation is suspended from ceilings.

Inquiries on special cases answered in detail.

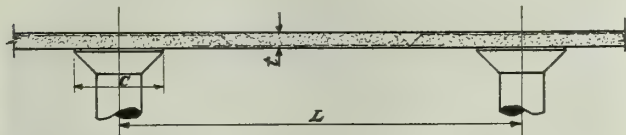


DIAGRAM FOR FLAT CEILINGS

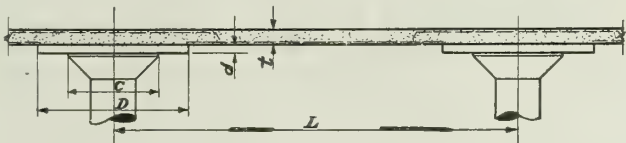


DIAGRAM FOR DROP PANEL CEILINGS

TABLE OF DIMENSIONS FOR FLAT CEILINGS (DIAGRAM TO LEFT)

L	C	40 Lbs. Roof		100 Lbs. L.L.		150 Lbs. L.L.		200 Lbs. L.L.		250 Lbs. L.L.		300 Lbs. L.L.		400 Lbs. L.L.		500 Lbs. L.L.	
		t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.	t	Weight, lbs. per sq. ft.
ft.	ft. ins.	ins.		ins.		ins.		ins.		ins.		ins.		ins.		ins.	
16	3 9	6	75	7	85	7 3/4	95	8 1/2	106	9	113	9 3/4	122	10 3/4	134	11 1/2	144
18	4 0	6 1/2	81	7 3/4	95	8 3/4	109	9 1/2	119	10 1/4	128	10 3/4	134	12	150	13	163
20	4 6	7	85	8 3/4	109	9 1/2	119	10 1/2	131	11 1/4	141	12	150	13 1/4	166	14 1/2	181
22	5 0	7 3/4	95	9 1/2	119	10 3/4	134	11 3/4	147	12 1/2	156	13 1/4	166	14 3/4	184	16	200
24	5 6	8 3/4	109	10 1/2	131	12	150	12 3/4	159	13 3/4	172	14 3/4	184	16 3/4	203		
26	6 0	9 3/4	122	11 1/2	144	13	163	14	175	15	188	16	200				

TABLE OF DIMENSIONS FOR DROP PANEL CEILINGS (DIAGRAM TO RIGHT)

L D C					40 Lbs. Roof			100 Lbs. L.L.			150 Lbs. L.L.			200 Lbs. L.L.			250 Lbs. L.L.			300 Lbs. L.L.			400 Lbs. L.L.			500 Lbs. L.L.		
					t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.	t	d	Wt., lbs. per sq. ft.
ft.	ft.	ins.	ft.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	
16	5	7	3	9	6	4	78	6	4	80	6	4	80	6½	4	87	7	4	94	7½	4	100	8	6	108	9	6	121
17	6	0	4	0	6	4	78	6	4	80	6	4	80	6½	4	88	7¼	6	98	7¾	6	105	8½	6	115	9½	6	127
18	6	4	4	0	6	4	78	6	4	80	6¼	4	84	7	6	94	7½	6	101	8	6	108	9	6	122	10	6	134
19	6	8	4	3	6	4	78	6½	4	85	6¾	4	91	7¼	6	98	8	6	108	8½	6	115	9½	6	128	10½	8	140
20	7	0	4	6	6	4	78	7	4	91	7½	6	98	7½	6	102	8½	6	114	9	6	122	10	6	135	11	8	148
21	7	4	4	9	6¼	6	84	7¼	6	96	7½	6	101	8	6	108	9	6	121	9½	6	129	10½	8	142	11½	8	155
22	7	8	5	0	6½	6	91	7½	6	99	8	6	107	8½	6	114	9½	6	128	10	6	135	11	8	149	12	8	162
23	8	1	5	3	7¼	6	96	8	6	105	8¼	6	111	9	6	121	10	6	134	10½	8	142	11½	8	156	12½	8	169
24	8	5	5	6	7½	6	100	8¼	6	109	8½	6	115	9½	8	128	10¼	8	138	11	8	148	12	8	162	13	10	176
25	8	9	5	9	8	6	107	8½	6	113	9	6	121	9¾	8	131	10½	8	142	11¼	8	152	12½	8	169	14	10	188
26	9	2	6	0	8¼	6	110	9	6	122	9½	6	130	10¼	8	138	11	8	148									
28	9	10	6	3	8½	6	116	9½	6	130	10	8	135	10¾	8	145	11½	10	156									
30	10	6	6	9	9	6	122	10½	6	140	11	8	150	11½	10	156	12¼	10	166									
32	11	3	7	3	9½	6	130	11	8	150	11½	10	156	12	10	163	13	10	180									



# CORRUGATED BAR COMPANY

## Fireproof Floor Systems

Mutual Life Building  
BUFFALO, N. Y.

### DISTRICT OFFICES

NEW YORK, N. Y., Whitehall Building, 17 Battery Place  
CHICAGO, ILL., 20 West Jackson Boulevard  
ST. LOUIS, MO., Federal Reserve Bank Building  
ATLANTA, GA., 1017 Grant Building

BOSTON, MASS., 27 School Street  
ST. PAUL, MINN., Pioneer Building  
PHILADELPHIA, PA., Transportation Building  
SYRACUSE, N. Y., Union Building  
DETROIT, MICH., Penobscot Building

### Products.

#### FIREPROOF FLOOR CONSTRUCTION.

For Concrete Reinforcement, see pages 190-92.

### Corr-Plate Floors.

DESIGN—The flat-slab or beamless floor suggests a stress distribution at the columns corresponding to an umbrella action, requiring, in reinforced concrete, a system of radiating rods. It is not generally understood that in over 90% of the area of the panel, the lines of principal stress in such floors are parallel to the sides of the panel, and that therefore a two-way system of reinforcing is bound to be more economical and more scientifically correct, provided the quantity of reinforcement per unit of width is made to vary in accordance with the gradual change in stress, as determined by extensive laboratory and field tests such as are conducted by the Research Department of the CORRUGATED BAR COMPANY, and reported in various technical journals as well as in its own catalogue literature.

The Corr-Plate Floor satisfies both of these requirements, and is therefore a technically correct system of flat-slab construction.

ADVANTAGES—The company's experiments demonstrated that a floor of uniform thickness was not economical, the stresses around the column being much heavier than in the middle of the panel. The Corr-Plate Floor therefore employs a cap, usually about 2 ins. in thickness, the width of which is marked "C" in the diagram, by means of which much saving in concrete is effected. This cap can be placed underneath the floor; or, if wood floor surface is used, it can be placed on top, thus giving a perfectly smooth ceiling.

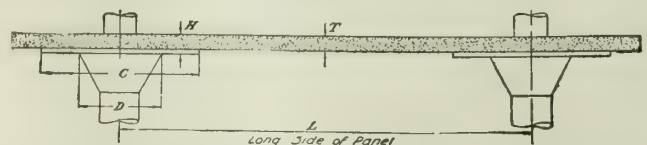
The reinforcement in quantity and location was adjusted to meet the actual theoretical requirements; and as it runs at practically all points in exactly the right direction to coincide with the principal stresses, there can be no waste. The fact that the reinforcement is in but two layers gives an increased effective depth, as compared with those forms of flat-slab construction employing four layers of steel.

In addition to the advantages just recited that are particular to the Corr-Plate system, it has, of course, the generic advantages possessed by all types of flat-slab construction, i. e., the saving in total height of structure for given clear-story heights; simplicity of forms and ease of erection; better lighting; better ventilation; and less cost in sprinkling and overhead shafting installations.

PATENT SITUATION—The CORRUGATED BAR COMPANY is able to convey on its Corr-Plate construction not merely the protection of Lindau patent No. 1,050,477, but of Norcross patent No. 698,542 as well.



DAVISON-PAXON-STOKES BUILDING  
W. T. DOWNING, Architect, Atlanta, Ga.  
INDUSTRIAL ENGINEERING CO., Contractors



DIMENSION DIAGRAM

DIMENSION TABLE OF CORR-PLATE FLOORS

L	C	40 lbs.				150 lbs.				200 lbs.				300 lbs.				400 lbs.				500 lbs.			
		T	H	D	Wgt.	T	H	D	Wgt.	T	H	D	Wgt.	T	H	D	Wgt.	T	H	D	Wgt.	T	H	D	Wgt.
15	6'-0"	5 1/2	7 1/2	36	73	6	8	36	79	6	8	36	79	7	9	39	92	7 1/2	11 1/2	42	102	8 1/2	12 1/2	42	114
16	6'-6"	5 1/2	7 1/2	36	73	6	8	36	79	6 1/2	8 1/2	42	86	7 1/2	9 1/2	42	98	8	12	45	108	9	13	45	121
17	6'-9"	5 1/2	7 1/2	39	73	6 1/2	8 1/2	42	86	7	9	45	92	8	11	45	106	8 1/2	12 1/2	48	114	9 1/2	13 1/2	48	127
18	7'-3"	6	8	39	79	6 1/2	8 1/2	45	86	7	9	48	92	8 1/2	11 1/2	48	112	9	13	51	121	10	14	51	133
19	7'-9"	6	8	42	79	7	9	48	92	7 1/2	9 1/2	51	98	8 1/2	11 1/2	51	112	9 1/2	13 1/2	51	127	10 1/2	15 1/2	51	142
20	8'-0"	6	8	42	79	7 1/2	9 1/2	48	98	8	10	54	104	9	13	54	120	10	14	54	133	11	16	57	148
21	8'-6"	6 1/2	8 1/2	45	86	8	10	51	104	8	10	54	104	9 1/2	13 1/2	54	127	10 1/2	14 1/2	57	139	11 1/2	16 1/2	60	154
22	8'-9"	6 1/2	8 1/2	48	86	8	10	54	104	8 1/2	11 1/2	57	112	10	14	57	133	11	16	60	147	12	18	60	162
23	9'-3"	7	9	51	92	8 1/2	10 1/2	57	111	9	12	60	119	10 1/2	14 1/2	60	140	11 1/2	16 1/2	60	154	12 1/2	18 1/2	63	168
24	9'-9"	7 1/2	9 1/2	54	98	9	11	60	117	9 1/2	12 1/2	60	125	10 1/2	15 1/2	63	142	12	18	63	162	13	19	66	175
25	10'-0"	8	10	57	104	9 1/2	11 1/2	63	123	10	13	63	131	11	16	66	148	12 1/2	18 1/2	66	165	14	20	69	187

NOTE—Dimensions T, H and D are given in inches. Weight given in pounds per square foot.

DESIGNING TABLE—Table gives dimensions of Corr-Plate Floors when reinforced with Corrugated Bars for various sizes of panels and live loads. Data are based on a maximum theoretical concrete stress of 750 lbs. per sq. in. Slab thicknesses are such that the deflections under a superimposed test load equal to twice the safe live load plus dead load will not exceed 1/500 of span for a theoretical working stress in steel of 18,000 lbs. per sq. in.

Flat-slab designs, showing smaller column head diameters, or thinner slabs over the supports, should be carefully checked for shear at the edge of the column heads.



# S-M-I ENGINEERING COMPANY

Flat Slab Systems of Reinforced Concrete  
Designing and Consulting Engineers

13 Park Row  
NEW YORK, N. Y.

BRANCH OFFICE, BOSTON, MASS., 136 Federal Street

## Products and Services.

S-M-I FLAT SLAB SYSTEM of REINFORCED CONCRETE.

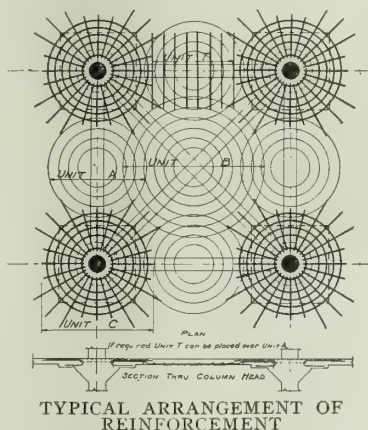
DESIGNING and CONSULTING ENGINEERS on Steel and Concrete Structures.

S-M-I ENGINEERING Co., an organization of skilled structural engineers, engages in the preparation of structural plans for all types of structures. Particular attention is given to the S-M-I flat slab system. Estimates, preliminary sketches and advice regarding the S-M-I flat slab system are furnished free of charge. Royalty charges, usually paid by the contractor, which include the cost of preparation of floor plans, are moderate and always smaller than the actual saving effected by the use of the system.

S-M-I ENGINEERING Co. does not sell any building materials, so that the use of the S-M-I flat slab system is not restricted to the use of any particular type of reinforcing bars.

## Description of S-M-I Flat Slab System.

S-M-I flat slab system of reinforced concrete, developed by Edward Smulski, member American Society Civil Engineers, distinguishes itself by economy and a scientific arrangement of reinforcement. The steel is placed in the direction of stresses to be resisted, thereby performing the work of carrying the load with the smallest expenditure of material. As is evident from the illustrations, the reinforcement consists of units composed of rings and radials. Units C at the column are near the top; units A and B are near the bottom of the slab.



## Advantages.

The S-M-I flat slab system has all the advantages of flat slab construction. An additional advantage is

that the S-M-I flat slab system requires a smaller amount of reinforcement for equal strength than any other flat slab system. It has been demonstrated, by competitive designs in a large number of buildings in which the system has been used, that a saving of from 20% to 30% of the floor steel has been effected over other systems, without reducing the capacity of the slab.

## Bending and Placing of Reinforcement.

The bending of steel is inexpensive, as the rings can be bent by means of ordinary tire benders, driven by hand or power, or by the use of wooden templets around which the rings are wound. All rings are lapped and not welded. Due to the small number of bars, the reinforcement can be placed with great speed. Due to the rigidity, the reinforcement at the column head can be kept the proper distance above the form without difficulty.

## Tests and Approvals.

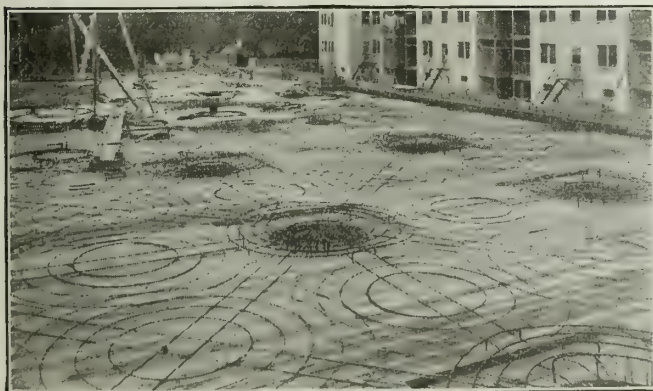
The system has been subjected to thorough tests and tried out by actual service in a large number of buildings. Report of the exhaustive test made by Professor Hatt of Purdue University will be sent on request. The system has been approved by all building departments to which it was submitted.

## Patents.

The S-M-I flat slab system is protected by patents issued Sept. 1915, Sept. 1916 and April 1917.

## Partial List of Buildings in Which S-M-I System Was Used.

Bankers Trust Building, Offices and Warehouse, Densmore & LeClear, Architects; Geo. A. Fuller Co., Contractors.  
Carter, Rice & Webster Buildings, Factory, Offices and Warehouse, George F. Shepard, Architect; National Engineering Corp., Contractors.  
Hinde & Dauch Paper Co. Building, Factory and Heavy Machinery, A. M. Allen & Co., Engineers; W. M. Sutherland Bldg. and Contg. Co., Contractors.  
Packard Automobile Service Building, Albert Kahn, Architect; Stone & Webster Engineering Corp., Contractors.  
Revere Sugar Warehouse, William Higginson, Architect; Turner Construction Co., Contractors.  
Union Envelope Co. Building, Printing Presses, Chas. M. Robinson, Inc., Architects; Travers Wood Co., Contractors.  
H. G. Thompson & Sons, Warehouse, Lockwood, Greene & Co., Architects; National Engineering Corp., Contractors.



SHOWING REINFORCEMENT IN PLACE



A TYPICAL INTERIOR VIEW



# CONCRETE ENGINEERING COMPANY

OMAHA, NEBR.

DISTRICT OFFICES

CHICAGO, ILL.

KANSAS CITY, MO.

SALT LAKE CITY, UTAH

## Products.

MEYER STEELFORM CONSTRUCTION, CONCRETE FLOOR SYSTEM (Patented); MEYER STEELFORMS; CECO EXPANDED METAL REINFORCING; CECO EXPANDED METAL LATH; CECO CORNER BEADS; CECO BASE BEADS; CECO STEEL CHANNELS.

Reinforcing Steel in Plain Round, Square or Deformed Bars in Mill Shipments and Fabricated Units; Column Spirals; Ceco Bar Chairs; Ceco Wire Fabric; Ceco Wire Lath; Plaster Board; Plaster Board Clips.

## Service.

Complete details, drawings and specifications of reinforced concrete construction are provided, drawings clearly indicating the character and exact location of reinforcement used. Meyer Steelforms and Ceco Fireproofing Materials, as listed above, are furnished from this company's warehouses at Chicago, Omaha and Kansas City, and installed on the job, if desired, under competent supervision.

## Meyer Steelform Construction.

This system of fireproof floor construction embraces the use of concrete joists, with an intervening slab, the load being carried by the joists in one direction to the supports. The illustrations show the method used in producing continuous joists, by using Meyer removable Steelforms. Meyer Steelforms are absolutely rigid, being made of No. 16-gage sheet steel, with depressed ribs in top surface. After being nailed to the open wood centering erected beneath, they can not get out of alignment. It is this solid rigidity which permits their removal and re-use in succeeding floors and different buildings.

Endforms are used to close each row of Steelforms, and are made both straight and tapered. As indicated in details given, single tapered Endforms effect an increase in concrete joists as they approach the supports, and double tapered Endforms make the compression flange or tee of supporting girder.

Wire lath, metal lath, or plaster board ceilings may be applied directly to, or suspended from, the concrete joists, after the removal of Steelforms. Wire ceiling hangers are placed through round openings provided in the top of each Steelform, before concrete is poured. As indicated in details, this company's standard ceiling constructions contemplate the use of channels, pencil rods and lath or plaster board. The very desirable hollow, soundproof floor is effected when this ceiling construction is plastered. Air chambers thus effected between joists make a perfect insulation. A thorough inspection of all concrete work can be made



APPLICATION OF STEELFORMS TO CONCRETE FLOOR CONSTRUCTION

after the Steelforms are removed, and an absolutely level ceiling is assured by erecting the ceiling just before plastering.

**ADVANTAGES**—Absolute accuracy of concrete work is assured through the solid rigidity of Meyer Steelforms. This exceptional rigidity permits their removal and re-use in succeeding floors and different buildings, allows the use of open wood centering, and eliminates loss due to breakage when clap tile are used. Joist floors constructed with Meyer Steelforms require a minimum of concrete and reinforcing steel. Concrete and steel are used only where they are effective in resisting stresses. Meyer Steelform Construction may be used with equal economy in concrete frame or steel frame buildings, the saving in materials through reduction in dead load being effective throughout all structural members of the building. A decided saving in formwork is effected through removal and re-use of Meyer Steelforms on a rental basis; maximum re-use and greatest possible speed in erection being secured with a minimum of formwork.

**SPECIFICATIONS**—This company will furnish promptly, on request, complete concrete specifications in accordance with Meyer Steelform Construction; also specifications of its several types of standard metal lath ceilings.



MEYER STEELFORMS READY FOR CONCRETE

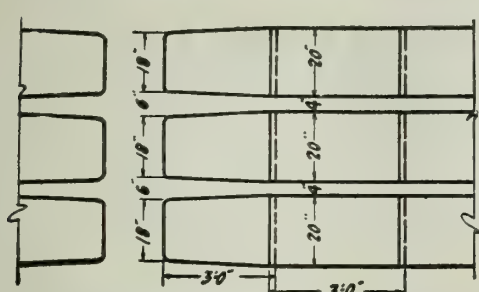


ERECTION OF METAL LATH CEILING



OPEN CONCRETE JOIST CEILING

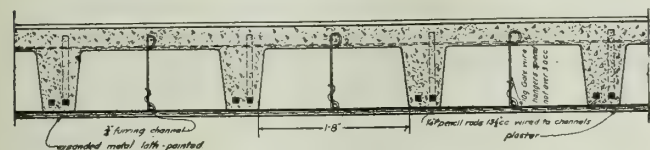




PLAN AND ELEVATION TO SHOW TAPERED ENDFORMS

	STANDARD STEELFORMS	STANDARD ENDFORMS
Depth, ins. ....	6, 8, 10 and 12	6, 8, 10 and 12
Length, ft. ....	3	3
Width, ins. ....	20	20, tapered to 18
Special lengths, ft. ....	1 and 2	1
Special widths, ins. ....	15 and 10	15 and 10

Tapered endforms in standard depths and lengths, 20 ins. wide at open end tapering to 18 ins. at closed end. Double tapered endforms the same, with additional taper of 3 ins. in height from open to closed end.



SECTIONS SHOWING APPLICATION OF METAL LATH AND PLASTER CEILING



TRADE-MARK

**Ceco Economy Lath.**

An especially economical, light weight lath of small mesh, requiring a light coat of plaster. Made of best grade open hearth steel. Exceptionally rigid. Furnished painted, galvanized or in copper iron alloy.

DATA, CECO ECONOMY LATH

Gage No. . . .	18	20	22	22½	23	24	25	26
Weight per sq. yd., lbs. . .	5.50	4.15	3.40	3.33	3.10	2.75	2.40	2.10

Add 1 lb. per sq. yd. for lath galvanized after expansion. Sheets are all 21 by 97 ins., 1½ yds. per sheet, 14 sheets per bundle, 21 yds. per bundle.

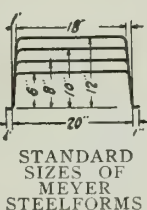
**Ceco Quality Lath.**

A very high grade lath, having wider strands of metal and weighing more than ordinary lath. More steel is used in this lath, and a minimum of plaster may be used due to its solid rigidity. Furnished either painted, galvanized or in copper iron alloy.

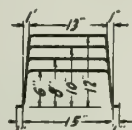
DATA, CECO QUALITY LATH

Gage No. . . .	18	20	22	24	25	26
Weight per sq. yd., lbs. . .	8.00	6.00	5.00	4.00	3.50	3.00

Add 1 lb. per sq. yd. for lath galvanized after expansion. Sheets are all 21 by 97 ins., 1½ yds. per sheet, 14 sheets per bundle, 21 yds. per bundle.



STANDARD SIZES OF MEYER STEELFORMS



SPECIAL SIZES OF MEYER STEELFORMS



CECO ECONOMY LATH



CECO QUALITY LATH

**Ceco Self-furring Lath.**

Admirably and economically adapted for exterior stucco work. This lath is corrugated, the raised arches or corrugations eliminating the necessity of furring strips, and giving the lath added strength and rigidity. Stucco will stay on when this lath is used.

DATA, CECO SELF-FURRING LATH

Gage No. . . .	24	25	27
Weight per sq. yd. lbs. . .	4.00	3.00	2.80

Add 1 lb. per sq. yd. for lath galvanized after expansion. Sheets are all 21 by 97 ins., 1½ yds. per sheet, 14 sheets per bundle, 21 yds. per bundle.

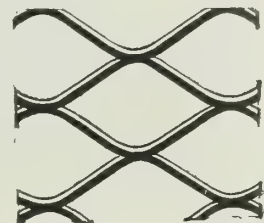


CECO SELF-FURRING LATH

**Ceco Expanded Metal.**

A labor saving concrete reinforcement, affording practically any desired sectional area of steel and correct gaging.

Furnished in gages from No. 20 to ¼ in. in thickness, in the following sizes of mesh: 1 by 2 ins.; 1½ by 3 ins.; 2½ by 5 ins.; 3 by 6 ins.; 3 by 7 ins.; 3½ by 7 ins.



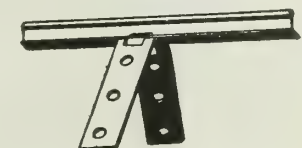
CECO EXPANDED METAL

**Ceco Corner Beads.**

An exceptionally heavy, rigid bead that will not get out of alignment. Made of No. 24-gage steel, galvanized after forming. Will not rust. Clips furnished if desired.

CECO CORNER BEAD  
Lengths, 6, 7, 8, 9, 10 and 12 ft.**Ceco Rail Beads.**

Affording a substantial protection for the plastered corner; adjustable for any depth of grounds. One clip furnished per foot of length. Heavily galvanized.

CECO RAIL BEAD  
Lengths, 6, 7, 8, 9, 10 and 12 ft.**Ceco Cold Formed Channels.**

PLAIN

Gage No. . . .	Size, ins. . . .	Weight per 1000 lin. ft., lbs. . .	Size of flange, ins. . .
16	¾	276.0	...
16	7/8	304.0	...
16	1	331.5	...
16	1¼	386.8	...
16	1½	456.0	...
16	2	580.0	3/8
16	2	635.4	1/2
16	1½	539.0	1/2
18	1½	458.2	1/2



CECO PLAIN COLD FORMED CHANNEL

PERFORATED

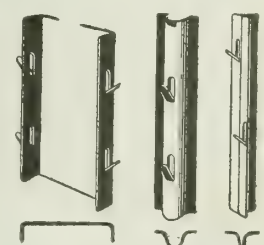
Gage No. . . .	Size, ins. . . .	Weight per 1000 lin. ft., lbs. . .	Size of flange, ins. . .
16	1½	455.8	3/8
18	1½	458.2	1/2
18	2	479.0	1/2
18	2¼	520.6	1/2
18	2½	562.3	1/2
18	3	645.6	1/2
18	3½	728.9	1/2



CECO PERFORATED COLD FORMED CHANNEL

**Ceco Prong Lock Studding.**

Made of 2 gages, Nos. 18 and 20, with prongs every 3½ ins. Double stud for hollow partitions comes in widths of 2, 3, 4, 5 and 6 ins., and lengths of 10 and 12 ft. Small tee stud for solid partitions comes in ¾-in. widths only, and 10-ft. lengths. Lath is quickly and economically clinched to stud by bending back prongs with a hammer. Standard partition details furnished on request.



CECO PRONG STUDS



# BURCHARTZ FIREPROOFING COMPANY, INC.

## Two-way Fireproof Floor Construction

26 Cortlandt Street

NEW YORK, N. Y.

### Product and Service.

BURCHARTZ SYSTEM OF FLOOR CONSTRUCTION for all fireproof buildings.

The Burchartz Two-way Floor Construction is sold under exclusive license on patents covering hollow structures enclosed by channels, angles, plates, telescoping, turning blocks at right angles to each other; in addition to which the company has many other methods of closures and block constructions.

A corps of engineers is prepared to furnish designs and estimates for the Burchartz floor and on request will be glad to send catalogues with complete description and references.

### Description.

**HOLLOW TILE**—The Burchartz patented two-way terra cotta hollow tile blocks are completely closed on all sides and used with a crosswise system of reinforced concrete of the proper consistency, which can be tamped or spaded into place.

**SOUNDPROOF**—The combined elements are non-conductors of, and impervious to sound.

**CONSTRUCTION**—Hollow terra cotta units produce an all-tile ceiling surface for plaster.

Burchartz blocks of required sizes are placed in true alignment and the block closures placed to prevent the concrete or the water and cement from the concrete entering the tile.

Intersecting channels between the tile are filled with reinforced concrete, which is carried upward to form a continuous uniform slab of requisite thickness over the tops of the tile.

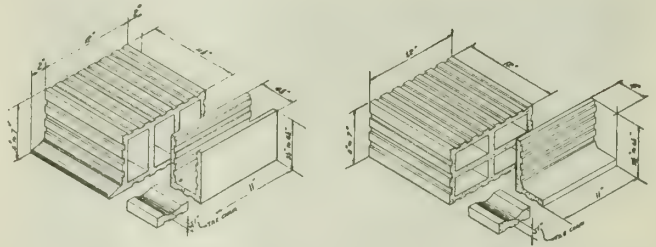
**ECONOMY AND EFFICIENCY**—Maximum efficiency is derived from the concrete, because compressed in two directions at right angles to each other. Stiffness of the construction makes the use of long spans safe, and reduces requirements in structural steel or concrete.

Burchartz floor is so light for the spans that can be constructed by stressing the concrete in two directions in conjunction with the Burchartz enclosed hollow blocks, that there is a material saving in structural steel or reinforced concrete girders and columns, in addition to the economy of the Burchartz floor itself.

Square panels about 18 ft. or over between column centers is the ideal condition for the Burchartz two-way floor. Saving in structural steel under such conditions would be from 30% to 50% as compared with structural steel required for short span systems. A floor thinner by several inches than other systems suitable for "Class A" work, is produced. Direct application of plaster to tile effects another saving in cost.

**ADAPTABILITY AND STRENGTH**—It is adaptable to architectural treatment owing to its remarkable strength and its lightness.

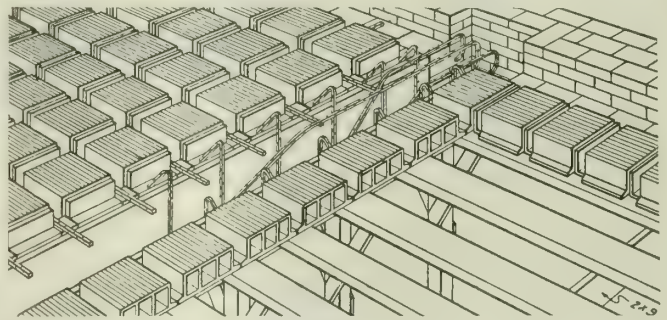
The Burchartz crosswise floor construction is designed to use concrete compressed in two directions. The tile blocks act as fillers or forms and give an ideal ceiling for the adhesion of plaster without the possibility of stains, also they fireproof the concrete which produces a floor construction doubly fireproof.



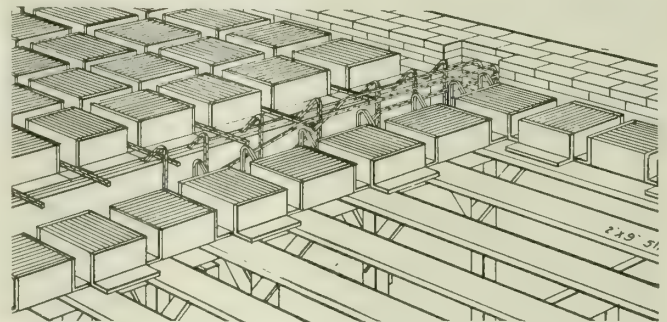
BURCHARTZ BLOCKS, CHANNELS AND ANGLES

Blocks are 4 ins., 5 ins., 6 ins., and 7 ins. high, with channels  $4\frac{1}{2}$  ins. and angles 4 ins. wide; and 8 ins., 9 ins., 10 ins. and 12 ins. high, with channels  $5\frac{1}{2}$  ins. and angles 5 ins. wide.

Fillers and chairs, which insure correct position of bars, are the same width as channels and angles



METHOD OF ALIGNMENT, BURCHARTZ CHANNELS AND BLOCKS, SYSTEM A



METHOD OF ALIGNMENT, BURCHARTZ ANGLES AND BLOCKS, SYSTEM B

### Features of Burchartz Floor.

(1) A floor slab reinforced in one or more directions resting on four supports produces reactions at every point of its support, resulting in stresses set up internally in all directions. (2) By virtue of the support on four sides a floor is restrained from deflecting as freely as a floor supported on only two sides. (3) For moving loads, the one-way reinforced floor is not qualified to distribute concentrated loads; whereas, with the two-way reinforced floor, concentrated loads are distributed over an entire panel. It is unnecessary, therefore, to require as much live load for the two-way reinforced floor as for the one-way floor. (4) Through distribution of loads to four supports, walls and foundations can often be lighter than with the one-way reinforced floor.



WILLIAM L. CHURCH, PRESIDENT

NILS F. AMBURSEN, ENGINEER

# THE UNI-FORM COMPANY

## Floor and Roof Construction in Reinforced Concrete

10 High Street  
BOSTON, MASS.

### Products.

STEEL FORMS and CENTERING for Floor and Roof Construction. Licensors under the Uni-Form patents.

### Adaptability.

Adaptable for any live load up to 500 lbs. and any variation of span up to 34 ft.

### Service.

The universal geographical application of the Uni-Form system compels this company, as such, to limit itself to consultation and special design of floors and roofs. Its construction work is carried out by a selected organization of licensed contractors so located as to adequately serve the whole country.

The engineering work is confined strictly to concrete floors and roofs, relatively the most costly part in building construction in reinforced concrete.

The primary object of Uni-Forms is not the saving of concrete. Of course, 20% to 40% of it is saved, by the use of pans and domes, as many others do, neither more nor less; but the saving is in such a simple and practical way that it is a real and net saving. Saving concrete is a good thing, but not the whole thing; not even a good thing if it costs \$1.10 in lumber and labor to save \$1.00 in concrete.

This company's peculiar field is the vast, unworked no-man's land remaining, namely, to save the appalling waste in lumber and labor of the present methods.

Now, using tabloid assertions, what does THE UNI-FORM COMPANY do that is worth while?

The huge lumber bill is eliminated, also nails, also wire; that is, nearly all of the consumable material is cut out, and by complete salvage what little is left is converted into "permanent plant." The labor account is cut down, not 25% or 50%, but nearer 75%; the work is speeded up 4 to 1, man for man; cement losses are absolutely saved and a smooth finish left; an end is put to re-shoring; 90% of the field-fitting is eliminated even when the building is out of square and, with the above, 20% to 40% is still saved of the concrete.

Architects will figure for themselves how many tons of dead load will come out of the floors, and will also recognize that this saving is repeated in the girders, walls, columns, foundations and piling. The aggregate value is tremendous.

The distinguishing characteristics of the Uni-Form system is neither the pans nor the domes, but the light, stiff, self-centering, steel supporting system. Here is where the labor and lumber are saved. For a complete appreciation of detail, see this company's various bulletins sent on request.

### Features.

Inasmuch as the Uni-Form system aims to modify both the beam and girder and the flat slab constructions, it necessarily takes two forms, conveniently known as the pan and dome systems. Both are identical as to the centering, using the same plant.

Fig. 1 shows the application of pans, resulting in the well-known beam and joist construction and replac-

ing the beam and girder paneling. Saving of dead load 30% to 40%.

Fig. 2 substitutes removable domes for pans and results in a floor which is effectively a flat slab relieved of 20% to 30% of dead weight, with a proportional saving in reinforcement.

The entire steel system, including pans and domes, is practically indestructible and may be used year after year without sensible depreciation.

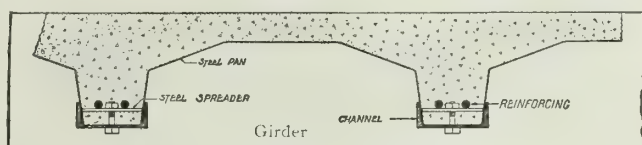


FIG. 1. BEAM AND JOIST CONSTRUCTION TO REPLACE BEAM AND GIRDER

Adaptable to any load and extensible to any span up to 34 ft.

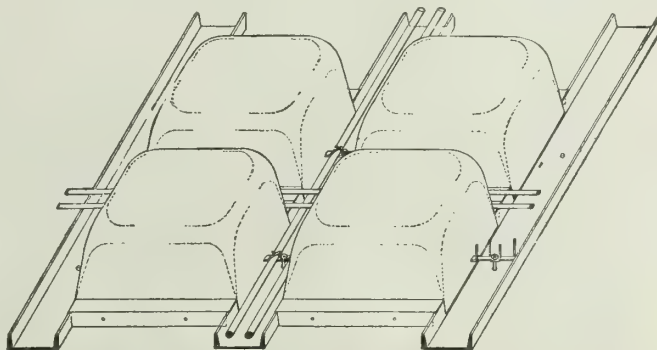


FIG. 2. DOMES TO REPLACE FLAT SLAB



FIG. 3. GENERAL ARRANGEMENT OF THE UNI-FORM SYSTEM

### Literature.

This company's descriptive literature is complete and clear.

The design tables on the following pages apply only to the beam and joist system, and are reprinted in pamphlet form with larger type on heavy paper for the convenience of architects. Similar design tables for the dome system are in preparation, and all are for gratuitous distribution. Consultation is invited



for which no charge is made except in special cases by previous agreement.

### Formulae and Calculations.

**RECTANGULAR BEAMS OR GIRDERS**—The chart conforms to the recommendation of the Joint Committee and is constructed for girders carrying a uniformly distributed load, which is the condition usually obtaining in practice. Fundamental formulae for bending moment in foot-pounds for continuous beams is  $M = \frac{WL^2}{18}$ . As it is more convenient to read the curves in inch-pounds the base is laid out accordingly. Following formulae in inch-pounds determine the bending moment for the conditions noted.

- (1)  $M = WL^2$  For beams with fixed ends (continuous girders).
- (2)  $M = 1.5WL^2$  For beams supported at both ends.
- (3)  $M = 1.2WL^2$  For beams with one end fixed and one supported, in all of which  
 $M$  = Bending moment.  
 $W$  = Total load in pounds per foot of length.  
 $L$  = Clear span or length in feet.

### Use of Tables.

**GENERAL EXAMPLE**—Design a floor to carry a live load of 150 lbs. per sq. ft., supported by square columns 2x2 ft. on 20-ft. centers both ways.

Such a floor will be carried on parallel girders running lengthwise or crosswise of the building as conditions may determine. The Uni-Form floor will be supported directly upon these girders without any cross beams.

First, assume a trial dimension for girder, say 18x30 ins. Including steel, such a girder will weigh 560 lbs. per running foot.

The clear span for floor between girders will be 18.5 ft. Assume that live load is of such a nature that 2-in. thickness of floor at crown will be ample. First try an 8-in. rise, working from table. 150 lbs. live load on 18.5-ft. span falls in right-hand column between ninth and tenth lines from top. This calls for two  $\frac{7}{8}$ -in. square bars; and as it comes just above the shear line, a little stirrup reinforcement near end will be necessary. Weight of such a floor is 52 lbs. per sq. ft.

If desirable to avoid stirrup reinforcement try a 10-in. rise, working from table. Live load will fall in fifth column from left and is well below the shear line. Reinforcement will consist of two  $\frac{3}{4}$ -in. square bars and weight per sq. ft. is 58 lbs.

Using these last values proceed to calculate the girder as described above. Each lineal foot of girder supports 18.5 sq. ft. of floor, of which dead load is  $58 \times 18.5 = 1073$  lbs. and live load  $150 \times 18.5 = 2775$  lbs. Total load per running foot of girder, including its own weight, is therefore 4408 lbs.

Bending moment is  $4408 \times 18 \times 18 = 1,425,000$  lbs.

Locate this on chart at intersection of proper vertical line with 18-in. curve. On left- or right-hand scale read depth of center of the steel 27 ins., and add 2 ins. for concrete, below the steel, making total depth of beam 29 ins.

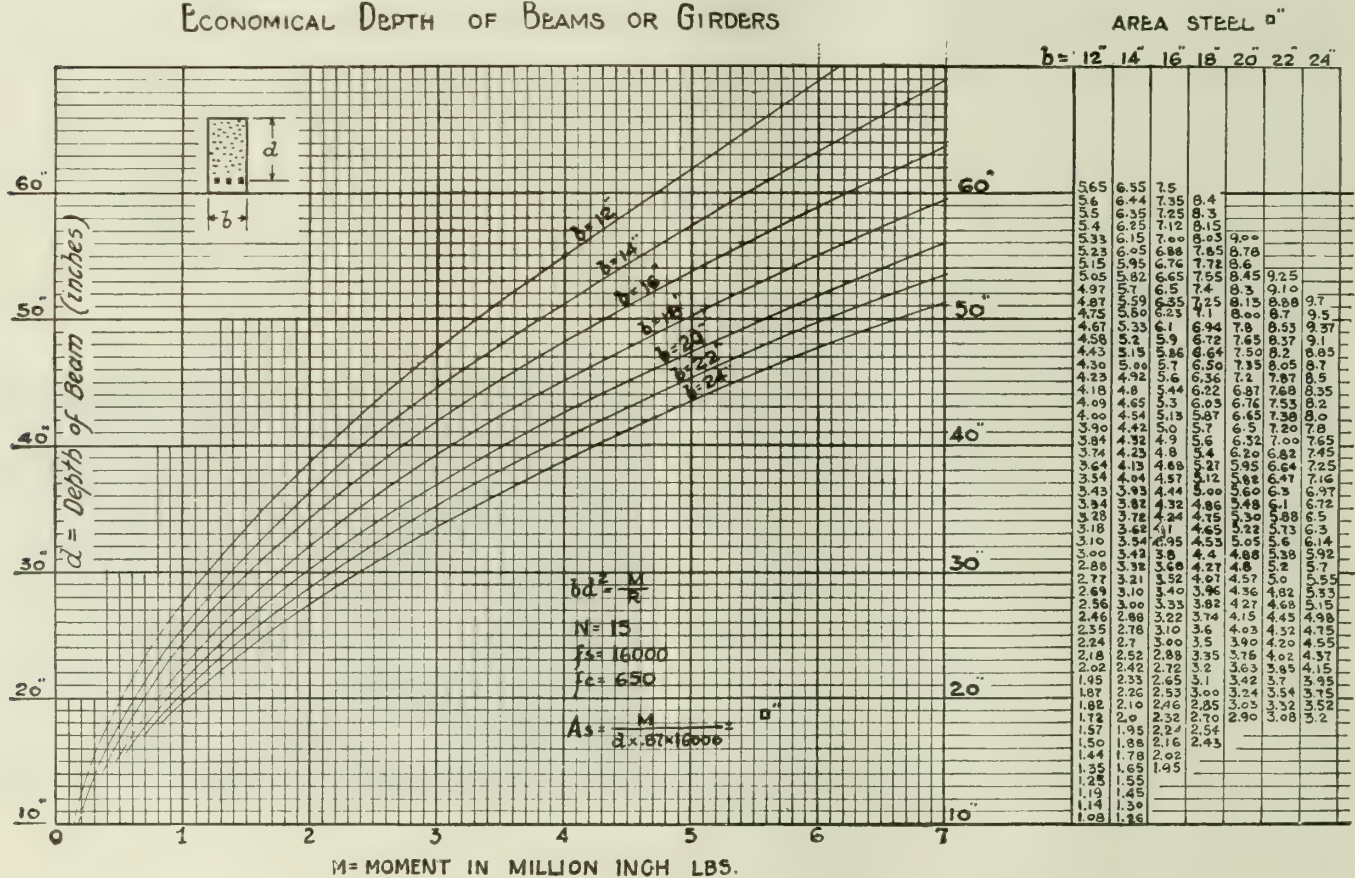
Carrying point of intersection to right, area of steel in 18-in. column is found to be 3.82 sq. in., from which suitable rods can be selected.

This girder is of good proportion; but if for any reason the general result is not satisfactory, other trials can be made involving different proportions for floor and girder until satisfactory result is reached.

The quantity and cost of concrete and steel for each trial can be computed at prevailing market prices, and most economical proportion thus determined having reference to architectural consideration.

The use of these tables will save from 30% to 40% of concrete and dead load as compared with the beam and girder construction which it replaces.

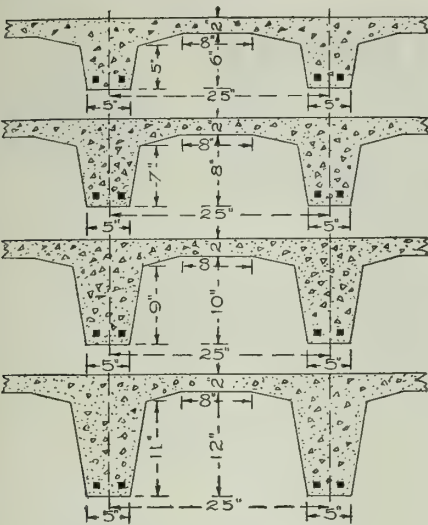
## ECONOMICAL DEPTH OF BEAMS OR GIRDERS



**USE OF CHART**—First, assume a trial breadth and depth of beam from experience, say 18 x 30 ins. (Depth always refers to distance from top to center of steel reinforcement.) Compute weight of this beam per running foot and add to it dead load of strip of floor supported and live load on that strip corresponding to 1 ft. of length. The sum of these is  $W$ , equal, let us say, to 4,500 lbs. Suppose span is 20 ft., the value of  $L$ . If beam is continuous, substitute these values in formula (1) and find  $M = 1,800,000$  inch-pounds. Locate this on base line, which is on a scale of 1,000,000 inch-pounds to the square. It will fall on the 18th line from left-hand margin. Follow up this line until it intersects the curve corresponding to breadth  $b = 18$  ins. Follow from this point out to left-hand scale and depth is read as 30.5 ins. Follow from same point to table on right-hand till it crosses the 18-in. column and area of steel will be a mean between 4.27 and 4.4, or 4.34 sq. ins., from which proper size and number of rods can be selected. The beam thus found being well proportioned, it only remains to add 2 ins. of concrete below the steel, making working dimensions of beam 18 x 32½ ins.

Table used in reverse will give the bending moment ( $M$ ) of any beam within its range. Substitute this and the known span ( $L$ ) in formula corresponding to conditions and solve for  $W$ , which is total load from which live and dead loads can be separated.





STANDARD UNI-FORM SECTIONS

TABLES OF SAFE LOADS IN POUNDS PER SQUARE FOOT

Depth	6" RISE + 2" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 43 lbs.				Cu. ft. of Concrete Per sq. ft. .30			
	Area, steel	.28	.40	.50	.64	.78	.95	1.34
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	60	110	155	203	260	300	400
	11	40	85	120	162	206	241	290
12			62	93	130	166	197	235
13			48	72	102	134	160	195
14			35	56	82	110	130	160
15				44	66	90	108	135
16					52	72	90	110
17					40	60	75	95
18					48	60	80	90
19					38	50	65	75
20						40	55	65
21							45	50
22							38	43
23								35

Depth	8" RISE + 2" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 52 lbs.				Cu. ft. of Concrete Per sq. ft. .36			
	Area, steel	.50	.64	.78	.95	1.12	1.34	1.54
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	199	270	335	415	496	596	635
	11	155	210	265	335	400	480	515
12		120	170	215	270	328	395	425
13		90	135	175	225	270	330	353
14		75	110	145	185	225	275	300
15		60	90	118	155	190	235	260
16		45	70	100	130	160	200	215
17		35	55	80	108	135	170	185
18		45	65	90	115	145	180	195
19		35	55	75	95	125	155	170
20				42	62	85	108	118
21				35	52	70	92	100
22					42	60	80	88
23					35	50	68	75
24						40	58	65
25						32	50	55
26							40	50
27							35	40
28								35
29								
30								

Depth	10" RISE + 2" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 58 lbs.				Cu. ft. of Concrete Per sq. ft. .40			
	Area, steel	.50	.64	.78	.95	1.12	1.34	1.53
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	256	338	420	525	510	505	500
	11	200	268	338	420	420	422	420
12		160	216	274	345	420	422	420
13		125	175	225	286	348	422	420
14		100	142	185	238	290	355	415
15		80	115	152	200	245	300	348
16		62	95	126	168	208	258	302
17		50	75	105	140	178	220	260
18		38	60	88	120	152	190	226
19			50	72	100	130	165	196
20			38	60	85	110	142	175
21				48	71	95	125	152
22				38	60	80	108	130
23					50	70	92	114
24					40	58	80	102
25					50	70	86	90
26					40	60	76	78
27						50	66	68
28						42	56	60
29						50	50	50
30							42	42

Depth	12" RISE + 2" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 67 lbs.				Cu. ft. of Concrete Per sq. ft. .46			
	Area, steel	.50	.64	.78	.95	1.12	1.34	1.53
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	314	412	518	614	510	515	526
	11	250	328	416	514	420	426	435
12		196	264	336	420	426	435	448
13		156	215	276	347	426	435	448
14		125	176	228	290	356	435	448
15		100	142	188	245	300	370	430
16		80	120	158	206	258	316	370
17		65	98	132	174	218	272	320
18		48	78	108	148	190	234	278
19		34	65	94	125	162	208	242
20			50	76	106	140	178	211
21			38	62	90	118	156	186
22				50	76	102	134	162
23				42	63	88	116	142
24					52	76	102	125
25					42	62	88	110
26					26	52	76	96
27						44	66	84
28						36	56	74
29						47	64	70
30						40	55	60

Depth	6" RISE + 3" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 58 lbs.				Cu. ft. of Concrete Per sq. ft. .388			
	Area, steel	.39	.50	.64	.78	.95	1.12	1.34
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	124	174	234	296	346	416	500
	11	93	134	182	235	276	335	402
12		68	103	145	188	222	270	330
13		50	80	114	152	180	222	272
14		35	60	90	124	150	182	225
15			45	72	100	120	152	190
16			32	56	80	100	126	160
17				44	65	80	105	134
18					52	66	88	114
19					42	53	72	95
20					42	60	80	90
21						50	68	78
22						40	55	65
23							46	54
24							37	45

Depth	8" RISE + 2" CONCRETE							
	5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 66 lbs.				Cu. ft. of Concrete Per sq. ft. .443			
	Area, steel	.50	.64	.78	.95	1.12	1.34	1.53
Length of span in feet.	Size, square bars	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{1}{2}$ "
	10	220	290	368	455	438	526	510
	11	170	230	290	364	438	526	510
12		130	182	233	295	360	432	502
13		102	145	190	242	295	358	418
14		80	115	155	200	245	300	350
15		60	90	125	165	205	250	300
16		45	74	102	138	172	212	254
17		32	57	84	115	145	180	218
18			43	68	95	121	155	185
19			32	54	78	102	130	161
20				40	64	86	112	138
21				30	50	70	96	120
22					40	60	80	102
23					32	50	70	88
24						40	60	75
25					30	48	64	80
26						40	54	70
27						30	45	60
28							37	50
29							42	50
30							36	40

Depth		10" RISE + 3" CONCRETE									
		5" Joist 25" C-C Weight of Slab and Beam per sq. ft. 72 lbs.					Cu. ft. of Concrete Per sq. ft. .488				
Area, steel		.50	.64	.78	.95	1.12	1.34	1.53	1.76	2.00	
Size, square bars		$\frac{1}{2}$ " + $\frac{1}{2}$ "	$\frac{1}{2}$ " + $\frac{5}{8}$ "	$\frac{5}{8}$ " + $\frac{5}{8}$ "	$\frac{5}{8}$ " + $\frac{3}{4}$ "	$\frac{3}{4}$ " + $\frac{3}{4}$ "	$\frac{3}{4}$ " + $\frac{7}{8}$ "	$\frac{7}{8}$ " + $\frac{7}{8}$ "	$\frac{7}{8}$ " + 1"	1" + 1"	
Length of span in feet.	10	272	360	450							
	11	212	284	358	450	442	538				
	12	166	226	288	368	442	538				
	13	130	182	235	302	366	448	520			
	14	102	148	192	250	305	376	440	512		
	15	80	118	160	208	256	318	372	436	495	
	16	60	96	130	174	216	270	320	376	426	
	17	46	76	106	146	182	230	274	324	368	
	18	34	60	88	122	156	200	236	280	322	
	19		46	76	102	132	170	204	245	280	
20		34	56	85	112	146	176	212	246		
21			44	70	94	126	154	187	216		
22			34	58	80	108	134	164	190		
23				46	66	93	116	144	168		
24				36	55	80	100	126	148		
25					45	68	88	110	130		
26					36	56	75	96	116		
27						46	65	84	102		
28						38	54	73	90		
29							46	63	78		
30								38	54	60	

# AMERICAN STEEL & WIRE COMPANY

## Manufacturers of Wire Rope

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NEW YORK, 30 Church Street  
 WORCESTER, 94 Grove Street  
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 DENVER, First National Bank Building  
 SALT LAKE CITY, Walker Bank Building

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PACIFIC COAST REPRESENTATIVES, UNITED STATES STEEL PRODUCTS Co., San Francisco, Los Angeles, Portland, Seattle

### Products.

All kinds of WIRE ROPE in the following qualities: IRON, CRUCIBLE CAST STEEL, EXTRA STRONG CRUCIBLE CAST STEEL, PLOW STEEL and MONITOR PLOW STEEL or TICO SPECIAL.

A full line of Wire Rope Fittings: Slings, Thimbles, Clips, Clamps, Sockets, Hooks, Turnbuckles, Shackles, Blocks, Sheaves, etc.

For Concrete Reinforcement, see pages 232-33; for Electric Wires and Cables, see pages 1182-87.

### Qualities of Wire Rope and Their Uses.

Wire rope is made in the following five qualities:

**IRON ROPE**—The wires are made from the best quality iron, being soft, tough and flexible. They are of low tensile strength, approximately 85,000 lbs. per sq. in. Iron hoisting rope is most generally used for elevator hoisting, where the strength is sufficient. It is almost universally employed for counterweight ropes, except on traction elevators. For traction elevators we recommend mild steel hoisting rope.

**CRUCIBLE CAST STEEL ROPE**—This is a medium strength material, tough and pliable, of moderate cost and general utility. Weighs only about half as much as iron for same strength; is harder, and better resists external wear. This rope is applicable to a great variety of uses, among which may be noted mine hoisting, logging, elevators, derricks, hay presses, dredges, cableways, inclined planes, coal hoists, conveyors, ballast unloaders, skip hoists and many other uses.

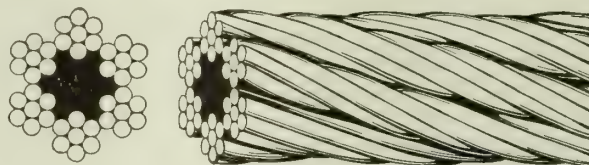
**EXTRA STRONG CRUCIBLE CAST STEEL ROPE**—Of higher tensile strength than the crucible steel, and is tough, pliable, a little lighter for the same strength than crucible steel, and about two and one-half times the strength of iron. It has been found particularly useful for oil well drilling and tubing lines. Its other general uses are similar to those of the crucible steel, except that it may be used where loads are somewhat heavier.

**PLOW STEEL ROPE**—Combines lightness and great strength; is somewhat stiffer than crucible steel and nearly three times as strong. Used particularly for heavy mine hoisting, derricks, inclined planes, dredges, cableways, for heavy logging and similar uses. It is the most economical rope to use where the weight of the rope has to be considered, or where the capacity of the machinery is to be increased without a corresponding increase in sheaves and drums.

**MONITOR PLOW STEEL ROPE**—This is the highest strength rope made. It is somewhat stiffer in the same diameter than the plow and crucible steel grades, but, strength for strength, it is equally flexible. Very useful where great strength, lightness and abrasive resisting qualities are required.

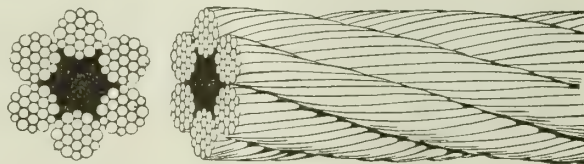
### Construction of Wire Rope, Data and Adaptability.

**TRANSMISSION, HAULAGE OR STANDING ROPE**—The coarsest rope, *i. e.*, 6 by 7 construction, a relatively stiff rope with large wires, capable of resisting external wear or abrasion; but it is the least flexible.



TRANSMISSION, HAULAGE OR STANDING ROPE (6 x 7)

**HOISTING ROPE**—Composed of 6 strands of 19 wires each, with hemp core. Used for elevators, mine hoisting, derricks, dredges, cableways, inclined planes, coal hoists, conveyors, ballast unloaders, skip hoist, oil well drilling and tubing lines.

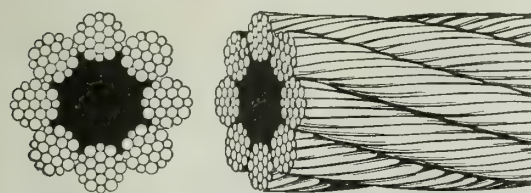


HOISTING ROPE (6 x 19)

**EXTRA FLEXIBLE HOISTING ROPE**—This rope is composed of 8 strands of 19 wires each, laid around a hemp core. The addition of these 2 strands over the standard hoisting rope increases the flexibility and permits the rope being used over comparatively smaller sheaves and drums.

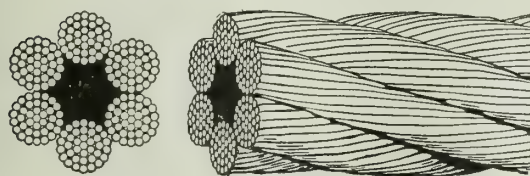
Adaptable for derricks, steam dredges, coal and ore handling machinery, pile drivers, and also for logging purposes, as well as tubing lines for oil wells.





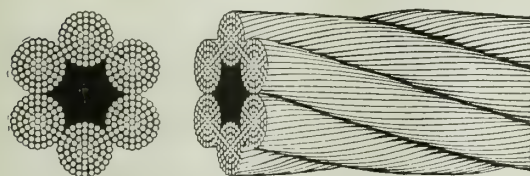
EXTRA FLEXIBLE STEEL HOISTING ROPE (8 x 19)

**SPECIAL FLEXIBLE HOISTING ROPE**—This rope is composed of 6 strands of 37 wires each, laid around a hemp core. This is a very flexible rope, and used largely on cranes and similar machinery where sheaves, of a necessity, are small.

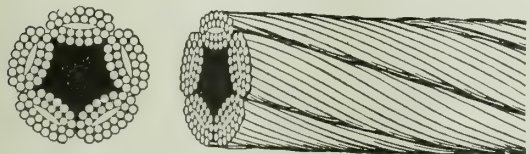


SPECIAL FLEXIBLE STEEL HOISTING ROPE (6 x 37)

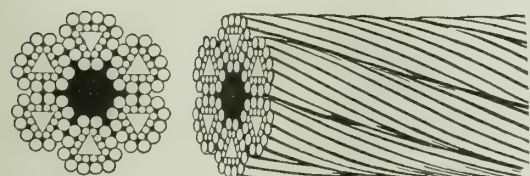
**EXTRA SPECIAL FLEXIBLE HOISTING ROPE**—Composed of 6 strands of 61 wires each, with 1 hemp core, and recommended for dredging purposes, for which it is usually made with special wire center.

EXTRA SPECIAL FLEXIBLE HOISTING ROPE  
(6 x 61)

**FLATTENED STRAND HOISTING ROPES**—These ropes compare in flexibility with the standard hoisting rope, but possess about 150% greater wearing surface than the round strand ropes of same diameter, and have been used generally in the same places. (For data see following page.)



Type A (5 x 28)



Type B (6 x 25)

FLATTENED STRAND HOISTING ROPES

## DATA, VARIOUS CONSTRUCTIONS AND GRADES OF WIRE ROPE

Diam., ins.	Weight per ft. in lbs.	IRON		CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL			
		Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.		
TRANSMISSION, HAULAGE OR STANDING ROPE—6 STRANDS, 7 WIRES TO STRAND, 1 HEMP CORE													
1 1/2	3.55	6.4	16	\$0.51	12.6	11	\$0.60	14.6	\$0.75	16.4	\$0.90	18	\$1.05
1 3/4	3	5.6	15	.43	10.6	10	.51	12.6	.64	14.4	.76	16	.88
1 1/2	2.45	4.6	13	.36	9.2	9	.43	10.8	.53	12.2	.62	13	.72
1 1/4	2	3.8	12	.30	7.4	8	.36	8.6	.44	9.4	.51	10	.58
1	1.58	3	10.5	.24	6.2	7	.29	7	.35	7.6	.41	8.4	.48
3/4	1.20	2.4	9	.18 1/2	4.8	6	.22 1/2	5.6	.27	6.2	.32	6.6	.37
5/8	.89	1.7	7.5	.14	3.7	5	.17	4.2	.20	4.6	.24 1/2	5	.28 1/2
3/4	.75	1.5	7 25	.12	3.1	4 3/4	.14 1/2	3.3	.17	3.6	.21	4	.24 1/2
5/8	.62	1.2	7	.10	2.6	4 1/2	.12	2.9	.14 1/4	3.2	.17 1/2	3.5	.20 1/2
3/4	.50	.96	6	.08 1/4	2	4	.10	2.2	.12	2.4	.14 1/2	2.6	.17
5/8	.39	.74	5.5	.06 1/2	1.5	3 1/2	.08	1.8	.09 1/2	2	.11 1/2	2.2	.13 1/2
3/4	.30	.52	4.5	.05 1/2	1.1	3	.06 1/2	1.25	.07 1/2	1.4	.09	1.5	.11 1/2
5/8	.22	.44	4	.04 1/2	.92	2 3/4	.05 1/2	1.05	.06	1.2	.06 3/4	1.3	.08 3/4
3/4	.15	.34	3.5	.03 1/2	.70	2 1/4	.04 1/2	.79	.05 1/2	.88	.06		
5/8	.12 1/2	.24	3	.03 1/4	.50	1 3/4	.04	.59	.05	.68	.05 1/2		
HOISTING ROPE—6 STRANDS, 19 WIRES TO STRAND, 1 HEMP CORE													
2 3/4	11.95	22.2	17	\$1.70	42.2	11	\$2.10	48.6	\$2.55	55	\$3.00	63	\$3.45
2 1/2	9.85	18.4	15	1.40	34	10	1.75	40	2.10	46	2.50	53	2.80
2 1/4	8	14.4	14	1.17	26.6	9	1.44	32	1.70	37	2.00	42	2.50
2	6.30	11	12	.95	21.2	8	1.16	24.6	1.34	28	1.58	33	1.85
1 3/4	5.55	10	12	.88	19	8	1.02	22.4	1.25	25	1.46	30	1.75
1 3/4	4.85	8.8	11	.80	17	7	.90	19.8	1.1	22	1.30	27	1.60
1 3/4	4.15	7.6	10	.65	14.4	6.5	.77	16.6	.94	19	1.08	22	1.30
1 1/2	3.55	6.6	9	.57	12.8	6	.66	14.6	.80	16	.93	20	1.10
1 1/2	3	5.6	8.5	.49	11.2	5.5	.56	12.8	.68	14	.79	17	.90
1 1/4	2.45	4.56	7.5	.40	9.4	5	.46	10.6	.56	12	.65	14	.75
1 1/4	2	3.72	7	.33	7.6	4.5	.38	8.6	.46	9.4	.54	11	.62
1	1.58	2.90	6	.26	6	4	.31	6.80	.37	7.6	.43	9	.50
3/4	1.20	2.36	5.5	.20	4.6	3.5	.24	5.20	.29	5.8	.34	7	.39
5/8	.89	1.70	4.5	.16	3.5	3	.19	4.04	.22	4.6	.26	5.3	.31
5/8	.62	1.20	4	.12	2.5	2.5	.14	2.80	.16 1/2	3.1	.19	3.8	.22 1/2
5/8	.50	.94	3.5	.10	2	2.25	.12	2.24	.14	2.4	.16	2.9	.19
3/4	.39	.78	3	.08 1/2	1.68	2	.11	1.84	.12 1/2	2	.14	2.4	.17
3/4	.30	.58	2.75	.07 1/2	1.30	1.75	.10	1.45	.11 1/2	1.6	.13	1.9	.15 1/2
3/4	.22	.48	2.25	.07	.96	1.50	.09 1/2	1.06	.11	1.15	.12 1/2	1.35	.14 1/2
5/8	.15	.30	2	.06 3/4	.62	1.25	.09 1/4	.70	.10 3/4	.76	.12 1/4	.9	.13 1/2
5/8	.10	.22	1.50	.06 1/2	.44	1.00	.09	.49	.10 1/2	.53	.12	.63	.13
EXTRA FLEXIBLE HOISTING ROPE—8 STRANDS, 19 WIRES TO STRAND, 1 HEMP CORE													
1 1/2	3.19				11.6	3.75	\$0.73	13	\$0.88	14.8	\$1.03	16	\$1.19
1 3/4	2.70				10.2	3.5	.62	11	.75	12.8	.87	13	.98
1 1/2	2.20				8.4	3.2	.51	9.4	.62	10.4	.72	11	.82
1 1/2	1.80				6.8	2.83	.42	7.6	.51	8.6	.60	9.2	.68
1	1.42				5.2	2.5	.34	5.9	.41	6.6	.48	7.2	.55
3/4	1.08				4	2.16	.27	4.6	.32	5.2	.38	5.6	.43
5/8	.80				3.06	1.83	.21	3.5	.25	4	.29	4.4	.34
5/8	.56				2.18	1.75	.16	2.5	.18 1/2	2.8	.21	3	.25
5/8	.45				1.74	1.5	.14	2	.16	2.32	.18	2.4	.22
5/8	.35				1.46	1.33	.12	1.6	.14	1.74	.16	1.9	.19
5/8	.27				1.14	1.16	.11	1.26	.13	1.38	.15		
5/8	.20				.84	1	.10 1/2	.93	.12 1/4	1.02	.14		
5/8	.13				.55	.83	.10 1/4	.61	.12	.67	.13 1/2		
5/8	.09				.36	.75	.10	.40	.11 1/4	.45	.13 1/4		
SPECIAL FLEXIBLE HOISTING ROPE—6 STRANDS, 37 WIRES TO STRAND, 1 HEMP CORE													
2 3/4	11.95				40		\$2.30	47	\$2.80	53	\$3.30	55	\$3.75
2 1/2	9.85				32		1.92	37	2.35	43	2.75	45	3.15
2 1/4	8				25		1.60	30	1.90	35	2.20	37	2.50
2	6.30				21		1.35	23	1.55	26	1.80	27	2.10
1 3/4	5.55				18.8		1.20	21.2	1.41 1/2	23.8	1.65	25	1.92 1/2
1 3/4	4.85				17		1.05	19	1.28	22	1.50	23	1.75
1 3/4	4.15				14		.89	16	1.07	18	1.25	19	1.45
1 1/2	3.55				12	3.75	.79	14	.95	16	1.10	17	1.25
1 1/2	3				11	3.5	.65	12	.78	14	.91	14	1.05
1 1/4	2.45				9	3.2	.55	10	.65	11	.75	11	.86
1 1/4	2				7	2.83	.46	8	.55	9	.64	9.2	.75
1	1.58				6	2.5	.37	6.4	.44	7	.51	7.4	.59
3/4	1.20				5	2.16	.28	5	.34	5	.40	5.8	.46
5/8	.89				3.5	1.83	.23	3.8	.27	4	.31	4.6	.36
5/8	.62				2.2	1.75	.18	2.5	.21	3	.24	3.2	.27
5/8	.50				1.9	1.5	.15	2.1	.17 1/2	2.3	.20	2.5	.23
5/8	.39				1.45	1.33	.13	1.65	.15	1.85	.17	1.9	.20
5/8	.30				1.1	1.16	.12 1/2	1.27	.14	1.4	.16	1.5	.18 1/2
5/8	.22				.84	1	.12	.93	.13	1	.15	1.06	.17 1/2

Diameter of drum advised for extra strong crucible cast steel, plow steel and monitor plow steel ropes is same as for crucible cast steel.

The tensile strength is five times the proper working load given above.

## EXTRA SPECIAL FLEXIBLE HOISTING ROPE—6 STRANDS, 61 WIRES TO EACH, 1 HEMP CORE

Diam., ins.	Weight per ft. in lbs.	Diam. of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
3 1/4	16.60	11	56		63		70		74	
3	14.20	10	48		55		62		65	
2 3/4	11.95	9	40	\$2.53	47	\$3.08	53	\$3.63	56	\$4.12
2 1/2	9.85	8	32	2.11	37	2.58	43	3.02	45	3.46
2 1/4	8	7	25	1.76	30	2.09	35	2.42	37	2.75
2	6.30	6	21	1.48	23	1.70	26	1.98	27	2.31

## DATA, FLATTENED STRAND HOISTING ROPES

Diam., ins.	IRON				CRUCIBLE CAST STEEL				EXTRA STRONG CRUCIBLE CAST STEEL*			MONITOR FLOW STEEL				
	Type A				Type A	Type B		Types A and B		Type A	Type B	Types A and B				
	Proper working load in tons of 2000 lbs.	Weight per ft. in lbs.	Diam. of drum or sheave in ft. advised	List price per ft.	Proper working load in tons of 2000 lbs.	Proper working load in tons of 2000 lbs.	Weight per ft. in lbs.	Diam. of drum or sheave in ft. advised	List price per ft.	Proper working load in tons of 2000 lbs.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	Proper working load in tons of 2000 lbs.	Diam. of drum or sheave in ft. advised.	List price per ft.
2 3/4	14.4	8.00	11 1/4	\$1.52	26.6	29.2	9.20	8 1/2	\$1.82	32.	35.2	\$2.20	42	46.2	12	\$2.85
2 1/2	11	6.30	10 3/4	1.20	21.2	23.4	7.25	8	1.44	24.6	27	1.77	33.2	36.6	11	2.25
2 1/4	8.8	4.85	9 3/4	1.04	17.0	18.8	5.60	7 1/4	1.21	19.8	21.8	1.55	26.6	29.2	9	2.08
2 1/8	7.6	4.15	8 1/2	.82	14.4	15.8	4.75	6 3/4	.96	16.6	18.2	1.30	22	24.2	8 1/2	1.56
2 1/16	6.6	3.55	7 3/4	.74	12.8	14.0	4.00	5 3/4	.86	14.6	16	1.05	19.6	21.6	8	1.37
1 3/4	5.6	3.00	6 3/4	.625	11.2	12.4	3.45	5 1/2	.73	12.8	14	.90	16.8	18.4	7 1/2	1.12
1 3/8	4.56	2.45	5 3/4	.52	9.4	10.4	2.80	4 3/4	.595	10.6	11.6	.70	13.8	15.2	7	.89
1 3/16	3.72	2.00	4 3/4	.43	7.6	8.4	2.30	4 1/2	.50	8.6	9.4	.59	11.2	12.4	6	.71
1 1/2	2.90	1.58	4 1/4	.34	6.0	6.6	1.80	4	.395	6.8	7.4	.48	9	10.0	5	.60
1 1/8	2.36	1.20	4	.26	4.6	5.0	1.38	3 1/2	.30	5.2	5.8	.38	7	7.8	4 1/2	.49
1 1/16	1.70	.89	3 1/2	.21	3.5	3.86	1.00	3	.24	4.04	4.44	.30	5.26	5.8	4	.375
1 1/32	1.20	.62	3	.155	2.5	2.76	.72	2 1/4	.18 1/4	2.80	3.08	.225	3.8	4.2	3 1/2	.28
1 1/64	.94	.50	2 1/2	.13	2	2.2	.58	1 3/4	.165	2.24	2.46	.195	2.9	3.2	3	.25
1 1/128	.78	.39	2	.105	1.68	1.86	.45	1 1/2	.145	1.84	2.02	.175	2.42	2.7	2 3/4	.20 3/4
1 1/256	.48	.22	1	.095												

Weights for Types A and B respectively are the same for all constructions. Standard plow steel grade is also furnished if desired.  
 \*Diameters of drums are the same as for Crucible Cast Steel.

**SASH CORD**—Made "dead soft" unless ordered to the contrary. Used principally for window weights, bell cords, automobile brakes and whistles. 3/32-in. diameter galvanized sash cord is used on electric open car curtain fixtures. 1/16-in. galvanized sash cord is used on car curtain fixtures.



SASH CORD (6 x 7)

DATA, SASH CORD  
 6 strands of 7 wires each, 1 cotton core

Trade number	Diam., ins.	Weight per ft. in lbs.		Approximate breaking stress in lbs.			List price per ft.		
		Iron	Copper	Bright iron	Annealed iron	Bright copper	Iron annealed or bright	Tinned or galvanized iron	Copper
26	1/4	.101	.115	2200	1650	1320	\$0.03	\$0.04	\$0.09
27	3/16	.077	.087	1800	1411	1080	.02 3/4	.03 1/2	.07 1/2
27 1/2	5/16	.056	.064	1400	1100	840	.02 1/4	.03	.06
28	1/8	.025	.029	550	425	350	.01 3/4	.02 1/4	.04 1/2
28 1/2	3/16	.014	.016	320	250	200	.01 1/2	.02	.03 1/2
29	1/16	.006	.007	140	110	90	.01 1/4	.01 3/4	.03

**STEEL WIRE STRAND**—Used chiefly for guying poles and smokestacks, supporting trolley wire, and operating railroad signals.



STEEL WIRE STRAND

DATA, STEEL WIRE STRAND  
 7 steel wires twisted into a single strand, galvanized or extra galvanized

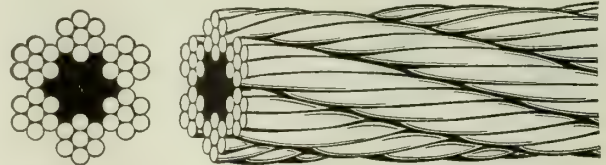
List price per 100 ft.	Diam., ins.	Sizes of wire Am. Steel & Wire Co.'s steel wire gage	Weight per 1,000 ft. in lbs.	Strength, lbs.
\$14.00	3/4	3	1200	18000
8.50	5/8	5	800	14000
7.00	3/4	6	650	11000
5.50	1/2	8	510	8500
4.50	3/8	9	415	6500
3.50	5/16	11	295	5000
2.50	3/16	12	210	3800
2.25	1/4	13	160	2800
1.75	5/16	14	125	2300
1.50	3/8	15	95	1800
1.25	1/2	16	75	1400
1.15	5/8	17	55	900
1.00	3/4	19	32	500
.80	7/8	21	20	400

## DATA, STEEL WIRE STRAND

19 wires twisted into a single strand, galvanized or extra galvanized

List price per 100 ft.	Diam., ins.	Sizes of wire, ins.	Weight per 1,000 ft. in lbs.	Strength, lbs.
\$26.00	1	.200	2100	32000
20.70	7/8	.175	1610	24000
16.80	3/4	.150	1200	18000
11.00	5/8	.125	800	14000
9.25	1/2	.110	650	11000
7.30		.100	510	8500

**GALVANIZED IRON OR STEEL GUY ROPE**—For supporting derricks, and for general standing rope service; it is not designed to run over drums or sheaves.



GALVANIZED IRON OR STEEL GUY ROPE (6 x 7 or 6 x 12)

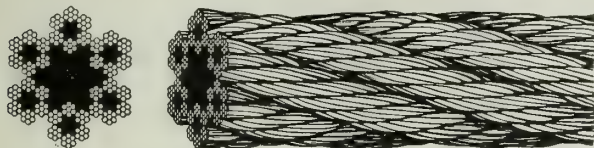
## DATA, GALVANIZED IRON OR STEEL GUY ROPE

IRON			CRUCIBLE CAST STEEL		
6 strands, 7 or 12 wires each, 1 hemp core			6 strands, 7 wires each, 1 hemp core		
Diam., ins.	Weight per ft., lbs.	Strength in tons of 2000 lbs.	Diam., ins.	Weight per ft., lbs.	Strength in tons of 2000 lbs.
1 3/4	4.85	42.	1 1/4	2.45	42
1 1/2	4.42	38	1 1/8	2.21	38
1 1/8	4.15	35	1 1/16	2	34
1 1/16	3.55	30	1 1/16	1.77	31
1 1/32	3.24	28	1	1.58	28
1 1/64	3	26	7/8	1.20	22
1 1/128	2.45	23	3/4	1.03	19
1 1/256	2.21	19	5/8	.89	16.8
1 1/512	2	18	1/2	.62	11.7
1 1/1024	1.77	16.1	3/8	.50	9
7/8	1.58	14.1	5/16	.39	7
3/4	1.20	11.1	1/4	.34	6
5/8	1.03	9.4	3/16	.30	5
1/2	.89	7.8	1/8	.22	4.2
3/8	.62	5.7	3/32	.15	3.2
5/16	.50	4.46			
1/4	.39	3.39			
3/16	.30	2.35			
1/8	.22	1.95			
3/32	.15	1.42			
5 STRANDS					
1 1/2	.125	1.20			
1 1/4	.09	.99			
1 1/8	.063	.79			
1 1/16	.04	.61			

List prices furnished on application.



**TILLER OR HAND ROPE**—Used for starting and stopping elevators, and also for steering lines on yachts and motor boats.

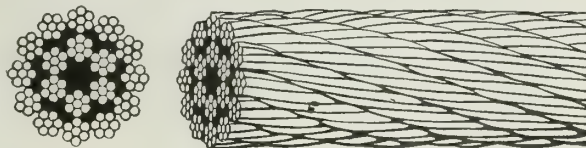


TILLER ROPE OR HAND ROPE (6 x 42)

DATA, TILLER OR HAND ROPE  
6 strands of 42 wires each, 7 hemp cores

Diam. ins.	Weight per ft. lbs.	Diam. of drum or sheave in ft. advised	IRON		CRUCIBLE CAST STEEL	
			Breaking strength, lbs.	List price per ft.	Breaking strength, lbs.	List price per ft.
1	1.10	24	22000	\$0.33	35000	\$0.43
7/8	.84	21	15500	.27	26000	.36
3/4	.62	18	11000	.22	18000	.30
5/8	.43	15	7000	.17	13500	.24
1/2	.35	13 1/2	6300	.14	11000	.20
3/8	.28	12	5800	.11 1/2	9000	.17
7/16	.21	10 1/2	4000	.10	6500	.15
1/4	.16	9	3000	.09	4800	.14
3/16	.11	7 1/2	1900	.08	3600	.12 1/2
5/16	.07	6	1300	.07 1/2	2500	.11

**NON-SPINNING HOISTING ROPE**—This type of rope is so constructed that it prevents the rotating of a free load suspended on the end of a single line. It is recommended for "back haul" or single line derricks.

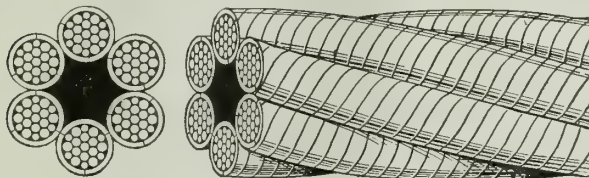


NON-SPINNING HOISTING ROPE (18 x 7)

DATA, NON-SPINNING HOISTING ROPE  
18 strands, 7 wires each, 1 hemp core

Diam. ins.	Weight per ft. lbs.	Diam. of drum or sheave in ft. advised	IRON		CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
1 3/4	5.50	7.00	9.1	\$0.80	17.1	\$0.90	20.2	\$1.10	22.2	\$1.30	24.4	\$1.60
1 1/2	4.90	6.50	7.9	.65	14.8	.77	17.5	.94	19.2	1.08		
1 1/4	4.32	6.00	6.8	.57	12.7	.66	15.0	.80	16.5	.93	18.1	1.10
1 1/8	3.60	5.50	5.6	.49	10.4	.56	12.4	.68	13.7	.79	15.1	.90
1 1/4	2.80	5.00	4.6	.40	8.7	.46	10.3	.56	11.3	.65	12.5	.75
1 1/8	2.34	4.50	3.9	.33	7.3	.38	8.6	.46	9.5	.54	10.4	.62
1 1/8	1.73	4.00	2.9	.26	5.6	.31	6.6	.37	7.2	.43	7.8	.50
1 1/8	1.44	3.50	2.3	.20	4.5	.24	5.3	.29	6.3	.34	7.0	.39
1 1/8	1.02	3.00	1.7	.16	3.3	.19	3.9	.22	4.9	.26	5.4	.31
1 1/8	.70	2.50	1.1	.12	2.2	.14	2.6	.16 1/2	3.1	.19	3.4	.22 1/2
3/4	.87	2.25	.97	.10	1.8	.12	2.1	.14	2.5	.16		
3/4	.42	2.00	.73	.08 1/2	1.3	.11	1.6	.12 1/2	1.9	.14	2.1	.17
3/4	.31	1.75	.52	.07 1/2	.98	.10	1.1	.11 1/2	1.3	.13		
3/4	.25	1.50	.42	.07	.78	.09 1/2	.92	.11	1.1	.12 1/2	1.2	.14 1/2

**STEEL CLAD HOISTING ROPE**—Each strand is spirally wound with flat steel strips, which gives considerable wearing surface over the ordinary type. When the flat strips of a steel clad rope have worn through, there still remains the complete hoisting rope with unimpaired strength. Where ropes wear out quickly, this feature is a distinct advantage. Made in 3 constructions: 6 strands of 19 wires each; special flexible, 6 strands of 37 wires each; and extra special flexible, 6 strands of 61 wires each.



STEEL CLAD HOISTING ROPE (6 x 19)

DATA, STEEL CLAD HOISTING ROPE  
6 strands, 19 wires to strand

Diam. ins.	Weight per ft. lbs.	Diam. of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
2 1/4	8.45	8	21.2	\$1.56	24.6	\$1.74	28	1.98	33	\$2.25
2 1/2	6.70	7 1/2	19.2	1.29	22.4	1.52	25	1.73	30	2.02
2 3/4	6.02	7	17.0	1.16	19.8	1.36	22	1.56	27	1.86
1 3/4	5.25	6.5	14.4	1.01	16.6	1.18	19	1.32	22	1.54
1 1/2	4.62	6	12.8	.89	14.6	1.03	16	1.16	20	1.33
1 1/4	3.95	5.5	11.2	.78	12.8	.90	14	1.01	17	1.12
1 1/4	3.30	5	9.4	.67	10.6	.77	12	.86	14	.96
1 1/4	2.80	4.5	7.6	.57	8.6	.65	9.4	.73	11	.81
1 1/4	2.12	4	6.0	.49	6.8	.55	7.6	.61	9	.68
1 1/4	1.72	3.5	4.6	.41	5.2	.46	5.8	.51	7	.56
1 1/4	1.30	3	3.5	.36	4.04	.39	4.6	.43	5.3	.48
1 1/4	1.00	2.5	2.5	.30	2.80	.32	3.1	.35	3.8	.38
3/4	.70	2	1.68	.26	1.84	.27	2.0	.29	2.4	.32

DATA, STEEL CLAD, SPECIAL FLEXIBLE HOISTING ROPE  
6 strands, 37 wires to strand, 1 hemp core

Diam. ins.	Weight per ft. lbs.	Diam. of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
2 3/4	12.05	8	32	\$2.52	37	\$2.95	43	\$3.35	45	\$3.75
2 1/2	9.90	7	25	2.10	30	2.40	35	2.70	37	3.00
2 1/4	8.00	6	21	1.75	23	1.95	26	2.20	27	2.50
2	6.60	5.25	18.8	1.47	21.2	1.68	23.8	1.92	25	2.19
1 3/4	5.90	4.75	17	1.31	19	1.54	22	1.76	23	2.01
1 1/2	4.90	4.25	14	1.13	16	1.31	18	1.49	19	1.69
1 1/4	4.30	3.75	12	1.02	14	1.18	16	1.33	17	1.48
1 1/4	3.75	3.5	11	.87	12	1.00	14	1.13	14	1.27
1 1/4	3.05	3.2	9	.76	10	.86	11	.96	11	1.07
1 1/4	2.40	2.83	7	.65	8	.74	9	.83	9.2	.94
1 1/4	2.00	2.5	6	.55	6.4	.62	7	.69	7.4	.77
1	1.75	2.16	5	.45	5	.51	5	.57	5.8	.63

DATA, STEEL CLAD, EXTRA SPECIAL FLEXIBLE HOISTING ROPE  
6 strands, 61 wires to strand, 1 hemp core

Diam. ins.	Weight per ft. lbs.	Diam. of drum or sheave in ft. advised	CRUCIBLE CAST STEEL		EXTRA STRONG CRUCIBLE CAST STEEL		PLOW STEEL		MONITOR PLOW STEEL	
			Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.	Proper working load in tons of 2000 lbs.	List price per ft.
3 1/4	16.80	10	48	\$3.90	55	\$4.55	62	\$5.10	65	\$5.70
3 1/2	14.35	9	40	3.23	47	3.78	53	4.33	55	4.82
2 3/4	12.05	8	32	2.71	37	3.18	43	3.62	45	4.06
2 1/2	9.90	7	25	2.26	30	2.59	35	2.92	37	3.25
2 1/4	8.45	6	21	1.88	23	2.10	26	2.38	27	2.71

R. GUASTAVINO, PRESIDENT

WM. E. BLODGETT, TREASURER

F. M. SUMMERVILLE

**R. GUASTAVINO COMPANY**

INCORPORATED UNDER THE LAWS OF THE STATE OF MASSACHUSETTS

Designing and Installing the System of Timbrel Vault Construction and  
Installation of "Rumford" Tile for Improving Acoustic Properties

BOSTON, MASS.  
40 COURT STREET

Fuller Building  
NEW YORK, N. Y.

TELEPHONE, GRAMERCY 6567

FACTORY  
WOBURN, MASS.

**Products and Services.**

The business of this company is that of DESIGNING and INSTALLING the SYSTEM of TIMBREL VAULT CONSTRUCTION with which its name has been identified for many years.

"RUMFORD" TILE, for use in Auditoriums, to improve Acoustic Properties.

It is equipped for work in any section.

**Timbrel Tile.**

The company owns and operates for its sole use, as contractors, a factory for the manufacture of the finer grades of timbrel tile required in its exposed

or finished work, thus having unexcelled facilities for prompt installation and the making of special pieces in connection with its contracting business.

**Ceilings, Roofs, Floor Construction.**

A large portion of our business is the construction of large vaulted ceilings and roofs in all forms, and floor construction for very heavy loads.

CONSTRUCTION—In nearly all cases the small amount of steel required is used in tension only, and thoroughly embedded in the masonry. This system of construction has been approved by the New York Building Department.



AUDITORIUM IN THE MUSEUM, UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA, PA.

WILSON, EYRE & McILVAINE, DAY BROTHERS & KLAUDER, STEWARTSON & PAGE, Associated Architects

Ceiling vault 90-ft. span, supporting floor above, with soffit course and side wall finish (except faience inserts) of "Rumford" acoustic tile, constructed by R. GUASTAVINO COMPANY

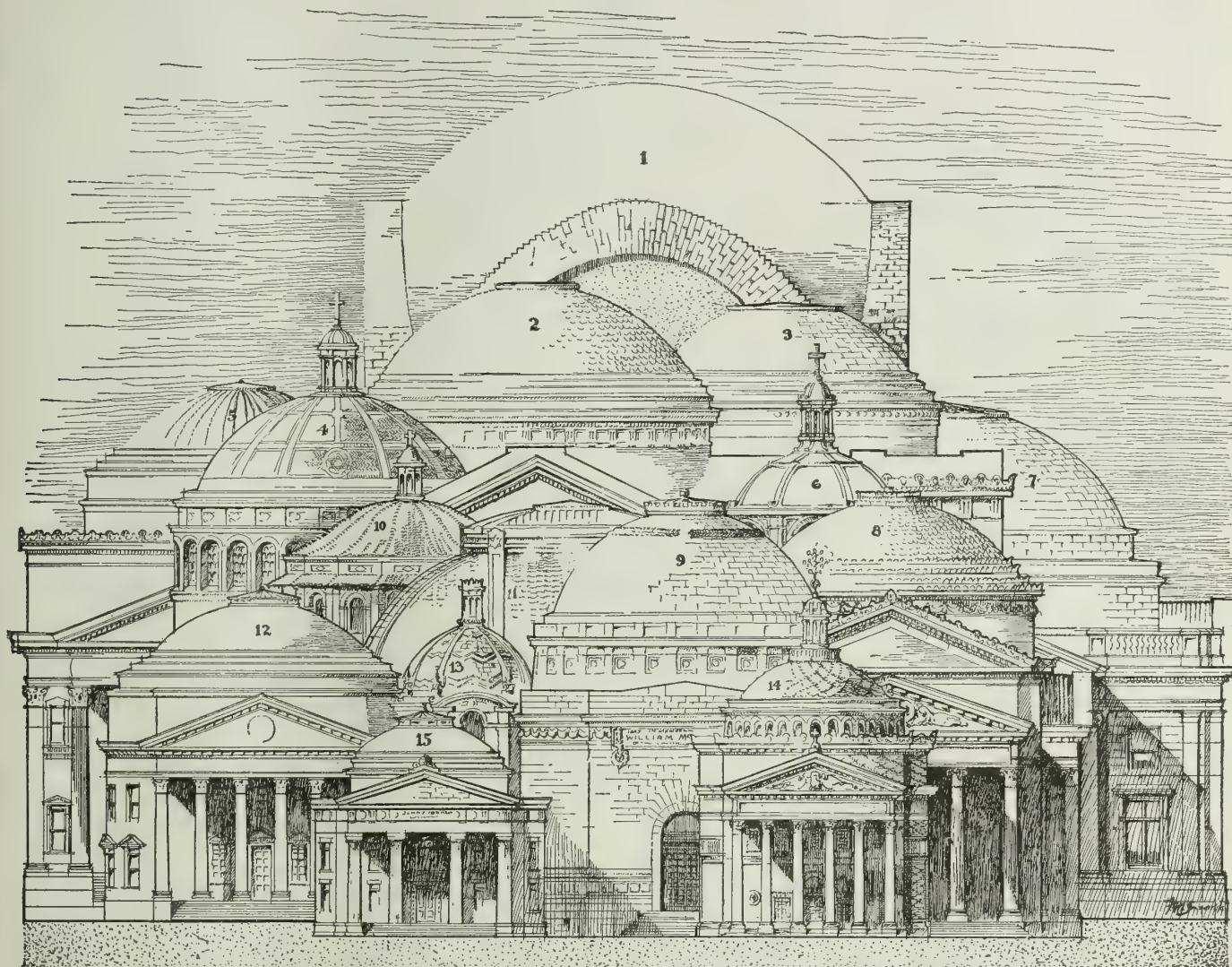


**Adaptability.**

The class of work for which this system is particularly adapted is that of buildings of a monumental type, State houses, court houses, churches, libraries, etc., in which the vaulted ceiling is notably acceptable, especially when laid in finished repressed tiles of designs as required, either unglazed or glazed, of any color desired.

**Co-operative Service.**

Owing to the varied uses of our construction, involving engineering and architectural features, the more satisfactory method is to send us, before the plans are fully drawn, a sketch outline of the requirements, which will enable us to indicate the most approved method of treatment and the approximate cost.



SOME DOMES CONSTRUCTED BY R. GUASTAVINO COMPANY

BUILDING AND LOCATION	SPAN	ARCHITECT
1. Cathedral, St. John the Divine, New York, N. Y.....	135 ft. at base	Heins & La Farge
2. National Museum, Washington, D. C.....	80 " " "	Hornblower & Marshall
3. Institute of Arts and Sciences, Brooklyn, N. Y.....	64 " " "	McKim, Mead & White
4. St. Francis de Sales Church, Philadelphia, Pa.....	61 " " "	Henry D. Dagit
5. Bank of Montreal, Montreal, Can.....	69 " " "	McKim, Mead & White and A. T. Taylor
6. Church of St. Barbara, Brooklyn, N. Y.....	43 " " "	Helmle & Huberty
7. Girard Trust Co., Philadelphia, Pa.....	64 " " "	McKim, Mead & White
8. University of New York, New York, N. Y.....	70 " " "	McKim, Mead & White
9. McKinley National Memorial, Canton, Ohio.....	56 " " "	H. Van Buren Magonigle
10. St. Paul's Chapel, Columbia University, New York, N. Y..	52 " " "	Howells & Stokes
11. Rodef Sholem Synagogue, Pittsburg, Pa.....	90 " " "	Palmer & Hornbostel
12. University of Virginia, Charlottesville, Va.....	70 " " "	McKim, Mead & White
13. Elephant House, Bronx Park, New York, N. Y.....	34 " " "	Heins & La Farge
14. Madison Square Presbyterian Church, New York, N. Y..	46 " " "	McKim, Mead & White
15. J. J. Jermain Memorial Library, Sag Harbor, N. Y.....	30 " " "	Augustus N. Allen



# H. W. JOHNS-MANVILLE CO.

## Acoustical Service; Waterproofing Materials; Sheathing

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910

### Services and Products.

ACOUSTICAL CORRECTION of commercial, industrial and public buildings.

JOHNS-MANVILLE CONCRETE PRIMER, ASPHALT WATERPROOFING CEMENT, WATERPROOFING ASBESTOS FELT, ASPHALT SATURATED FABRIC, ASBESTOS DUCK, SELF-HEALING CEMENT, LIQUID ASPHALT COATING, CUT STONE BACKING, AQUADAM.

JOHNS-MANVILLE KEYSTONE HAIR INSULATOR.

For Asphalt Mastic Flooring, see page 331; for Roofing Material, see pages 402-05; for Asbestos Shingles, see pages 386-87; for Radiator and Steam Traps, see page 930; for Underground System of Pipe Insulation, see page 910; for Pipe and Boiler Insulation, see pages 1076-77.

### Johns-Manville Acoustical Service.

Confusion of sound or poor acoustics in buildings, otherwise creditable from an architectural standpoint, is due in many instances to recent developments in fire-proof construction. The use of harder wall, ceiling, and flooring materials, and of hard surfaced equipment, has increased reverberation appreciably. In the case of offices another factor has been the elimination of inter-office partitions and the grouping of typewriters and other noise producers as demanded by modern efficiency.

Acoustical correction is not a matter for haphazard guesswork. Reverberation and echoes causing sound confusion are dependent on so many surrounding conditions that comprehensive rules for correction would be too exhaustive to be practicable. The sound absorbing qualities of every material used in the building or its decoration, as well as its quantity and position, have relation to the quantity, quality and location of the corrective material required. The problems involved are highly technical, and for their satisfactory solution the expert knowledge of the specialist is indispensable.

In the Acoustical Department of the H. W. JOHNS-MANVILLE Co., the advice of the best acoustical authorities in the country, and the services of competent acoustical engineers, are available to architects and others who have difficulties to overcome either in designing new buildings or in correcting existing ones.

### Johns-Manville Waterproofing Service.

Johns-Manville waterproofing methods are the result of years of experience in the successful waterproofing of every type of construction. Each waterproofing job demands individual study of a highly technical nature. When problems are submitted, our engineers will suggest the most efficient method, supply material and see that it is properly applied.

### Johns-Manville Waterproofing Materials.

JOHNS-MANVILLE CONCRETE PRIMER—Penetrates the surface and forms an anchorage for the subsequent waterproofing coats. Covering capacity about 100 sq. ft. to the gal. on comparatively smooth surfaces.

JOHNS-MANVILLE ASPHALT WATERPROOFING CEMENT—Applied hot (450° Fahr.) over the priming coat, to cement the various fabrics into one composite sheet. Bituminous material, 99.5% pure, absolutely uniform, contains no matter that will disintegrate or decay. Proof against action of cold acid, alkali, brine and water. One ton should cover 3,000 sq. ft.  $\frac{1}{8}$  in. thick.



TRADE-MARK

JOHNS-MANVILLE WATERPROOFING ASBESTOS FELT—Used to give body to the membrane, and bonded to the concrete by the waterproofing cement.

Made of pure asbestos rock fiber, thoroughly impregnated with pure asphalt—the only all-mineral felt made.

JOHNS-MANVILLE ASPHALT SATURATED FABRIC—An especially strong open mesh cotton or hemp fabric used as a reinforcement for the waterproofing cements, in as many piles as are required to meet conditions.

JOHNS-MANVILLE ASBESTOS DUCK—A composite sheet of asbestos felt and cotton duck applied in the same manner as the other reinforcing materials, but only where unusual strength is desired. Largely used under wall footings or column bases.

JOHNS-MANVILLE SELF-HEALING CEMENT—An Asphaltic compound with a very low congealing point and a melting point of 125° Fahr. (can be furnished with melting point of 90° Fahr. when a softer material is desired). Very satisfactory for brine decks in packing house and for waterproofing work between wooden floors. Also an excellent expansion joint filler on account of its adhesiveness at low temperatures.

### Johns-Manville Dampproofing Materials.

JOHNS-MANVILLE LIQUID ASPHALT COATING—Applied cold over Concrete Primer in 1 or 2 coats for damp-proofing only. For surfaces not liable to abrasion and where there is no hydrostatic pressure. Will withstand seepage of surface water, and prevent discoloration or staining of the outside face of concrete walls. Covering capacity, about 200 sq. ft. to the gal.

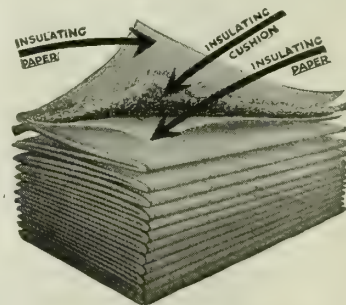
JOHNS-MANVILLE CUT STONE BACKING—For coating sides and back of cut stone, to prevent discoloration and dampness of interior walls. Covering capacity, about 60 sq. ft. per gal. over rough surfaces.

JOHNS-MANVILLE AQUADAM—Applied cold, in 1 or 2 coats, depending upon porosity of surface, to damp-proof walls and provide a plaster finish. Makes furring and lathing unnecessary, thus eliminating possible passage for flames in case of fire. Covering capacity, about 80 sq. ft. to the gal.

### Johns-Manville Keystone Hair Insulator.

A sheathing composed of a heavy layer of cleansed and sterilized cattle hair secured between sheets of tough building paper or a s b e s t o s paper; the crossing and recrossing of the fibers, at every conceivable angle, forms innumerable small cells in which the air is sealed and deadened by the paper, producing an insulating cushion more effective than many layers of building paper. Proof against rot, moisture and vermin; slow burning; and will not settle, dry out or split.

Supplied packed in bales (folded; not rolled) 3 ft. wide, containing 500 sq. ft. each.



JOHNS-MANVILLE HAIR INSULATOR



# THE ANTAKWA COMPANY

Manufacturers of Waterproof, Dampproof and Technical Paints

LONG DISTANCE TELEPHONE  
MAIN 3893

Chamber of Commerce  
CHICAGO, ILL.

FACTORY  
1329 MOHAWK STREET

## Products and Services.

"ANTAKWA" DAMP RESISTING PAINTS: "ANTAKWA PLASTER KEY," "ANTAKWA HEAVY," "ANTAKWA COLORLESS"; "ANTAKWA BLACK" PAINT, for structural steel.

"LIBERTY" CONCRETE DRESSING; "LIBERTY" WHITE ENAMEL; "LIBERTY" LIQUID CONCRETE HARDNER.

"REGAL" COATINGS and FINISHES, for floors, walls and ceilings.

Where desired, this company will contract for the application of its materials.

## Antakwa Paints.

"Antakwa" Damp Resisting Paints are known as "the Better Dampproofing."

### "Antakwa Plaster Key."

"Antakwa Plaster Key" applied to the inner walls of masonry dispenses with furring and lathing. Being plastic, it expands and contracts in unison with the surface to which it is applied, and permits scratch coat of plaster to absorb sufficiently so as to form a perfect permanent bond between wall and plaster.

VERMINPROOF—There being no space between wall and plaster, vermin are eliminated.

PREVENTS DISCOLORATION—Being dampproof, "Antakwa Plaster Key" prevents discoloration of plaster.

INSULATION—"Antakwa Plaster Key" used on interior of brick walls seals wall airtight, transforming it from simply a windstop into a perfect heat and cold insulating barrier. The millions of air cells in the brick permit cutting down very materially the radiation necessary for heating the building. The saving in the first cost of heating much more than pays for the applying of "Antakwa Plaster Key."

SAVING IN SPACE—"Antakwa Plaster Key" eliminates furring and lathing, resulting in a saving in space.

FIREPROOF CONSTRUCTION—Where the object is to secure a fireproof construction, "Antakwa Plaster Key" dispenses with metal lath on walls and ceilings, at a saving of about 50%.

### "Antakwa Colorless."

A paint composed of waterproof, airproof and acid-proof materials, with slightly heavier body than water, and applied with a brush. On first application, paint penetrates the pores (carried under surface), where it becomes as indestructible as the surface itself.

### "Antakwa Heavy."

Practically a cement, with heavier body than "Antakwa Medium." Elastic always. Used effectively for heavy waterproofing of foundations under ground, cellars, etc., alone or in combination with burlap or felt, against any ground-water pressure.

### "Liberty" Concrete Dressing.

A technical chemical compound for treating concrete surfaces, hardening them and making them dust-proof, waterproof and oilproof.

It is harmless, contains no acids nor paraffin oils.

If properly applied, one coat may be sufficient to make the surface dustless. If concrete is porous, 2 or 3 coats may be necessary to make surface waterproof and oilproof.

Once applied the effect is permanent. Floors last longer than if not dressed. Dressing must be renewed on walks or runways, where there is wear and tear, when surface is worn down.

Nothing is equal to it for concrete floors and walks of warehouses, factories, engine rooms, theaters, cellars, dairies, garages, stables, slaughter houses, tanneries or breweries; in fact, wherever concrete is used.

Absorbs quickly; can be walked on in couple of hours after being applied. Hardens in 6 to 8 hours (over night), and gets harder with time. Uneven drying shows uneven troweling of surface.

### "Liberty" White Enamel.

"Liberty" is a pure white enamel that stays white. It is slow drying and forms an elastic film that will not crack, check or peel.

"Liberty" White is made by the old Dutch process, developed in Holland. This is the best recommendation.

"Liberty" White equals the best enamel made and is sold at a reasonable price.

It comes in gloss white, flat white and eggshell finish. For exterior and interior purposes.

### "Liberty" Liquid Concrete Hardner.

"Liberty" Hardner is colorless, and discolors slightly. Makes an extremely hard surface, which will stand very heavy service and which will not disintegrate from oil action, nor dust up from wear.

The floor uses are many, and the results are marvelous.

### "Regal" Coatings.

FOR CEMENT FLOORS—"Regal" floor coatings prevent cement floors from dusting, and lessen the wear and tear on machinery, especially dynamos, due to the settling of the fine particles of cement on them. They are oilproof and greaseproof, preventing the disintegrating action of same on such floors, and are also waterproof and permit of their being properly cleaned.

FOR CEMENT, STUCCO OR BRICK WALLS AND CEILINGS—These coatings are manufactured in a number of soft, harmonious colors that not only waterproof the surface, but appeal to the artistic sense as well. As a rule cement or stucco walls are seldom uniform in color, due to the variations in mixing, or being charged with moisture, especially after a rain storm. This can be remedied by the use of "Regal" coatings, as they effect a chemical change in the surface of the cement or stucco, filling the pores with an insoluble material that is impervious to the action of water, gas or oil.

### "Regal" Flat Finishes.

"Regal" flat finishes, for interior decoration, take the place of cheap water colors, kalsomine and wall paper. They are not only hygienic, for they can be kept clean at all times with just soap and water, but they afford a combination of beautiful, soft colors that are pleasing as well as restful to the eye.

# ANTI-HYDRO WATERPROOFING CO.

TELEPHONE:  
CORTLANDT 7224

Singer Building  
NEW YORK, N. Y.

LABORATORIES, NEWARK, N. J.—Telephone, Market 5069

## Products and Services.

"ANTI-HYDRO," a Liquid Compound to be used with Portland cement for waterproofing, dampproofing, hardening, and other purposes.

CONSULTING WATERPROOFING ENGINEERS. The consulting engineers are ready at all times to advise concerning difficult waterproofing problems. Correspondence is invited.

## Description.

"Anti-Hydro's" function may be expressed as waterproofing cement with cement; that is, filling the voids with a cement solution, which crystallizes at the same time as the cement, integrally forming a hard, insoluble silicate of greater tensile strength, density and activity. It enriches mortars so that cost of troweling, mixing and supervision is reduced to a minimum. In fact, it more than pays its cost in labor saving. It hardens wearing surfaces to a degree that makes them dustless and adamant.

"Anti-Hydro" is a liquid compound, neutral to cement. When added, in certain percentage to the water used in gaging Portland cement mixtures in the usual way, it has the effect, without retarding setting, of rendering cement in all kinds of masonry impervious to water, moisture, frost, gas, oils, odors, etc. It excites and brings into service all the cohesive or colloidal possibilities of Portland cements, which in themselves are most efficient waterproofing mediums. There are no alums, hydrate of lime, greases, oils, stearic acid, or decomposable ingredients used; neither are there any iron admixtures, which are sure to disintegrate concrete in time.

USES—Because of its remarkable properties "Anti-Hydro" is used for hardening cement floors, for waterproofing concrete in mass and in surface coating, for dampproofing and for waterproofing mortar in brickwork.

QUANTITY REQUIRED—In general, 1 gal. of "Anti-Hydro" to a barrel of cement (water properly used) is sufficient for any concrete mixture.

## Specifications.

FLOOR HARDENER—Upon fill shall be laid a 1-in. topping of 1 part Portland cement and 2 parts clean sand. This shall be gaged by addition of "Anti-Hydro" to all water used in tempering dry mixture, in proportion of 1 gal. of "Anti-Hydro" to 10 gals. of water. The proper consistency will be obtained if, for each barrel of cement, 1 gal. of "Anti-Hydro" and 10 gals. of water be used.

WATERPROOFING IN MASS—To water used in gaging mixture add 1 gal. of "Anti-Hydro" for every 10 gals. water. Proper consistency will be obtained if, for each barrel cement, 1 gal. "Anti-Hydro" and 10 gals. water be used.

WATERPROOFING IN COATINGS—All interior surfaces of all exterior walls, upper surface of concrete floor slab of basement or cellar, all pits, piers, etc., as shown on plans, shall be waterproofed by the addition of "Anti-Hydro" Liquid Waterproofing Compound to all water used in tempering dry mixture



TRADE-MARK

of 1 part cement and 2 sand, in proportion of 1 gal. "Anti-Hydro" to 10 gals. water.

To assure perfect bond to underlying masonry, all surfaces, before application of waterproofing, shall be thoroughly roughed, cleaned and dampened. Coatings shall be applied not later than 24 hours after surfaces have been prepared. A slush or grout of neat cement, using 1 part "Anti-Hydro" to 3 parts water, is

first applied, then followed by a 1 cement : 2 sand mixture.

Floor work shall be 1 in. in thickness, and shall serve the double purpose of a waterproofing agent and dustless wearing surface.

Wall coatings shall be  $\frac{5}{8}$  in. in thickness from floor level, where they shall be properly coved and bonded to floor, and carried up to at least 1 ft. above grade level.

DAMPROOFING—To a mixture of 1 gal. "Anti-Hydro" and 3 gals. water gradually stir about  $\frac{1}{2}$  bag of Portland cement to a creamy consistency. Apply in 3 coats with a brush or spray.

The first coat is a penetrating one, the mixture for which should be as thick as the brush will carry and well rubbed in, taking particular care to fill all joints and cracks. The second is a further filler. The third is the finish coat, to which any color or effect can be given.

BRICKWORK—Brickwork to be laid in mortar of 1 part Portland cement and 2 parts clean sand. This to be gaged or tempered with water having the addition of "Anti-Hydro" Liquid Waterproofing Compound in the proportion of 1 gal. "Anti-Hydro" to 10 gals. water. Each course of brick to be carefully grouted, filling all joints with a liquid mixture as above, carrying the same percentage of "Anti-Hydro" to the water used in gaging it, 1 to 10.

STUCCO ON SOLID MASONRY—The stucco shall be applied in 2 coats. The straightening coat shall consist of 1 part Portland cement and 3 parts sand. This shall be gaged with a solution of 1 part "Anti-Hydro" to each 10 parts of water. The wall shall first be thoroughly wetted and the straightening coat applied  $\frac{3}{4}$  in. thick. The finish coat shall consist of 1 part Portland cement and  $2\frac{1}{2}$  parts clean sand, which shall be gaged with the same strength solution of "Anti-Hydro" and water as the straightening coat and applied  $\frac{1}{4}$  in. thick. Surface to be stippled. No lime should be used.

STUCCO ON METAL LATH—The stucco shall be applied in 3 coats. The first and second coats shall consist of 1 part Portland cement and 3 parts clean sand, and shall be gaged with a solution of 1 part "Anti-Hydro" to each 10 parts water. The first coat shall be applied  $\frac{7}{8}$  in. thick and  $\frac{3}{8}$  in. over the face of the lath. The second coat shall be  $\frac{3}{8}$  in. thick. The finish coat shall consist of 1 part Portland cement and  $2\frac{1}{2}$  parts clean sand, which shall be gaged with the same strength solution of "Anti-Hydro" as the first and second coats and shall be applied  $\frac{1}{4}$  in. thick. Surface to be stippled. No lime should be used.

## Approval.

The superiority of "Anti-Hydro" for waterproofing and concrete hardening is demonstrated by the permanency of work completed as long as fourteen years ago, and by the comparative tests of the United States Bureau of Standards. In these tests, reported in their Technologic Paper No. 3, they designate "Anti-Hydro" as Compound No. 40, and state "It is most impermeable of any of the Mortars."

## Shipment.

"Anti-Hydro" is shipped in 5-gal. and 10-gal. boxed cans and in 20-gal. and 30-gal. steel barrels, f. o. b. Newark, N. J.



## E. N. BIEGLER MFG. CO.

Manufacturers of Waterproofing, Technical Paints, Roofing, Paving and Insulating Compounds

TELEPHONE:  
HUMBOLDT 135

2734 North Rockwell Street  
CHICAGO, ILL.

### Products.

High grade WATERPROOFING MATERIALS for basements, subbasements, tunnels, reservoirs, subways, bridges, sidewalks, floors, cisterns, pits, silos and roofs; TECHNICAL PAINTS for steel and metal; ACIDPROOF and ALKALIPROOF PAINTS; CONCRETE TOUGHENER; CEMENT and MORTAR COLORS.

Insulating Compounds, Paving, Roofing, Rock Mastic Floors, Asphalt Products and Metallic Floor Hardener.

### Biegler's Dampproof Plaster Bond.

A combination of bituminous compounds, having great elasticity and durability. Forms perfect bond between plaster and brick, tile or concrete surface, resisting dampness, alkali, and saltpetre.

SPECIFICATION—Apply to all brick, tile or concrete surfaces to be plastered, 1 heavy coat of Biegler's Dampproof Plaster Bond.

### Biegler's Dampproof Stone Backing.

Used on unexposed surfaces of limestone, granite, marble and all cut stone for preventing stain or dampness from reaching face.

SPECIFICATION—Thoroughly apply 1 coat Biegler's Dampproof Stone Backing to all unexposed surfaces of stone at stone yard and apply another coat at job just before stone is set.

### Biegler's Dampproof Foundation Coating.

A bituminous compound of heavy consistency for dampproofing foundation walls, parapet walls, retaining walls, etc., to resist dampness. Used also on top of foundation walls as dampcourse.

SPECIFICATION—Apply 1 or 2 coats (2 preferable) of Biegler's Foundation Coating to exterior of all foundation walls below grade and top of all foundation walls at grade.

### Biegler's Ever-Tite Plastic Asbestos Cement.

An elastic waterproof cement applied with trowel. Being of a heavy plastic consistency, it has a greater tendency to resist water pressure than our Biegler's Foundation Coating when used for waterproofing foundation walls. Ever-Tite Plastic Cement is also adapted for repairing leaks in old gravel, prepared felt or metal roofs and is especially suitable around skylights, chimneys, vent ducts, pipes, etc., as material always remains elastic, and expands and contracts with surface to which applied.

### Biegler's Reinforced Membraneous Waterproof Construction.

Where there is considerable water pressure to contend with, this construction is recommended. To secure best results each job should be executed according to existing conditions, and, therefore, we prefer having clients advise nature of work to be waterproofed, stating water pressure, etc. Recommendation and method of construction will then be submitted.

### Biegler's Integral Waterproof Compound.

A water resisting compound prepared in powder form. Where membrane system of waterproofing is



not practical, this compound is recommended for waterproofing concrete foundations, swimming pools, pits, cisterns, etc. Old brick and concrete cellar walls and floors which are damp and leaking can be made watertight by properly applying a mixture of this compound with cement and sand.

### "Tuffner" Concrete Surfacers.

A technical chemical compound for treating concrete surfaces, toughening and making them dustproof. This material has no equal for concrete floors subject to excessive wear, such as floors of factories, warehouses, engine rooms, theaters, garages, dairies, cellars, stables, slaughter houses, tanneries or breweries; in fact, wherever concrete is used and a tough, durable and dustless surface is desired.

SPECIFICATION—Have surface clean and dry. Cover thoroughly with 1 coat "Tuffner" Concrete Surfacers with brush. Do not rub in. If concrete is soft and has not been evenly mixed there will be patches of flat or rough appearance which will require an additional coat. Entire surface when dry should present a smooth, glistening finish.

### Biegler's Duro-Carbo.

A durable, carbon graphite metal preservative paint of high quality which prevents corrosion, and when properly applied protects all metals from atmospheric and electrical influence to which a metal surface is generally exposed. It should be used on all structural steel work, bridge and truss work, viaducts, fire escapes, metal lath, tanks, boilers, etc.

### Biegler's Acidproof Insulating Coating.

An acidproof and alkaliproof quick drying paint for coating interior of tanks, either metal or wood, brine and condenser pipes, smokestacks, etc. For underground water mains, surface pipes, gas pipes, telephone and electric conduits, to prevent electrolysis and corrosion. For all electrical insulating, such as armatures, transformers, storage batteries, etc.

### Biegler's Cement and Mortar Colors.

Especially prepared for coloring cement and mortar. Ground exceedingly fine so they will go further and look brighter. Only richest and purest, carefully selected ores are used, and colors are permanent. These colors will not impair strength of cement or mortar.

### Prices.

Prices and additional information gladly furnished.

### References.

The fact that our products have been used successfully on hundreds of buildings, including over 200 United States Government buildings, is a guarantee that Biegler's products are equal to any, and absolutely satisfactory for the purposes intended. Names of architects and contractors, also list of buildings in any architect's locality upon which Biegler's materials have been used will be furnished on request.

# THE BITU-MORTAR WATERPROOFING COMPANY, INC.

Manufacturers of Cement Waterproofing and Dampproofing Compounds  
Waterproofing Engineers and Contractors

TELEPHONE:

MADISON SQUARE 5931, 5932

340-342 East 27th Street  
NEW YORK, N. Y.

NORTHWESTERN AGENTS

ST. PAUL, MINN., K. F. LOTT &amp; Co., 101 East 8th Street

MINNEAPOLIS, MINN., K. F. LOTT &amp; Co., Andrus Bldg.

## Products and Services.

"B-M No. 78" BITU-MORTAR LIQUID WATERPROOFING COMPOUND, "B-M No. 123" BITU-MORTAR POWDER INTEGRAL WATERPROOFING COMPOUND.

Also "B-M No. 208" and "B-M No. 212" BITU-MORTAR DAMPPROOFING and FURRING COMPOUNDS for coating brick, stone or concrete. Substitutes for furring and lathing.

CONTRACTORS for the EXECUTION OF WATERPROOFING AND DAMPPROOFING WORK in all sections of the country, making a specialty of difficult operations where other materials have failed. Will furnish bond from any bonding company, when required, guaranteeing work to remain absolutely watertight for a long term of years.

An engineering department is maintained, which is at the service of all seeking advice on any questions concerning waterproofing or dampproofing of Tunnels, Subways, Foundation Walls, Sewers, Reservoirs, etc.

## "B-M No. 78" Bitu-Mortar Liquid Waterproofing Compound.

This is a bituminous emulsion which can be readily incorporated in ordinary Portland cement mortar, ren-



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dering same absolutely and permanently impervious to water, even under severe pressure.

Mortar so prepared will bond perfectly to either old or new concrete, brick, stone or iron, and can be applied to surfaces even when water is coming through.

## "B-M No. 123" Bitu-Mortar Powder Waterproofing Compound.

This compound is manufactured in the form of extremely fine powder, which, when thoroughly mixed with dry Portland cement (2 lbs. of powder to 1 bag of cement), makes mortar or concrete waterproof. Does not affect strength, color, or setting and hardening of concrete. Especially adapted for reservoirs, sea walls, dams, tanks and foundations of buildings. Its base is composed of a highly refined bituminous substance.

## Suggestions for Application.

NATURE OF WORK	CONDITIONS	MATERIAL REQUIRED
Tunnels, subways, cellar walls.	Already constructed. Water coming through floors, ceilings or sidewalls.	Bitu-Mortar Liquid Waterproofing Compound, "B-M No. 78."
Foundation walls of buildings, sewers, reservoirs.	In course of erection.	Bitu-Mortar Powder Waterproofing Compound, "B-M No. 123."
Dampproofing substructure and superstructure walls of buildings.	After erection and before plaster has been applied and before backfilling.	Bitu-Mortar Dampproofing Compound, "B-M No. 208." or "B-M No. 212."

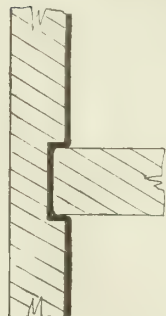
## References.

Partial list of buildings recently waterproofed with Bitu-Mortar Waterproofing Compound:

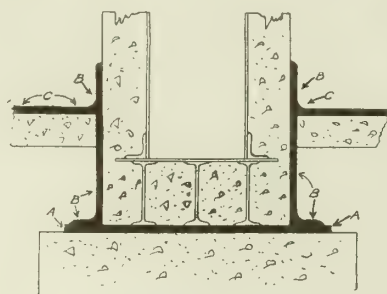
No. 680 Fifth Ave., New York, N. Y.; J. D. Rockefeller, Jr., Owner; Wm. Wells Bosworth, Architect; Marc Eidlitz & Son, Contractors  
Ice Mfg. Co.'s Plants at Coney Island, N. Y., and 11th Ave. and 49th St., New York, N. Y.; Mortensen & Co., Engineers  
Ajax Rubber Co. Building, Trenton, N. J.; S. M. Greene, Inc., Engineers, Springfield, Mass.  
Brown Bros. & Co. Building, Hanover St., New York, N. Y.; Delano & Aldrich, Architects; Marc Eidlitz & Son, Contractors  
Livingston Residence, 12 E. 96th St., New York, N. Y.; Ogden Codman, Architect; M. Reid & Co., Contractors  
W. R. Coe Buildings, Oyster Bay, N. Y.; Walker & Gillett, Architects; Elliott C. Brown, Contractor  
A. D. Carver Residence, Locust Valley, N. Y.; Tooker & Marsh, Architects; H. H. Smith Building Co., Builders  
B. C. Hoppin Residence, Islip, N. Y.; Cross & Cross, Architects  
Packard Motor Co. Building, Buffalo, N. Y.; Mann & Cook, Architects  
Second Church of Christ Scientist, 67th St., Brooklyn, N. Y.; Bernhardt E. Mueller, Architect  
St. Christopher's Hospital, 277 Hicks St., Brooklyn, N. Y.; Donn Barber, Architect; Whitney Co., Contractors  
Thanhouser Gate Lodge and Garage, Bayville, N. Y.; Tooker & Marsh, Architects  
Decker Building, Maplewood, N. J.



METHOD OF CARRYING WATERPROOFING BACK OF BEAMS



DETAIL SHOWING METHOD OF OBTAINING CONTINUOUS COATING WHERE INTERIOR WALL BUTTS AGAINST OUTSIDE WALL



DETAIL SHOWING METHOD OF WATERPROOFING UNDER GRILLAGES

- A First operation, "dampcours"  
B Second operation  
C Third operation, finished floor



# CERESIT WATERPROOFING COMPANY

972 Westminster Building  
CHICAGO, ILL.

NEW YORK OFFICE, 18 East 41st Street

PHILADELPHIA OFFICE, 1218 Chestnut Street

AGENCIES IN PRINCIPAL CITIES

## Products.

CERESIT WATERPROOFING COMPOUND;  
INDURITE LIQUID CONCRETE HARDENER;  
CEM-BRIC COVERING COMPOUND; RADIO-  
LITE WHITE ENAMEL; CERESITOL; LUX-  
STAR WHITE; C. W. CO. DAMPPROOF PLASTER BOND;  
C. W. CO. DAMPPROOF COATING; C. W. CO. DAMPPROOF  
STONE BACKING; C. W. CO. METALLIC FLOOR HARD-  
ENER.

### Ceresit Waterproofing Compound.

Ceresit is a plastic paste, and has two general uses, as follows:

(a) The waterproofing of substructure work, including foundation walls, basements, elevator and boiler pits, tunnels, swimming pools, dams, tanks, etc. (b) Protecting and making permanent above ground cement work, with Ceresit, including cement stucco, retaining walls, pergolas, balustrades, concrete bridges and all ornamental cement construction.

The two methods of use are the incorporation of Ceresit in mass concrete, and waterproofing by means of a cement mortar coating mixed with Ceresit.

CONDENSED SPECIFICATIONS—(1) All substructure concrete shall be waterproofed by the use of Ceresit waterproofing compound in the mass concrete, to be used in accordance with the manufacturer's general specifications for this particular class of work.

(2) All substructure work shall be waterproofed by the use of Ceresit waterproofing compound by means of a cersitized cement mortar coating, to be applied in accordance with the manufacturer's general specifications for this class of work.

(3) All cement stucco shall be waterproofed with Ceresit waterproofing compound, in accordance with manufacturer's specifications; pergolas, and ornamental cement work shall be waterproofed and protected against disintegration by the use of Ceresit waterproofing compound in accordance with the manufacturer's specifications.

QUANTITIES REQUIRED—For mass concrete, 10 to 13½ lbs. Ceresit per cu. yd. of concrete.

For cement mortar, 12 lbs. Ceresit per 100 sq. ft., 1 in. thick, and proportionate quantities for fraction of an inch thickness.

### Indurite Liquid Concrete Hardener.

A colorless chemical compound, which, when applied to Portland cement surfaces, changes them to a flinty, granitlike hardness. Indurite gives concrete floors a permanent wearing surface, and protects them against dusting and the action of oils and moisture.

Covering capacity for both coats, 80 to 110 sq. ft. per gal.

CONDENSED SPECIFICATIONS—Thoroughly clean floor, removing all foreign matter such as oils, grease and paints. Workmen should wear rubbers or rubber boots. Use Indurite as it comes in the original container, flushing the floor to full absorbent capacity and scrubbing in with long handled brushes with stiff bristles. Apply second coat of Indurite after a few hours, preferably the next day. Scrub the second coat into the surface. Any material which is not absorbed should be removed with a rubber squeegee.

### Cem-bric Covering Compound.

A waterproof decorative coating for building exteriors and concrete floors. Cem-bric protects and beautifies exterior surfaces of brick, cement, stucco, con-



TRADE-MARK

crete and masonry. It seals the surface pores, preventing water penetration. Concrete floors painted with Cem-bric will withstand repeated scrubbing without injury to the paint film. It has a perfect

affinity for concrete, and therefore penetrates the surface and becomes actually a part of it.

The 10 Cem-bric colors are white, cement gray, French gray, dark gray, tile green, cream, tan, buff, terra cotta and tile red.

Covering capacity for 2-coat work approximately 150 sq. ft. per gal.

CONDENSED SPECIFICATIONS FOR EXTERIOR USE—Surface to be dry. Use an ordinary wide brush, and give a flowing coat so that surface pores will be thoroughly saturated. First coat can be thinned with turpentine or a good substitute in the proportion of 1 pt. of thinner to 1 gal. of Cem-bric. Apply second coat as it comes in the original container, 24 hours after first coat.

### Radiolite White Enamel.

A slow drying enamel giving a permanent velvety gloss and elastic finish. Radiolite is made by an old Dutch formula, and, due to its slow drying qualities, it spreads easily, will not show brush marks, and will retain its white luster indefinitely.

Covering capacity, 325 to 350 sq. ft. per gal., 1 coat; 200 sq. ft. per gal., 2 coats.

### Ceresitol.

A transparent liquid, applied with a brush, rendering cement mortar, stone, brick, roof tile, porous stone, earthenware, etc., moistureproof. Comes ready to use.

Covering capacity, 150 to 200 sq. ft. per gal.

### Luxstar White.

An interior oil paint with an enamel finish, either gloss or flat, for industrial, office, and other buildings where a pure white surface is desired with high light reflecting qualities.

### C. W. Co. Dampproof Plaster Bond.

For dampproofing inside of exposed walls, and providing a bond for cement, lime or gypsum plaster. To be applied in continuous coating as per manufacturer's specifications.

Covering capacity, 75 to 90 sq. ft. per gal.

### C. W. Co. Dampproof Coating.

An asphaltic material for dampproofing foundation walls against surface water seepage; also, for protecting wood floors laid on concrete base.

Covering capacity, 40 to 50 sq. ft. per gal.

### C. W. Co. Dampproof Stone Backing.

For stainproofing and dampproofing building stone. To be painted on five unexposed surfaces in accordance with manufacturer's specifications.

Covering capacity, 125 to 150 sq. ft. per gal.

### C. W. Co. Metallic Floor Hardener.

To harden and dustproof concrete floors by means of a ground iron hardener, to be incorporated in top finish of floor in accordance with manufacturer's specifications. In 2 colors, steel gray and tile red.

Covering capacity, from 25 to 50 lbs. per 100 sq. ft.

# THE GENERAL FIREPROOFING COMPANY

## Waterproofing and Dampproofing Products and Technical Paints

### YOUNGSTOWN, OHIO

#### BRANCH OFFICES

CHICAGO, ILL., 325 West Madison Street  
 BUFFALO, N. Y., 696 Ellicott Square Building  
 WASHINGTON, D. C., 711 Woodward Building

ATLANTA, GA., Third National Bank Building  
 PHILADELPHIA, PA., 1119 Pennsylvania Building  
 KANSAS CITY, MO., 1009 Waldheim Building

EXPORT DEPARTMENT: NEW YORK, N. Y., 395 Broadway

#### Products.

**INTEGRAL WATERPROOFING:** GF No. 10, PASTE, and GF No. 11, POWDER; **TROWEL COATING,** GF No. 15; **FOUNDATION BRUSH COATING,** GF No. 16; **MOP COATING** GF No. 17; **WATERPROOF FELT,** GF No. 18; **SATURATED FABRIC,** GF No. 21; **ACIDPROOFING,** GF No. 99; **COLORLESS WATERPROOFING,** GF No. 100; **BRICK and CEMENT COATING (in colors),** GF No. 101; **CRYSTALROX,** GF No. 145; **FLOOR PRIMER,** GF No. 150; **FLOOR COATING (in colors),** GF No. 151; **FLOOR ENAMEL (in colors),** GF No. 155; **DAMPPOOFING COATING,** GF No. 200; **STAINPROOF STONE BACKING,** GF No. 220; **MASTIC CEMENT (in colors),** GF No. 250; **BLACK MASTIC ROOF CEMENT,** GF No. 250R; **STEEL COATING,** GF No. 300; **PROTECTIVE COATING (for steel),** GF No. 325; **GALVANIZED STEEL PRIMER,** GF No. 350; **WOOD PRESERVATIVE,** GF No. 550.

Bonding Compound, GF No. 400.

For Metal Lath Reinforcement, see pages 210-13; for Metal Furniture, see page 1414.

#### Service.

A Waterproofing Service Department is maintained, in which are practical engineers who have had wide experience on waterproofing jobs. Their time is devoted to studying actual conditions and recommending the right method along with the most suitable material for the job. This department will give complete specifications if informed regarding nature of the work.

#### GF No. 10 Integral Waterproofing Paste.

A smooth white paste mixed with the gaging water for concrete and cement.

GF No. 10 makes the concrete mass permanently watertight. The small quantity required, and the ease of using GF No. 10 make it an effective and inexpensive waterproofing.

**USES**—For waterproofing concrete foundations, floors, tanks, silos, etc., as an integral part of the mix; for waterproof coating when mixed with cement plaster; for waterproofing stucco exteriors over masonry, metal lath, hollow tile, etc.

#### GF No. 11 Integral Waterproofing Powder.

For the same work as GF No. 10 Paste. The only difference is the form and method of application.

#### GF No. 15 Trowel Coating and No. 16 Foundation Brush Coating.

The former a thick pastelike compound, the latter a heavy bitumen which can be swabbed on with a brush.

**USES**—For dampproofing substructures.

#### GF No. 17 Mop Coating, GF No. 18 Waterproof Felt and GF No. 21 Saturated Fabric.

For membrane waterproofing courses.

**USES**—Nos. 17 and 18 used for waterproofing basements, floors, roofs, etc.; Nos. 17 and 21, for swimming pools, steel and concrete bridge decks, etc.

#### GF No. 99 Acidproofing.

A thin transparent liquid which effectively resists dilute acids and acid gases.

#### GF No. 100 Colorless Waterproofing for Exteriors.

A permanent pore-filling liquid, which in no way

changes appearance of walls but waterproofs them.

**USES**—For waterproofing exterior walls of brick, stone or stucco; for copings, parapets, cornices; for cisterns, water tanks and pools.

#### GF No. 101 Brick and Cement Coating.

For uses similar to GF No. 100, except that it imparts a lasting color to the surface. Furnished in colors—white, old ivory, buff, Bedford gray, Portland gray, concrete gray, tile red and brownstone.

#### GF No. 145 Crystalrox.

A concentrated liquid for hardening and dustproofing concrete floors, both new and old. Also used to prevent streaking and staining on the face of granite and limestone. Proof against water, oil and dilute acids.

#### GF No. 150 Floor Primer and No. 151 Floor Coating.

Together they make a pleasing sanitary floor coating, which renders the floor non-dusting, and increases its resistance to wear. Colors—Bedford gray, Portland gray, concrete gray, tile red and brownstone.

#### GF No. 155 Floor Enamel.

Similar to No. 151 Floor Coating, but contains less pigment and more vehicle. Consequently, while not giving as dense a color, makes a better dustproofing. With No. 155, no priming coat is required. Supplied colorless, or in red, brown, gray and green. Especially suitable for factories, warehouses and office buildings.

#### GF No. 200 Dampproofing Coating.

A bitumen paint applied cold to brick or tile walls. The strong "tack" aids in bonding the plaster; also forms an insulator.

**USES**—As a dampproofing on walls to which plaster is applied directly under lath and furring.

#### GF No. 220 Stainproof Stone Backing.

Applied on the back and joint surfaces of limestone, marble, etc., before erection to prevent staining and efflorescence.

#### GF No. 250 Mastic Cement.

A puttylike waterproofing in colors for roofs and joints.

#### GF No. 255 Mastic Roof Cement.

An inexpensive black trowelling compound for waterproofing roof surfaces.

#### GF No. 300 and No. 325 Structural Steel Coatings.

For structural steel, either permanently exposed or to be incased in masonry or concrete.

#### GF No. 350 Galvanized Steel Primer.

One coat applied with a brush to any galvanized surface will prepare the surface for ordinary oil paint. GF No. 101, in colors, can be used over this priming coat.

#### GF No. 550 Wood Preservative.

Makes wood impervious to water; protects it from rotting due to dampness; prevents formation of fungi, and discourages wood-boring insects. Applied by brush, spray or immersion. Nut brown color, leaves no film.

#### Handbook.

The Waterproofing Handbook containing complete specifications furnished on request.



# A. C. HORN COMPANY

## Waterproofings, Dampproofings, Technical Paints; Technical and Structural Compounds

Horn Building

LONG ISLAND CITY, N. Y.

TELEPHONE:

HUNTERS POINT 3671

CABLE ADDRESS

"HORNACO, NEW YORK"

AGENCIES LOCATED IN PRINCIPAL CITIES OF UNITED STATES, CANADA, SOUTH AMERICA AND AUSTRALIA

The names of our distributors and the nearest points of distribution will be given on request

### Products.

WATERPROOFINGS; DAMP-PROOFINGS; TECHNICAL PAINTS; TECHNICAL and STRUCTURAL COMPOUNDS, which include:

Dehydratine; Hydratite (paste and powder); Symentrex; Hornstone Solution and Everlastic Cement.

### Services.

For 26 years this company has been meeting unusual situations and solving difficult problems in its lines, and is always at the service of architects, engineers and contractors.

When necessary, new methods are devised or new materials manufactured.

**SPECIFICATIONS**—This company will write specifications for any specific job, and in addition will furnish literature containing detailed specifications for each product. A short form of specification is often adequate for our more familiar products. The following is suggested:

"For (name of operation) use (mention 1 or 2 coats if a coating) of (name of product) as manufactured by and in accordance with the directions of the A. C. HORN COMPANY, Long Island City, N. Y."

### General Specifications.

#### FOUNDATION WALLS

##### Membrane Method—

- (1) Brush coating—Dehydratine No. 4.  
One gal. double coat, 25 to 40 sq. ft.
- (2) Trowel coating—Dehydratine No. 6.  
One gal. 1/16 in. thick, 26 sq. ft.
- (3) Mop coating with felt or fabric—Dehydratine No. 7 and Tripleflex Fabric.  
One gal. melted, 33 sq. ft. per coat.  
Fabric in rolls, 140 sq. yds. each.

##### Integral Method—

- (1) Waterproofing powder—Hydratite No. 1.  
2% by weight of cement used.
- (2) Waterproofing paste—Hydratite No. 2.  
2% by weight of cement used.

#### PITS, RESERVOIRS, SWIMMING POOLS, TUNNELS AND FLOORS BELOW GRADE

Same materials and quantities as for foundation walls.

#### SUPERSTRUCTURAL WALLS

##### Exterior Surfaces—

- (1) Cement coating—Symentrex.  
One gal. double coat, 100 to 135 sq. ft.
- (2) Colorless waterproofing—Dehydratine No. 2.  
One gal. single coat, 175 to 200 sq. ft.  
One gal. double coat, 80 to 100 sq. ft.
- (3) Stainproofing stone—Dehydratine No. 3.  
One gal. single coat, 150 to 175 sq. ft.  
One gal. double coat, 75 to 90 sq. ft.
- (4) Cement mortar and exterior stucco—Hydratite Nos. 1 and 2.  
2% by weight of cement used.
- (5) Densifying and preserving limestone—Hornstone Preservative.  
One gal. single coat, 150 sq. ft.



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#### SUPERSTRUCTURAL WALLS (Continued)

##### Interior Surfaces of Exterior Walls, etc.—

- (1) Brush coating—Dehydratine No. 1.  
One gal. single coat, 80 sq. ft.  
One gal. double coat, 50 sq. ft.
- (2) Trowel coating—Dehydratine No. 10.  
One gal. 1/16 in. thick, 30 sq. ft.
- (3) Wall coating for industrial buildings—Hornstone Enamel.  
One gal. double coat, 300 sq. ft.
- (4) Mortar color—Horn's Watertite Mortar Colors.  
10 to 15 lbs. per bag of cement.

#### STEEL WORK

- (1) Priming or metal protective coat—Rust Baar.  
One gal. single coat, 400 sq. ft.  
One gal. double coat, 300 sq. ft.
- (2) Final or saponification-proof coat—Dehydratine No. 5.  
One gal. 500 sq. ft.

#### ROOFS

##### Of Every Character—

- (1) Trowel coating—Everlastic Cement.  
One gal. 1/16 in. thick, 26 sq. ft.

##### Concrete—

- (1) Integral method—Hydratite Nos. 1 or 2.  
2% by weight of cement used.

#### CEMENT FLOORS

- (1) Steel hardener—Ferro Fax.  
15 to 33 lbs. per 100 sq. ft., depending on traffic.
- (2) Chemical hardener—Hornstone Solution.  
One gal. 2 coats, 125 to 150 sq. ft.
- (3) Cement coating—Koncrex (with color or colorless).  
One gal. single coat, 200 to 225 sq. ft.  
One gal. double coat, 150 to 175 sq. ft.

#### BUILDING INTERIORS

##### Kitchens, Lavatories, Bathrooms—

- (1) High glaze waterproofing enamel to resist condensation and steam—Hornstone Enamel.  
One gal. double coat, 300 sq. ft.

##### Flat Wall Finish—Symentrin—

- One gal. single coat, 300 to 400 sq. ft.  
One gal. double coat, 175 to 225 sq. ft.

#### MISCELLANEOUS

##### Window Calking—

- Dehydratine Slate and Tile Cement.  
Weighs 9 lbs. per gal.

##### Bonding New to Old Concrete—

- Bondsit.  
Two lbs. dissolved in 1 gal. water covers 150 sq. ft.

##### Wood Preservative—

- Kopper Karbol.  
One gal. rough lumber, 200 sq. ft.  
One gal. planed lumber, 250 sq. ft.

##### To Prevent Splintering of Wood Floors—

- Woodcex.  
One gal. single coat, 400 sq. ft.

### References.

Due to the long period of successful manufacturing in which this company has been engaged, it is able to refer to a large number of jobs on any of its products.

Should a desire be had to visit and inspect some of these jobs, reference lists will be promptly supplied.

# THE HYDREX FELT & ENGINEERING CO.

Specialists in Structural Waterproofing, Insulation and Soundproofing

120 Liberty Street  
NEW YORK, N. Y.

FACTORIES  
RAHWAY, N. J.

BRANCH OFFICES  
CHICAGO      WASHINGTON      PHILADELPHIA

## Products.

HYDREX WATERPROOFING FELT  
HYDREX (BITUMEN) COMPOUND  
HYDREX-"SANIFLOR" DEADENING FELT  
HYDREX-"NOVENTO" WATERPROOF  
SHEATHING PAPER

HYDREX WATERPROOFED BURLAP  
HYDREX PRESERVATIVE PAINT  
HYDREX-"BIKOTA" SHEATHING PAPER  
HYDREX WATERPROOF CLOTH  
HYDREX WATERPROOF CANVAS  
HYDREX-"PLUVINOX" READY ROOFING

Hydrex Expansion Joint (strips); Technical, Roofing and Asphalt Paints; Cold Storage Insulation, Damp Course, Asphalts, Cloth-backed Case Lining, etc.



TRADE-MARK  
Reg. U. S. Pat. Off.

## Hydrex-"Novento" Waterproof Sheathing Paper.

An extra heavy *felt paper*, first waterproofed through and through and then given a *glazed coating* on both sides. Is further improved by a coating of powdered soapstone on the weather side, the soapstone being a great water repellant and preservative. When used under clapboards, slate, tile, stucco, tin, etc., the gray or soapstoned surface should be turned outward towards the weather; and when used under floors, the soapstone surface should be turned upward.

Hydrex-"NOVENTO" contains no *coal tar* or *acids* to corrode tin, nails or other metal. Being unaffected by alkali, it is specially adapted for use under stucco. Made in 1-ply, 2-ply, 3-ply. Put up in rolls of 500 sq. ft.

## Hydrex Waterproofing Felt.

This well-known waterproofing felt is an absolutely impervious leatherlike sheet, first saturated and then given a *glazed coating* on both surfaces. Used in two or more layers (as the conditions may require) for waterproofing foundations, tunnels, subways, reservoirs, swimming pools, dry docks, fortifications, battery room floors, etc.

For general waterproofing work, four layers of the felt are used, cemented together with hot Hydrex Compound (*The Membrane Method of Waterproofing*), which has been successfully used in the most difficult water pressure work throughout the world.

For waterproofing upper floors in mills, warehouses, etc., specify two layers of Hydrex Felt "*Penna. Special*" grade, cemented together with hot Hydrex Compound.

Detailed specifications, suited to particular needs and conditions, will be promptly supplied, upon request. As engineers and experts in structural waterproofing, we furnish estimates, plans and specifications for waterproofing any kind of construction.

## Hydrex-"Saniflor" Sound Deadening Felt.

A thick, soft felt *coated* on both surfaces so as to hermetically seal in the felt and render it non-absorbent, clean, sanitary and absolutely verminproof. Moths, mice and other vermin will *not* and can *not* eat the coating, because gnawing causes the teeth to stick. The well-known sound deadening quality of Hydrex-"SANIFLOR," together with its verminproof features, makes it unequalled for use in hospitals, residences, apartment houses, schools, etc.

Also widely used as a warmth giving, blanketlike lining under clapboards and roofs, and for cold storage, icehouse and refrigerator car insulation.

Hydrex-"SANIFLOR" is put up in rolls 36 ins. wide, containing 300 sq. ft.



METHOD FOR SOUND DEADENING FLOORS WITH  
HYDREX-SANIFLOR

## Hydrex Preservative Paint.

A heavy bodied black paint for dampproofing the interior surface of exterior walls, and also the outside of hollow terra cotta tile walls to be stuccoed.

It excels in acid resisting qualities, especially against sulphuric acid, and is therefore standard for use in electric storage boxes and battery rooms, for coating walls and all exposed metal.

This paint forms a heavy, tenacious, impervious coating to which plaster and stucco tightly bond. For the best results, 2 coats should be used. Covering capacity, 1 gal. for about 100 sq. ft. of brick surface.

Also used as a preservative coating for structural iron and steel work, because of its being unaffected by the lime in cement and mortar.

## Hydrex Waterproof Canvas.

A heavy, strong canvas, impregnated and coated with an elastic waterproof compound. Used on porch roofs, boat decks, piazza floors, etc., where there is considerable walking. Shipped in rolls 29 ins. wide, containing 216 sq. ft.

## Hydrex Burlap, "New York Subway Brand."

A saturated and coated burlap accepted and used for waterproofing New York Subway. Put up in rolls of 400 sq. ft.

## Hydrex Waterproof Cloth.

A waterproofed woven fabric used for waterproofing in connection with (hot) Hydrex Compound. Shipped in rolls 36 ins. wide, containing 500 sq. ft.

## Hydrex-"Pluvinox" Ready Roofing.

A high grade, smooth surfaced, durable roofing. Made in 1-ply, 2-ply, 3-ply. Rolls contain 216 sq. ft.



# THE HYDROLITHIC WATERPROOFING CO., INC.

Engineers and Contractors for Waterproofing

TELEPHONES:

GREELEY 2264, 2265

1328 Broadway  
NEW YORK, N. Y.

## Services and Products.

ENGINEERS and SPECIALISTS for WINSLOW'S HYDROLITHIC SYSTEM OF WATERPROOFING.

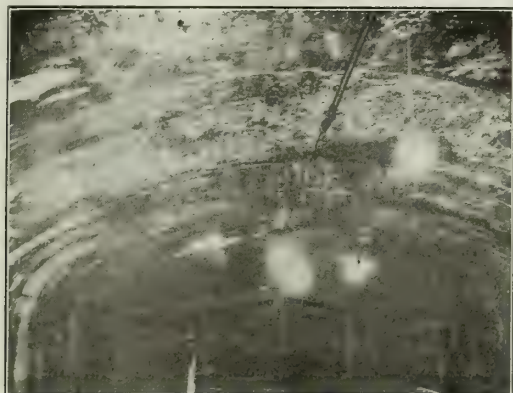
This company takes and executes contracts for the WATERPROOFING of all kinds of SUBSTRUCTURES, such as Subways, Tunnels, Reservoirs, Vaults, Swimming Pools, Boiler Rooms, Cellars, etc., giving a guarantee against any percolation, whether structures are of concrete, brick or stone.

## Winslow's Hydrolithic System.

All work is executed in the well-known Winslow's hydrolithic system, using either hydrolithic cement or hydrolite as the conditions may require. Hydrolithic coatings contain all the good points of a first class true Portland cement mortar, with the addition of their water repellent and waterproofing qualities.

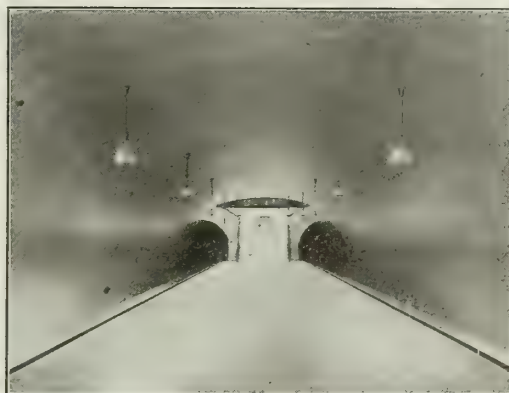
APPLICATION—Hydrolithic waterproofing is applied on the interior of exterior walls and floor forming one monolithic shell, and the adhesive qualities are such that it will withstand any water pressure, and will last just as long as the structures waterproofed will last. Hy-

**HYDROLITHIC**  
TRADE-MARK



Before applying Waterproofing

42ND STREET (NEW YORK) STATION, QUEENSBORO SUBWAY



After being Waterproofed

droolithic waterproof coatings,  $\frac{5}{8}$  in. thick on brick, have withstood a laboratory test of 1200 lbs. per sq. in.; and actual successful work has been done 162 ft. below grade, representing a hydrostatic pressure of over 70 lbs. per sq. in.

ADVANTAGES—The advantages of Winslow's hydrolithic system over the old membrane method are many: Repairs of any defects can be made easily, as the work is always in sight; it gains floor space, taken up in the membrane method of protecting brick walls, not necessary under the hydrolithic system; the waterproof coat constitutes the finish of the walls and floors, and being impervious, is absolutely sanitary. Hydrolithic coatings are perfectly bonded to waterproofed structures, forming a part of such and thereby add strength to walls, and especially to floors.

RECORD—Winslow's hydrolithic system has been used for 20 years; has stood the test of time, and the company can truly say there is nothing superior to it on the market to-day.

ESTIMATES—If architects will write their requirements, specifications and estimates will be gladly furnished, no matter how large or small the job may be.

REFERENCES—A few of the buildings where Hydrolithic Waterproofing was used:

Delaware & Hudson Office Building, Albany, N. Y., M. T. Reynolds, Architect  
Third National Bank, Springfield, Mass., Starrett & Van Vleck, Architects; Hoggson Bros., Engineers  
Peoples National Bank, Jackson, Mich., Rocker & Vattet, Architects; Hoggson Bros., Engineers  
Michigan City Trust & Savings Bank, Michigan City, Ind., T. C. Visscher, Architect; Hoggson Bros., Engineers  
Wm. Penn Hotel, Pittsburgh, Pa., Janssen & Abbott, Architects  
St. Paul's Cathedral, Pittsburgh, Pa.  
Union Arcade Building, Pittsburgh, Pa.  
Goodyear Rubber Tire Co., Long Island City, N. Y., A. H. Bowditch, Architect  
Royal Bank of Canada, Liverpool, N. S., Purdy & Henderson, Engineers  
Bridgeport Trust Co., Bridgeport, Conn., G. A. Freeman, Architect  
Residence of Jas. Gamble Rogers, Architect, New York, N. Y.

## Hydro-Crete.

A concrete especially adapted in the construction of bank vaults producing the highest degree of protection against fire, water, intense heat, riots and burglary.

**HYDRO-CRETE**  
TRADE MARK

Hydro-Crete received the indorsement of experts after thorough tests had been made, representing as near as possible actual conditions of destruction by fire, drilling, cutting and smashing.

REFERENCES—Hydro-Crete has been used lately in the construction of the following bank vaults:

Federal Reserve Bank, Equitable Building, New York, N. Y.  
Guaranty Trust Co., 43rd St. and Fifth Avenue, New York, N. Y.  
Guaranty Trust Co., 140 Broadway, New York, N. Y.  
Metropolitan Life Insurance Co., New York, N. Y.  
Rhode Island Hospital Trust Co., Providence, R. I.

# THE OBELISK WATERPROOFING COMPANY

Contractors and Engineers

TELEPHONE:  
GRAMERCY 2710, 2711

1 Madison Avenue  
NEW YORK, N. Y.

## Services.

We contract for the SCIENTIFIC TREATMENT for PRESERVING and WATERPROOFING EXTERIOR and INTERIOR STONE, MARBLE, BRICK, CONCRETE and STUCCO, by the "CAFFALL PROCESS." BUILDINGS CLEANED and RENOVATED. CONCRETE FLOORS MADE SANITARY.

## Process.

The "Caffall Process" for waterproofing and preserving structures was applied in 1885 to the Egyptian obelisk ("Cleopatra's Needle") in Central Park, New York by Robert M. and Edward M. Caffall.

It is a method of treating stone, brick, terra cotta and concrete walls (including joints), marble monuments, garden statuary, etc., to permanently prevent penetration of dampness and preserve against damage by weather. It consists in remedying surface or structural defects, such as open or cracked joints, applying heat to surface, brushing on a hot paraffin compound to saturation, and removing superfluous wax by special processes, leaving treatment invisible.

Thus surfaces of buildings are sealed against absorption of water, consequently are unaffected by frost, and rendered impervious to gases and other influences tending to disintegration and defacement.

It will be understood that application of heat to buildings, particularly to fine marble and granite, requires expert skill. Heat serves the double purpose of drying out surface and forcing penetration of preservative material. On cooling, the wax congeals and becomes an integral part of material at and below surface.

## Leaks in Buildings Prevented and Cured.

The problem of preventing buildings from leaking and deteriorating, which confronts all architects and builders, is solved by this process. Buildings which previously were damaged by water leaking through the walls have been restored and made perfectly dry. Buildings without furrings are kept dry by use of this process on exterior walls.

## Disintegration and Decay.

Architects are using more exterior color decoration in modern buildings, often very delicate and extremely sensitive to ravages of time and weather. Dangers of disintegration are proportionately increased, and the value of a successful preservative treatment becomes more apparent.



MRS. WHITELAW REID'S RESIDENCE, WHITE PLAINS, N. Y.  
Treated in 1915



MANHATTAN LIFE INSURANCE BUILDING,  
NEW YORK  
Side and rear walls treated in  
1894-95



"CLEOPATRA'S NEEDLE"  
CENTRAL PARK,  
NEW YORK  
Treated 1885

## Durability.

The principal components can not be easily oxidized and are insoluble in water, or acidulated or alkaline solutions and gases. This is the only preservative process having a history covering any considerable period. Buildings treated 48 years ago are still dry.

## Marble Treatment.

Delicate marble, ordinarily used only for interior decoration, can be used for exterior if treated with the "Caffall Process." The fact that such delicate marble can be preserved has caused dealers and architects to realize that an entirely new field is open to them in the way of exterior decoration with high grade colored marble.

## Cost.

Cost can be ascertained upon application to company. It is determined by character of material to be treated; condition, whether newly erected, old or requiring renovation; superficial area requiring treatment; character of surface, whether plain or ornamental; and location of building or monument.



COMMODORE JAMES' RESIDENCE, NEWPORT, R. I.  
Treated 1912



# PERMANENT IRONITE WATERPROOFING CO.

Engineers and Contractors for Waterproofing

Lathrop Building  
KANSAS CITY, MO.

## Products.

IRONITE WATERPROOFING; IRONITE CEMENT FLOOR HARDENER.

## Ironite Waterproofing.

Made in the form of a very fine metallic powder. It is mixed with water, and on application to a porous masonry surface will penetrate where moisture will penetrate. The Ironite oxidizes and expands, becoming an integral part of the material to which it is applied, both strengthening and waterproofing same.

Ironite is an insulator against electricity, steam, heat and cold. It is non-magnetic, prevents electrolysis, and withstands a high degree of heat. Tests have proved it to withstand higher degrees of heat than concrete, steel and fire brick.

**WHERE USED**—Used in buildings, reservoirs, pits, bridges, etc., on porous building products such as concrete, brick and stone, on wet or dry surfaces.

**APPLICATION**—Applied directly to the surfaces to be treated by brush or spray, and is put on continuously until finished. Can be applied either to interior or exterior surfaces of walls as conditions require. By applying to the interior surface of walls or floors no outside excavation is necessary, consequently old work can be waterproofed as readily as new construction. Further, for inside treatment, the most opportune time can be selected to treat surfaces. In case of fractures in the structure, repairs can be easily made.

**PRESSURE**—Ironite waterproofing is guaranteed to prevent leaks, providing structure stands where pressure does not exceed 4320 lbs. per sq. ft.

**COLOR**—Black when first put on, which soon turns to reddish color and then a dark brown.

**FINISHING OF WALLS**—Walls may be plastered after waterproofing has been applied.



MIDLAND MILLING COMPANY BUILDING, NORTH KANSAS CITY, MO.

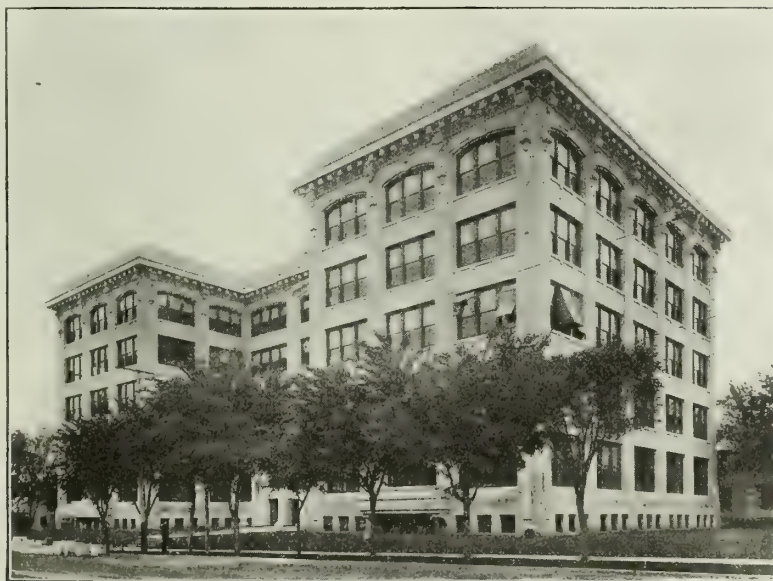
SMITH, REA & LOVITT, Architects, Kansas City, Mo.

**SPECIFICATIONS**—Specify that all surfaces you want treated shall be taken care of by the PERMANENT IRONITE WATERPROOFING Co., according to their standard specifications and under their five-year guarantee.

## Ironite Cement Floor Hardener.

A metallic hardener, which, when mixed with cement, expands to such an extent as to close the pores in the cement finish. The result is a solid floor with a wearing surface of maximum density, adding strength to the concrete.

Specifications and information furnished on request.



PRAIRIE OIL & GAS COMPANY BUILDING, INDEPENDENCE, KANS.

THOMPSON-STARRETT Co., Chicago, Ill., Contractors  
MADORIE & BIRDSALL, Architects, Kansas City, Mo.

# THE STANDARD PAINT COMPANY

NEW YORK

BOSTON

CHICAGO

SAN FRANCISCO

MONTREAL

## Products.

IMPERVITE CEMENT WATERPROOFING COMPOUND (Patented) "Regular" and "White"; Permeameter.

For Ruberoid Roofing, Felts, Papers, P & B Technical Paints and Insulating Materials, see page 393.

## Permeameter.

An instrument designed and built by this company, which is for sale or loan to those wishing to test permeability of waterproofing materials.

## Advantages of Impervite.

(1) A  $\frac{3}{4}$ -in. facing of Impervite mortar, plastered on the inside of a structure according to Specification A, by THE STANDARD PAINT COMPANY, or under their supervision, is guaranteed to make and maintain the job watertight.

(2) Due to the efficiency of Impervite, a leaner mortar than ever before specified may be used for waterproofing and stucco work. This very remarkably reduces the tendency to crack on drying. THE STANDARD PAINT COMPANY is a pioneer in lean mixtures; special data on request.

(3) Impervite differs from practically all other waterproofing compounds, because it contains no calcium stearate or other soap. Unlike soap compounds it does not tend to reduce the strength or delay the set. Guaranteed weight for weight, 2 to 5 times more efficient than any soap compound on the market.

(4) Impervite is a paste, whose principal ingredient is asphalt, emulsified so as to be mixable with water. The value of asphalt has long been known, and Impervite now adapts it to concrete.

(5) Impervite can not be washed out. It will resist hot water, steam, oil and most chemicals.

(6) As compared to a membrane of tar and felt, the Impervite system is applied direct to the inside of walls and top of floor, and does not require any protecting wall or double floor construction. This saves in excavation and construction costs, and on a plot of limited size, more useful space is secured.

(7) The Impervite system speeds up construction, because the masons do not have to wait for the membrane waterproofer to do his work before they can finish the bearing walls.

(8) The Impervite system can not be punctured by stones, or tools which frequently injure membrane waterproofing.

(9) Impervite is mixed in with the regular 1-in. floor top, and forms a hard wearing surface. The mortar bonds perfectly to old walls or floors.

(10) Impervite mortar prevents disintegration from sea water.

## Co-operative Service.

This company's experts are members of the United States Bureau of Standards, Waterproofing and Stucco Committees, and are consulted by such organizations as Westinghouse Church Kerr & Co., Inc., The Foundation Co., and the New York Public Service Commission.

Ask about new methods for bridges, roofs, subways, viaducts and swimming pools (with special provision for possible cracking); cheapest type of water-



TRADE-MARK

proofing known, yet it is absolutely safe.

If nature of problem is stated, the company will endeavor to have an expert call (without charge), who is able to estimate contract cost and discuss the engineering features, or send for "Question Blank" (copyrighted) prepared in ballot form: an "X" marked in the proper squares describes the work and will bring special instructions.

## Official Comparative Tests.

A—SAN FRANCISCO EXPOSITION—As the result of comparative tests, Impervite received the Gold Medal, highest award.

B—PERMEABILITY TEST—Impervite mortar,  $\frac{3}{4}$  in. thick, has been tested to 150 lbs. pressure per sq. in. without any percolation taking place.

C—BONDING TEST—Impervite facing bonded to old concrete shows an adhesion of 290 lbs. per sq. in., equal to about 600-ft. head of water.

D—"ENGINEERING RECORD"—See Oct. 10, 1914, for description of an Impervite job withstanding 200-ft. head.

E—UNITED STATES BUREAU OF STANDARDS—In Technologic Paper No. 18, reports on page 101, "No check tests were run on the other integrals, with the exception of No. 11, which was the only one giving results that warranted further investigation." In a letter, dated March 24, 1915, they state, "Compound No. 11 is Impervite."

F—UNITED STATES DEPARTMENT OF AGRICULTURE.	
CRUSHING STRENGTH	LEAKAGE IN 5 HOURS
(6-in. cylinders, age 28 days)	(40 lbs. water pressure)
Plain.....1350 lbs. per sq. in.	Plain.....17 cubic centimeters
Impervite..1470 lbs. per sq. in.	Impervite.....No leakage
G—DR. SEGER'S LABORATORY OF CERAMICS: LEAKAGE IN 24 HOURS.	
Plain 1:3 mortar.....384 cc.	2% Impervite.....56 cc.
2% Soap compound C...240 cc.	5% Impervite.....5 cc.
2% Soap compound B...216 cc.	10% Impervite.....0 cc.

## Important Statement Regarding Specification A.

"Specification A" has been compiled at the request of a number of architects, who wanted a clear and strict specification that would secure a "factor of safety" and relieve them for all time of waterproofing worry.

By using a lean mortar (which reduces the tendency to check), and a large amount of compound (which increases the waterproofing efficiency), this specification provides against variations in exposure, workmanship and materials.

If architect desires "Specification A," he must not say "or equal," because waterproofing according to "Specification A" costs about 10% more than competitive specifications. It demands more compound than competitors are able to use, but gives twelve times the security.

Considering that the square foot cost of labor and materials for a waterproof facing is 15 to 30 cents, and the cost of compound 2 to 5 cents, it is seen that the extra safety is a comparatively small investment.

## Specification A—Mortar Facings, (1 : 2½).

The first paragraph is sufficient for a short specification.

All walls and floors, where indicated on plans or specifications, are to be waterproofed on the inside with Impervite mortar, according to Specification A of THE STANDARD PAINT COMPANY.

GUARANTEE—Contractor must repair promptly on notice any leak, not due to mechanical injury, occurring in his waterproofing within 2 years after completion.

PROPORTIONS—All mortar shall be in the proportion of 1 bag approved Portland cement to 2½ bags sand.

Sand must have large proportion of grains  $\frac{1}{16}$  in. to  $\frac{1}{8}$



in. in size. If sand dirties the fingers on rubbing, or clouds water when stirred in a glass, it must be washed till free from loam, clay or organic matter. (It is absolutely impossible to secure results with dirty or fine sand.)

Mix equal parts Impervite and water. Take a 12-qt. pail full of the well stirred mixture for each bag of cement.

Wall facings are to be  $\frac{3}{4}$  in. thick in 2 coats, taking  $\frac{1}{2}$  lb. Impervite per sq. ft. Floor facings are to be 1 in. thick in 1 coat, taking  $\frac{1}{2}$  lb. Impervite per sq. ft.

**APPLICATION**—The purpose of this specification is to secure a continuous layer of waterproof mortar, well worked and bonded. It shall be applied by experienced cement masons.

To secure perfect bonding to wall and floor, have surfaces clean, free from paint or oil, and thoroughly roughened. New concrete walls should be picked by the general contractor as soon as possible after removing forms. Old walls must be chipped closely and deeply enough to remove entirely the old surface. Any laitance or chalky material on floor must be removed.

**Saturate surfaces with water.** Very hard or old concrete must be washed with dilute muriatic acid and well flushed off.

Walls are treated first; floors last. Brush a grout of plain cement and water on to a small section, working well into the pores; follow with mortar within 10 minutes.

Apply scratch coat to wall, pressing into the crevices. Allow to harden 1 or 2 hours, then work thoroughly with wooden float to remove all air bubbles or holes; scratch lightly with  $\frac{1}{2}$ -in. wire mesh.

Apply finish coat, stopping 6 ins. above floor. Allow to harden, then float well and carefully polish with steel trowel to smooth, dense surface. (Any pinhole, cavity, trowel mark or scratch visible in the finished surface is of itself proof of careless workmanship.)

Apply floor in 1 coat, sweeping 6 ins. up wall in a rounded cove; float and trowel carefully.

When joining to any facing that has stood 12 hours or more, break off the edge to expose a clean fresh surface, and then brush on a cement grout.

After getting first set, cover floor for 1 week with moist sand or water 1 in. deep. If room is heated, keep walls covered for 1 week with wet burlaps.

Go over finished job with a light hammer. Any hollow sound proves faulty bonding. Cut out the place, then roughen well, apply grout and replaster.

If necessary to combat water, get special directions.

**NOTE**—Protect floor from cracking by heat of boilers or ashes. Domestic furnaces should rest on a layer of plain brick, extending out 4 ft. in front. Large boilers should rest on 2 ins. of sand, covered with brick and extending out 8 ft. in front.

All floors should have some reinforcement to prevent cracking due to temperature stresses and the shrinkage of concrete on setting. A safe rule for small floors subject to not over 2-ft. head of water is a 5-in. base of 1:2:4 concrete, reinforced with  $\frac{3}{8}$ -in. deformed steel bars, 1 in. from top of floor and spaced 1 ft. apart in both directions across floor.

It is absolutely necessary that floors be reinforced strongly enough to resist the upward pressure of the ground water. This is 62½ lbs. per sq. ft. of floor for each 1 ft. of head. (Clay or rock formation does not permanently reduce this.) A floor 20 by 50 ft. subject to 5-ft. head has a total upward pressure of 312,500 lbs. Determine the maximum head of water before starting construction. *Special data on request.*

### Specification B—Mortar Facings, (1 : 2).

**PROPORTIONS**—Mortar for all coats shall be in the proportion of 1 bag approved Portland cement to 2 bags clean, coarse sand.

Mix 1 pail of Impervite with 15 pails of water, use this instead of plain water for making the mortar. Figure on 2 lbs. of Impervite per bag of cement.

**APPLICATION**—Same as Specification A.

### Specification C—Mass Concrete.

**PROPORTIONS**—To each bag of cement, take a pint dipper full of Impervite as made by THE STANDARD PAINT COMPANY. Throw right into the mixer, giving at least 60 seconds in the mixer. Figure on 5 lbs. of Impervite per cu. yd. of concrete. (More may be used as desired.)

**APPLICATION**—In placing concrete, do not have it so wet that a laitance or chalky deposit is formed on top. Spade or tamp the concrete so as to compact the mass.

If possible, make placing of waterproof concrete a continuous operation, to avoid the troublesome joining of day's work. If necessary to interrupt concreting, roughen upper surface with a steel rake before concrete has hardened and pour 2 ins. of mortar without stone, just before restarting.

**NOTE**—Under ideal conditions, concrete can be made waterproof without any compound. Under practical conditions, it is very easy to slip up on any of the following details:

(1) Rigid and watertight formwork. (2) Well graded aggregates, that run uniform from day to day. (3) Uniform proportioning and adequate mixing of every batch. (4) Preventing the use of an excess of water. (5) Depositing the concrete without segregation in chutes or forms. (6) Conscientious spading. (7) Either continuous night or day work, or very careful attention to the bonding planes. (8) Preventing the infiltration of water, before concrete is hard. (9) Curing to prevent freezing, or too rapid drying.

The addition of compound is useful, but even a 3-ft. thickness of mass concrete is not as safe as a  $\frac{3}{4}$ -in. Impervite mortar facing according to Specification A.

### Specification D—Non-cracking Stucco, (1 : 3½).

**PROPORTIONS**—Mortar for all coats shall be in the proportion of 1 bag approved Portland cement to 3½ bags clean, coarse sand. Each batch of sand must be measured accurately.

Hair is unnecessary. Lime or hydrated lime will not be permitted. (Lime contracts on drying and increases tendency to hair crack.)

Mix equal parts water and White Impervite, as made by THE STANDARD PAINT COMPANY. Take 4 qts. of the well stirred mixture for each bag of cement.

Stucco to be 1 in. thick, taking  $\frac{3}{4}$  lb. Impervite per sq. yd.

**APPLICATION**—Saturate tile or masonry walls with water before stuccoing. Keep stucco from drying till 1 week old; cover with tarpaulins or spray frequently.

To prevent diagonal cracks at the corners of door and window openings, place an extra strip of expanded metal 1 ft. square.

**NOTE**—The Pamphlet, "Inside Facts about Stucco," will be sent on request. This was the first printed literature showing the important fact that rich mortar is the main cause of hair cracking. Impervite is being recommended by leading architects and manufacturers of tile, lath and Portland cement, because it makes stucco waterproof and non-cracking.

An old client reports, "The Impervite stucco is the best job in the county; not a hair-crack in the whole structure."

For valuable data on Impervite stucco, see Technologic Paper, No. 70, of the United States Bureau of Standards.

### Specification E—Brush Coating for Exterior Walls.

**PROPORTIONS**—Mix 1 part Impervite, as made by THE STANDARD PAINT COMPANY, with 2 parts water in a pail, and stir in enough Portland cement to make a thick cream.

Figure on 10 lbs. of White Impervite and  $\frac{1}{3}$  bag of cement for 100 sq. ft. of surface.

Use immediately, applying 1 thick coat, well brushed into the irregularities of the surface.

**APPLICATION**—Interior surfaces may be treated at any time, when temperature is above freezing; but exterior surfaces are best treated in the Spring or Fall, when the hot sun will not cause too rapid drying. Cloudy weather is best. Coating can not be applied over a painted surface.

Before applying the coating, thoroughly saturate the surface of masonry, as otherwise the coating will dry too quickly, without proper setting of the cement.

**NOTE**—This is a dampproofing method which is cheaper than paint and if applied under favorable conditions will last much longer, but it should not be confused with *Waterproofing Specification A*, which can be guaranteed.

### References.

A few regular users:

Rangeley Construction Co.—Swimming pool, Berkeley Irving High School, 309 W. 83rd St., New York, N. Y., made by plastering walls of old cellar with Impervite mortar.

Isaac Hopper & Sons, Inc.—Pump pit, Yonkers, N. Y., 30 ft. diam., 25 ft. below water level, waterproofed with inside facing of Impervite mortar after failure of 9-ply tar and felt.

Bridgeport Projectile Co.—Gun-shrinkage pit, fuel-oil storage tank, etc.

American Hard Rubber Co.—Tunnels, tanks, reservoirs, pits, cellars, etc.

Atlas Portland Cement Co.—Miscellaneous "problems."

Moulton Engineering Corp.—Hundreds of concrete chemical tanks.

Walter Kidde & Co., Inc.—Scores of miscellaneous jobs.

Altoona-Marble & Tile Co.—Non-staining mortar.

Snare & Triest—Pier C,

Brooklyn Navy Yard, etc.

M. W. Kellogg Co.—Acid-proof concrete chimneys, etc.

City Stables, Edmonton, Canada—Waterproofing, wear-

resisting floors.

Holbrook, Cabot & Rollins—

Subways, cellars, pits,

bridges, etc.

E. I. DuPont deNemours;

Terry & Tench, etc.

New York Central Lines; D.,

L. & W.; and N. Y., N. H.

& H. R.Rs.



ESTABLISHED 1848

## TOCH BROTHERS

Inventors and Manufacturers of Technical and Scientific Paints, Waterproofing Compounds, Enamels, Varnishes, Colors, etc.

320 Fifth Avenue  
NEW YORK, N. Y.

DISTRIBUTING AGENCIES IN THE WORLD'S PRINCIPAL CITIES  
WORKS: LONG ISLAND CITY, N. Y., LONDON, ENGLAND, AND TORONTO, CANADA

**Products.**

"R. I. W." STEEL PROTECTIVE PAINTS:  
"Tockolith" (The Patented  
Cement Paint)

Nos. 110, 112, 49 "R. I. W."  
Damp Resisting Paints

Battleship Gray

No. 137 "R. I. W." (Red)

"R. I. W." INTEGRAL WATERPROOFING:  
"Toxement"

"R. I. W." DAMPPROOFING COATINGS:

No. 232 "R. I. W." Damp Resisting Paint  
"Liquid Konkerit" Primer and "Liquid  
Konkerit"

"Toxloxpore"

"Marine Cement"

"Trimbak"

"R. I. W." CEMENT FLOOR COATINGS:

Cement Filler (Patented)

Cement Floor Paint (Patented)

"Flintox"

"Dustop"

"R. I. W." DECORATIVE PAINTS:

"Verte Antique," Interior, and Exterior

"Flex-Sicco" Ready Mixed Paint

Hospital and Laboratory Enamel

Other Decorative Paints for all purposes; "Anhydrosol" and "Self-Healing" Bridge Cement, damp-proof coatings; Insulating Paint; Machinery Enamel; Smokestack Paint; Roofing Paint; Mortar, Cement and Plaster Colors.

**Steel Protection against Corrosion or Electrolytic Action.**

"R. I. W." TOCKOLITH (PRIMING COAT) (PATENTED)—A Portland cement paint, gray in color, used only as a priming coat on iron, steel or other metal.

A finishing coat must always be applied according to the character of the finished surface required and the nature of the service expected.

**Steel Protective Paint for Grillage and Foundation Beams.**

No. 110 "R. I. W." DAMP RESISTING PAINT—Black, waterproof, specially adapted for painting steelwork in factories or laboratories where paint is not subjected to atmospheric conditions, but must resist severe corroding agencies such as the fumes of acids or alkalis.

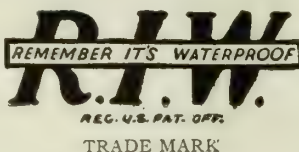
Used widely on metal lath to prevent corrosion and staining of the plaster. Adheres perfectly to concrete.

Used as a finishing coat on structural grillage work which is to be embedded in masonry, also on railroad bridge floors and column footings.

**Steel Protective Paint for Structural Steel to Be Incased in Masonry.**

No. 112 "R. I. W." DAMP RESISTING PAINT—Black, waterproof, renders steel or metal impervious to moisture, acids, alkalis or electrolysis.

Has wonderful resistance to alkalis in cement mortar and concrete.



Recommended as a second coat over "R. I. W." Tockolith on steel to be embedded or incased in masonry, and on steelwork inside of factories where dampness and acid or alkali fumes are present.

**Steel Protective Paints for Extreme Exposure.**

No. 49 "R. I. W." DAMP RESISTING PAINT—Black or dark olive green exterior paint. Black will be shipped unless otherwise specified.

Gives a firm, elastic coating which resists corrosion by locomotive fumes and atmospheric conditions. Dries with a good gloss.

Furnished also in dull or bower-barff finish for interior wrought iron railings and ironwork.

"R. I. W." BATTLESHIP GRAY (FINISHING COAT OVER "TOCKOLITH")—Endures the excessive heat and moisture of the tropics.

A remarkable preservative of wood and metal subjected to atmospheric conditions.

Particularly adapted for molasses tanks, fire escapes, and other steel or metal structures, and for ships.

It does not attract and intensify heat on metal structures as is the case with black or dark colored paints.

No. 137 "R. I. W." (RED) (FINISHING COAT OVER "TOCKOLITH")—For interior or exterior use. Resists acid fumes. Endures the excessive heat and moisture of the tropics. A remarkable preservative of wood and metal under adverse conditions in chemical works where acid fumes prevail.

For roofs, gutters, tanks, shutters, fire escapes and structures constantly exposed to the weather.

**For Corroded Copper Effect.**

"R. I. W." VERTE ANTIQUE—Interior—For coating brass, copper and other surfaces to obtain an antique copper finish.

Chandeliers and other fixtures treated with this material have the appearance of old corroded copper.

"R. I. W." VERTE ANTIQUE—Exterior—For use on metal cornices, ornamental ironwork, grillwork and similar surfaces to obtain an antique copper finish. Has a percentage of free acid which combines with copper and dries more slowly and withstands exposure to the elements.

**Waterproofing against Pressure, Integral Method (Foundation Walls, Boiler and Elevator Pits, Reservoirs, etc.).**

"R. I. W." TOXEMENT (PATENTED)—It lubricates, owing to its colloidal nature, making the particles of concrete flow together in a denser mass.

It reduces the number of voids to the minimum.

It makes Portland cement construction absolutely waterproof.

Especially adapted for waterproofing concrete construction of dwellings, factories, lofts, office buildings,



floors, elevator and boiler pits, cement mortar troweled on the outside of rubble foundations, also cement stucco surfaces of buildings. For foundations, bridges, silos, dams, piers and walls. Used by tilesetters in their cement grout to make a firmer bond between the tile and the concrete surface against which the tile is laid.



METHOD OF ADDING "R. I. W." TOXEMENT TO DRY MIXTURE

#### Dampproofing Walls above Grade (Interior).

No. 232 "R. I. W." DAMP RESISTING PAINT—A black, waterproof, elastic, tacky material.

Renders furring and lathing unnecessary.

Used extensively on the interior of outside walls, above grade level.

Bonds perfectly with plaster, prevents the penetration of dampness, renders the inside of walls vermin-proof and stainproof.

#### Dampproofing Walls above Grade (Exterior).

"R. I. W." LIQUID KONKERIT PRIMER—Patented as to Portland cement Feb. 27, 1906. The priming coat of "R. I. W." Liquid Konkerit Primer neutralizes the lime inherent in all cement, stucco and concrete, and gives the proper foundation for the succeeding coats of the two following finishes:

"R. I. W." LIQUID KONKERIT—Patented as to Portland cement Feb. 27, 1906. In any color.

A dampproof, weather resisting coating, protecting the walls from the disintegrating influence of the elements, preventing efflorescence, and imparting a uniform and pleasing appearance to the surface. Dries flat.

"R. I. W." FLEX-SICCO READY MIXED PAINT—A special paint for use over "R. I. W." Liquid Konkerit Primer on 2-coat work, and over "R. I. W." Liquid Konkerit on 3-coat work. Dries glossy. 42 standard shades.

"R. I. W." TOXLOXPORE (TRANSPARENT)—Applied direct to brick, concrete, stucco, limestone, Bedford stone, wood, etc.

Prevents efflorescence and penetration of dampness.

#### Dampproofing Walls below Grade (Exterior).

"R. I. W." MARINE CEMENT—A black, waterproof composition.

Used for dampproofing the exterior of foundation walls and footings and to waterproof wood sleepers laid in concrete. Applied cold with a brush.



APPLYING "R. I. W." MARINE CEMENT TO WALLS

#### Stainproofing Granite, Marble, Limestone, etc.

No. 110 "R. I. W." DAMP RESISTING PAINT—A black, alkaliproof and waterproof coating for backing limestone, Bedford stone, granite, marble or any cut stone.

#### For Backing Wood Trim.

"R. I. W." TRIMBAK—A black, alkaliproof and waterproof, elastic material.

For backing wood trim to prevent dampness and alkali in plaster and green masonry walls from warping and swelling the trim, and damaging the finish on the wood itself.

"R. I. W." Trimbak contains no saponifiable oil, therefore it is superior to metallic and other oil paints sometimes used for the backing of wood trim.

Used extensively on underside of wood floors and the 4 sides and ends of wood sleepers to prevent warping and rotting.

#### Fumeproof Enamel.

"R. I. W." HOSPITAL AND LABORATORY ENAMEL—A hard usage enamel. Made for service which ordinary enamel can not give.

Resists the action of sulphuretted hydrogen, gases and fumes of acids and chemicals.

Waterproof and will not crumble or turn color.

Stays white and glossy long after ordinary enamels would have succumbed.

Meets the most rigid sanitary requirements.

For bathrooms, breweries, milk stations, stables, garages, engine rooms, subway cars, or wherever sulphur or acid fumes are present.

#### Surface Coatings for Rendering Cement Floors Dustless; Also to Prevent Penetration of Water, Oil or Grease.

"R. I. W." CEMENT FILLER—Patented as to Portland cement Feb. 27, 1906. A transparent organic acid-resin composition which penetrates the pores. It hardens the floor into a homogeneous surface and is easily renewable. Prevents dusting, and is oilproof and waterproof.

Prevents absolutely all wear and dusting of cement floors in factories, office buildings, power plants, garages, warehouses and other buildings.

Neutralizes the lime in cement or concrete and gives proper foundation for the application of "R. I. W." Cement Floor Paint.

"R. I. W." CEMENT FLOOR PAINT—Patented as to Portland cement Feb. 27, 1906. Intended for interior use only, but can be specially made for exterior use, such as porch or piazza floors. Specifications for special use will be furnished on request.

Prevents dusting, and is oilproof and waterproof.

Gives a sightly appearance and makes for sanitation.

Gloss finish in 12 standard shades or special shades if required.

"R. I. W." FLINTOX—Where it is essential to treat a concrete floor to prevent it from absorbing oil or grease, a liberal application of this material will harden and cure it, even though the floor may contain a large amount of moisture, either apparent or hidden. Within 24 hours a concrete floor so treated is converted into a flintlike mass which does not "dust" or abrade.

"R. I. W." DUSTOP (TRANSPARENT)—Sometimes it is necessary in a busy department store or factory to apply a material to a concrete floor to prevent "dusting," and it must be done so as not to interfere with business or manufacturing.

One application of "R. I. W." Dustop at night, after the operatives have left, is sufficient to keep the floor in good condition for several months.

#### Literature.

Descriptive printed matter, together with specification book, to all architects and engineers on request.



# THE TRUS-CON LABORATORIES

Waterproofings, Dampproofings and Technical Paints  
DETROIT, MICH.

## BRANCH OFFICES

ATLANTA, GA., 604 Forsyth Building  
BALTIMORE, MD., Munsey Building  
BOSTON, MASS., 32 Oliver Street  
BUFFALO, N. Y., 141 Erie Street  
CHICAGO, ILL., 1506 Garland Building  
CINCINNATI, OHIO, 409-11 Johnston Building  
COLUMBUS, OHIO, 1011 Columbus Savings & Trust Building  
DENVER, COLO., 510 Colorado Building  
EL PASO, TEX., 400 North Santa Fe Street  
KANSAS CITY, MO., 326 Railway Exchange Building  
MINNEAPOLIS, MINN., 603 Metropolitan Bank Building  
NEW YORK, N. Y., 30 East 42nd Street (For City)  
NORFOLK, VA., Dickson Building

PHILADELPHIA, PA., 512 Crozer Building  
PITTSBURGH, PA., 604 Standard Life Building  
PORTLAND, ORE., 194 North 13th Street  
ST. LOUIS, MO., 1006 Syndicate Building  
SALT LAKE CITY, UTAH, 424 McIntyre Building  
SEATTLE, WASH., 448 Central Building  
SPOKANE, WASH., 1416 Old National Bank Building  
TOLEDO, OHIO, 12 Spitzer Arcade  
WASHINGTON, D. C., 311 Woodward Building  
WEBSTER, N. Y. (For State)  
WALKERVILLE, ONT., The TRUS-CON LABORATORIES OF CAN-  
ADA, LTD.  
LONDON, ENGLAND, Central House, Kingsway

## Products.

TRUS-CON CHEMICAL PRODUCTS, including DAMPPROOFINGS, WATERPROOFINGS, FLOOR HARDENERS and TECHNICAL PAINTS.

### Trus-Con Waterproofing Paste, Concentrated.

An integral waterproofing compound, in paste form, for waterproofing concrete and cement mortar. Being perfectly mixable with water, it diffuses readily throughout the concrete mixture, giving absolute and uniform results.

Has a very general application in concrete work of all kinds, such as foundations, dams, tunnels, reservoirs, tanks, floors and similar structures where absolute waterproofness is essential.



TRADE-MARK

Before plastering the cement mortar on the hardened concrete, the surface of same shall be mechanically roughened by chipping and thoroughly cleaned so as to afford a satisfactory bond. Further treatment of such surface as directed by manufacturers.

The plaster coat shall be applied to the walls in 2 coats, each of which shall be  $\frac{3}{8}$  in. in thickness. The second coat shall be applied just before the first coat shall have reached its final set.

For detailed specifications, see "Science and Practice Combined in Waterproofing," furnished free on request.

### Trus-Con Stonetex.

A specialized liquid cement coating for damp-proofing, protecting and beautifying exposed stucco, concrete and masonry surfaces of all kinds. Applied with a brush like any paint. Seals pores and hair checks, prevents absorption and penetration of moisture, and gives a handsome stonelike appearance to the coated surface.

Especially formulated to meet the exact physical and chemical requirements of exposed walls.

**SPECIFICATIONS**—The surface to be coated must be absolutely dry. Surface must be freed from dirt and loose particles that would interfere with a perfect bond.

Apply Trus-Con Stonetex in 2 coats; the second coat to be applied 72 hours after the first.

For full information and color card, see Trus-Con Stonetex Booklet, furnished free on request.

### Trus-Con Por-Seal.

A transparent colorless liquid for dampproofing exterior masonry walls without changing the physical appearance and texture of the coated surfaces. Effectively seals the pores, rendering the porous surface positively repellent to moisture.

Applied with a brush.

**SPECIFICATIONS**—All surfaces to be perfectly dry at the time of application to insure thorough penetration and absorption of Por-Seal into the pores.

It is applied in 2 coats; the second coat to be applied not less than 12 hours after the first.

### Trus-Con Plaster Bond.

A special bituminous coating for dampproofing all exposed walls. Its use provides a continuous damp-proofing element in all such walls, and perfectly insulates the interior from any evidence of dampness. On application to the surface, it is partially absorbed into the pores, thoroughly sealing them and establishing a most inseparable bond.



SEWAGE DISPOSAL PLANT, ROCHESTER, N. Y.  
50 tons of Trus-Con Waterproofing Paste used

**SPECIFICATIONS**—FOR WATERPROOFING MASS CONCRETE BY INTEGRAL METHOD—The dry mixture of cement, sand and stone (1:2:4 mix) shall be tempered to a medium wet consistency with water, to which 1 part of Trus-Con Waterproofing Paste, Concentrated, has been added as directed by the manufacturers for every 24 parts of water.

All the concrete shall be placed in one continuous operation, each pouring being thoroughly spaded to insure uniform density.

FOR WATERPROOFING CONCRETE AND GENERAL MASONRY STRUCTURES BY MEANS OF WATERPROOFED PLASTER COAT METHOD—The waterproofed cement mortar shall be prepared by thoroughly tempering (to the required consistency) a dry mixture of 1 part of cement and 2 parts of sand, with water to which Trus-Con Waterproofing Paste, Concentrated, has been added in the proportion of 1 part of paste to 18 parts of water as directed by the manufacturers.





METHOD OF APPLYING TRUS-CON PLASTER BOND

Also furnishes a bond for the plaster, and eliminates the necessity for furring or lathing.

**SPECIFICATIONS**—Trus-Con Plaster Bond shall be applied with a brush to a clean dry surface. Very porous places should be retouched the following day to insure an even, uniform coating. Special care should be taken to make the coating of Trus-Con Plaster Bond perfectly continuous over the entire surface. Should be used only on vertical surfaces. Plaster shall not be applied until 24 hours after the surface has been coated.

Free booklet on request.

### Trus-Con Foundation Coat.

A liquid, bituminous cement, of heavy consistency, adapted for dampproofing general substructural work under earth filling. To be used where hydrostatic pressures are comparatively light, and when more complicated waterproofing methods are not considered necessary.

**SPECIFICATIONS**—The surface shall be dry and free from any adhering earth or foreign matter, so as to insure thorough penetration and perfect bond. Trus-Con Foundation Coat shall be applied in a continuous coating with a large mop or brush.

The product shall be applied in 2 coats; the second coat shall be applied not less than 24 hours after the first. The coated surface should be allowed to dry at least 12 hours before being backfilled.

Free booklet furnished on request.

### Trus-Con Floor Enamel.

This product produces a tough, hard, elastic and reasonably durable finish on cement floors. Affords a perfect and attractive enamel finish that prevents dusting and granulation of floor surfaces. Protects floor from stain due to absorption of oils, greases and other foreign matter. It is applied with a brush, and should only be used on floors subjected to light traffic, such as office buildings, garages, etc.

**SPECIFICATIONS**—Surface shall be absolutely dry and thoroughly cleaned. Trus-Con Floor Enamel shall be applied in 2 coats; 48 hours should be allowed between application of the first and second coats. The finishing coat shall be allowed to dry 48 hours before being subjected to any use.

For floors laid directly upon the ground, a coat of Trus-Con Floor Primer is required before the coating of Floor Enamel.

For full details and color card, see Trus-Con Floor Enamel Booklet, furnished free on request.

### Trus-Con Bar-Ox "Inhibitive" Coating.

A protective coating for structural steel bridges and all exposed iron and steel surfaces. Formulated in strict accordance with the electrolytic theory of corrosion. This product forms an absolutely impenetrable film that completely excludes the moisture necessary for the beginning of corrosion.

**SPECIFICATIONS**—All steel shall receive a thorough coat of Trus-Con Bar-Ox "Inhibitive" Red well brushed on.

All surfaces to be riveted in the shop shall receive 2 thorough coats of Bar-Ox "Inhibitive" Red before assembling.

All surfaces to be riveted on the field shall receive 2 thorough coats of Bar-Ox "Inhibitive" Green, in addition to the priming coat, before leaving the shop.

After erection, all abrasions shall be touched up with Bar-Ox "Inhibitive" Red.

The entire structure shall then receive a second coat of Trus-Con Bar-Ox "Inhibitive" Black or Green.

No painting shall be done in wet weather, and no paint applied to a wet or damp surface.

Free booklet sent on request.

### Trus-Con Floor Hardener.

This product provides a simple and economical method of producing wearproof and dustproof floors. It gives a hard, dense surface that will be dustless and wear resisting, suitable to floors subjected to trucking and the heaviest traffic.

**SPECIFICATIONS**—After the floating of the topping and preceding troweling, a dry mixture of 20 lbs. of Trus-Con Floor Hardener and 15 lbs. of Portland cement, mixed thoroughly to an even, uniform color, shall be sprinkled over each 100 sq. ft. of surface.

The dry mixture of cement and floor hardener shall be well floated to insure its perfect combination and assimilation with the concrete, and then troweled to an even, smooth surface.

The surface shall receive a second troweling when the finish has set sufficiently to finish smoothly.

For detailed specifications and further descriptive matter, see Trus-Con Floor Hardener Booklet, furnished free on request.

### Trus-Con Agatex.

Chemically transforms a soft, dusting cement floor to a hard, dense, impenetrable surface without changing its color or appearance. Actually enters into chemical reaction with the constituents of the cement and forms entirely new compounds, that are hard, enduring and resistive to wear.

Affords three indispensable factory requirements—dustproof, wearproof and sanitary floors.

**SPECIFICATIONS**—All cement floors shall be given 3 liberal treatments of Trus-Con Agatex as manufactured and recommended by THE TRUS-CON LABORATORIES, Detroit, Mich.

**Condition of the Surface**—The floor shall be free from all dust, dirt, and oil, or other foreign matter that would retard the penetration and absorption of the Agatex into the pores of the surface.

**Application**—The product as supplied shall be diluted with water in the following proportions, and applied in liberal saturating coats with a long handled brush.

For the first application—Use 1 part Trus-Con Agatex and 2 parts water.

For the second application—Use 1 part of Trus-Con Agatex and 1 part of water.

For the third application—Use 2 parts Trus-Con Agatex and 1 part of water.

An interval of 24 hours shall be allowed between coats.

One gal. of Trus-Con Agatex will cover from 100 to 125 sq. ft. for 3 applications, depending on the porosity of the surface.

# THE WATERPROOFING COMPANY

Engineers and Contractors for Waterproofing

345 East 33rd Street  
NEW YORK, N. Y.

BRANCH OFFICES  
BOSTON, MASS., 65 Albany Street

PITTSBURGH, PA., Benedum-Trees Building

## Product and Services.

Manufacturers of "Cow Bay" WATER-PROOF CEMENT.

Engineers and Contractors for WATER-PROOFING, making a specialty of CEMENT WATER-PROOFING.

We contract for the waterproofing of basements, subways, reservoirs, vaults, tunnels, swimming pools, etc., guaranteeing a positive and permanent waterproofing for all kinds of masonry construction. We also design and contract for reinforced concrete constructions.

## "Cow Bay" Waterproof Cement.

"Cow Bay" waterproof cement, a true cement—not one of the numerous compounds advertised for mixing with cement or concrete. The properties of "Cow Bay" waterproof cement include all the advantages of a first class Portland cement with the addition that it is a water repellent.

## Application.

Wherever practicable, "Cow Bay" waterproof cement is placed upon the inner face of the wall, and over the upper surface of the floor, where it serves not only as a waterproof medium but a wearing surface as well. So great is the adhesive power of "Cow Bay" waterproof cement that it withstands, without cracking

or showing the slightest evidence of percolation, a pressure of 140 lbs. per sq. in.

## Advantages.

(1) Ease and economy with which repairs may be made should leakage occur through settlement of the structure or accidents of any kind.

(2) With "Cow Bay" cement waterproofing, no extra supporting walls are required.

(3) Not only is the expense of supporting walls obviated, but there is a large gain in floor space.

(4) In basements and subbasements, no furring and plastering are necessary.

(5) The walls are left with a neat finish.

(6) Where applied to floors, no further floor finish is necessary.

(7) "Cow Bay" cement waterproofing is applied independent of and without delay to other work upon the structure.



TRADE-MARK  
Reg. U. S. Pat.  
Office

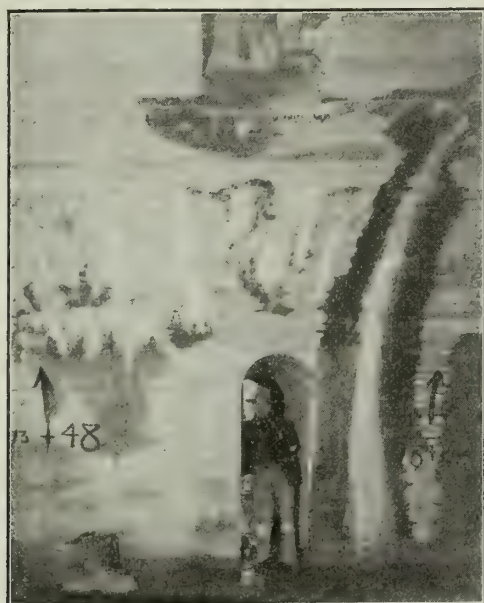


BANKERS TRUST BUILDING  
TROWBRIDGE & LIVINGSTON, Architects  
Waterproofed with "Cow Bay" Waterproof Cement



WOOLWORTH BUILDING  
CASS GILBERT, Architect  
Swimming pool and all space below water level waterproofed with "Cow Bay" Waterproof Cement





Before being Waterproofed



After being Waterproofed

SAME POINT IN PENNSYLVANIA TUNNELS BEFORE AND AFTER BEING WATERPROOFED WITH "COW BAY" WATERPROOF CEMENT

(8) "Cow Bay" cement coating adds to the strength and durability of walls or floors to which it is applied.

(9) As this system employs neither paper nor cloth, and as the material is mineral, the coating is a positive and permanent waterproofing agent, no decomposition or disintegration being possible—the cement becoming harder with age.

(10) "Cow Bay" cement waterproofing is fire-proof, and may be used to advantage in close proximity to boilers, furnaces, or other places where heat would cause tar waterproofing to melt and run.

(11) "Cow Bay" waterproof cement, when set, is as hard as the best Portland cement mortar, and may be placed beneath grillages and column bases without danger of settlement—eliminating the metal pans used with tar and felt waterproofing.

(12) "Cow Bay" cement waterproofing may be carried directly through walls, eliminating the trouble and expense of forming a key; the danger from slipping in retaining walls, so common with tar and felt seal, being overcome.

### Experience.

"Cow Bay" waterproof cement is beyond the experimental stage, having been employed since 1900. During the past 12 years, more important buildings in New York, Boston and Pittsburgh have been waterproofed by this company with this cement than by all other methods combined.

### Specifications.

**MATERIAL**—All interior surfaces of all exterior walls, and the upper surface of the concrete floor slab throughout the basement (or subbasement), elevator pits, machinery foundations, trenches, etc., as shown on plans, shall be waterproofed with "Cow Bay" Waterproof Cement.

The waterproof cement must be delivered at the building ready for mixing with water. In no case will liquid or powdered compounds mixed with ordinary cement and sand mortar be allowed.

**WORKMANSHIP**—All surfaces, before the application of the waterproof coating, shall be thoroughly chipped or cleaned, and the coating applied not later than 24 hours after the surface has been prepared. A perfect bond must at all points be secured with the underlying masonry.

Wall coating shall be  $\frac{5}{8}$  in. in thickness, applied in 2 coats, thoroughly floated and troweled to a smooth and even finish,

free from imperfections. Floor work shall be 1 in. in thickness, and is to serve the double purpose of a waterproofing agent and wearing surface. Floor coating shall be floated and finished as described for wall coating.

**GUARANTEE**—The waterproofing contractor shall furnish a written guarantee that his work will be waterproof; that during a period of 5 years after the completion of the waterproofing, he will promptly repair any leaks appearing through same which are not due to causes beyond his control.

### A Few Important Contracts.

J. P. Morgan & Co. Building, New York, N. Y., Trowbridge & Livingston, Architects  
 Joralemon Street Tunnel, Brooklyn, N. Y., George H. Pegram, Chief Engineer  
 Hudson Terminal Buildings, New York, N. Y., Clinton & Russell, Architects  
 United States Express Company Building, New York, N. Y., Clinton & Russell, Architects  
 City Investing Building, New York, N. Y., Francis H. Kimball, Architect  
 Adams Express Company Building, New York, N. Y., Francis H. Kimball, Architect  
 Singer Building, New York, N. Y., Ernest Flagg, Architect  
 Western Union Telegraph Company Building, New York, N. Y., Wm. Welles Bosworth, Architect  
 Municipal Building of New York, N. Y., McKim, Mead & White, Architects  
 Guarantee Trust Building, New York, N. Y., Yorke & Sawyer, Architects  
 Aeolian Building, New York, N. Y., Warren & Wetmore, Architects  
 Turks Head Building, Providence, R. I., Howell & Stokes, Architects  
 New York State Educational Building, Albany, N. Y., Palmer & Hornbostel, Architects  
 School of Mines Building, Pittsburgh, Pa., Palmer & Hornbostel, Architects  
 Liberty Tower, New York, N. Y., Henry Ives Cobb, Architect  
 Union Bank Building, Pittsburgh, Pa., MacClure & Spahr, Architects  
 Jones & Laughlin Building, Pittsburgh, Pa., MacClure & Spahr, Architects  
 New York Telephone Co., Office Building, New York, N. Y., McKenzie, Voorhees & Gmelin, Architects  
 Fort Pitt Hotel, Pittsburgh, Pa., Janssen & Abbott, Architects  
 Oliver Office Building, Pittsburgh, Pa., D. H. Burnham & Co., Architects  
 Colgate Buildings, "H," "I" and "K," Jersey City, N. J., William P. Fields, Engineer  
 College of City of New York, New York, N. Y., George B. Post & Sons, Architects  
 Copley Plaza Hotel, Boston, Mass., Henry J. Hardenbergh, Architect

# THE SANDUSKY CEMENT CO.

Manufacturers of Waterproofing

CLEVELAND, OHIO

FACTORIES

BAY BRIDGE, OHIO

SYRACUSE, IND.

DIXON, ILL.

YORK, PA.

## Product.

MEDUSA WATERPROOFING, in either Powder or Paste form—the original integral concrete waterproofing.

For Medusa Portland Cements see page 128.

## Medusa Waterproofing Paste.

A white emulsion to be added to the gauging water. Especially recommended for machine mixed concrete.

## Medusa Waterproofing Powder.

To be mixed dry with dry cement before sand and water are added.

## Description.

The paste is identical with the powder in resulting composition and waterproofing effect. The sole difference between the two is the greater ease and convenience of mixing which the paste form offers. If the mixing of the powder with the cement is thoroughly and carefully done, however, equally good results can be obtained with either form.

Medusa Waterproofing forms in concrete a water repellent compound, thoroughly and effectually rendering the mass impermeable. It is not subject to deterioration and is as everlasting as the concrete itself.

## Advantages.

Concrete contains many microscopic pores or capillary tubes constituting from 20% to 40% of the cubic contents. Water enters concrete because of the physical law of capillary attraction. To make concrete waterproof the walls of the capillary tubes must be made impermeable.

Medusa Waterproofing, being mixed with the cement, becomes an inseparable part of the concrete itself. It is designed to be mixed with the cement, to lubricate the particles and form an integral part of the mixture. It thus becomes an inseparable part of the mass, being tightly sealed within the concrete.

Medusa Waterproofing will positively and permanently render concrete dampproof and waterproof.

## Uses.

Medusa will give positive watertight and dampproof results in construction of concrete reservoirs, water towers and tanks, bathing pools, tunnels, disposal plants, pumping stations, elevator pits, stucco, basement walls and floors, cisterns, cement blocks, etc.



TRADE-MARK

## Quantity Required.

POWDER—From 1½% to 2% of weight of cement (6 to 8 lbs. Waterproofing to 1 bbl. cement).

PASTE—1 gal. to 1 bbl. Portland cement (dissolved in the water to be used for mortar or concrete).

## Specifications.

Specify "According to Manufacturers' Directions." Write for specification booklet.

## Catalogue and Samples.

Write for samples. New illustrated catalogue describes work in which Medusa has been used, and gives tests and testimonials. A postal card will bring it.

## References.

Y. M. C. A. Building, Providence, R. I.  
 Y. M. C. A. Building, Central Falls, R. I.  
 Y. M. C. A. Building, Rock Island, Ill.  
 Y. M. C. A. Building, Moline, Ill.  
 Y. M. C. A. Building, Covington, Ky.  
 Y. M. C. A. Building, Paris, Ky.  
 Y. M. C. A. Building, New London, Conn.  
 Y. M. C. A. Building, Erie, Pa.  
 Y. M. C. A. Building, Wheeling, W. Va.  
 Y. M. C. A. Building, Staunton, Va.  
 Y. M. C. A. Building, Elyria, Ohio  
 Y. M. C. A. Building, Atlanta, Ga.  
 Y. M. C. A. Building, Eau Claire, Wis.  
 Y. M. C. A. Building, Kellogg, Idaho  
 Naval Y. M. C. A. Building, Norfolk, Va.  
 Y. M. C. A., Chicago, Ill., Swimming Pools, Shattuck & Hussey, Architects  
 Y. M. C. A., New York, N. Y., Swimming Pools, Louis E. Jallade, Architect  
 San Francisco, Cal., Municipal Pumping Station  
 East St. Louis, Ill., Municipal Pumping Station  
 John S. Metcalf Co., Montreal, Que., Grain Elevators  
 Indianapolis Motor Speedway, Subways Under Track  
 Union Station, Kansas City, Mo., George A. Fuller Construction Co., General Contractors  
 Grand Trunk Pacific Hotel, Winnipeg, Can., Ross & Macdonald, Architects; George A. Fuller Co., General Contractors  
 United States Government, Artillery Fire Control Structures  
 English, Canadian, New Zealand, and Queensland Governments  
 Union National Bank Building, Cleveland, Ohio, Walker & Weeks, Architects  
 Cudahy Packing Co., Chicago, Ill., Floors and Foundations  
 Rapid Transit Railway Tunnel, New York to Brooklyn  
 Olympic Club Building, San Francisco, Cal., Swimming Pool and Foundations  
 St. Louis Auditorium Swimming Pool, largest in the world  
 State Capitol Building, Little Rock, Ark.  
 Warren, R. I., Pumping Station and Disposal Plant, Charles F. Chase, Engineer  
 Waltham, Mass., 2,000,000-gal. Reservoir  
 Inland Steel Co., Reinforced Concrete Tunnels  
 Montreal, Que., Public Market, Marius Dufresne, City Architect



# ZIBELL DAMP RESISTING PAINT CO.

Manufacturers of Waterproofing and Dampproofing Paints and Compounds  
Waterproofing and Dampproofing Contractors

FACTORY AND OFFICE

181-191 Culver Avenue  
JERSEY CITY, N. J.

TELEPHONE:  
BERGEN 3041

## Products.

WATERPROOFINGS; DAMPPROOFINGS; TECHNICAL PAINTS; TECHNICAL AND STRUCTURAL COMPOUNDS—PROTECTORINE; ALKACENE.

## Experience.

Since 1903 this company has been manufacturing and selling "Protectorine," "Alkacene" and waterproofing paints. These paints have been successfully and extensively used on difficult work, such as leaky walls, elevator pits, tunnels, leaky cellars, foundations, weather exposed walls, reservoirs and concrete tanks. We are always at the service of architects, engineers and contractors. The following article will show that we are the originators of waterproofing products.

## Patent Rights.

Zibell wins again; defeats another manufacturer in patent suit. Patent No. 813,841 for waterproofing, wearproofing, dustproofing, oilproofing of cement walls and floors held invalid as to all claims in litigation in United States courts.

Since 1903 Zibell, with his "Protectorine" and waterproof paints for foundations, walls, cement floors or roofs of cement, mortar, plaster, stucco, brick, stone or metal, has won over the goods of competitors under the most severe test requirements.

This time we have won in patent litigation which threatened the entire Portland cement industry of the country. It means a large saving to architects on these paints. Ask to be shown.

## Inside Dampproofing.

Black "Protectorine," made from a combination of highly elastic waterproof gums, is a viscid, leathery liquid, absolutely poreless, waterproof, windproof, frostproof and weatherproof. Applied by means of a 4-knot brush to inside of exposed walls of a building, it forms a tough, continuous, elastic, glossy surface, impenetrable by rains and storms; the plaster is applied direct to the "Protectorine," and a perfect bond is formed between concrete, brick and plaster, furring and lathing being entirely dispensed with. Architects please specify.

## Stainproof "Protectorine."

Applied direct to marble, Bedford stone, limestone, granite, cut stone. A black waterproof and alkaliproof coating; also made transparent water white, to waterproof the most delicate surfaces.

## Black "Protectorine."

Acidproof, rustproof, alkaliproof; is an indispensable article for painting iron and metal work, railroad cars, ships, floating equipments (inside and outside), bridges, structural iron roofs, galvanized iron cornices, architectural railings, for it is durable.

## Black "Protectorine" Concentrated.

Against water pressure for foundation walls, tunnels, elevator pits, swimming pools, boiler rooms, etc.

## "Protectorine" White Paint.

Rustproof, acidproof; an undercoating for steel, iron and other metals.

MURAL DECORATION—As an efficient protection for

ceiling and mural decoration, white "Protectorine" is unsurpassed; it prevents discoloration, efflorescence and exudation of dampness. Saltpetre is held in check and all possibility of staining is eliminated.

## "Protectorine" Battleship Gray Paint.

As a finishing coat, applied over rustproof and acidproof coating, is durable.

## "Protectorine."

Our colorless concrete cement coating, for wearing quality, is superior to any concrete, cement or stucco coating in existence. Plugs up the pores; strengthens and hardens the cement, concrete, stucco, terra cotta and brick; renders same absolutely waterproof and rainproof, and sets as hard as porcelain.

CONCRETE FLOORS—Concrete floors treated with 1 or 2 coats of colorless "Protectorine," well brushed in, will be rendered dustproof, wearproof, waterproof, oilproof and acidproof; and sets as hard as granite.

## Concrete Waterproof Paint.

Concrete Waterproof Paint is a high grade of waterproof paint, highly elastic, made of the best material, and possesses remarkable qualities as a finishing coat. Concrete Waterproof Paint is tough, tenacious and durable; becomes an integral part with the object applied to; is quick drying; can be washed with soap and water without injury.

Concrete Waterproof Paint applied to concrete, cement, stucco, brick or wood, has the tendency to force itself deeply into the pores, plugs up the pores, rendering them absolutely waterproof and wearproof; will not crack, blister or chip off. Concrete Waterproof Paint is made in colors. Ask for catalogue.

## "Alkacene" Waterproof Powder.

"Alkacene" Waterproof Powder, a powder intensely water repellent, waterproof and hydrolithic, for mixing with Portland cement.

For 1 to 3 mixture: to 1 bag of Portland cement mix 2 lbs. of "Alkacene" Waterproof Powder.

For lime mortar, same formula.

## "Alkacene" Waterproof Stucco.

"Alkacene" Waterproof Stucco applied over cement and concrete or wood produces a monolithic slab as hard as granite; guaranteed not to crack; absolutely impervious to rain and frost; rich in color and texture.

Alkacene Waterproof Stucco is made in marble, sandstone, terra cotta or cement texture; and made by the same process as fluxing or baking terra cotta, the difference being that terra cotta is fluxed at the temperature of from 1800° to 2400°, while Alkacene Waterproof Stucco gives the same result under a cold process.

We manufacture and sell Alkacene Waterproof Stucco.

## Fireproof Compound.

A fireproof compound for wood, burlap, canvas, cotton or any fibrous material, and of non-flashing finish removers that contain benzol, wood alcohol, benzine. In paste form and liquid, or made in sheets to suit the trade. Patents pending.

# NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION

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JOHN S. McDANIEL, SECRETARY

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BOSTON, MASS.

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208 Broadway, New York, N. Y.  
Branch Office, New London, Conn.

H. E. FLETCHER COMPANY  
West Chelmsford, Mass.  
Branch Office, 31 State Street, Boston, Mass.

JOHN L. GOSS CORPORATION  
Stonington, Me.  
Branch Office, 166 Devonshire Street, Boston, Mass.

LOVEJOY GRANITE COMPANY  
Milford, N. H.

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ROCKPORT GRANITE COMPANY

Rockport, Mass.

Branch Offices:

31 State Street, Boston, Mass.

21 Park Row, New York, N. Y.

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Branch Offices:

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101 Park Avenue, New York, N. Y.

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## Products.

ROUGH, DRESSED AND POLISHED GRANITE for Commercial, Public, Monumental and Residential Buildings, Vaults, Mausoleums, Landscape Work, Monuments and other Memorials, and Ornamental Public Improvements.

ROUGH AND DRESSED GRANITE for Foundations, Bridges, Sea Walls, Dry Docks and similar construction.

GRANITE FLAGGING for all purposes.

GRANITE RIPRAP, RUBBLE, etc.

SEAM FACE GRANITE.

## The Association. Its Object.

The aim of this Association is to promote the sale and use of granite for building purposes in preference to other materials less adapted to particular needs and circumstances, as well as to advance the general welfare of the granite building industry.

## Co-operative Service.

This Association and its individual members desire to co-operate with architects, and place the result of many years' experience in this field of work at their disposal. Impartial and practical advice relating to the uses of granite, samples, specifications, etc., furnished gratis.

## General Description of Granite.

Granite is the name of a family of igneous, crystalline rocks, that are believed to have had their origin from reservoirs of molten material at a sufficient distance below the surface of the earth to have cooled under pressure, and in many instances the rock that rested above the molten mass has been removed by ages of exposure and various other agencies such as movements of glaciers and erosion.

The minerals which generally make up the stone are, in quantity as to the order named: feldspar, quartz, mica.

While a granite may contain as many as twenty different minerals, usually all but three are secondary.

In some granites there is little or no mica, which is replaced with pyroxine or hornblend. Such granites are known as "syenite."

Feldspar can generally be determined by its cleav-

age structure and the fact that it is the main mineral constituent of granite. It may also be determined by its opaqueness, pearly luster, and property to reflect light and give brilliancy to the granite. Color may be milky or bluish white, or reddish, or brownish, or greenish.

Quartz is an essential constituent of all granites and is the most abundant mineral next to feldspar. Its occurrence in granite is irregular, apparently filling in the space separating other minerals. Its hardness and glassy appearance serves to permit it to be distinguished from the other minerals. Quartz usually occurs in granite as angular grains; that is, the quartz structure is granular. It may be colorless, bluish, opalescent, amethystine or smoky.

Mica is the third most abundant mineral found in granite; but while quartz and feldspar are essential constituents, mica is not, and frequently occurs in only very minute quantities, and is generally regarded as an accessory mineral. The larger portion of granites are mica granites, muscovite (white mica) or biotite (black mica). Mica is easily determined from the spangle effect it imparts to granite.

Hornblende and pyroxine can be hardly distinguished from one another, and occur frequently together. The non-aluminous hornblende is white, gray or pale green; and the aluminous, dark green, brown and black. The hornblende in building stones is dark green—almost black.

## Colors and Textures.

Granite can be obtained from the quarries of Association members in a large variety of colors: *white*, many beautiful shades and tints of *gray*, *pink*, *red*, *green*, *brown*, *yellow*, etc.

The most important characteristic of a granite is the character of the grain. The feldspar being the most abundant mineral, and its crystals being larger than most other minerals, the granite is graded as to texture by the size of the feldspar crystals.

(1) Coarse, in which the feldspar crystals generally measure over 1 cm. (2/5 in.).



(2) Medium, in which the feldspar crystals measure 1 cm. (2/5 in.) and over 0.5 cm. (1/5 in.).

(3) Fine, in which the feldspar crystals measure under 0.5 cm. (1/5 in.).

In some coarse grained granites the feldspar measures 1 or several inches; and in some fine grained ones, all the particles range from 0.25 to 1 mm. or 1/8 in.

The fact that a granite is coarse grained does not necessarily indicate its unsuitability for any purpose for which granite may be used, as generally the granites with the large sized mineral crystals possess features that are much sought by the architect, either in the rough or polished state, while the fine grained granites may possess an elegance that fit them for exquisite interior work, as well as exterior.

Granite is of wonderfully even texture and color. This can be seen in some of the largest buildings erected in this country, where the granite is all of one even color and texture.

The use of variegated colors in granite work has also been used extensively, which usually means a saving to the owner, as careful selection of stock is unnecessary. Many beautiful effects have been obtained by the use of granite from the same quarry but of varied shades. The possibilities of color combination in granite work should not be overlooked.

### **Durability.**

The durability of granite is unquestioned by those acquainted with the material. The reasons for this are numerous, among which are (1) its great resistance to compression, (2) the low per cent. of wear, (3) the non-absorptive qualities, a protection from frost action, (4) the absence of oxidizable or perishable minerals.

Observation in the quarries and on the natural ledges, where the granite has been exposed to the ravages of the elements for thousands of years, shows that it is almost as free from indication of decay, disintegration, or scaling at the surfaces as in the deeper parts of the quarries.

### **Finishes and Relative Costs.**

The finishes generally used for exposed faces for granite work from coarsest to finest, and arranged here in the order of their relative costs, are: rock faced, pointed, pean hammered, four-cut, six-cut, eight-cut, rubbed and polished—the coarsest finish being the least expensive.

The six-cut finish is recommended for the average face of building work with four-cut work for the upper portions. Four-cut finish at approximately 15 ft. above ground level will have the same appearance as six-cut work on a line with the eye.

Six-cut finish should be also used for reveals and portions of work close to the eye.

Four-cut finish produces an excellent effect for large scale work and eight-cut finish for small scale designs.

Polished granite for base courses or portions subject to splatter or sidewalk or stain of traffic is very desirable.

Rock faced, pointed or pean hammered work is excellent for exposed portion of substructure.

Rock faced work, in addition to its relative lower cost, is also decorative and may be used in conjunction with hammered work with very satisfactory effects.

### **Carving Qualities.**

Granite is especially adapted to carving of all kinds, from the most delicate to the massive.

In "Architecture," October, 1917, Mr. Egerton Swartwout, architect for the Mary Baker Eddy Memo-

rial, Mount Auburn Cemetery, Cambridge, Mass., says of the carving:

"One has to see the carving itself to appreciate the marvelous delicacy which has been obtained."

The ornamentation of the central portion of the Baltimore & Ohio Railroad Office Building, Baltimore, Md., illustrates an example of massive carving.

### **Distribution.**

There are granite deposits in thirty-five states of the Union, from New England to Gulf states and from the Atlantic to the Pacific oceans. On account of this wide distribution, granite can be delivered economically to any section of the country.

### **Facilities.**

The facilities of Association members represent millions of dollars invested, in acreage, derricks, hoists, cutting plants, powerhouses, saws, polishing machines, surfacing machines, lathes for column work, etc. Complete compressed air plants are installed at every quarry.

Thousands of acres are quarried, and wherever necessary closed plants are used, so that work is never interrupted.

No contracts too large or too small to handle.

The amount of finished granite that can be produced in an ordinary working day is practically unlimited.

All of the Association members' quarries and plants have railway outlets, and not a few are located at tide-water and own their own vessels.

### **Deliveries.**

Owing to the wide distribution of granite deposits and active quarries, the facilities of Association members for handling large and small contracts, and railroad and shipping conveniences, granite can be delivered at a reasonable cost and promptly to all points in the country.

Granite from the Atlantic States has been used in California; also in Cuba, South America and other foreign countries.

### **Samples.**

Requests for samples will be referred to members and will receive prompt attention, and should state the color and the kind of finish or finishes that architects are interested in, and, where possible, the class of work contemplated.

### **Estimates, etc.**

Association members solicit the opportunity of submitting prompt and reliable estimates, free of cost to architects, engineers or owners.

Preliminary estimates are also gladly furnished gratis.

The Association does not quote prices, but will gladly refer requests for estimates to all the members.

### **Competition.**

Competition is the life of trade, and is often the means of construction work going ahead immediately instead of being delayed on account of cost.

In specifying granite, architects can be assured that not only one bid, or several, but many bids, will be received.

### **Prices.**

The price for granite work depends largely upon the design, jointing employed and finish used. Granite used in a building, where its use was contemplated and prepared for in the planning and designing, will compare favorably in price with other good building stones.

This Association solicits an opportunity to advise with architects, engineers and owners, regarding the use of granite in such a way that the cost be reasonable and within the limits of appropriation for construction work.

ORGANIZED 1864

C. HARRY ROGERS, TREASURER AND MANAGER

**ROCKPORT GRANITE COMPANY**

Dealers in Rough and Finished Granite

NEW YORK, N. Y., 21 Park Row  
 BOSTON, MASS., 31 State Street  
 CHICAGO, ILL., Chamber of Commerce Building

ROCKPORT, MASS.

QUARRIES  
 ROCKPORT, MASS., BAY VIEW,  
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 JONESPORT, ME.

**Products.**

Quarriers and producers of ROCKPORT RED, GRAY and SEA GREEN GRANITES for the better class of Buildings, and for Bridge Work, Breakwaters, Wharves, etc. Manufacturers of Granite Paving Blocks.

**Facilities.**

The plant of the ROCKPORT GRANITE COMPANY consists of more than 800 acres of quarry land, finishing, cutting and polishing sheds, wharves, and a fleet of sloops, schooners, barges, towboats, and lighters. The company also charters the best class of coasting schooners, barges and steamers up to 2,500 and 3,000 tons. This enables them to handle contracts of any size promptly and at moderate cost, particularly to the seacoast cities, where water transportation gives them a decided advantage over inland competitors. At the quarries and sheds every modern appliance is utilized that will facilitate the quarrying, building-stone cutting, and carving work. These appliances include air compressors with an aggregate capacity of 6,500 cu. ft. of free air per minute, 40 large modern steam derricks, many of which are capable of hoisting over 75 tons, hoisting engines of the latest type. Newly equipped electric drive polishing mill, with large polishing wheels, lathes, surface cutters, etc. From 800 to 1,000 men are employed.

**Rockport Granite.**

Rockport Granite—"the Granite of Character"—is a true Hornblende granite, composed as indicated in test data below, and resembling in composition the Egyptian granite from which ancient obelisks and sarcophagi were built. It is of decided toughness, firm and uniform in texture, of high crushing test, free from impurities, enduring in color, and susceptible to a beautiful and lasting polish.

**Tests.**

UNITED STATES DEPARTMENT OF AGRICULTURE  
 OFFICE OF PUBLIC ROADS, WASHINGTON, D. C.  
 DIVISION OF TESTS. July 18, 1913.  
 Report on Sample No. 6893 No. 4 of road material from Essex County, Mass. ROCKPORT  
 Made at the request of ROCKPORT GRANITE COMPANY.  
 Material—Plutonic Rock. Name—Biotite Granite.

DETERMINATIONS	
Specific gravity.....	2.65
Weight per cu. ft. ....	165. lb.
Water absorbed per cu. ft. ....	0.24 lb.
Per cent. of wear.....	3.8
French coefficient of wear.....	10.5
Hardness.....	18.8
Toughness.....	10.
Crushing strength 22,670 lbs. per sq. in. (* Note)	

Remarks—This is a very hard rock, showing average resistance to wear.

\*Note—Crushing strength tests made on cylinders 1.75 ins. in diameter and 2 ins. high.

**Carving Qualities.**

Particularly significant of the toughness and carving quality of Rockport Granite is the fact that Prof. John H. Sears, Peabody Academy of Science, was able, in his microscopic studies of this stone, to make sections of it 1/700 of an in. thick.



SECURITY NATIONAL BANK, LOS ANGELES, CAL.

**Co-operation and Estimates.**

Samples furnished to architects. Opportunity is solicited to submit prompt and reliable estimates from plans and specifications.

**References.**

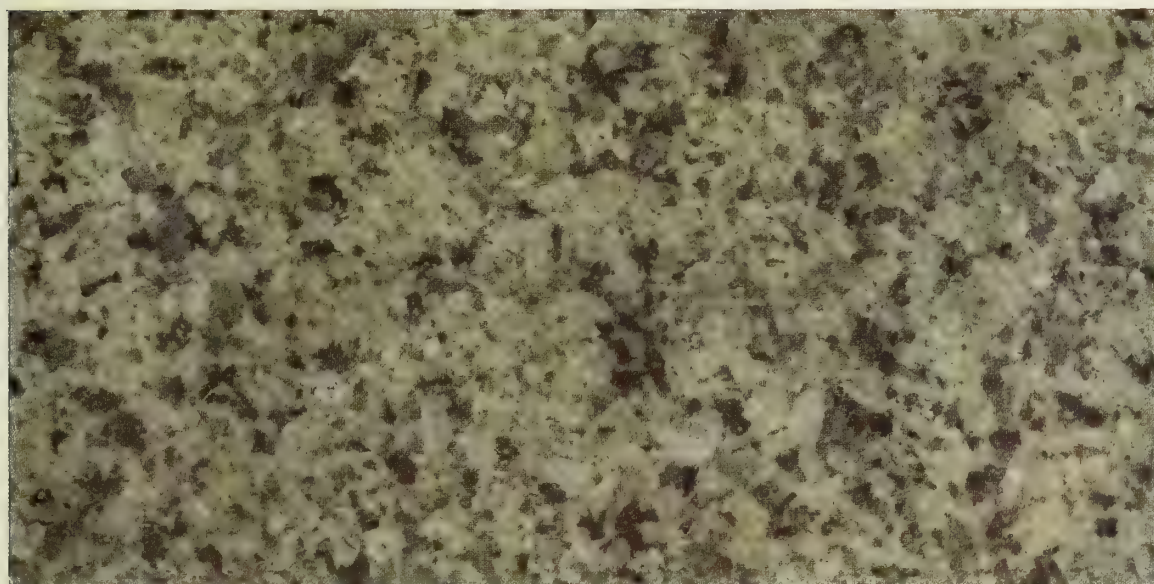
BUILDINGS  
 Boston Custom House Tower, Light Gray Granite; Peabody & Stearns, Architects  
 Woolworth Building, New York, N. Y., Polished Sea Green; Cass Gilbert, Architect  
 Registry of Deeds and Probate Court, Salem, Mass., Light Gray Granite; Clarence Blackall, Architect  
 National State Bank, Newark, N. J., Polished Sea Green; Cass Gilbert, Architect  
 Dr. A. G. Thomson Residence, Grassland, Pa., Moose-a-pec Red Granite; H. Brooks Price, Architect  
 Cook County Hospital, Chicago, Ill., Light Gray Granite; Paul Gerhardt, Architect  
 Washington Trust Co., Chicago, Ill., Polished Sea Green; C. A. Eckstrom, Architect  
 Delaware, Lackawanna & Western R. R. Terminal, Buffalo, N. Y., Moose-a-pec Red Granite; Kenneth Murchison, Architect  
 Lehigh Valley Railroad Terminal, Buffalo, N. Y., Light Gray Granite; Kenneth Murchison, Architect  
 Old State National Bank, Evansville, Ind., Polished Moose-a-pec Red Granite; Adolf Scherrer, Architect  
 Joseph Slocum College of Agriculture, Syracuse, N. Y., Cut Moose-a-pec Red Granite, Dept. of Architecture, Syracuse University, Architects  
 Security Trust & Savings Bank, Los Angeles, Cal., Rockport Pink Granite; John Parkinson, Architect  
 Hamilton County Court House, Cincinnati, Ohio, Polished Interior Columns, and other work; Sea Green Granite; Rankin, Kellogg & Crane, Architects  
 Union National Bank, Pittsburgh, Pa., Gray Granite; McClure & Spahr, Architects  
 Kansas City Public Library, Rockport Pink Granite; Chas. A. Smith, Architect  
 Merchants National Bank, New Bedford, Mass., Rockport Pink Granite; Adden & Parker, Architects  
 Nebraska Telephone Co. Office Building, Omaha, Nebr., Polished Rockport Light Gray Granite; George B. Prinz, Architect  
 Charlestown, Mass., High School Building, Light Gray Granite; Stickney & Austin, Architects

MONUMENTS  
 Schenley Memorial, Pittsburgh, Pa., Polished Sea Green; Victor Brenner, Sculptor  
 President Tyler Monument, Richmond, Va., Light Gray Granite; Raymond A. Porter, Sculptor





Pink



Green



Gray

TYPICAL COLOR EXAMPLES OF ROCKPORT GRANITE



# THE PRESBREY-COYKENDALL CO.

Designers and Builders of Monuments and Mausoleums

198 Broadway  
NEW YORK, N. Y.

BRANCH OFFICES  
KENSICO CEMETERY, VALHALLA, N. Y.

HARTFORD, CONN.

## Products.

MAUSOLEUMS, MONUMENTS, SARCOPHAGUS MONUMENTS, MEMORIALS, HEADSTONES, etc., designed, constructed and erected, complete.

## Co-operative Service.

This company places the results of its many years of experience in this specialized field at the disposal of architects and of contractors, with whom correspondence is solicited. Expert advice pertaining to the design, details or construction of monuments or mausoleums in any locality will be extended as an assistance in eliminating any features which experience has demonstrated might, if not corrected before erection, produce objectionable results in the completed structure.

## Plant and Equipment.

The plant and equipment of THE PRESBREY-COYKENDALL Co. at Barre, Vt., comprise one of the largest works of its kind in this country. The entire plant, which is under the direct supervision of the vice-president of the company, as resident manager, includes within its large area all of the most modern devices for cutting, carving and polishing stone. The Chase patent granite saw is capable of slicing from the quarry block (60 ft. long by 6 ft. 6 ins. high), if desired, a slab as thin as 1 in., the full length of the stone.

Other facilities, such as air hammers, surfacing machines, and large electric polishers, as well as every appliance demanded in the execution of work of the highest quality, place this company in a position to supply and construct monuments, mausoleums and memorials of any size, from design to completion, with unequalled rapidity of execution.

## Architects' Requirements.

A most important factor in this company's business is furnishing, cutting and erecting its granite in accordance with architects' drawings and specifications, for all types of work previously mentioned. That architects who entrust the execution of their designs to THE PRESBREY-COYKENDALL Co. may feel certain of securing the best materials, honest and intelligent workmanship, and a refined interpretation of their detailed drawings, is evidenced by the approval given its work by so many of the leading members of the profession in this country.

## References.

A partial list of architects for whom we have done work:

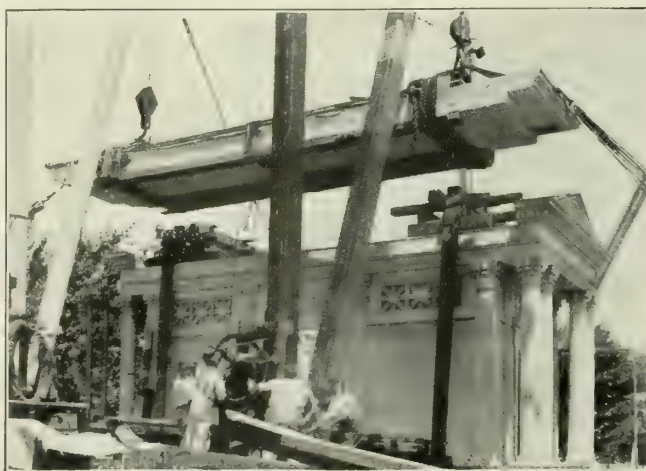
McKim, Mead & White, New York	Howard Major, New York
Carrère & Hastings, New York	Frank A. Rooke, New York
Henry Bacon, New York	Henry Baechlin, Newark
H. VanBuren Magonigle, New York	J. C. M. Shirk, Philadelphia
Harry A. Jacobs, New York	John T. Windrim, Philadelphia
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E. K. Rossiter, New York	Walker & Weeks, Cleveland
	James Jamison, St. Louis
	Wm. E. Parsons, Chicago



LAFAYETTE MONUMENT, PROSPECT PARK, BROOKLYN  
HENRY BACON, Architect DANIEL CHESTER FRENCH, Sculptor  
Cut from Stony Creek Granite and erected by this company



PLANT OF THE PRESBREY-COYKENDALL CO., BARRE, VT.  
One of the largest granite cutting plants in the United States



A 35-TON ROOF STONE 38 FT. LONG, READY TO BE SET IN PLACE ON THE JOHN R. HEGEMAN MAUSOLEUM  
FERDINAND PROCHAZKA, Architect  
Cut and erected by this company in Woodlawn Cemetery, New York



# THE JOHN SWENSON GRANITE CO.

## Concord Granite

CONCORD, N. H.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue

CHICAGO, ILL., Marquette Building

### Product.

CONCORD GRANITE, ROUGH OR FINISHED, for buildings and memorials.

### Concord Granite.

Concord granite is light gray and of fine, firm and remarkably even texture. The normal essential components are quartz, feldspar, muscovite (white mica), and biotite (black mica). Muscovite, although commonly called the white mica, is here of a soft, brownish shade, giving the stone as a whole a warmer tone than is usual with granites of this class. Concord granite is susceptible of a good and lasting polish, and is remarkable for the ease with which it can be worked.

**STRENGTH**—Definite tests have been made to determine the resistance to compression. A 3-in. cube was crushed at the Watertown Arsenal, with the following results: On bed, or at right angles to the rift, total load 289,500 lbs., or 30,830 lbs. per sq. in. On edge, or parallel with the rift, total load 224,000 lbs., or 23,860 lbs. per sq. in.

**DURABILITY**—Specially contributing to make this granite durable and weatherproof, are: (1) its unusual strength; (2) the absence of sensible porosity, making it non-absorptive and insusceptible of injury by frost action; and (3) the absence of pyrite or other oxidizable or perishable minerals.

### Finishes and Relative Cost.

Cost of granite depends considerably upon the character of cutting of exposed faces. The types of finish for exposed faces from coarsest to finest are: (1) rock-face (natural quarry face); (2) pointed; (3) pean-hammered; (4) four-cut; (5) six-cut; (6) eight-cut; (7) ten-cut; (8) rubbed; (9) polished. The cost of these finishes rises in numerical succession, No. 1 being the cheapest, and No. 9 the most expensive.

To finish No. 6, which is eight-cut, costs approximately 10% more than to finish No. 5, which is six-cut; to finish No. 5, which is six-cut, costs approximately 10% more than to finish No. 4, which is four-cut. The relative costs of the other finishes vary in the same ratio.

Ten-cut and rubbed finishes are used principally for monumental purposes. These finishes, and even eight-cut finish, are unnecessarily fine for building purposes. Six-cut work for the lower portion of a building and four-cut work for the upper portion produce an excellent effect. Four-cut finish at approximately 15 ft. above the ground level will have about the same appearance as six-cut work on a line with the eye.

A polished base course, where the base is along a walk, is ultimately cheap, as it remains clean.

### Ashlar Facing.

For the ashlar facing of a building, alternate courses of 4 ins. and 8 ins. produce a perfect bond with the backing; and as 4 ins. of ashlar can be sawed, a considerable saving is made in stock, freight and hauling.

### Specification Notes.

**FINISH**—The main walls up to (certain height or course) shall have a six-cut finish; all granite above that point shall have a four-cut finish.

**THICKNESS OF COURSES**—All granite to be of thickness as shown on detail; ashlar facing to be 4 ins. and 8 ins. thick in alternate courses.

**BEDS AND JOINTS**—All stones to be cut at right angles to face for a distance of 1 in. from face; balance of beds to be cut so that one stone when set on another will balance without wedging from the back. Joints may fall away not over 2 ins. from a point 1 in. back of face.

### Facilities.

The exceptional facilities of this company's plant, including power saws of the latest model, insure economy and dispatch in the filling and shipping of all orders.

Shipments can economically be made to all parts of the United States.

### Co-operative Service.

Granite is, without doubt, the most enduring and dignified of all building stones. Its possibilities for effective use are, however, greater than is commonly recognized. This is because its cost is often unnecessarily increased by the adoption of too fine a finish and of a system of jointing not characteristically practical for granite.

This organization will gladly co-operate with architects and others in the study of their granite problems, and places the entire facilities of its "Service Bureau" at their disposal.

### References.

Buildings containing Concord granite, with names of architects:

#### OFFICE BUILDINGS

Germania Life Insurance Co., New York, N. Y., D'Oench & Yost  
 Railway Exchange, St. Louis, Mo., Mauran, Russell & Crowell  
 Amicable Insurance Co., Waco, Tex., Sanguinet & Staats  
 Book Building, Detroit, Mich., Louis Kamper  
 60 Liberty Street Building, New York, N. Y., Cross & Cross  
 New Hampshire Fire Insurance Co., Manchester, N. H., Edw. L. Tilton

#### BANKS

German Savings Bank, Davenport, Iowa, F. G. & R. J. Clausen  
 First National Bank, Johnstown, Pa., Samuel Hannaford & Son  
 Citizens National Bank, Frederick, Md., J. A. Dempwolf  
 Farmers' Trust Co., Maryville, Mo., Wilder & Wight

#### RESIDENCES

Mrs. Eleanor Elkins Widener, Newport, R. I., Horace Trumbauer  
 Adolphus Busch, St. Louis, Mo., Widmann & Walsh

#### PUBLIC BUILDINGS

Post Office and Court House, Dayton, Ohio, James Knox Taylor  
 State House, Concord, N. H., Peabody & Stearns  
 City Hall, Yonkers, N. Y., E. A. Quick & Son  
 Ives Memorial Library, New Haven, Conn., Cass Gilbert  
 Lehigh County Court House, Allentown, Pa., R. S. Rathbun  
 Municipal Courts Building, Detroit, Mich., Smith, Hinchman & Grylls

Albany County Court House, Albany, N. Y., Hoppin & Koen

#### CHURCHES

Roman Catholic Cathedral (Portion of), St. Louis, Mo., Barnett, Haynes & Barnett  
 First Church of Christ, Scientist, Providence, R. I., Howard Hoppin  
 Rodef Sholem Synagogue, Pittsburgh, Pa., Palmer & Hornpestel

# WEBB PINK GRANITE COMPANY

MAIN OFFICE, QUARRIES AND CUTTING PLANT  
MILFORD, MASS.

## Products.

MILFORD, MASS., GRANITE for commercial and monumental buildings and memorials.

WEBB PINK, WHITE and BUFF MILFORD GRANITE, Rough, Cut, or Polished.

WEPICO PRODUCTS (Crushed Granite), for stucco, ornamental concrete, roof coatings, etc.

## Description Milford Granite.

WEBB PINK MILFORD—A distinctive, warm-toned, pink granite, with small spottings of biotite distributed uniformly throughout its mass. This distribution of biotite crystals serves to emphasize the pink in the predominating feldspars, and gives to the granite the distinctive characteristics which place Milford, Mass., granite in a preferred class among building stones.

WEBB WHITE MILFORD—The Albino of the Milford family. The feldspars, which predominate, are creamy white, and the small, clear black spottings of biotite increase its white appearance, at the same time giving it character and texture.

T. Nelson Dale, of the United States Geological Survey, describes this granite as "the whitest of Milford granites." The creamy tone of the feldspars gives this granite an ivory whiteness which has warmth; not the cold tone of a grayish white. This is also one of the hardest of Milford granites and the most uniform in tone and texture.

WEBB BUFF MILFORD—Unlike any other Milford granite, the predominating tone is a soft buff, or yellowish brown, with the biotite spottings partly clouded and less clearly defined.

This buff granite is more particularly adapted to special work, the care in selection and matching making it impracticable for use in large or commercial buildings. Its characteristics are most beautifully brought out in a rubbed or honed finish, and its use is not recommended in hammered finish.

## Strength of Milford Granite.

Webb Milford granite is one of the strongest of building granites, its strength being considerably above the average. Tests at the Watertown Arsenal on six cubes of this granite showed an average compressive strength of 29,235 lbs. to the sq. in.

## Special Notes.

This company has developed a recently acquired quarry from which its pinkest granite is produced, completing the chain of granites from the whitest Milford to the deep pink Milford, frequently termed the "old-fashioned pink Milford granite."

Two points are particularly emphasized: (1) If a *White* granite is wanted, *Webb White Milford* should not be overlooked. (2) If a *Real Pink* granite is wanted, *Webb Pink Milford* has the real, "old-fashioned" pink color.

## Finishes and Relative Cost of Milford Granites.

The company's Milford granites are adapted to all the standard finishes used on granite, except as noted in the description of buff granite.

The cost is somewhat more than for many standard granites, because of its relative hardness. On the other hand, the 6-cut finish on Webb Milford is equal to 8-cut

on almost any other granite, and this applies throughout the scale of cut finishes, due primarily to the characteristics of the stone; it "closes up" quicker under the hammer, and its texture and color do not require as fine a cutting to produce the appearance of finer work.

These granites take a beautiful polish. Special mechanical facilities make it possible to produce plain hammered or highly polished surfaces, in competition with granites not nearly as hard, or desirable.

## Wepico Products.

The WEBB PINK GRANITE COMPANY has recently erected a complete crushing plant, producing carefully graded granules of its Milford granite ranging in size from that of the finest sand to granules approximately  $\frac{1}{2}$  in. in size.

Among the many uses for these Wepico products are the architectural uses for stucco and ornamental concrete.

Wepico aggregate in stucco and ornamental concrete produces a fadeless and durable tone, color and texture, adding the same desirable characteristics as pertain to the granite itself.

The most convincing argument in favor of its use, for the various purposes to which it is adapted, is actual inspection of the material itself.

Samples furnished on request.

## Facilities and Service.

The quarries and plant at Milford, Mass., are completely provided with the most modern and efficient equipment for the production of building granite.

The character and efficiency of the organization and workmanship is evidenced in the partial list (below) of a few contracts which have been successfully executed.

The New York Post Office and the Cleveland Courthouse serve to demonstrate the company's ability to successfully handle large and important contracts.

The new Equitable Building, the largest office building in the world, illustrates the WEBB PINK GRANITE COMPANY's ability to maintain fast time schedules without sacrificing good workmanship, where "time" is more than the "essence of the contract."

## Some Contracts Executed.

The following brief list comprises a few typical buildings in which Webb granites have been used, the contracts for same aggregating approximately \$2,500,000.00.

BUILDING AND LOCATION	ARCHITECT
New Post Office, New York, N. Y.	McKim, Mead & White
Cuyahoga County Courthouse, Cleveland, Ohio	Lehman & Schmitt
New Castle County Courthouse and Municipal Building, Wilmington, Del.	John D. Thompson, Jr., and Palmer, Hornbostel & Jones, Associated Architects
New Equitable Building, New York, N. Y.	E. R. Graham
Peoples Gas Building, Chicago, Ill.	D. H. Burnham & Co.
First National Bank, Cleveland, Ohio	J. Milton Dyer
Union Station, Baltimore, Md.	Kenneth Murchison
Lexington Street Building, Baltimore, Md.	Parker, Thomas & Rice
Freer Collections Building, Smithsonian Institute, Washington, D. C.	Charles A. Platt



# WOODBURY GRANITE COMPANY

## Vermont Granites for Building, Monumental and Structural Purposes

SELLING OFFICES  
NEW YORK, N. Y., 101 Park Avenue  
CHICAGO, ILL., Insurance Exchange

HARDWICK, VT.

CUTTING PLANTS  
HARDWICK, NORTHFIELD AND BETHEL, VT.

QUARRIES  
WOODBURY, VT.  
BETHEL, VT.

### Products.

#### GRANITES FOR BUILDING PURPOSES:

Woodbury Gray Granite, a standard light gray granite—"The Stone of the Chicago, Cleveland and Pittsburgh City Halls."

Vermont White Granite, a white gray granite. See the Northwestern Insurance Building, Milwaukee.

Bethel White Granite, the whitest and purest granite known—"The Stone of the Wisconsin State Capitol."

#### GRANITES FOR MONUMENTAL PURPOSES:

Woodbury Granite, a clean light gray stone—"The Monumental Granite of the Age."

Imperial Blue Granite, a fine-grained, dark bluish-gray granite—"The Blue That Will Not Fade."

Peerless White Granite, from Bethel, Vermont—"Century Endurance; Ivory Whiteness."

#### GRANITES FOR CONSTRUCTION PURPOSES:

Crushed Granite, either Woodbury Gray or Bethel White, screened to size, for concrete or artificial stone, at a low price.

Bridge Stone, Grout, Rip Rap, Random Ashlar, and Quarry Waste, shipped promptly in any desired quantity.

Paving Blocks, in any quantity.

### Rough Granite.

Any of these granites furnished in the rough, in carload shipments, to the monumental or building trade, in sizes up to the limit of transportation. Quick deliveries.

### Polished Granite.

The polishing equipment is the largest in the trade. No material is more suitable for a city building than polished granite, for it retains its color and brilliance, and remains clean. Quick deliveries.

#### ANALYSIS OF GRANITES

	WOODBURY GRAY	BETHEL WHITE
Silica .....	70.75	72.70
Oxides of iron.....	2.70	Trace
Alumina .....	15.80	18.35
Lime .....	2.03	2.80
Magnesia .....	1.35	....
Soda .....	3.88	4.52
Potash .....	3.46	.95
Loss at red heat.....	.35	.60
	100.32	99.92

### Granite Columns and Monoliths.

The heavy sheet quarries of this company are especially suitable for producing large columns or monoliths. Any size to the limit of transportation can be had promptly. Lathes that will turn columns 36 ft. in length and 7 ft. in diameter are installed in the plants.

### Setting.

The company maintains setting crews and equipment, and is prepared to contract for granite work set in place. This method of placing granite contracts, definitely fixes responsibility for the work and enables this organization to achieve satisfactory results.

### Organization.

Capital is \$1,000,000. No contract too large or too small. Careful draughting, well equipped plants and quarries, efficient methods of production. We have handled many of the largest granite contracts of recent years.

### Deliveries.

Four large quarries and two modern stone cutting plants, equipped with electric power and unit motor drives are operated. Overhead electric cranes, McDonald machines, surfaces, saws and air tools for rapid production and handling of products. The capacity of the plants is 3500 cu. ft. of finished work per 8-hour day. Blocks of any size.

### References.

The following is a partial list of prominent public buildings in which WOODBURY GRANITE COMPANY'S products were used:

#### WOODBURY GRAY GRANITE

Pennsylvania State Capitol, Harrisburg, Pa.  
Kentucky State Capitol (base course and interior polished columns).

Iowa State Capitol (steps and platforms).

Idaho State Capitol (main entrance).

Michigan State Capitol (steps and platforms).

Kansas State Capitol (steps).

Mercantile Trust Co., St. Louis, Mo.

#### VERMONT WHITE GRANITE

Northwestern Insurance Building, Milwaukee, Wis.

Museum of Fine Arts, Minneapolis, Minn.

Bridgeport Trust Co., Bridgeport, Conn.

Soldiers and Sailors Memorial, Wichita, Kan.

#### BETHEL WHITE GRANITE

Union Station, Washington, D. C.

Post Office, Washington, D. C.

Wisconsin State Capitol, Madison, Wis.

State Library and City Hall, Hartford, Conn.

Telegraph and Telephone Building, New York, N. Y.

Mary Baker Eddy Memorial, Cambridge, Mass.



# MATTHEWS BROTHERS COMPANY

Cut Stone Contractors for Indiana Limestone  
BLOOMINGTON, IND.

## Products.

BUFF, GRAY ("BLUE") and VARIEGATED ("MIXED") INDIANA LIMESTONE, in the finished state, executed in strictest accord with architect's plans and details, delivered ready to set on cars to destination or erected in place. (Indiana Limestone is sometimes called "Bedford Stone.")



## Description.

Indiana limestone serves as a standard by which other stones and substitutes are judged. It is used to the extent of many millions of cubic feet each year in all classes of construction. It is the noblest means for expressing *genuineness* in public buildings, churches, banks, libraries and other edifices of a monumental nature. At the same time, it lends itself with equally advantageous results for use in residences, hospitals and schools, or factory buildings, bridge and foundation work, and other commonplace types of construction, where strength and durability only are required.

Its range of adaptability is very wide. The fact that Indiana limestone is so durable, renders it equally valuable for a purely structural use, as well as the proper medium of expression for a design wholly æsthetic.

## Reliability.

This company is the pioneer of the Indiana limestone industry, having been established in 1862, and controlled and managed by the same family since that date; and the broad conception of "real service to the customer" has won for it an enviable reputation. Every piece of stone leaving the plant is absolutely guaranteed to fill the requirements in quality, workmanship, and date of delivery.

## Facilities.

Facilities are unexcelled, the plant being a model of efficiency. Machinery is all of the latest and most approved type, electrically operated. Each

department head is a man of long experience. There is no contract too large to handle satisfactorily, and none too small to receive best attention.

## Estimates.

The estimating department will, upon receipt of plans, prepare an estimate on requirements for Indiana limestone, and submit it for consideration. This service is rendered free to architects and owners interested, for it is the company's only means of quoting prices. Sizes and quantities of different moulds required form such an important factor in determining prices, that the actual plans and details must be in evidence before the company is justified in making quotations.

## References.

The work MATTHEWS BROTHERS COMPANY has executed is scattered throughout practically every state in the Union, and on request, citations nearest the point of inquiry will be furnished.



DEKALB COUNTY COURT HOUSE, AUBURN, IND.  
MAHURIN & MAHURIN, Architects, Ft. Wayne, Ind.



# SHEA & DONNELLY COMPANY

MEMBER INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION

## Indiana Limestone

MAIN OFFICE  
LYNN, MASS.

BRANCH OFFICES

BOSTON, MASS.

BEDFORD, IND.

MILLS AND QUARRIES: BEDFORD, IND.

### Products.

INDIANA LIMESTONE: "REAL BEDFORD" BRAND, BUFF, GREY and VARIEGATED ("MIXED"), Rough, or Cut and Finished, ready to set.



on large, as well as small, contracts will be quoted.

It is the policy of the company to see to it that no work leaves the plant which does not do full justice to the excellence

of this unsurpassed material.

### Description.

The stone from this company's "Real Bedford" quarries shows, upon analysis, not only the highest purity but the greatest perfection of grain, texture and color.

On account of these facts both architects and contractors often express a decided preference for this stone for use in the highest class construction.

### Colors.

The Buff stone is of a peculiarly soft tone, while the Grey is lighter than most—really a silvery bluish grey. Variegated is, of course, a mixture of the above.

### Facilities and Service.

Cut ready to set in the wall—capacity, ten carloads per day.

Mechanical and personal equipment is complete and capable of handling contracts of any size.

Some of the largest contracts in the country have been executed by the SHEA & DONNELLY COMPANY. Plants and quarries are equipped in such a manner as to enable the company to give prompt and satisfactory attention to all inquiries and contracts. Attractive prices

### Estimates.

Estimates are gladly furnished on receipt of sufficient data sent to the nearest office.

### Samples.

Architects or contractors are promptly served with adequate samples of Indiana Limestone on request. Inquiries from architects are solicited.

### A Few Recent Contracts.

Massachusetts Institute of Technology, Cambridge, Mass.

(One of the largest limestone contracts ever awarded at one time, and finished two months ahead of contract time.)

Albany County Courthouse, Albany, N. Y.

B. F. Jones Residence, Sewickley, Pa.

Bankers' Realty Trust Building, Boston, Mass.

Boys' Latin School, Cleveland, Ohio

City and County Building, Cheyenne, Wyo.

City Hall, Pueblo, Colo.

College of Pharmacy, Boston, Mass.

Dining Halls, Princeton College, Princeton, N. J.

15-Story Apartment, 19th and Walnut Streets, Philadelphia, Pa.

Matthew-Harkins Hall, Providence, R. I.

Music Building, Yale College, New Haven, Conn.

Rhode Island Hospital Trust Building, Providence, R. I.

St. Albans Cathedral, Washington, D. C.

State Capitol, Oklahoma City, Okla.

Union Station, St. Paul, Minn.



NEW COLLEGE BUILDINGS FOR MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.  
1,000 carloads of Indiana Limestone in these buildings

# THE GEORGIA MARBLE COMPANY

TATE, GA.

NEW YORK OFFICE, 1328 Broadway—Telephone, 2193 Greeley

CLEVELAND OFFICE, Guardian Building

## Products.

GEORGIA MARBLE in rough quarry blocks, sawed or finished for Exterior and Interior Building Work, also Monumental Work.

We are in position to supply either the rough quarry blocks, sawed stock or finished work for exterior and interior of buildings, monuments and mausoleums, etc., in the following marbles produced by us: "WHITE," "AMICALOLA," "LIGHT CHEROKEE," "SILVER GRAY," "MEZZOTINT," "CREOLE," and "PINK."

## Durability.

Georgia marble, owing to its dense, flawless, crystalline formation and non-absorbing qualities, does not disintegrate or decompose in any climate and will stand the test of time.

## Colors.

"WHITE"—We operate four quarries of white marble ranging from almost pure white to white with more or less dark marking, known as "White Georgia,"

"Kennesaw," and "Amicalola." "Light Cherokee," a very light gray with clouding and veins running in waves well distributed.

"SILVER GRAY"—A uniform pearl gray, practically free from marking.

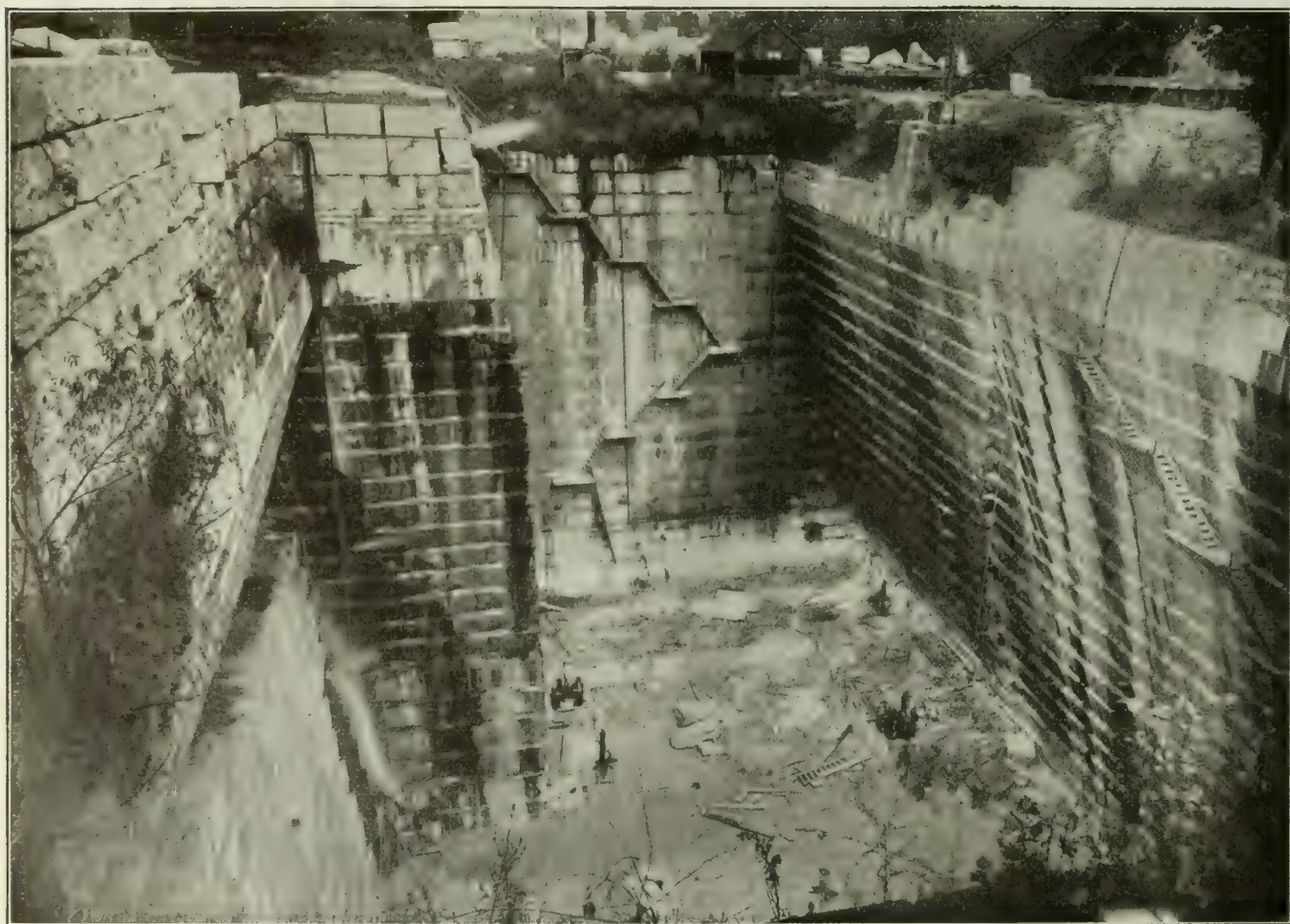
"MEZZOTINT"—Gray background with rather heavy dark marking occurring in waves, between "Silver Gray" and "Creole."

"CREOLE"—Heavily veined and having white background with black and bluish black veining and figures.

"PINK"—Ranges from a very light salmon to a deep old rose with very warm tints.

## Crushing Strength.

The following is an extract from the report of physical tests on specimens of Georgia marble made by J. B. Johnson, professor of civil engineering and director of testing laboratory, Washington University, St. Louis, Mo.:



"CREOLE" QUARRY NO. 4



"Six 3-in. cubes were tested upon a U. S. standard Riehle testing machine of 100,000 lbs. capacity. The details of these tests are given in the accompanying certificate. I was only able to break four of the specimens. The other two stood 112,000 and 109,300 lbs., respectively, without crushing; which was a much greater load than the machine should be allowed to carry.

"The lowest test was 76,200 lbs., or 8,330 lbs. per sq. in.; but since two of the six specimens remained uncrushed, it is perhaps fair to say the average crushing strength is not less than 10,500 lbs. per sq. in. This is equivalent to 750 tons per sq. ft.

"The fractures showed a remarkably uniform composition without seams or lines of cleavage.

"The strength of granite is from 700 to 1,000 tons per sq. ft.; the strength of limestone and marble varies from 350 to 700 tons per sq. ft.

"The average strength of the best sandstone is about 500 tons per sq. ft.

"The average strength of the St. Louis pressed brick is about 250 tons per sq. ft.

"It is thus seen that the strength of 'Kennesaw' marble is about equal to that of granite, and greater than any other form of building stone or brick."

### Absorption.

This marble absorbs only 4/100 of 1% of moisture, the lowest percentage of absorption in stone known, as shown in the following report of test:

"UNIVERSITY OF WISCONSIN,  
DEPARTMENT OF GEOLOGY,  
MADISON, January 9, 1906.

"Sample of marble from THE GEORGIA MARBLE COMPANY, submitted to me by Professor Leith, has been analyzed and tested for its absorption power. The results obtained are almost the same as those printed in their handbook. Following is the chemical analysis:

CaCO <sub>3</sub> .....	97.95%
MgCO <sub>3</sub> .....	.57%
SiO <sub>2</sub> (insoluble matter) .....	.54%
Iron .....	traces
Aluminum .....	traces
Total .....	99.06%

"In determining the absorption, a piece weighing 15 gr. was dried for 10 hours at a temperature of 150° C. and weighed, then soaked in distilled water for 24 hours and re-weighed. The difference in weight divided by the dry weight gave the absorption of the stone, or .04%, which is very small.

### References.

A few representative buildings in which our material has been used:

BUILDING	LOCATION	ARCHITECT
	EXTERIOR OF BUILDINGS	
Girard Trust Company	Philadelphia, Pa.	{ McKim, Mead & White
National McKinley Birthplace Memorial	Niles, Ohio	{ Furness, Evans & Co.
Field Museum of Natural History	Chicago, Ill.	McKim, Mead & White
Cleveland Museum of Art	Cleveland, Ohio	Graham, Burnham & Co.
Brooks Memorial	Memphis, Tenn.	Hubbell & Benes
Emory University	Atlanta, Ga.	Jas. Gamble Rogers
Franklin National Bank	Philadelphia, Pa.	Henry Hornbostle
Brown Bros. Co. Bank	New York, N. Y.	{ McKim, Mead & White
Crozer Building	Chester, Pa.	{ Furness, Evans & Co.
Dollar Savings Bank	Niles, Ohio	Delano & Aldrich
Post Office	Augusta, Ga.	Mowbray & Uffinger
	INTERIOR OF BUILDINGS	C. F. Owsley
State Capitol	Salt Lake City, Utah	Supervising Architect
State Capitol	Frankfort, Ky.	Richard Kletting
Guardian Savings & Trust Co.	Cleveland, Ohio	F. M. Andrews & Co.
Manufacturers & Traders National Bank	Buffalo, N. Y.	Walker & Weeks
Courthouse	Atlanta, Ga.	Furness, Evans & Co.
Candler Building	Atlanta, Ga.	{ A. Ten Eyck Brown
House of Representatives Office Building	Washington, D. C.	{ Morgan & Dillon
	MONUMENTAL AND SCULPTURE	Geo. E. Murphy
Colleoni Monument (Reproduction)	Newark, N. J.	Thos. Hastings & Elliott Woods
Pediment, National Capitol	Washington, D. C.	J. Massey Rhind
Figures Public Library	New York, N. Y.	Paul Bartlett
Soldiers Monument	Oregon, Ill.	Paul Bartlett
Statue of McKinley	Niles, Ohio	Lorado Taft
Pediment, Stock Exchange	New York, N. Y.	J. Massey Rhind
		J. Q. A. Ward

"The rock is white and coarsely crystalline. Because of its purity, especially the absence of iron, the marble will retain its white color, and due to its low absorption power, the agents of disintegration will have but little effect upon the stone.

Very truly yours,  
E. B. HALL, Assistant in Geology."

### Statuary.

Our "White" and "Silver Gray" Georgia marble are both well adapted for sculptors' use. They are very translucent and impart "life" to sculptured work, which can not be obtained in other marbles. Large sizes can readily be obtained.

### Columns and Monoliths.

Can be furnished in any color to size of the capacity of transportation.

Special attention is given to the production of blocks for long columns in one piece. Have furnished monoliths 30 by 4 by 4 ft.

### Facilities.

Facilities for production and finishing are unexcelled. We operate 8 quarries which will easily produce 1,000,000 cu. ft. per annum. We operate 5 plants with upward of 100 gang-saws, 22 rubbing beds, planers, lathes, diamond saws, carborundum machine, etc. With an unlimited supply of marble and up-to-date finishing plants, any size order can be accurately and promptly filled.

### Co-operative Service.

We shall take pleasure at all times in giving any information in regard to our marbles and will furnish samples. Kindly state size desired.

### Medals.

Georgia marble was awarded a gold medal at the St. Louis Exposition, the highest award; also, received the highest award at the Jamestown Exposition, a silver medal.

# TOMPKINS-KIEL MARBLE CO.

505 Fifth Avenue  
NEW YORK, N. Y.

CHICAGO OFFICE, 231 Insurance Exchange Building  
YARD AND WHARF, 3 Mill Street,

PHILADELPHIA OFFICE, 314 South 25th Street  
ASTORIA, L. I., N. Y.

## Products.

Importers and wholesale dealers in FOREIGN and DOMESTIC MARBLES and STONES in the ROUGH BLOCK for all purposes, including bank and office buildings, churches, etc.

## Stock List.

A partial list of the marbles and stones carried in stock is given below. A quarterly list of stock sizes with prices will be sent on request.

DOMESTIC MARBLES—Tennessee Marble, Alabama Marble, Antwerp Black, American Cream White Lens, Bianco Statuary Veined, Eastman's Marbles, Easton Green, Littleton Stone, Napoleon Gray, Nebo Golden Travis, Westfield Green, York Fossil.

FOREIGN MARBLES—Blanco P, Black and Gold, Breche Blanc, Breche Violet, Breche Opal, English Veined, Italian Marble, Statuary Veined, Second Statuary, Basseville, Bongardt, Botticino, Cenere, Champville Emerald Green Escallete, Eschallion, Famosa, Fleuri de Peche, Fossil Eschallion, Genoa Green, Hauteville, Onyx Pedrara, Italian Pavonazzo, Rosato, Schupach, Tavernelle, Traniville, Ural, Verona (Red), Verona (Yellow), Verde de Estours, Vert Maurin (French Alpsgreen).

## American Marbles and Stones.

These marbles and stones are equal to the best from European quarries.

ALABAMA (MORETTI HARRAH QUARRY)—*America's White Statuary*—A marble of rare quality, cream white in color. Due to its beautiful carving qualities, it is unsurpassed for ecclesiastical work, also bank and building interiors and monuments.

ANTWERP (VIRGINIA) BLACK MARBLE—The finest black marble of its kind. Jet black, of good even color. It takes an exceptionally high polish and is considered by architects and marble workers to be fully equal to imported Belgium Black. Blocks can be furnished in good sizes and large quantities.

The Temple of the Scottish Rite (Masonic), Washington, D. C., John Russel Pope, Architect, is the most prominent and recent work executed in Antwerp (Virginia) Black. A large quantity of this marble was used for decorations throughout the building.

BIANCO STATUARY VEINED—*California's English Veined*—A marble of white background with fine black veinings. Especially adaptable for wainscoting in matched panels. Equal to the one-time English veined marble from Italy.

NAPOLEON GRAY MARBLE—This marble when sawed across the bed to show veining is warmer and richer in tone than any marble now on the market that it resembles. Used effectively in large quantities for bank, office and residence interiors. For exterior use it has no equal. Carves beautifully and will withstand any climatic condition. Can be produced in large quantities at low cost. Blocks run 40 ft. long.

NEBO GOLDEN TRAVIS—*Utah's Rich Product*—A marble of rich golden background with variegated markings of antique rose and golden tints. This marble is meeting with great favor for decorating bank, hotel and residence interiors.

WESTFIELD GREEN—*America's Verde Antique*—A dark green marble with light green markings. It is hard and sound, and polishes well. This marble has been used extensively throughout the country for exterior and interior uses.

AMERICAN CREAM WHITE LENS—*America's Caen Stone*—A limestone of equal quality to French caen stone, both in color and texture. Has beautiful carving qualities.

DUNNVILLE STONE—*Quarried at Dunnville, Wisconsin*—This material is of exceptionally good quality, rich in color and adaptable to exterior as well as interior uses. Has a cream white ground with tints of pink and yellow water lines running through it. This gives it character and warmth in color absolutely unknown in any other stone now on the market.

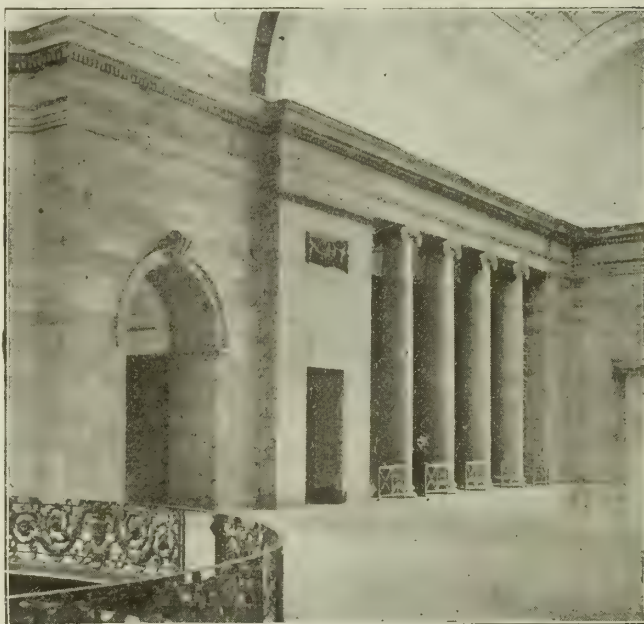
Analysis shows Dunnville stone to have a very fine grain 98.64% silica; crushing strength 3,872.5 lbs. to the cu. in.

Dunnville stone is now being installed for the interior of the new Richmond County Courthouse, S. I., N. Y., Carrère & Hastings, architects. As well as for the reredos of St. Thomas' Church, New York, N. Y.; Bertram G. Goodhue, architect; Lee O. Lawrie, sculptor; Ardolino Bros., contractors.

LITTLETON STONE—*Quarried at Littleton, W. Va.*—This stone is typical of the English Stade stone from New Castle, as well as the English Dorchester stone. It is of light golden buff shade, which does not change color, but always remains the same. This stone is meeting with considerable favor for both interior and exterior uses. Good sizes and large quantities can be furnished. Crushing strength 8,110 lbs. to the cu. in. Specific gravity 2.509.

## Samples.

Furnished on request.



MAIN ROTUNDA, MISSOURI STATE CAPITOL,  
JEFFERSON CITY, MO.  
TRACY & SWARTWOUT, Architects  
Marble work in Napoleon Gray



# THE ALLIANCE BRICK CO.

40 South Linden Avenue

ALLIANCE, OHIO

## Products.

ALLIANCE MULTI-COLOR RUFF BRICK.

ALLIANCE MULTI-COLOR RUFF-FACE HOLLOW BUILDING BLOCK.

They are thoroughly vitrified, permanent in color, standard in size—right in every characteristic.

They are being used in many of the finest buildings in America.



ALLIANCE MULTI-COLOR RUFF BRICK NO. 76

## Alliance Multi-color Ruff Brick.

Excel all other brick as to beauty of coloring.

The chromatic scale of colors runs through the beautiful rough texture faces, most of the individual brick showing on the face of each brick 3 or 4 or more

The 7 brick illustrated represent the 7 distinct types of brick composing the panel illustrated.

Study these two illustrations—they tell of wonderful possibilities for the architect and builder.

The dark wine or gunmetal brick at the right of



THE SEVEN TYPES IN ALLIANCE MULTI-COLOR RUFF BRICK NO. 76

of the 7 primary colors or their shades—gunmetals, wines, chocolates, browns, ox-blood reds, buff tones and multi-colors.

These brick are made of Ohio shale of the highest grade.

above 7 brick is also sold as a straight shade, Alliance gunmetal ruff brick No. 75. The red brick at the left is sold as a straight red shade, Alliance red ruff No. 72.

## Samples.

If interested, write for samples, prices, etc.



**Alliance Multi-color Ruff Brick Fireplaces.**

All of the beauty, warmth and soft, luxuriously indefinite color suggestion so desirable for fireplace effects are found in Alliance multi-color ruff brick fireplaces. The one shown here is rich in texture and tone and is simple and very economical in cost.

Other standard designs, carefully and skillfully

*Setting Drawings*—Show floor plans, elevations, correct flue design and complete and definite scale drawings for erection. Furnished with each fireplace.

*Price*—For this fireplace, \$30.00. This includes all plain and special brick for facing and for back walls and sides of openings, and all brickettes for hearth and under fire (no wood shelf or iron work),



ALLIANCE MULTI-COLOR RUFF BRICK FIREPLACE NO. 1

prepared and correct in artistic proportions and effects will be forwarded to those interested, as well as fireplace suggestions and samples of individual brick.

The possibilities of individual architectural expression are unlimited with the use of this rare and beautiful material.

**ALLIANCE MULTI-COLOR RUFF BRICK FIREPLACE No. 1—Dimensions**—Height, 4 ft. 9 ins.; width, 5 ft. 3 ins.; opening, 2 ft. 2½ ins. high, 2 ft. 3½ ins. wide; projection from wall, 5 ins.; shelf, 9 ins. These dimensions can be varied somewhat to meet requirements.

Brick and rough face, 2¼ by 3⅞ by 8⅞ ins. Brickettes in hearth are smooth face, 1 by 2¼ by 8¼ ins.

all properly packed and delivered f.o.b., Alliance, Ohio.

**Alliance Multi-color Ruff-face Hollow Building Block.**

Especially adapted to foundations, range work, garages and low priced buildings of all kinds. The coloring and texture are similar to Alliance multi-color ruff face brick, making a most beautiful wall.

With Alliance hollow ware, architects can produce most desirable effects in thoroughly vitrified, permanent material at low cost.

**SIZES**—4 by 4 by 12 ins.; 4 by 8 by 12 ins.; 8 by 8 by 16 ins. All sizes have corners, pieces, etc.

Further information on request.



# SAYRE & FISHER COMPANY

Manufacturers of All Kinds of Brick

261 Broadway (cor. Warren Street)  
NEW YORK, N. Y.

## Products.

FINE PRESSED FRONT BRICK; SUPERIOR ENAMELED BRICK.

In the Red Brick Department: HARD BUILDING BRICK; SELECTED COMMON BRICK; "S. & F." CLINKER STRETCHERS; "RAIN WASHED," "OLD ENGLISH" RED, REPPRESSED DOWN-DRAFT RED, and REPPRESSED UP-DRAFT RED STRETCHERS, and BLACK HEADERS for Facing; HOLLOW BRICK and FIRE BRICK.

## Front Brick in Various Colors.

Manufactured by this company in a great variety of colors: white, light and dark buff, red, gray, old gold, rough face Persian and mottled—other shades to order—enabling architects to select a material that, while fire resisting and easily handled, shall permit them to lighten and beautify and add strength and variety to a street façade.

## Superior Enameled Brick.

Superior enameled brick is manufactured in white and various colors. They are coming into more general use for a great variety of purposes, and are especially adapted for lining of waiting rooms of railroad stations, tunnels, markets, hospitals, engine and boiler rooms, kitchens, etc.

## Red Brick Department.

HARD BUILDING BRICK—Hard burned, dark red color. Shipments, in cargo lots, via our fleet of barges or schooners or via rail to all points. A very economical building brick for heavy construction work.

SELECTED COMMON BRICK—For facing. Of general dark red color and sufficiently varied in color and shape for "Harvard" work. These are very desirable for Colonial work.

"S. & F." CLINKER STRETCHERS—Are also for facing. Sometimes called "Clinker Brick," because they are nearest the fire in the kilns and are burned black and twisted.

"RAIN-WASHED" RED STRETCHERS—Are a pitted

face brick and laid either with or without Black Headers. A "chance" product caused by rain on the brick when in a green state on open yards.

"OLD ENGLISH" RED STRETCHERS—This product is something new and is about the size of the Old English Brick, made in dark red tone and measuring about  $8\frac{7}{8}$  by  $2\frac{7}{8}$  by 4 ins.

Over six hundred thousand in the new Curtis Publishing Company's Building in Philadelphia, being selected by the architects after searching the Old World for ideas that were unique and artistic.

REPPRESSED UP-DRAFT RED STRETCHERS—Same as the Down-draft, except that these show light and dark kiln marks on the stretcher side, which gives a diversified effect.

REPPRESSED DOWN-DRAFT RED STRETCHERS—These are of a dark cherry red color and very popular for face work.

BLACK HEADERS—Made to be used with the Selected Common Brick or Repressed Stretchers for the "Harvard" effect if desired.

HOLLOW BRICK—Both stretchers and headers (Haverstraw size) of a very superior quality. They can be furnished in cargo lots.

FIRE BRICK—Two grades: No. 1 "Sayre & Fisher" and No. 1 "Phenix." Very desirable for boiler settings, furnace linings, etc., in all standard sizes.

## Shipping Facilities.

The favorable location of SAYRE & FISHER COMPANY works at deep water on the Raritan River, N. J., permits the loading of vessels of large draught.

Shipments can also be made direct to all points, connecting with any line of railroad.

## Export Trade.

With such adequate and satisfactory facilities for shipment, as well as such large and complete stock always on hand, our export trade has grown to great proportions and is still increasing.



BRICK WORKS OF THE SAYRE & FISHER COMPANY, SAYREVILLE (ON RARITAN RIVER), N. J.

# AMERICAN ENAMELED BRICK & TILE CO.

INCORPORATED 1893

## Manufacturers of Enameled and Fire Brick

Vanderbilt Concourse Building

52 Vanderbilt Avenue  
NEW YORK, N. Y.

### TELEPHONES:

8787-8788 MURRAY HILL

### CABLE ADDRESS:

"AMEREBRICK"

### Products.

ENAMELED BRICK in Standard Sizes and Ornamental Shapes. (See plates.)

FIRE BRICK, Standard 9-in. and 9-in. Series Shapes, as adopted by the Members of the Refractories Manufacturers Association, and Special Shapes.

### Territory.

The business operations of this firm cover the entire United States, Canada and South America.

### Personal Representatives.

With our customers scattered over the United States and Canada, we have, in order to keep in closer touch with them, located representatives in all the principal cities to attend personally to inquiries, orders and deliveries.

### Dispatch of Shipments.

Factory and office are in constant telephone connection with each other, and we have a local telephone exchange connecting every department of the factory for quick and systematic dispatch of business.

### Shipping Facilities.

Our works, located but an hour's travel from the New York office, are situated so as to enable shipping over two of the largest railroads, viz., the Pennsylvania and the Central of New Jersey, and their connecting lines. We are also situated on tide water, so that shipments can be made by vessel.

### Precaution Against Delay.

Every part of our factory, including machinery, has its duplicate, which prevents any possibility of delay caused by breakdowns, should they occur.

### Capacity.

Our present capacity is 8,000,000 brick per annum, which will be increased as occasioned by the demand.

### Stock.

The average stock on hand at our factory is more than 2,000,000 brick, giving a large assortment for immediate delivery.

### Illustrations of Stock Designs.

Much delay is saved by use of stock designs of moulded brick.

In the following pages are shown designs that we recommend as being most satisfactory in manufacturing results.

We try to keep a stock of these on hand, in standard colors in American size. English size made to order.

These designs are chosen to reduce manufacturing difficulties and delays to a minimum; to enable composite mouldings to be made up; and to enable prompt filling of orders.

No other manufacturer offers the variety we do. (See plates.)

Two stock sheds are devoted exclusively to these specials.

As we are always improving our designs and adding new features, it is well to write us at the inception of your work.

### Colors—Bright, Medium or Matt Finish.

In addition to our regular white and standard colors, such as our sage green, red brown, etc., we have made a specialty of mottles in the following colors:

Gray, brown, black, blue and blue brown, which give a very fine appearance for both interior and exterior work, having a finish more on the type of marble than enameled brick.

If you have in mind, at any time, a particular color, shade or finish of enameled brick for interior or exterior purposes, advise us of your ideas and requirements and we will be pleased to submit samples.

Color sheet showing a few of the various colors and shades that we manufacture may be seen in previous issues of SWEET'S ARCHITECTURAL CATALOGUE.



**Uniformity of Shade.**

We guarantee uniformity of shade in all first quality deliveries to the limit of practicability. Colors giving most uniform results are, in order of degree of uniformity, white, sage green and red brown. Other colors follow in irregular positions.

We will try on orders of moderate size, or on larger orders, if ample time be given, to match in shade the moulded and stretcher stock, but can not always guarantee to uniformly shade shipments of specials, particularly on hurry orders.

N. B.—Uniform shading in first quality white, brown, sage green, and chocolate a specialty.

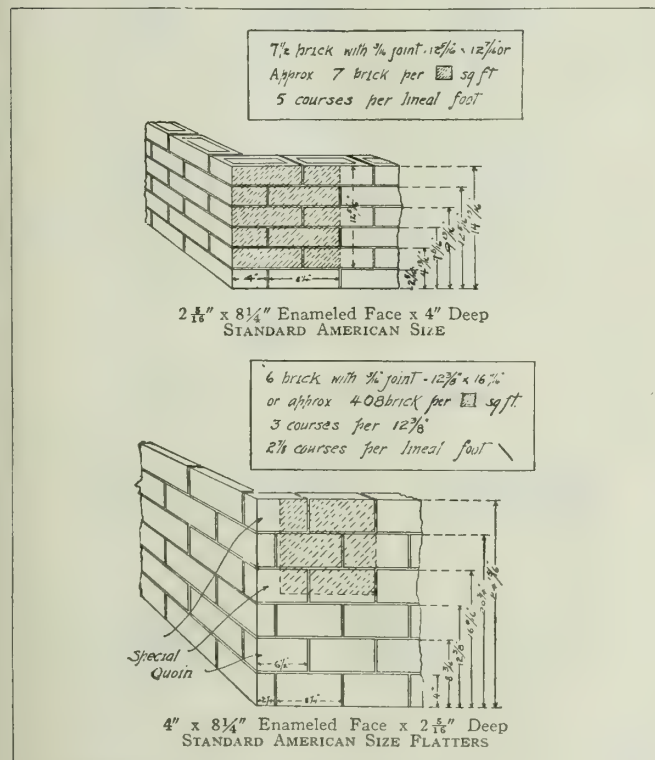
**Special Features and Advantages of Our Enameled Brick.**

In making our product we follow the English and Scotch systems, working by the soft mud process. This is without question the only process which insures durability and the closest relation of bond obtainable between body and glaze.

Our brick are burnt in but one fire, thus making the chemical change in the body and the glaze simultaneous.

Where manufacturers use the dry pressed process, the brick have to be burnt first as front brick before the enamel can be applied, and fired again for the fluxing of the glaze.

Where the enamel is applied on an already burnt brick and fluxed in a second fire, the bond is weak and peeling is sure to follow.



COMPARISON OF SIZES, SHOWING NUMBER OF BRICK PER SQUARE FOOT

All dimensions are approximate  
American size is kept in stock. English size made to order only.

We use hard and durable glazes, not soft lead glazes frequently seen on inferior grades of enameled brick.

There has not been a single case during our twenty-two years of business where any peeling or discoloring has been seen or reported.

This is better than any guarantee which we might be asked to give, as it covers a distributed output of over 100,000,000 brick, located all over the United States, Canada and South America, and subject to all varieties of climatic conditions.

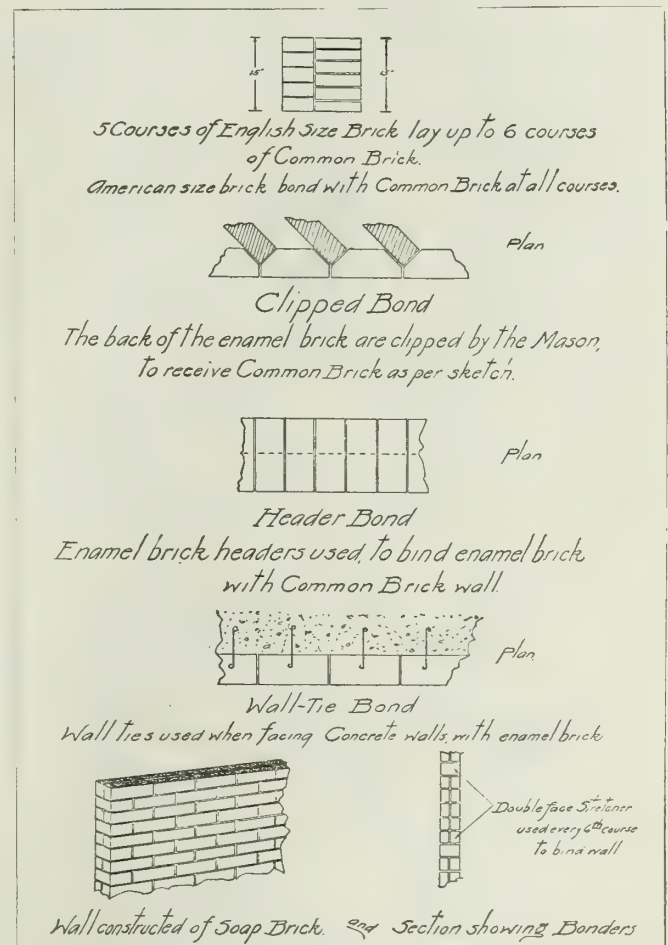
**Cleaning.**

Enameled brick are best cleaned with some alkaline solution, such as caustic soda or sodium carbonate. This cleans the enamel and does not affect the cement or lime mortar.

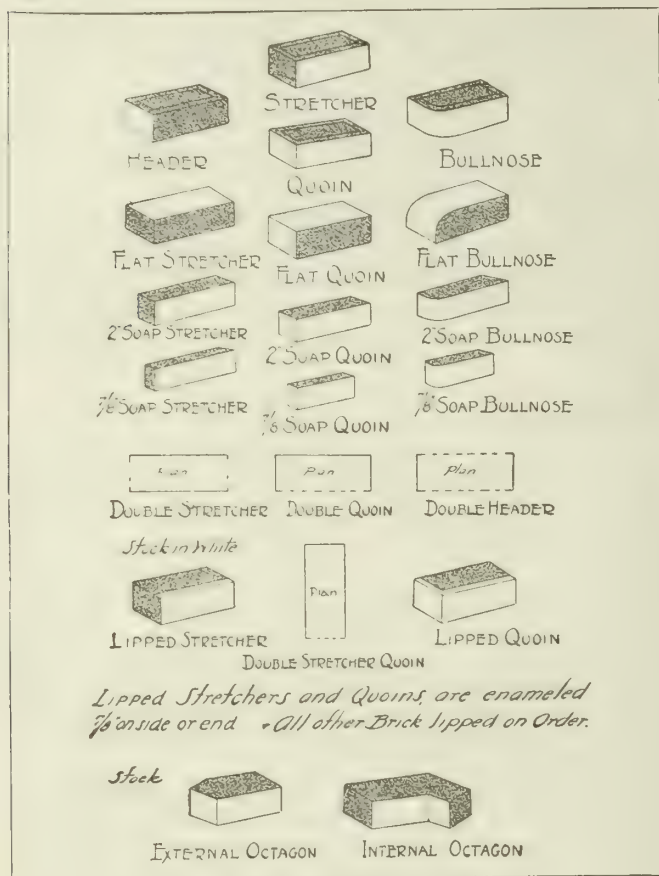
**Acids.**

Sulphuric, nitric or hydrochloric acids, even in concentrated form, will not affect our glazes; but if used as a wash, even when diluted, they will attack the cement or lime mortar.

The only commercial acids which will attack and destroy our enamel are hydrofluoric and hydrofluosilicic.

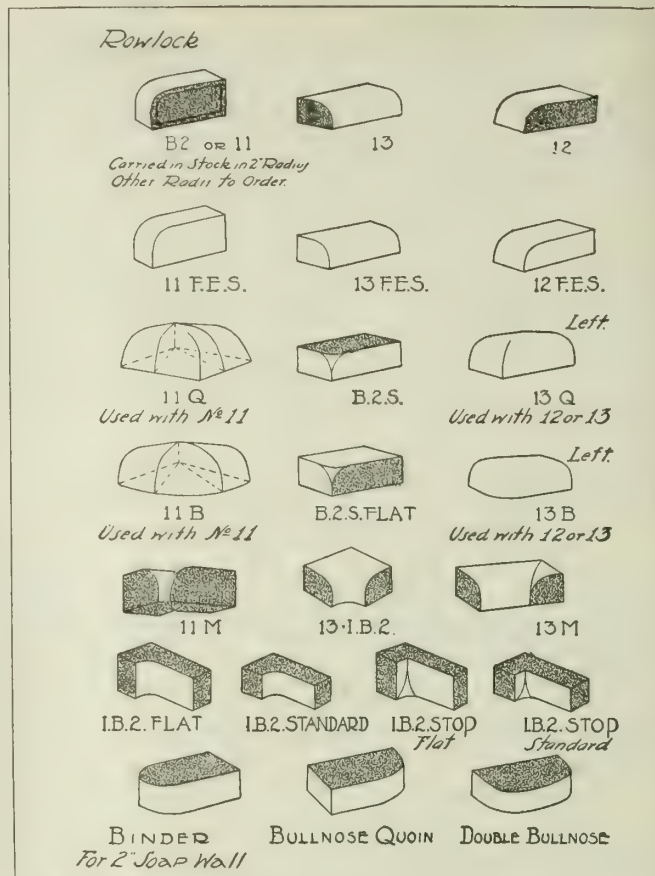


SYSTEM OF BINDING OR TYING ENAMELED BRICK TO COMMON BRICK OR CONCRETE BACKING; ALSO METHOD OF BONDING SOAP BRICK FOR 4-INCH PARTITION



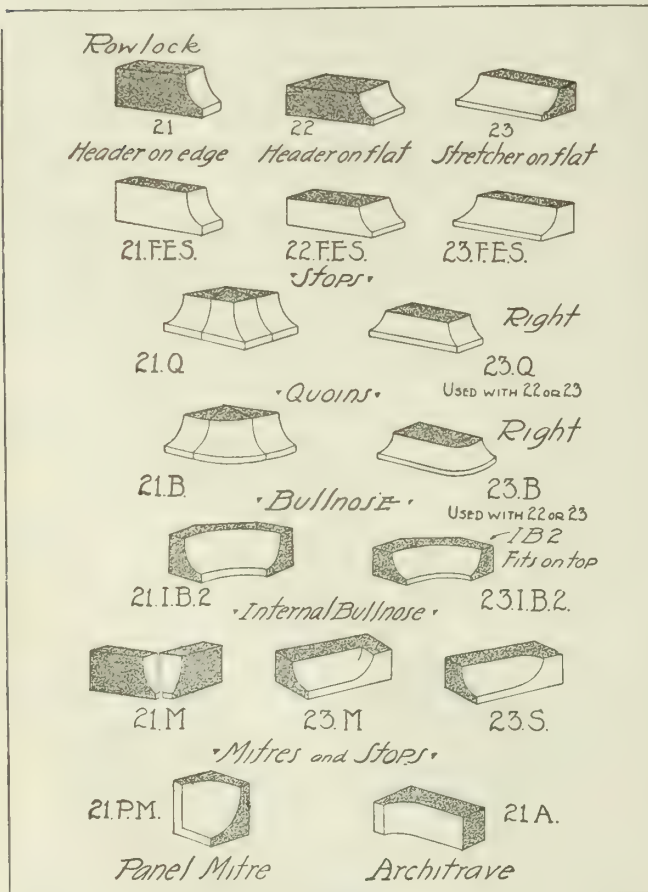
## ILLUSTRATIONS OF TYPES

For projection and dimensions, see key, next page  
On double brick, shown above in plan, solid lines represent faces enameled; dotted lines represent faces not enameled



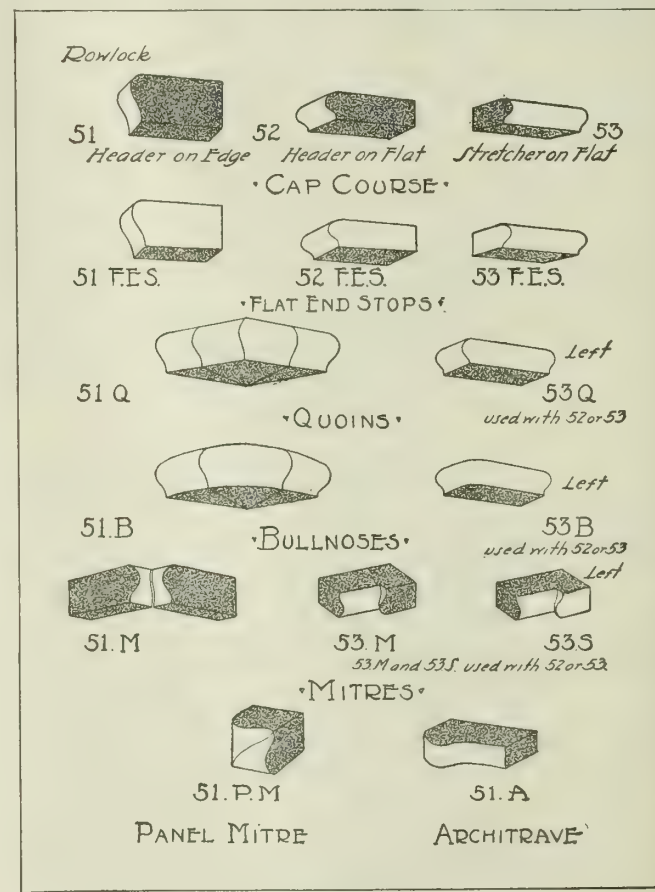
## BULLNOSE SPECIALS

For projections and dimensions, see key, next page



## COVE MOULD

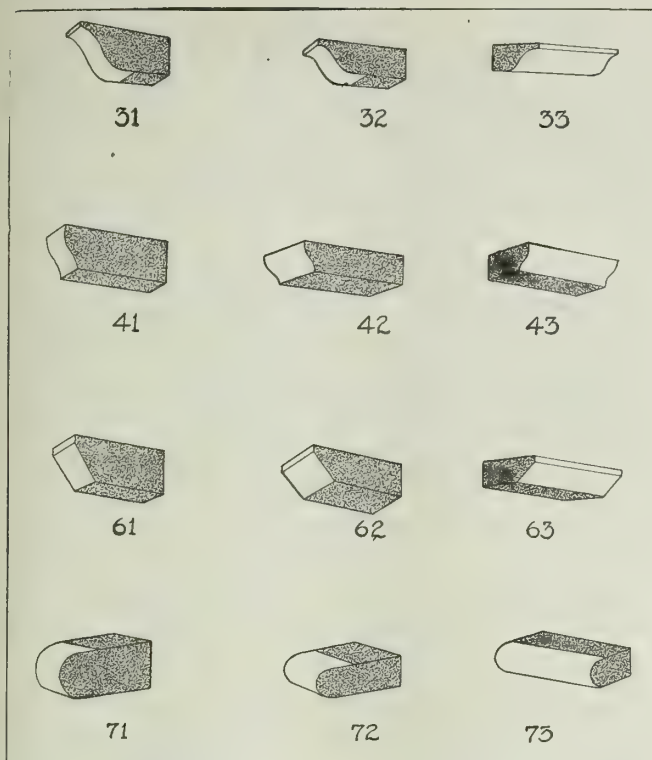
For projection and dimensions, see key, next page



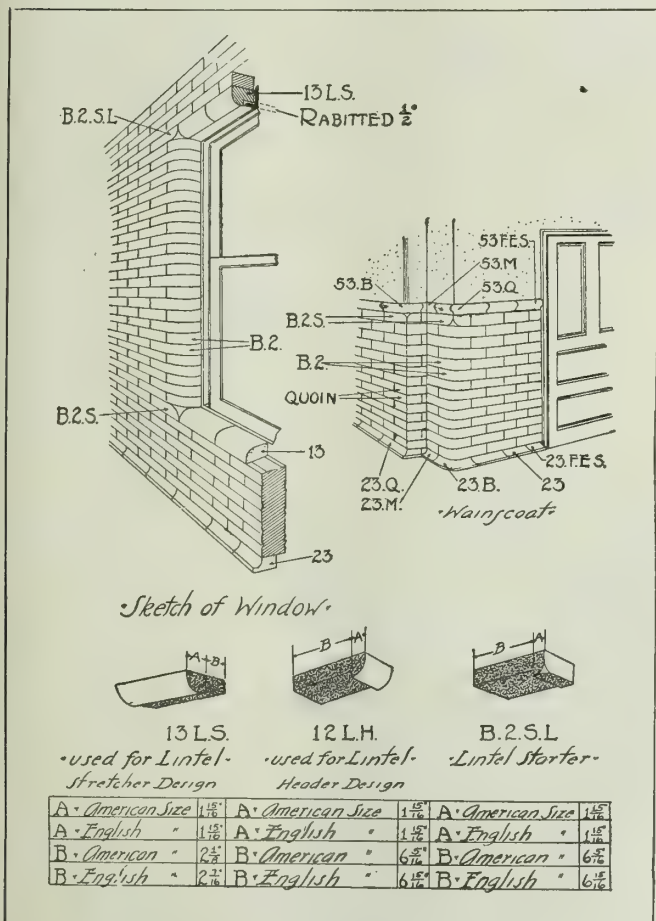
## OGEE MOULD

For projection and dimensions, see key, next page





TYPES OF OGEE, CHAMFER AND BEAD MOULDS  
Specials made to order only  
For type of special returns, see illustration of mould 53  
For projection and dimensions, see key alongside



STUDY OF A WINDOW OPENING; ALSO BASE AND CAP COURSE  
A suggestion for the use of stock specials, eliminating particularly flat and circular arches, which have to be made specially to order, often causing annoying and sometimes serious delays

		No English American		
21	A	21	2"	2"
	A	23	1 1/2"	1 1/2"
	B	21	1 1/2"	1 1/2"
	B	23	1 1/4"	3/4"
31	A	31	3 1/2"	2 1/2"
	A	33	2 1/4"	2 1/4"
	B	31	1 1/4"	3/4"
	B	33	1"	3/8"
41	A	41	1 5/8"	1 5/8"
	A	43	1 1/4"	3/4"
	A	51	1 1/4"	1"
	A	53	3/4"	5/8"
51	A	61	2 5/8"	2 1/4"
	A	63	2"	1 1/4"
	B	61	1 1/4"	1 1/2"
	B	63	1"	3/4"
61	A	71	2"	1 3/4"
	A	73	1 1/2"	1 1/2"
71	A	Flat	American 1 1/2"	Flat 1 1/2"
	B	English 1 1/2"	American 1 1/2"	Flat 1 1/2"
	B	Flat 1 1/2"	American 1 1/2"	Flat 1 1/2"
	B	English 1 1/2"	American 1 1/2"	Flat 1 1/2"

internal Bullnose  
internal octagon  
External octagon  
Standard

Measurements shown are approximate only.

KEY SHEET OF SIZES AND PROJECTION OF SPECIAL SHAPES  
Kept in stock in American size. Made to order in English size

### Details Required for Special Arch Brick Work.

When ordering special arches please consult the accompanying cuts and give all necessary information as to details. Furnish details as long as possible in advance of time the arches will be required. We should be allowed from four to six weeks' time to make up arch brick to conform with detail. We keep no arches in stock.

We can not always guarantee uniformity of shade in arches as in regular deliveries of first quality plain stock brick, therefore strongly recommend the use of stock specials for lintels of doors and windows. (See study of window opening on this page.)

You send scale blue prints—we do the rest, viz.:

We make full sized working drawings (shrinkage scale).

We mark drawing so that each different brick has its designating letter or number in arch, and make type-written schedules.

We make every brick as per drawing, each brick marked with designating letter or number as per schedule and drawing.

We ship you copy of drawing and schedule with the brick to serve as guide in setting. The mason should lay each brick in its place on drawing before attempting to set the arch.

We pack arches separately in barrels, and mark barrels distinctly to avoid confusion at job. What can be simpler for you?

# BRADFORD PRESSED BRICK COMPANY

WILLIAM HANLEY, PRESIDENT

BRADFORD, PA.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

## Products.

"BRADFORD PRESSED BRICK" (both dry press and impervious red), (Trade-mark Reg. U. S. Pat. Office), including "BRADFORD REDS," carefully sorted to shade and size, and "BRADFORD RUFFS," rough textured face of beautiful shade variation; HOLLOW TILE and PARTITION TILE.

Paving Blocks.

Specialists in RED BRICK of various shades.

## "Bradford Pressed Brick."

"Bradford Pressed Brick" are made of the famous Bradford red shale and popularly known as "Bradford Reds" and "Bradford Ruffs."

## Shapes.

Standards, Romans, 8-in. Romans, tiles, and brickettes; also, in ornamental designs.

## "Bradford Reds."

A smooth faced brick, adapted for fine buildings. Wherever a distinctive unfading red, combined with remarkable durability of material, is desired, "Bradford Reds" are admittedly superior. They are carefully sorted to insure uniformity of shade, and the texture and size are invariable. They also lend themselves admirably to the construction of artistic mantels, pilasters, arches, etc. They are made in both dry pressed and impervious.

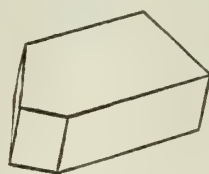
## "Bradford Ruffs."

"Bradford Ruffs" are rough textured face brick, made in beautiful shade variations and adapted for producing unusual effects. The material is the same distinctive Bradford red shale used in "Bradford Reds," and they produce a beautiful flat red finish. Laid with mixed shades and wide mortar joints they give an appearance that is both artistic and unique.

In these two products the BRADFORD PRESSED BRICK COMPANY has specialized for years, to the end that it has earned the name throughout the United States and Canada of "The Red Brick People."

## Moulded Brick; Arches.

A large line of moulded and ornamental brick are carried in stock and any special shape not shown in the catalogue will be made. When special moulds are required, from 4 to 6 weeks should be given to insure good work. The company will correspond with architects regarding their requirements at any time. Full sized detail sketches should accompany any order for special moulds or arches. Arch brick of any size or style can be produced from drawings submitted by architects.



NO. 2 OCTAGON OR BAY WINDOW BRICK



NO. 6 JAMB BRICK  
3-in. bead



NO. 11 JAMB BRICK  
4-in. radius



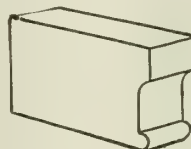
NO. 12 RADIUS OR  
CIRCLE BRICK



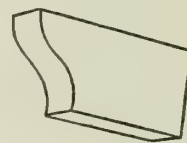
NO. 46 STRETCHER  
Projection 1 in.



NO. 48 STRETCHER  
Projection 1 3/4 in.



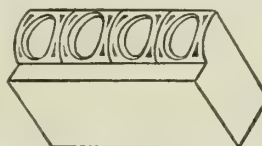
NO. 54 HEADER  
Projection 1 3/4 in.



NO. 56 HEADER  
Projection 2 3/8 in.



NO. 62 HEADER  
Projection 1 3/8 in.



NO. 100 STRETCHER  
Projection 1 in.



NO. 112 STRETCHER  
Projection 1 3/8 in.



**Hollow Tile Construction.**

Owing to its undoubted economical advantages, hollow tile construction is rapidly displacing common brick for backing-up purposes. Among other things, it saves 40% of the cost of material and labor, and produces a drier wall, making it practicable to apply the plaster direct to the wall and avoiding the expense of furring.

The construction is rapid and economical and buildings are warmer in winter and cooler in summer, thanks to the air cells within the tile, and the structure is fire-proof.

This company also manufactures hollow tile smooth on two faces, which is being used extensively in buildings of every description. These tile possess the same rich red color as the famous "Bradford Reds" and are gas burned. The United States Government is using this smooth tile in the construction of the Armor Plate Plant, Charleston, W. Va., and at Picatinny Arsenal, Dover, N. J. The feature of the smooth blocks is that a finished wall is presented when laid.

These blocks can be furnished with a rough textured face in variegated red colors. They appear to best advantage when set with  $\frac{3}{4}$ -in. mortar joints raked out to a depth of  $\frac{1}{4}$  in. Made in all sizes from 3 by 12 by 12 ins. up to and including 12 by 12 by 12 ins., also 5 by 8 by 12 ins.

This company manufactures tile for partition walls, and also furnishes a dovetailed tile suitable for exterior walls.

Samples and prices on request.

**Ford Buildings.**

The accompanying illustration shows one of the numerous Ford buildings throughout the United States and Canada, built of "Bradford Reds."

The fact that these have been specified by John Graham, architect, for all Ford buildings, regardless of location, and freight differentials, is a strong testimonial to their merit.

The latest Ford building to be constructed of these brick is that at Minneapolis, a twelve-story structure.

**Open Fireplaces.**

In the construction of the back, the key to the whole fireplace, it is important that it should not be drawn forward at all sharply until well up toward the top of the fireplace opening, otherwise, even with an excellent draught, smoke will strike the top of the opening, particularly if it is of square cross section, as is the case with a brick arch, allowing an occasional puff of smoke to be deflected into the room, particularly when a fresh fire is started.

Dimensions are subject to conditions. For a cord stick the opening should be 4 ft. 4 ins. in the rear by 34 to 36 ins. high, with sloping sides at an angle of 45°, or a little less, to the front of the opening, and not less than 20 ins. deep.

32 ins. wide by 30 ins. high by 18 ins. deep is a common opening allowing two stretchers, and a header for piers in a 6-ft. breast.

The flue is one of the most important factors, and a very good rule is to allow 13 sq. ins. for every square foot of opening. Thus in a fireplace 4 ft. wide by 3 ft. high or 12 sq. ft. you would have 156 sq. ins. of flue or approximately 9 by 18 ins., and in the above 32 ins. by 30 ins. a flue 8 by 12 ins.

Each fireplace should, by all means, have its own flue.

**Information, Prices and Catalogues.**

Estimates, samples, and all other information necessary for specifying "Bradford Pressed Brick" will be furnished.

Mantel Catalogue, also Red Catalogue of Ornamental Brick, sent on request.

**References.**

Some buildings constructed of "Bradford Reds."  
 Ford Office Buildings throughout the country  
 Scribner Building, 311 West 43rd Street, New York, N. Y.  
 Residence of Bishop Hoban, Scranton, Pa.  
 St. Mary's Hospital, Niagara Falls, N. Y.  
 Garfield Public School, Garfield, N. J.  
 Mother House of Sisters of Mercy, Buffalo, N. Y.  
 J. S. McKay, Residence, Windsor, Ont.  
 14th District School, Cincinnati, Ohio  
 Burrell Building, Buffalo, N. Y.  
 Henry Ford Hospital Buildings, Detroit, Mich.  
 Municipal Buildings, Randall's Island, New York, N. Y.



ONE OF THE NUMEROUS FORD BUILDINGS

# B. MIFFLIN HOOD BRICK COMPANY

Manufacturers of Tile, Brick and Terra Cotta

1014-15-34 Candler Building  
ATLANTA, GA.

REPRESENTED BY LEADING TILE AND BRICK DEALERS IN PRINCIPAL CITIES

## Products.

"POTTRY" TILES for all purposes; QUARRY TILE; PROMENADE TILE; BRICK for all architectural and structural uses; ARCHITECTURAL TERRA COTTA; FIREPLACES; STEPS.

## "Pottry" Tiles.

QUALITY—"Pottry" is made of pulverized pottery or *whisky jugs*, mixed with high grade shale.

The pottery acts as the backbone, like steel in reinforcing concrete, thus enabling us to burn at very much higher temperatures, producing a wealth of beautiful colors and rich textures heretofore unequaled, and at the same time preserving trueness as to shape and size.

TEXTURES—"Pottry" products are made in three textures.

The roughest is a twisted wire-cut called "Oriental"; medium is a straight wire-cut called "Matt," and the least rough is a comparatively smooth texture made by the die surface called "Old Flemish."

All shapes with the Old Flemish texture possess the Matt texture on the reverse side.

COLORS—Mingled shades of reds, browns, purples and blues with fire flashed edges and intermingled centers.

STOCK SHAPES—100 different sizes and shapes in the three artistic textures are carried in stock for immediate shipment.

The triangular shapes are perfectly cut and especially adapted for diagonal patterns in walls, fireplaces and floors in any of the three textures.

GUARANTEE—Our product is guaranteed to stand Canadian winters. It is used extensively in acid tower construction, because it is insoluble in boiling nitric

and sulphuric acids. Due to its vitrification and toughness, it is used as a lining for ladles in steel plants.

ESTIMATES AND CO-OPERATION—We will gladly render assistance in the adaptation of "Pottry" material to architects' designs and in estimating costs for appropriations.

To secure the best results, "Pottry" should be specified under allowance, reserving to the architect the right of selection. Samples sent on request.

Special shapes, other than our stock specials, will be executed in accordance with architects' designs. A free service department is at the command of architects.

## Quarry Tile, Promenade Tile and Brick.

Quarry tile in standard shapes repressed like imported tile. Promenade tile and the following brands of brick: Hood's Oriental, Hood's "Pottry," Southern Harvards and Smooth Impervious. New products are being developed; special sizes are being standardized and carried in stock. Ask for blue prints of stock sizes, fireplaces and books of views.

## Fireplaces.

Hood's fireplaces are furnished in tile of 1 in. and 2 in. thicknesses, also brick thickness. Thousands of interesting designs can be executed from our stock mantel shapes, in either smooth or rough texture.

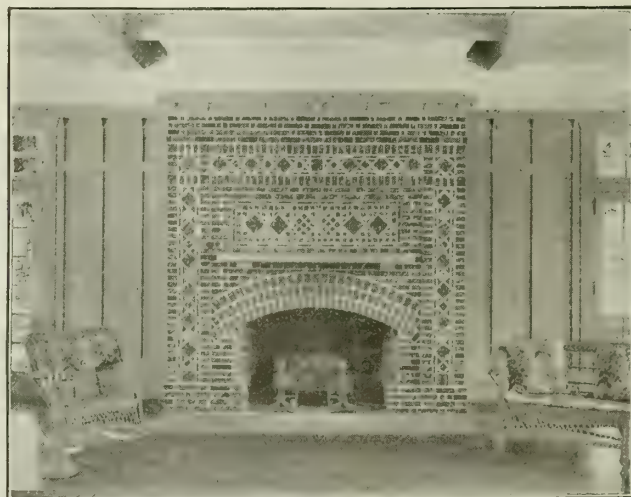
## Representation.

This company is represented by the leading mantel and tile dealers for "Pottry" fireplaces and tile, and by brick agents for inserts and landscape work.

For long distance shipments our special tile ½-in. thick is economical. New sizes, shapes, colors and textures are being developed from time to time.



DRUID HILLS GOLF CLUB, ATLANTA, GA.  
10,000 sq. ft. of 8 x 4 x 1 in. "Pottry" tile on terraces

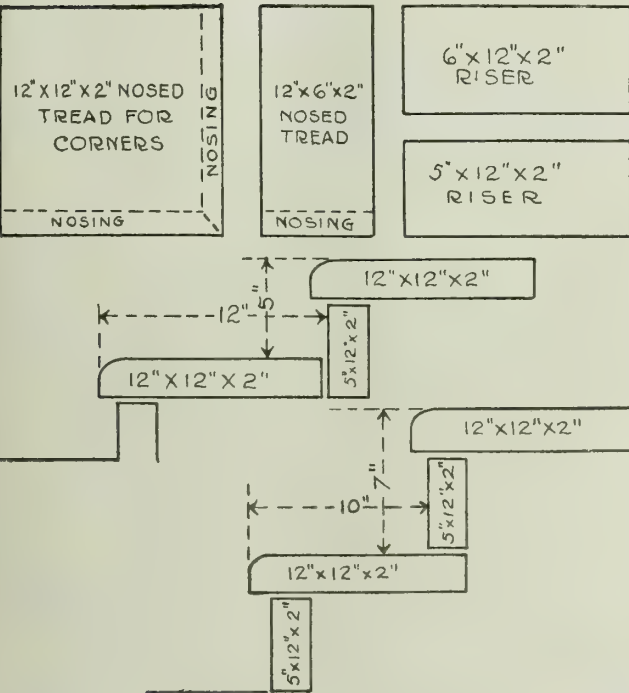


"POTTRY" FIREPLACE—DESIGN NUMBER 49  
Made from scrap whisky jugs and shale. Dimensions, 7 ft. wide by 5 ft. 9 ins. high. Opening 3 ft. 9 ins. high by 4 ft. 6 ins. wide. Hearth 7 ft. by 2 ft. 3 ins. Designed from stock sizes, which range from 1 to 12 ins.



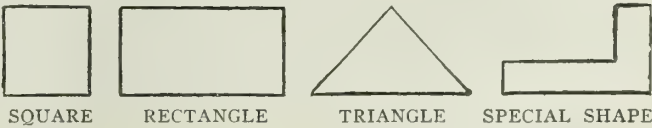


GILES RESIDENCE, ORLANDO, FLA.  
HENRY GREEN, Contractor  
L. PERCIVAL HUTTON, Architect  
Walks, steps and terraces are of Hood's Old English vitrified shale brick



DETAILS SHOWING "POTTRY" TILE STANDARD STAIR  
UNITS IN STAIR CONSTRUCTION

"Pottry" Tile and Brick.



DATA OF SIZES AND THICKNESSES					
SQUARE		RECTANGLE		TRIANGLE	
Sizes	Thickness	Size	Thickness	Size	Thickness
8" x 8"	1", 2" and 4"	8" x 4"	1", 2" and 4"	3" x 3"	1" and 2"
6" x 6"	1" and 2"	6" x 3"	1" and 2"	4" x 4"	1" and 2"
4" x 4"	1", 2", 4" and 5"	6" x 2 1/4"	1" and 2"	6" x 6"	1" and 2"
		6" x 1"	1" and 2"	8" x 8"	1" and 2"
3" x 3"	1" and 2"	6 3/4" x 1"	2"	QUARRY TILE	
2 1/4" x 2 1/4"	1", 2" and 4"	2 1/4" x 1"	2"	Size	Thickness
2" x 2"	1"	4" x 2 1/4"	1", 2" and 4"	6" x 6"	1"
1" x 1"	1" and 2"	8" x 2 1/4"	1", 2" and 3 3/4"	PROMENADE TILE	
				Size	Thickness
				6" x 9"	1"

Special made from any detail furnished.

Specify.

Hood's "Pottry" Tile-brick.  
Hood's Fireplace Design No. ...—shaded or mingled.  
"Pottry" sizes from 1 by 1 by 1 in. to 12 by 12 by 2 ins.  
Hood's Promenade.  
Hood's "Pottry" Stepping Stones.  
Hood's "Pottry" Landscape Tile.  
Inserts—Texture: Oriental, Matt or Old Flemish



# HYDRAULIC-PRESS BRICK COMPANY

MANUFACTURERS AND DISTRIBUTERS OF

## Hy-tex

The Standard of Quality in Brick

ST. LOUIS, MO.

### Products.

#### SMOOTH TEXTURE

HY-TEX GRAY and BUFF RANGES, in wide variation of tone and shade; HY-TEX RED RANGE, running from light reds to dark browns and blacks; HY-TEX FLAT SET RANGE, bronze and mahogany IRONSPOTS, in variation of shade; HY-TEX EQUITABLE RANGE, in whites and various speckled effects; HY-NAMEL RANGE, in white, cream, green, brown, blue, agate, onyx, delft, and in transparent brown, canary yellow, and speckled tones; HY-TEX COMMON RANGE, in wide variety of reds, a high grade common used for facing in the St. Louis market; WIRE-CUT-LUG and REPRESED PAVERS of the best shales.

HY-NAMELS and HY-TEX EQUITABLES are made in Standard, English, Norman, and Roman sizes, and in a great variety of moulded forms. See our "Catalogue of Moulded and Ornamental Bricks."

#### ROUGH TEXTURE

HY-TEX MATT RANGE in reds, browns, gunmetals, clear or flashed, served in varied mixtures, kiln run, or sorted to shades; HY-TEX CHALDEAN RANGE, in same color-tones as MATT RANGE; HY-TEX FERN LEAF RANGE, in brown shades. Special forms in MATT BRICK made on order.

### Color and Texture.

Our widely distributed clay fields make it possible for our experts to turn out any color or texture in face brick the architect, builder, or owner may need.

### Sizes and Special Forms.

All Hy-tex Brick, except pavers ( $2\frac{1}{4} \times 8\frac{1}{2} \times 4$  ins. to  $3\frac{1}{4} \times 9 \times 4$  ins.), are made standard size. When not in stock, English, Norman, and Roman sizes are manufactured to order. Approximate sizes are as follows:

Standard  $2\frac{1}{4} \times 8\frac{1}{4} \times 4$  ins.  
Roman  $1\frac{5}{8} \times 1\frac{1}{8} \times 3\frac{7}{8}$  ins.  
English  $2\frac{7}{8} \times 8\frac{7}{8} \times 4\frac{3}{8}$  ins.  
Norman  $2\frac{1}{4} \times 1\frac{1}{4} \times 4$  ins.  
Split  $1\frac{1}{8} \times 4 \times 8$  ins.

Moulded or special forms, when not in stock, are made on specification of the architect. Arch brick are ground or moulded to any required radius.

Please note the necessity of getting exact size of the particular brick to be used, as brick vary from  $\frac{1}{16}$  to  $\frac{3}{8}$  in. in dimensions, dependent on the nature of clay or the kiln burn.

### Service.

With our 22 plants and 12 branch offices, besides numerous agencies throughout the country, we can assure the architect or builder of what he must have, *prompt, responsible, and efficient service*. The elaborate and artistic exhibit rooms, connected with all of our offices, are a mine of valuable information and suggestion.

If architects can not visit them, send to us or to our nearest branch office for "The Hy-tex Brick Catalogue" or for samples, when considering face brick.

### Chicago Branch Office.

Chamber of Commerce Building.

### Products.

#### SMOOTH TEXTURE

HY-TEX LOMBARD RED RANGE, in light, medium, and dark shades; HY-TEX CALVERT COLONIAL RANGE, sanded face, in red, brown, green, and black tones.

#### ROUGH TEXTURE

HY-TEX VELOUR RANGE, in maroon, antique, and bronze tones; HY-TEX CHALDEAN RANGE, in varied shades of red and brown.

St. Louis, Davenport, Indianapolis, and Cleveland Ranges of Hy-tex and Hy-namel Brick distributed here.

### Cleveland Branch Office.

Schofield Building.

### Products.

#### SMOOTH TEXTURE

HY-TEX CHERRY RED RANGE, in light, medium, and dark shades; HY-TEX BLACKSTONES, or flashed CHERRY REDS; HY-TEX INDEPENDENCE RED SHALE RANGE, in rich dark reds, running to chocolate tones; HY-TEX ROUND-EDGE PAVER RANGE, a repress shale; HY-TEX OLD ENGLISH, with plain sanded surface or pebbled in imitation of old English brick, in a variation of shades.

#### ROUGH TEXTURE

HY-TEX BOKHARAS (rough horizontal scoring); HY-TEX ORIENTAL BOKHARAS (rough vertical scoring); HY-TEX NELA BOKHARAS (fine horizontal scoring); in a rich variety of red, brown, bluish, bronze, and polychrome effects, served in any desired percentages or in full range of color.

FLOOR TILE, smooth or rough, in a great variety of red, brown, and maroon tones, from  $3 \times 3$  ins. to  $9 \times 9$  ins.

Ornamental Forms in Special Shapes and Sizes are made to meet the architect's design. Consult our Architectural Service Department.

Indianapolis and DuBois Ranges of Hy-tex and St. Louis Hy-namel Brick distributed here.

### Davenport Branch Office.

Putnam Building.

### Products.

HY-TEX RUSTICO RANGE, in green, bronze, purple, and autumn leaf tones; HY-TEX OAK BARK RANGE, with a rough bark texture, in the same color-tones as the RUSTICOS; HY-TEX ANTIQUE MIXTURE, showing variation of olive, mahogany, bronze and old rose effects.

St. Louis, Chicago, and Indianapolis Ranges of HY-TEX and HY-NAMEL BRICK distributed here.

### DuBois, Pa., Branch Office.

Deposit National Bank Building.

### Products.

#### SEMI-SMOOTH AND ROUGH TEXTURE

Reds, Grays and Browns.

HY-TEX FALLS CREEK RED RANGE, in reds, browns and gunmetals, in both Semi-smooth and Rough Textures, Horizontal and Vertical Cut.

HY-TEX COWAN GRAY and BROWN RANGES, in both Semi-smooth and Vertical Texture, in wide variations of artistic color-tones.



Special Sizes and Shapes made on architect's specification.

Rough Texture and Repress Floor Tile, in various shades, suitable for porches, terraces, and hearths.

Philadelphia, Washington, and Cleveland Ranges of Hy-tex and St. Louis Hy-namel Ranges distributed here.

#### Indianapolis Branch Office.

Board of Trade Building.

#### Products.

##### SMOOTH TEXTURE

HY-TEX GOLDEN SALT GLAZE RANGE, in varied light, medium, and dark shades; HY-TEX RED OXFORD STANDARD RANGE, in light, medium, and dark shades; HY-TEX BUFF and GRAY RANGES, in whites, creams, steel grays, varied mottled grays, and light and dark buffs.

##### ROUGH TEXTURE

HY-TEX MATT RANGE, in ivory, gray, golden mottle, and mosaic effects; HY-TEX CHINCHILLA RANGE, in maroon red, seal brown, gunmetal, and black mission tones; FULL RANGE SEAL BROWN, and SARABAND, in blended shades.

St. Louis, Chicago, Cleveland, and DuBois Hy-tex and Hy-namel Ranges distributed from here.

#### Kansas City Branch Office.

Rialto Building.

#### Products.

##### SMOOTH TEXTURE

HY-TEX DIAMOND OXFORD RANGE, in a variation of reds and browns.

##### ROUGH TEXTURE

HY-TEX DIAMOND MATT RANGE; HY-TEX CHALDEAN RANGE, both running in reds and browns, served in full variation or in percentage mixtures.

St. Louis, Omaha, Davenport, Chicago, and Indianapolis Hy-tex and Hy-namel Ranges distributed here.

#### Minneapolis Branch Office.

211 South Fourth Street.

#### Products.

##### SMOOTH TEXTURE

HY-TEX RED PRESS and SAND MOULD GEORGIAN RANGES, running from light to dark reds; HY-TEX COLONIAL SAND MOULD RANGE, in a rich variety of red tones, fire flashed.

##### ROUGH TEXTURE

HY-TEX No. 30 CHENILLE, a Mixed Range, from rich maroon red to dark gunmetal, with flashed and polychrome effects, served also in uniform shades of red.

HY-TEX No. 20 MATT, same Range as above.

St. Louis, Indianapolis, Cleveland, Chicago, DuBois, and Washington Hy-tex and Hy-namels distributed here.

#### New York Branch Office.

Fredenburg & Lounsbury, Representatives,  
381 Fourth Avenue.

#### Products.

##### SMOOTH TEXTURE

WASHINGTON and PHILADELPHIA HY-TEX RANGES; ST. LOUIS HY-NAMEL RANGE.

##### ROUGH TEXTURE

DU-BOIS and PHILADELPHIA HY-TEX RANGES.

#### Omaha Branch Office.

Woodmen of the World Building.

#### Products.

HY-TEX QUIVERA RANGE (rough Chinchilla texture), in wide variation of red, tan, brown, and black tones; VERDE CHROME CHINCHILLA MIXTURE, in greens, purples, browns, and blacks, variegated with a high gloss, a most pleasing combination.

St. Louis, Kansas City, Davenport, Chicago, and

Indianapolis Hy-tex and Hy-namels distributed here.

#### Philadelphia Branch Office.

Real Estate Trust Building.

#### Products.

##### SMOOTH TEXTURE

HY-TEX WINSLOW IRONSPOT RANGE, in rich variation of peach blow and orange tones; HY-TEX EQUITABLE RANGE, in whites and light grays with small or large speckle, served in standard size or, on order, in Norman, English, and Roman sizes; also in various moulded forms.

##### ROUGH TEXTURE

HY-TEX WINSLOW BELGIAN RANGE, in tannish, copper, or bronze effects.

DuBois, Washington, St. Louis Hy-tex and Hy-namel Ranges distributed here.

#### Toledo Branch Office.

Ohio Building.

#### Products.

HY-TEX TOLEDO SAND MOULD RANGE, in uniform deep red tone or kiln run variation; on order, made in Radius, Octagon, and Bullnose forms.

Chicago, Cleveland, Indianapolis, and St. Louis, Hy-tex and Hy-namel Ranges distributed here.

#### Washington, D. C.

Colorado Building.

#### Products.

HY-TEX WASHINGTON RED RANGE (Dry-press), in reds and brown; HY-TEX WASHINGTON GRAY RANGE (Dry-press), in a variation of tones from plain white to dark mottled effects, served in English, Norman, and Roman, as well as standard sizes, and also in moulded and ornamental forms.

DuBois, Philadelphia, and St. Louis Hy-tex and Hy-namel Ranges distributed here.

#### Principal Selling Agencies.

ALLENTOWN, PA., GEORGE K. HALTEMAN, Hunsicker Bldg.  
ATLANTA, GA., SCIPLE SONS, Third National Bank Bldg.  
BINGHAMTON, N. Y., PRATT LUMBER Co.  
BOSTON, MASS., WALDO BROS., 45-49 Batterymarch St.  
BUFFALO, N. Y., JOHN H. BLACK Co., Builders' Exchange  
CINCINNATI, OHIO, D. C. SHOREY BRICK Co.  
COLUMBUS, OHIO, COLUMBUS BUILDERS' SUPPLY Co.  
DALLAS, TEX., FRASER BRICK Co., Sumpter Bldg.  
DES MOINES, IOWA, C. A. BAKER BRICK Co.  
DETROIT, MICH., UNITED FUEL & SUPPLY Co.  
DULUTH, MINN., STANDARD SALT & CEMENT Co.  
ERIE, PA., BOYD & SHAFER, 19th and Parade Sts.  
FLINT, MICH., BRIGGS Co.  
JACKSON, MICH., I. N. DELAMATER.  
JACKSONVILLE, FLA., BAKER & HOLMES Co.  
LANSING, MICH., BRIGGS Co.  
LOUISVILLE, KY., TYLER BUILDING SUPPLY Co.  
MEMPHIS, TENN., MEMPHIS BRICK SUPPLY Co.  
MILWAUKEE, WIS., RICKETSON & SCHWARZ  
MONTREAL, QUE., ALEX. BREMNER, LTD., 100 Bleury St.  
NASHVILLE, TENN., T. L. HERBERT & SON  
NEW ORLEANS, LA., FRITZ JAHNCKE, INC., 814 Howard Ave.  
NIAGARA FALLS, N. Y., MITCHELL BUILDERS' SUPPLY Co.  
NORFOLK, VA., G. S. FRIEBUS, Monticello Arcade Bldg.  
OKLAHOMA CITY, OKLA., LUMBERMEN'S SUPPLY Co.  
PEORIA, ILL., DERING & OLIVER Co., Lehmann Bldg.  
PITTSBURGH, PA., MARTIN BRICK Co., Empire Bldg.  
QUEBEC, QUE., PRUNEAU & Cie, 14 Rue St. Pierre  
RICHMOND, VA., R. MASSIE NOLTING, Mutual Bldg.  
ROCHESTER, N. Y., AMERICAN CLAY & CEMENT CORPORATION  
SEATTLE, WASH., F. T. CROWE & Co., 1003 First Avenue  
SPRINGFIELD, MO., LUMBERMEN'S SUPPLY Co.  
ST. JOSEPH, MO., ST. JOSEPH PRESSED BRICK Co.  
ST. PAUL, MINN., CORNING-DONOHUE BRICK Co.  
SYRACUSE, N. Y., PARAGON PLASTER Co.  
TAMPA, FLA., I. W. PHILLIPS & Co.  
TOPEKA, KAN., LUMBERMEN'S SUPPLY Co.  
TORONTO, ONT., DRUMMOND & REEVES, LTD., Mail Bldg.  
UTICA, N. Y., AMERICAN HARD WALL PLASTER Co.  
WICHITA, KAN., LUMBERMEN'S SUPPLY Co.  
WINNIPEG, MAN., N. J. DINNEN & Co., LTD.



# KUSHEQUA BRICK COMPANY

## Manufacturers of Face Brick and Paving Materials

### KUSHEQUA, PA.

#### Products.

VITRIFIED SHALE FACE BRICK, FLOORING and PAVING MATERIALS.

#### Kushequa Face Brick.

The characteristics of Kushequa face bricks are their deep color (specially dark red), great strength and high vitrification. Kushequa face bricks are made in the following types; Kq Paver, Wire-cut, Ox-blood Devonshire, Velours, Saruk and Blackheaders.

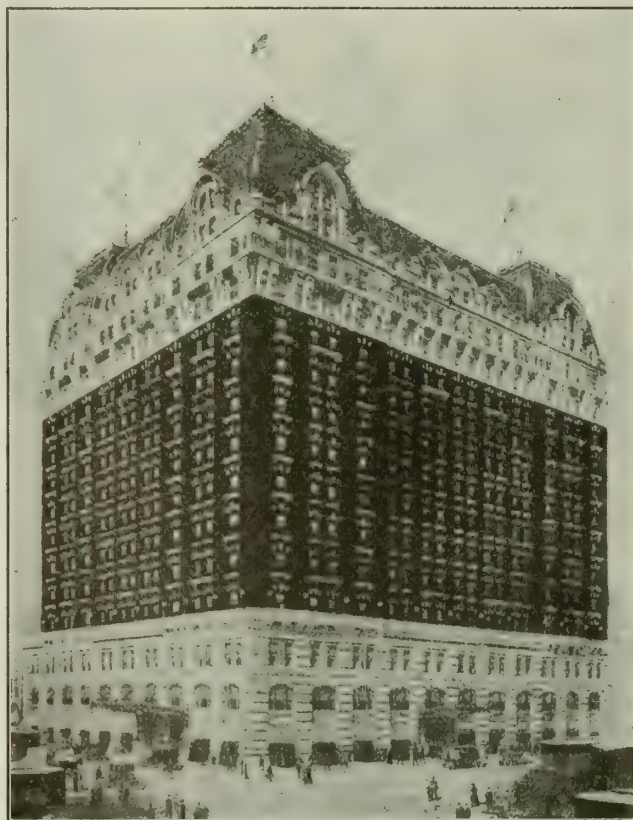
**KQ PAVER**— $2\frac{1}{4}$  by  $8\frac{1}{4}$  by  $3\frac{7}{8}$  ins.; weight  $6\frac{1}{8}$  lbs. This brick is repressed, with bevel edges and resembles a small paving block. It gives the effect of massive strength and is particularly pleasing in large buildings. Two shades, dark and light. In second quality it makes a handsome front at low cost.

**WIRE-CUT**— $2\frac{1}{4}$  by 8 by  $3\frac{3}{4}$  ins.; weight 6 lbs. A standard red brick with smooth face and wire-cut sides, in 4 shades. Shade 1, exceptionally dark and strong; Shade 2, a dark red brick of moderate cost; Shade 3, a clear red brick for sidewalks and fronts not requiring dark red; and Shade 4, a light red brick, sufficiently vitrified to withstand wet and frost. Shades 3 and 4 in mixture form our cheapest face brick.

**OX-BLOOD DEVONSHIRE**— $2\frac{1}{4}$  by 8 by  $3\frac{3}{4}$  ins.; weight  $5\frac{3}{4}$  lbs. Very rough texture and a clear, uniform red color. Shade 1, the darkest clear red on the market; Shade 2, a fine deep red; Shade 3, a bright red. The second quality in mixed shades is amply good for any large front and is recommended where price is an object.

**VELOURS**—Similar to Ox-blood, but of finer texture, giving a velvety appearance.

**SARUK**— $2\frac{1}{4}$  by 8 by  $3\frac{7}{8}$  ins.; weight  $5\frac{3}{4}$  lbs. The rough texture and variegated color gives this brick an Oriental rug effect. The hues harmoniously blend from deep red through old rose to greenish gray, and from bronze to tan. To get the best effect, it should be



HOTEL SHERMAN, CHICAGO, ILL.  
Faced with 500,000 Kq Pavers  
HOLABIRD & ROCHE, Architects

laid with dark mortar joints, not exceeding  $\frac{1}{2}$  in., raked. Saruks are choice enough for a parlor mantel, yet cheap enough for a fine hotel front. Second quality Saruks look well in large buildings, especially where "tapestry" effects are desired.

**BLACKHEADERS**—This brick is of rough texture, salt glazed, both ends glossy black. In laying, it is usually broken across so that both heads may be displayed in connection with our red stretchers, giving a checker-board or extreme Harvard effect.



LOUIS SEELBACH RESIDENCE, LOUISVILLE, KY.  
Faced with 80,000 Wire-cut Shade 2  
McDONALD & DODD, Architects, Louisville, Ky.



WESTMINSTER PRESBYTERIAN CHURCH, ROCHESTER, N. Y.  
Faced with 100,000 Saruk and Ox-blood mixed



### Paving and Acidproof Materials.

This company commenced business in 1904 with the manufacture of paving blocks out of a strongly ferruginous mountain shale highly vitrified by natural gas. The beauty of color and finish of the product created such demand for building purposes that, for several years, the capacity of the factory was principally taken for face bricks. The high vitrification of our products makes them acidproof and electric insulating. Such products comprise:

**KUSHEQUA REPPRESSED PAVING BLOCK**— $3\frac{1}{2}$  by  $8\frac{3}{4}$  by 4 ins.; weight, 10 lbs. Tough, durable, impervious and handsome in finish. Guaranteed to lay 40 per sq. yd., street measure.

**KQ PAVER**— $2\frac{1}{4}$  by 8 by 3 ins.; weight 6 lbs. Although made for a face brick, this is used extensively in municipal as well as private paving. Wire-cut,  $2\frac{1}{4}$  by 8 by 3 ins. This standard face brick in Shades 1 and 2 is sometimes set edgewise for street paving. In Shade 3, it is often laid on flat for sidewalks.

**BRICKETTE**— $2\frac{1}{4}$  by 8 by 2 ins.; weight,  $3\frac{1}{2}$  lbs. A dark red, thoroughly vitrified brick, useful for floors where hard wear is desired but unnecessary depth is objectionable. It is beautiful for porch floors and hallways. The Mall or concourse at Staten Island end of New York's Municipal Ferry is paved with Kushequa Brickets. It is a favorite for packing house floors.

**FLOOR BRICK**—4 by 8 by  $1\frac{3}{4}$  ins.; weight,  $4\frac{2}{3}$  lbs. Specially made for packing house floors to resist grease, hot water and heavy trucking. One side and two edges smooth; wire-cut back and ends. Durability and lightness are combined. For equal wearing surface the depth and weight are only half as great as with standard brick. The second quality looks well for porch or vestibule floors or hearths. Second quality, laid reverse side up, makes a superior sidewalk brick, edges showing no kiln marks.

**BATTERY ROOM FLOOR TILE**—8 by 8 by 2 ins.; weight, 11 lbs. Specially made for the purpose of insulating acidproof floors of electric storage battery rooms. Lugs on two opposite sides project  $\frac{1}{4}$  in. Highly vitrified and very strong.

### Shipping Facilities.

Daily output, 25,000 brick; 200,000 carried in stock of each of four best sellers (Kq Paver Dark, Ox-blood Devonshire Shade 1, Saruk, and Wire-cut Shade 3) to insure promptness. Works are located on the Mt. Jewett, Kinzua & Riterville R.R., a local railroad connecting direct with the Buffalo, Rochester & Pittsburgh Ry., Erie R.R., Pennsylvania R.R., Baltimore & Ohio R.R. and Pittsburgh, Shawmut & Northern R.R., whereby this company secures competition in freight rates, prompt car supply, and a minimum of embargo annoyances.

### References.

The following is a partial list of buildings in which Kushequa products were used, giving the location, architect, kind and quantity:

#### FACE BRICK

Thorp School, Lockwood and Berteau Streets, Chicago, Ill., A. F. Hussander; Brown Saruk, 60,000.  
San. Dist. Pump Sta., Mohawk and Menominee Streets, Chicago, Ill., F. J. Barrett; Ox-blood Devonshire, 40,000.  
Collins Apartments, 54th and Cornell Streets, Chicago, Ill., H. L. Newhouse; Kq Paver dark, 60,000.



Y. M. C. A. BUILDING, LOUISVILLE, KY.  
Faced with Saruk and Ox-blood Devonshire mixed  
McDONALD & DODD, Architects, Louisville, Ky.

G. S. Bridge, Residence, Evanston, Ill., Geo. W. Maher; Velours Shade 2, 30,000.  
Hotel Sherman, Clark and Randolph Streets, Chicago, Ill., Holabird & Roche; Kq Paver dark, 500,000.  
Stock Yards Inn, Chicago, Ill., R. L. Lindstrom; Ox-blood Devonshire Shade 1, 450,000.  
Highlands Co., 6811 Euclid Avenue, Chicago, Ill., J. R. Stone; Kq Paver dark, 25,000.  
Callahan Apartments, 1622-24 Garfield Boulevard, Chicago, Ill., Worthmann & Steinbach; Kq Paver light, 35,000.  
Y. W. C. A., Brooklyn, N. Y., Frank Freeman; Saruk and Ox-blood (Gardens), 180,000.  
Erie R. R. Station, Ridgewood, N. J., Graham King; Saruk, 40,000.  
Electric Power Plant, South Framingham, Mass.; Kq Paver (2nds), 90,000.  
Fire and Truck House No. 8, Germantown Avenue and Bringhurst Street, Philadelphia, Pa., W. B. Powell; 50,000 Wire-cut Shade 3; 52,000 Blackheaders.  
8th District Police Station, 10th and Buttonwood Streets, Philadelphia, Pa., W. B. Powell; 47,000 Wire-cut Shade 3; 48,000 Blackheaders.  
Church of Our Lady of Rosary, Yonkers, N. Y., John V. Van Pelt; Saruks.  
Boys' High School, Louisville, Ky., J. E. Henry; Ox-blood and Saruk mixed, 225,000.  
Louis Seelbach, Residence, Louisville, Ky., McDonald & Dood; Wire-cut Shade 2, 65,000.  
Westminster Presbyterian Church, Rochester, N. Y.; Saruk and Ox-blood Devonshire mixed, 100,000.  
Colonial Theater, Dayton, Ohio; Ox-blood Devonshire Shade 1, 27,000.  
Eagles' Temple, Jamestown, N. Y., Freeburg & Fidler; Saruk.  
United Evangelical Church, Oil City, Pa., J. C. Brenot; Saruk, 90,000.  
Mayo Bros. Clinic Hospital, Rochester, Minn.; Kq Paver, 125,000.  
Mayer Bros.' Block, Erie, Pa., Richard Irvin; Velours, 250,000.  
Academy High School, Erie, Pa., Wm. B. Ittner, St. Louis, Mo.; Saruk, 250,000.

#### PAVING MATERIALS

D. B. Martin Co., Packing House, Claremont, Baltimore, Md.; Brickette, 57,000.  
J. J. Felin Packing House, Philadelphia, Pa., C. B. Comstock; Floor Brick, 140,000.  
Solvay Process Co., Syracuse, N. Y.; Battery Room Floor Tile.  
Electric Storage Battery Co., North Philadelphia, Pa.; Wil-lard Floor Tile.  
C. K. G. Billings, Driveways, Riverside Drive, New York, N. Y.; Kq Paver (Spl.).  
W. M. Rice Institute, Courts and Cloisters, Houston, Tex., Cram, Goodhue & Ferguson; Kq Paver, 25,000.  
Hammond Packing Co., Packing House, East Liberty, Pittsburgh, Pa.; Floor Brick.  
Kingan & Co., Packing House Floor, Richmond, Va.; Brickets.

# WESTERN BRICK COMPANY

Manufacturers of All Kinds of Brick, Building and Partition Tile

GENERAL SALES OFFICE AND FACTORIES

DANVILLE, ILL.

BRANCH SALES OFFICES

PEORIA, ILL., 720-22 Jefferson Building

INDIANAPOLIS, IND., 804 Hume-Mansur Building  
FT. WAYNE, IND., 305-08 Shoaff Building

REPRESENTATIVES IN ALL PRINCIPAL CITIES OF THE MIDDLE WEST AND THE NORTHWEST

## Products.

FACING BRICK: "CLOISTER," SIDE-CUT, IMPERVIOUS; "RUGS," VERTICAL SCORED ROUGH TEXTURE; "EMPIRE," MATTE OR ROUGH TEXTURE; "DORIC" and "GOTHIC," STIPPLED TEXTURE.

Various grades of VITRIFIED, IMPERVIOUS and SEMIPOROUS COMMON BRICK.

BUILDING and PARTITION TILE and STANDARD HOLLOW BRICK.

All products are manufactured strictly from shale and fire clay.

## Facilities.

The WESTERN BRICK COMPANY manufactures annually 100,000,000 brick and tile at the three plants. The shale and clay supply for these factories is practically inexhaustible; fuel supply is owned by the company in sufficient quantities to last at least twenty-five years. Shipping facilities are unequaled, as the product can be distributed from Danville over 7 railroads. Plants have side track room for about 75 cars, and ordinary daily shipments, during the building season, exceed 500,000. Over 1,000,000,000 of brick have been manufactured and marketed.

## "Cloister" or 400 Series.

A medium priced, impervious, side-cut facing brick, manufactured from shale. Colors range from bright red through the intermediates to dark brown. Treated in the early stages of manufacture, in order to eliminate all harsh glaze. This face brick is absolutely the best value for the money that can be produced, and we are able to sell it at prevailing prices only on account of our exceptionally large production.

About 200,000,000 have been marketed in the middle West. The absorption is well below 4%, and the crushing strength exceeds 10,000 lbs. to the sq. in. None of the "Cloister," or 400 series, are of rough texture on face.

A brief description of various shades follows:

## "Cloister" No. 420.

Soft, velvety, grayish brown, with headers somewhat darker than the faces. Kiln marks are not prominent, and are of about the same shade as the headers.

A distinctive Western product, burned as hard as shale can be burned.

## "Cloister" No. 430.

Brownish edge, with deep red center are the prevailing characteristics of this brick. Headers are darker than the stretchers, and the wall is full of life and character.

## "Cloister" No. 440.

This shade is dark, wine red to brown; kiln marks show brownish black. Not sorted to uniform color but to shades that will give a well blended effect in the wall.

## "Cloister" No. 450.

A brilliant red brick, quite uniform, one of the most attractive of the "Cloister" shades.

## "Cloister" No. 460.

A light red facing brick, sold at very low price, suitable for unimportant buildings, inside facing, etc.

## "Western Rugs" or Vertical Scored Rough Texture; "Persians" or Horizontal Matte Texture.

Thoroughly burned, and ranging in color through the reds and purples. These "Rugs" and "Persians" are manufactured in very large quantities, and price will be found very moderate.

Following are brief descriptions of various shades:

## "Western Rugs" No. 531.

A beautiful rich, oriental red, shading toward wine color and purple; texture rough enough to show plenty of life, giving rich, warm, red effect. (Same shade in "Persians" No. 540.)

## "Western Rugs" No. 551.

A bright red; almost carmine in color. (Same shade in "Persians" No. 550.)

## "Western Rug Mixture."

A beautiful mingling of all shades which can be produced in burned shale. Effect can be varied to suit the purchaser. (Same mixture or mingled shades in matte texture called "Persian Mixture.")

## "Doric" and "Gothic" Stippled Brick.

This is of a new refined texture, developed by this company and placed on market January, 1916. The



principal feature is the elimination of all grain or lines by use of stippling process, making a myriad of small indentations. Colors in this texture are refined, deep and soft.

**"Empire."**

"Empire," of horizontal matte texture, in shades described below:

**"Doric" No. 871.**

Very dark purplish brown, and black, quite uniform in color. (Same shade in matte texture is "Empire No. 810.")

**"Doric" No. 872.**

Deep brown, with slight purplish cast; not absolutely uniform. (Same shade in matte texture is "Empire" No. 820.)

**"Doric" No. 875.**

A variant from No. 872 in that its prevailing color is lighter, the tans are more prominent, and shading not quite so uniform. (Same shade in matte texture is "Empire" No. 825.)

**"Doric" No. 876.**

A golden tan brick, distinctly different in shading from anything else produced; not absolutely uniform, but with sufficient life to make the wall interesting. (Same shade in matte texture is "Empire" No. 830.)

**"Doric" No. 878.**

Lively golden buff, comparatively even in color. (Same shade in matte texture is "Empire" No. 833.)

**"Gothic" No. 972.**

A dark rich brown, fairly uniform in color. (Same shade in matte texture is "Empire" No. 920.)

**"Gothic" No. 974.**

A brownish red mixture, having considerable variation in color, but of perfect blend. (Same shade in matte texture is "Empire" No. 940.)

**"Gothic" No. 973.**

This shade shows considerable variation, ranging through lighter reddish colors. (Same shade in matte texture is "Empire" No. 943.)

**"Gothic" No. 975.**

A red, with wonderful old rose shades. (Same shade in matte texture is "Empire" No. 950.)

**Shapes.**

Octagons, or 45° angles and round corners (2-in. radius), or bullnoses, are kept in stock at all times to match any of the foregoing shades.

Arches or specials, other than the above, can be made to order, cut green and burned, as all the facing brick are burned too hard to be successfully ground.

This work requires from 3 to 5 weeks, dating from the time the full sized details are received.

**Western Commons.**

These bricks are all manufactured from shale, and in the hard burned varieties are impervious and vitrified.

The company does not ship any common brick "kiln run," as all are carefully sorted for *hardness* (not for color) into 3 grades described below:

**VITRIFIED HARD COMMONS**—Very low absorption, and thoroughly vitrified. Not selected for color.

**MEDIUM HARD COMMONS**—Very durable, and can be used for all classes of work, either foundation or superstructure. Not selected for color.

**LIGHT COMMONS**—Suitable only for inside work, and are not recommended or suggested for use in work exposed directly to the weather.

**Chimney Brick No. 460.**

A light red, cheap, facing brick, selected for color and packed in straw.

Suitable for chimney tops and facing of unimportant buildings.

**Western Hollow Brick.**

These are manufactured from shale and are very high in crushing strength, exceeding 3500 lbs. to the sq. in.

Furnished in 2 grades, vitrified or semiporous.

**Western Partition and Building Tile.**

The following sizes, with returns and halves are kept in stock; other sizes can be made to order:

4 by 5 by 12 ins.; 5 by 8 by 12 ins.; 3 by 12 by 12 ins.; 4 by 12 by 12 ins.; 6 by 12 by 12 ins., and 8 by 12 by 12 ins.

These are manufactured from shale, with proper scoring, and are graded for hardness into vitrified and semiporous.

**Literature.**

Send postal for booklet on "Art of Stippling."

# STARK BRICK COMPANY

Manufacturers of Face Building Brick

CANTON, OHIO

REPRESENTATIVES

FACTORY  
OSNABURG, OHIO

BOSTON, MASS., FISKE & Co., INC.  
PROVIDENCE, R. I., P. L. MONROE & SON  
PHILADELPHIA, PA., A. S. REID & Co.  
NEWARK, N. J., A. S. REID & Co.  
SCRANTON, PA., R. N. LABAR  
PITTSBURGH, PA., MARTIN BRICK Co.  
CLEVELAND, OHIO, CUYAHOGA BUILDERS SUPPLY Co.  
COLUMBUS, OHIO, IRONCLAY BRICK Co.  
INDIANAPOLIS, IND., A. B. MEYER & Co.  
FT. WAYNE, IND., WM. MOELLERING'S SONS  
CHICAGO, ILL., S. S. KIMBELL BRICK Co.  
DETROIT, MICH., FREDERIC B. STEVENS  
ST. PAUL, MINN., TWIN CITY BRICK Co.  
ST. LOUIS, MO., ILLINOIS SUPPLY & CONSTRUCTION Co.

LOUISVILLE, KY., R. B. TYLER Co.  
CINCINNATI, OHIO, PURSELL-GRAND Co.  
TOLEDO, OHIO, TOLEDO PULP PLASTER Co.  
BUFFALO, N. Y., BUFFALO CLAY PRODUCTS Co.  
SYRACUSE, N. Y., FISKE & Co., INC.  
AKRON, OHIO, W. E. WRIGHT Co.  
GRAND RAPIDS, MICH., MICHIGAN FACE BRICK Co.  
DULUTH, MINN., PAINE & NIXON Co.  
DANVILLE, ILL., WESTERN BRICK Co.  
NEW YORK, N. Y., PROTENHAUER-NESBIT Co.  
YOUNGSTOWN, OHIO, YOUNGSTOWN ICE Co.  
MADISON, WIS., WISCONSIN BRICK Co.  
MILWAUKEE, WIS., WISCONSIN FACE & FIRE BRICK Co.  
WASHINGTON, D. C., HYDRAULIC-PRESS BRICK Co.

## Products.

FACING BRICK. SALT GLAZED BRICK a specialty.

## Salt Glazed Brick.

The brick are made from the best fire clay, taking a heavy glaze, free from iron.

The shades are buff, orange and mahogany.

ADAPTABILITY—The company suggests the use of salt glazed brick for interior decoration of walls in the following places: Schools, garages, market houses, dairies, hospitals, domestic science rooms, lavatories, club houses; and for other purposes where cleanliness and sanitary conditions are of prime importance.

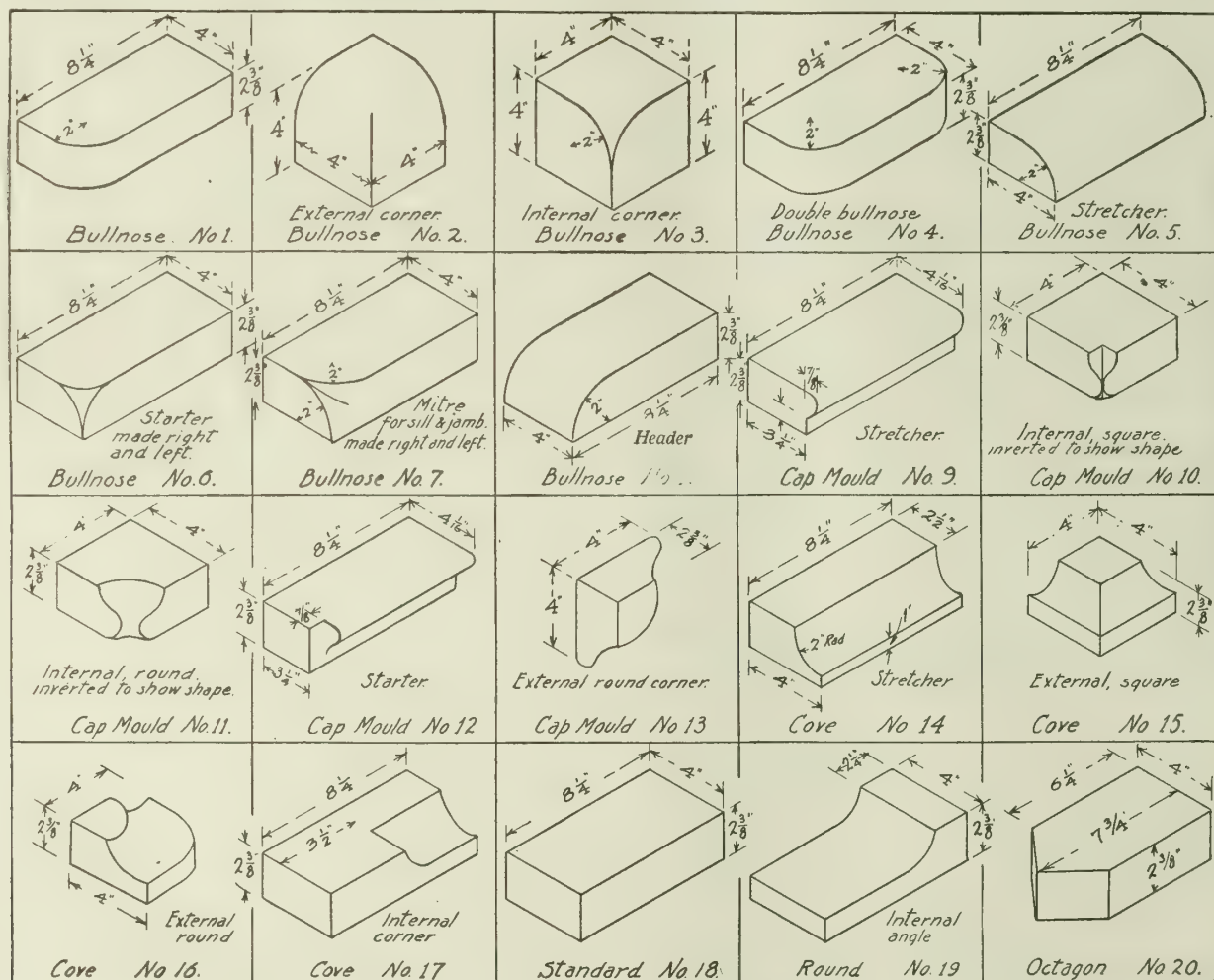
SIZE OF BRICK—Standards are  $8\frac{1}{4}$  by 4 by  $2\frac{3}{8}$  ins. All shapes are made to member with this size.

## References.

STARK BRICK COMPANY products have been used in:

Canton High School, Canton, Ohio  
West Technical High School, Akron, Ohio  
City Hospital, Cleveland, Ohio  
Catholic Club, Canton, Ohio  
Good Samaritan Hospital, Cincinnati, Ohio  
Massillon State Hospital, Massillon, Ohio  
Armour & Company, Garage, Chicago, Ill.

Also glazed brick for a large number of school buildings in the United States and Canada.



STANDARD SHAPES AND SIZES



# ALPHONS CUSTODIS CHIMNEY CONSTRUCTION CO.

Designers and Builders of Radial Brick Chimneys

Bennett Building  
NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, ILL., Marquette Building  
BOSTON, MASS., 261 Franklin Street  
DETROIT, MICH., Moffat Building  
PITTSBURGH, PA., Empire Building  
SEATTLE, WASH., Colman Building

PHILADELPHIA, PA., Pennsylvania Building  
ATLANTA, GA., Healy Building  
MONTREAL, P. Q., CAN., New Birks Building  
TORONTO, ONT., CAN., 506 Kent Building  
VANCOUVER, B. C., CAN.

## Products.

Designers and Builders of PERFORATED RADIAL BRICK CHIMNEYS, with FOUNDATIONS and FLUES, of all sizes, for boilers, furnaces, crematories and ovens. Also CHIMNEYS for smelters, hotels and office buildings; ACIDPROOF CHIMNEYS for paint works and chemical plants; HIGH TEMPERATURE CHIMNEYS for garbage destructors and incinerators.

KILNS, BOILER SETTINGS, etc.

## Services.

The ALPHONS CUSTODIS CHIMNEY CONSTRUCTION Co., through its forty years of experience, is equipped to give expert advice as to the size and shape of any kind of a chimney, for any purpose, as well as make recommendations through its engineers regarding boiler layouts, size, shape and design of flues.

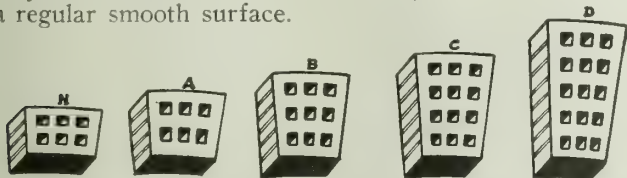
The boilers, the coal used, temperatures, gases generated, geographical location and many other conditions affect the determination of the most economical and efficient size of a chimney. State conditions and the results desired, and the engineers of this company will promptly give the correct, efficient and economical size of chimney, and will make recommendations, not from theoretical tables, but from forty years' experience and unpublished data collected from actual working conditions of our chimneys all over the world.

The fact that over 7000 Custodis radial brick chimneys are now in successful operation is conclusive proof of their efficiency, permanency and economy.

## Description.

The perforated radial blocks are made only from the purest clays, selected for high refractory powers and high crushing strength. Special attention is given in the brickyards to making the proper mix of clays in the right proportion to produce a radial brick chimney which will resist heat strains, as well as strains from weight and wind.

All the radial blocks are formed to suit the circular and radial lines of each part of the chimney, so that they can be laid with thin, even joints and produce a regular smooth surface.



PERFORATED RADIAL BLOCKS

Manufactured in sizes and shapes suitable for all chimney diameters

The blocks are larger than common bricks, making the number of mortar joints in a radial brick chimney one-third of those in a common brick chimney of the same size.

Moulded with vertical perforations, as shown in the illustration, the radial blocks are most thoroughly



and uniformly burned, increasing, to a marked degree, their density and strength. The

perforations form a dead air space around the chimney, insulating the hot column of rising gases on the inside from sudden changes of temperature of the outer air, resulting in a maximum draft under all conditions.

## Flues and Kilns.

This company designs and constructs flues and furnaces. It makes a specialty of building kilns of all kinds. Steel stacks, etc., lined.

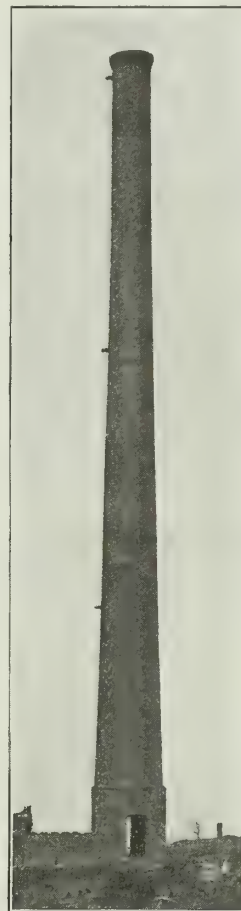
## Remodeling and Repairing.

Old chimneys can be heightened without any interruption to the plant.

Send the height, inside diameter, width at base and wall thickness, or a plan of the old chimney. The engineering department will furnish design, and figure on heightening it. Old brick chimneys can be removed without danger. We repair, straighten and point them while in operation, if necessary. We inspect old chimneys and make reports and recommendations on their condition.

## Information Required.

When requesting estimates, please give the following information:  
Name of place where chimney is to be erected.  
On what railroad siding is same located.  
Distance from siding delivery to chimney site.  
Is chimney to be used for boiler drafts or other purposes.  
Give probable temperatures of the flue gases.  
If for boiler draft, what is total horsepower.  
Kind of fuel or coal to be used.  
Amount consumed per horsepower or total per hour.  
Dimensions of chimney required—diameter; height.  
Is arrangement for overhead or underground flue.  
Give dimensions and shape of flue opening desired in chimney.  
Give height of same above or below foundation top.  
What is nature of soil where chimney will stand.  
What is estimated safe load per square foot.  
What depth of excavation is necessary to reach good soil.  
What is latest date allowed for erection of chimney.  
Sketch showing arrangement of building, boiler and chimney.  
Local prices—red brick, lime, cement and sand.



TALLEST CHIMNEY  
IN THE WORLD, BUILT  
FOR AMERICAN  
SMELTING & REFINING  
CO. (TACOMA  
SMELTER).  
TACOMA, WASH.  
Height above top of foundation ..... 571 ft.  
Inside diameter at top 25 ft.  
Built in 1917

# H. R. HEINICKE, INC.

## Builders of Radial Brick Chimneys

TELEPHONE:  
STUYVESANT 2686  
STUYVESANT 2855

147 Fourth Avenue  
NEW YORK, N. Y.

FACTORY  
NEWCOMERSTOWN, OHIO

### BRANCH OFFICES

BOSTON, MASS., Oliver Building  
CHICAGO, ILL., Corn Exchange Bank Building

PHILADELPHIA, PA., Stephen Girard Building  
CLEVELAND, OHIO, American Trust Building

CONNECTIONS THROUGHOUT THE UNITED STATES

### Products.

Specialists for 35 years in the design and construction of PERFORATED RADIAL BRICK CHIMNEYS and accessory structural members, including Foundations, Boiler Settings and Brick Furnaces.

Manufacturers of PERFORATED RADIAL BRICKS.

### Description of Heinicke Radial Bricks.

Heinicke chimneys are constructed of specially formed perforated bricks. These bricks are shaped to the circular and radial lines of the chimney, producing, when in place, smooth and true inner and outer surfaces.

All radial bricks are produced in the Heinicke brickyards, from selected, chemically tested and carefully proportioned refractory fire clay and shale.

The perforations permit of thorough burning of the bricks, assuring a product which is highly resistant to acids, heat, weather and other deteriorating influences.

### Features of Design and Workmanship.

(A) The perforations in radial bricks form insulating dead air spaces in the wall of the chimney, which reduce radiation and prevent sudden temperature changes within the chimney, resulting in a considerable saving in fuel. The mortar slightly extends into the perforations, forming an anchorage that adds greatly to the stability of the chimney.

(B) Concealed steel bands are used in reinforcing the chimney; these add materially to the strength of the stack in resisting stresses due to expansion, and insure safety against cracking.

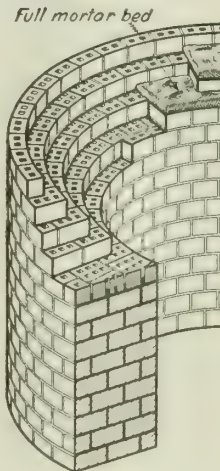
(C) The Heinicke system of bonding provides for the breaking of joints between courses, so that no vertical joint is higher than one brick. Every course is thoroughly bonded through the use of bricks varying in length from 4 to 10 ins. (See sectional detail.) This method of bonding gives a greater compressive strength and resistance to lateral stresses than any other system; the increase in strength over the common bond amounting to about 300%.

(D) The erection of the chimney is done from the inside, thus doing away with outside scaffolding and eliminating accompanying dangers to workmen as well as unnecessary cost.

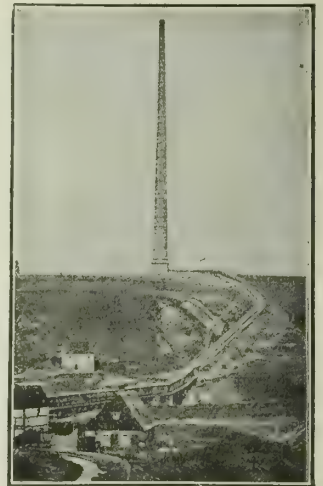
### Estimates.

In writing for information or estimates, please advise on the following points:

- (1) Distance from nearest railroad siding or team track.
- (2) Intended use of chimney (boilers, furnaces, incinerators, smelters).
- (3) Height and diameter, or boiler horsepower, or type, number and dimensions of boilers.
- (4) Kind of fuel to be used.
- (5) Character of soil for foundation.
- (6) Approximate price of cement, lime, sand, gravel, crushed stone and common hard brick, delivered at the chimney site.



SECTIONAL DETAIL  
OF CHIMNEY, SHOW-  
ING HEINICKE BOND



HEINICKE CHIMNEY SERVING  
A SMELTER  
Height, 460 ft.; clear diameter at  
top, 8 ft. Built 1889

### Specifications.

H. R. HEINICKE, INC., have endeavored to draw up a specification insuring a structurally well designed and efficient stack, without any patented material or appliances, enabling any reliable chimney builder to quote on the work. Typewritten copies, ready for use, furnished on request.

**GENERAL**—It is the intention to provide a radial brick chimney.....in height above the top of concrete foundation and of.....minimum diameter at the top, constructed in strict accordance with this specification, which is to become part of the contract.

The chimney contractor shall perform all the work in a practical and workmanlike manner, and shall furnish all labor, material and appliances called for herein, according to the true spirit and meaning of this specification, and any work, material or appliances obviously a part of this work and not called for in the specification shall be furnished by the contractor without extra charge to the purchaser, same as if here specified, described and shown in full. The chimney contractor shall provide all labor, rigging, scaffolding, cartage, etc., necessary for the proper performance of the work. It is the intention and spirit of this specification that the entire work shall be so furnished and installed by the contractor that the chimney will be left complete and ready for successful operation.

**TIME OF COMPLETION**—The contractor shall state in his bid the approximate number of working days in which he will furnish the stack after receipt of contract and approved drawings.

**ABILITY OF CONTRACTOR**—The chimney contractor must show that he has at least 5 years' experience in the building of chimneys such as specified herein.

**GUARANTEE**—The chimney contractor shall guarantee, for a period of 5 years from date of completion, that the chimney will withstand a wind pressure equal to 50 lbs. per sq. ft. on a flat surface, and the influence of combustion gases of a temperature up to 800° Fahr., and that he will, during this period, repair free of charge all defects traceable to inferior material, workmanship or design.

**LOCATION**—The chimney will be built at.....within approximately.....miles from a freight station of the..... Railroad.

Alternate: A siding of the.....Railroad is within..... feet wheeling distance of the chimney site.



**MATERIAL AND WORKMANSHIP**—All material and workmanship shall be first class in every respect; and to secure the greatest durability and efficiency of the stack, the work is to be carried on under the supervision of a competent foreman.

**BRICKS**—All bricks to be used in connection with this work shall be good, hard burned, regular in shape, and of sound ringing. The radial bricks shall have a water absorption of not more than 10% nor less than 5% of their dry weight after being immersed in water for a period of 24 hours. They shall have a crushing strength of not less than 6000 lbs. per sq. in. 1 cu. ft. of radial brick work shall weigh not less than 120 lbs. The radial bricks must conform to the radial and circular lines of the chimney, so as to give a smooth outside finish, and joints of reasonably even thickness. The joints shall not exceed  $\frac{1}{2}$  in. The perforations shall be so arranged that a thorough burning of the material may be obtained, but their total area shall not exceed 25% of the cross area of the brick. The bricks for the outside shall be of .... color.

**Note**—Red and buff radial bricks are held in stock. If other colors are desired, a reasonable time for manufacture must be allowed.

**MORTAR**—All bricks shall be laid in mortar consisting of 1 part of standard Portland cement, 2 parts of fresh lime (not to be used until thoroughly cooled), 6 parts of sand, clean, sharp, and free from loam or vegetable matters.

Running water will be furnished free of charge to the chimney contractor at the chimney site.

**MASONRY**—All masonry work shall be laid as per dimensions shown on the plan. Courses shall be kept level. Face and inside brickwork shall be laid at the same time, with full joints throughout. Special care is to be taken to insure proper bonding.

In common brickwork, at least every fourth course shall be a header course. In radial brickwork, every second layer shall bond through so as to break joints both horizontally and vertically in every course.

**FLUE OPENING**—The flue opening shall be provided. The brickwork above the opening shall be supported by heavy beams protected by a brick arch against the effects of the gases. Special care is to be taken to provide proper re-inforcing and ample space for expansion. Heavy steel bands concealed in the wall shall be provided above and below the opening.

**EXCAVATION**—The foundation soil has a carrying capacity of approximately .... tons, and the chimney contractor shall excavate for a foundation of ample depth and spread to safely sustain the weight of the chimney. After finishing the founda-

tion, the space around the concrete is to be filled in and carefully rammed. Surplus dirt will be removed by the purchaser.

**CONCRETE**—The concrete for the foundation shall consist of: 1 part Portland cement of standard mixture, 3 parts sand, sharp and free from impurities, 5 parts crushed stone or gravel, all properly mixed and rammed in layers not to exceed 8 ins. in thickness.

**BASE**—The base is to be built of common hard bricks.

**SHAFT**—The radial brick shaft must be built plumb and true to center. An ornamental head is to be provided subject to the approval of the purchaser or his representative. Steel bands  $2\frac{1}{2}$  ins. by  $\frac{1}{4}$  in. are to be inserted in the brickwork at every change of wall thickness, and an additional band is to be placed in a full bed of cement mortar at the top of the corbelling forming the head of the chimney.

**LINING**—The lining shall be made of radial bricks about 4 ins. thick, laid in cement lime mortar as specified. It is to be separated from the main wall of the chimney by an isolating air space of not less than 2 ins. It shall start 2 ft. below the bottom of the flue opening and shall extend at least 10 ft. above the top of the same. Proper care is to be taken to prevent any material from falling into the air space during construction or while the stack is in operation. For this purpose, the air space is to be properly covered up, and the method must be shown clearly in the drawing accompanying the bid.

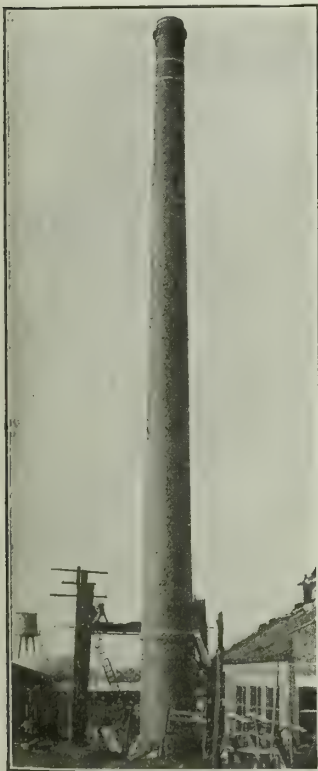
**CHIMNEY LADDER**—Chimney is to be provided with an inside ladder extending the full height of the chimney. The rungs are to be made of  $\frac{3}{4}$ -in. round iron, bent U-shape with hooked ends, and spaced 16 ins. apart.

**Note**—If the ladder is to be placed on the outside of the stack, it should be galvanized.

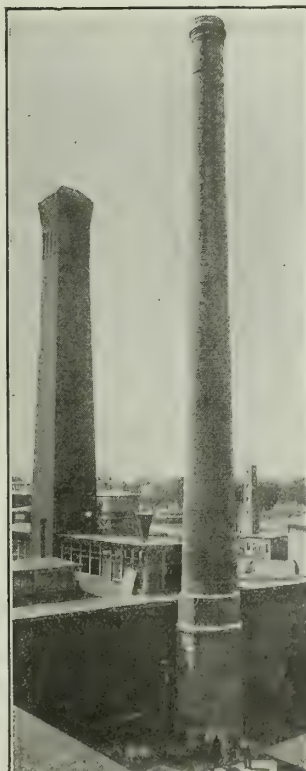
**CAST IRON DOOR**—Tight fitting clean-out door, at least 24 by 30 ins. in the clear, is to be furnished and set.

**LIGHTNING ROD**—Chimney is to be equipped with an approved lightning rod consisting of (see note) points with platinum tips. Earth connection is to be effected by  $\frac{1}{2}$ -in. copper cable, terminating in a copper ground plate, or cylinder of ample capacity. The cable is to be fastened to the stack by means of bronze anchors placed 8 ft. apart. The earth terminal is to be placed in permanently wet earth or a pocket of charcoal.

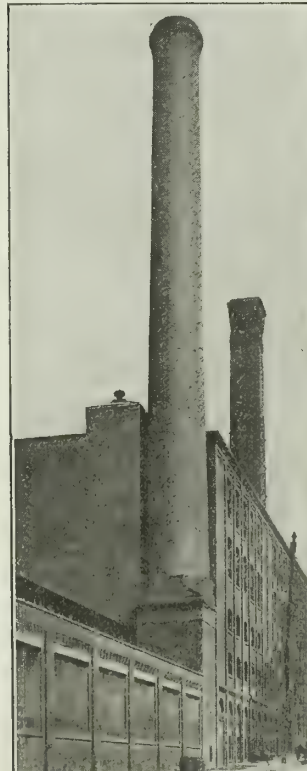
**Note**—Owing to the deteriorating effects of the combustion gases, it is inadvisable to use long points extending 5 or 6 ft. above top of stack. It is recommended to use a larger number of short points, made of copper or bronze, extending only 2 or 3 ins. above top of the stack, protecting them effectively against deteriorating influences. It is recommended to use one point for every 3 ft. outside circumference.



PASSAIC METAL WARE CO.,  
PASSAIC, N. J.  
Height, 125 ft.; clear diameter at top, 3 ft.



GORHAM MFG. CO.,  
PROVIDENCE, R. I.  
Height, 140 ft.; clear diameter at top, 5 ft. 6 ins.



HARDWICK & MAGEE CO.,  
PHILADELPHIA, PA.  
Height, 153 ft.; clear diameter at top, 8 ft.



CLARINDA STATE HOSPITAL,  
CLARINDA, IOWA  
Height, 165 ft.; clear diameter at top, 7 ft. 6 ins.



# THE M. W. KELLOGG COMPANY

Manufacturers of Perforated Radial Brick Chimneys

140 Cedar Street  
NEW YORK, N. Y.

BRANCH OFFICES

BOSTON PHILADELPHIA CHICAGO PITTSBURGH SAN FRANCISCO LOS ANGELES  
MONTREAL, TORONTO, WINNIPEG, CAN., CANADIAN KELLOGG Co., LTD.

## Products.

PERFORATED RADIAL BRICK CHIMNEYS.

## Service.

THE M. W. KELLOGG COMPANY has erected some of the finest chimneys in the United States during the last fifteen years, and is ready to share the results of that experience with architects and engineers who are engaged in problems where chimney construction is required.

This company's engineers will be glad to advise on types, sizes, shapes, etc., of chimneys for any condition that may arise.

## Kellogg Perforated Radial Brick Chimneys.

No artificially produced material for the construction of the modern factory chimney compares with refractory clay. This raw material is put through a variety of scientific treatments by skilled hands and especially designed machines before it comes from the kilns in the form of perforated radial brick ready for shipment, and for use in chimney construction.

Each brick is formed to occupy a certain position in the circular and radial lines of the chimney, as shown by the drawing on this page, and is sound ringing, hard, well burned and free from checks.

Bricks are made to conform closely with the circular and radial lines of the shaft and are weatherproof and acidproof.

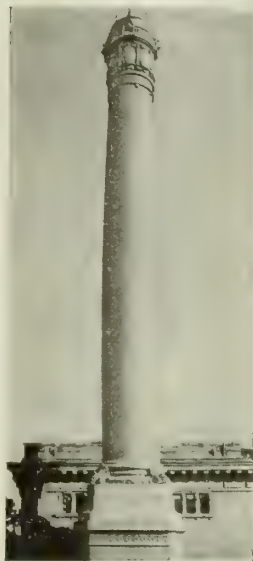
Total amount of perforations does not exceed one-fourth of the cross area of the brick, which are tested to a crushing strength of not less than 6000 lbs. per sq. in.

The perforations in the radial bricks form a dead air space about the core of the chimney. This has a marked effect in reducing amount of fuel used, in preventing sudden changes of temperature within the chimney, and in reducing radiation. Thus a uniformly maximum draft is maintained in any kind of weather.

A trained superintendent of construction, familiar with all the details of the plans and specifications of the chimney, accompanies each shipment of radial brick, to supervise unloading and stacking in the order of their use. Throughout the entire construction the bricks of each tier reach their final place under his direction.

An expert mortar man supervises the preparation and use of all of the mortar. The tensile strength of the chimney, its ability to withstand heat and cold and to defy all sorts of weather from without and all sorts of gases from within, depend largely upon this mortar. Each brick is laid in so full a bed of mortar that the latter enters the perforations of the brick from 1 in. to 1½ ins. The joints are struck both inside and out.

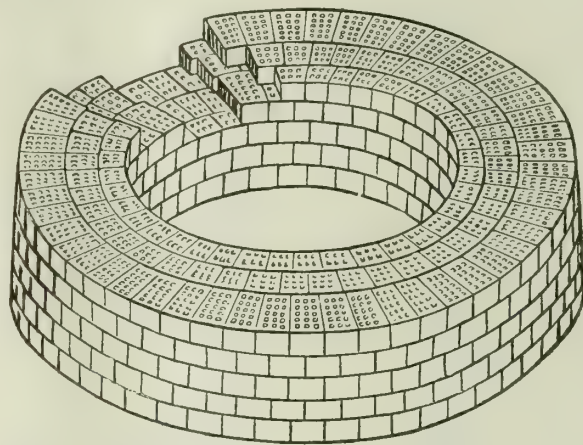
A crew of trained men in scientific chimney con-



QUEEN LANE FILTER  
PLANT,  
PHILADELPHIA, PA.



CORN PRODUCTS REFINING CO.,  
ARGO, ILL.



METHOD OF USING M. W. KELLOGG'S PERFORATED RADIAL  
BRICK IN CHIMNEY CONSTRUCTION

struction carry forward the erection of the chimney from start to finish, insuring careful construction and the proper grading and matching of brick throughout.

## Standard Specifications for Perforated Radial Brick Chimneys.

SCOPE—The work included under this contract is to consist of all labor and material necessary for the erection complete of one radial brick chimney in accordance with this specification, which shall become a part of the contract. The proposal shall include all scaffolding, cartage, unloading of material and removal of rubbish necessary to leave the chimney in a first class condition ready for operation.



**DELIVERY**—The chimney will be built at.....  
.....located on the.....  
.....railroad.

Material may be unloaded on owner's siding, which is within.....of the chimney site.

**SPACE**—Sufficient storage room for chimney contractor's materials will be provided adjacent to chimney, as well as unobstructed access from transportation delivery to the site of chimney for delivery and removal of materials and tools. At least one side of chimney will be left free and open by the owners for hoisting and working space until the chimney is completed.

**WATER**—The owners will provide the chimney contractor with necessary water within 50 ft. of the site of the chimney free of expense to the chimney contractor. From this point the chimney contractor will make his own hose connections, if required.

**WORKMANSHIP AND MATERIALS**—All workmanship and materials shall be first class.

The chimney contractor shall furnish a competent foreman under whose supervision the chimney will be built. Chimney must be built in a thorough, complete and workmanlike manner.

**TIME OF COMPLETION**—The chimney contractor shall state in bid the guaranteed number of working days in which he will finish the chimney after receipt of signed contract and approved drawings.

**FOUNDATION**—Proper foundation will be built by the owner from plans and specifications to be furnished by the chimney contractor, who will, upon completion, give in writing his approval of the foundation as being sufficient to sustain the chimney and fulfil the guarantee.

*Note*—In case, however, it is desired to have chimney contractor build the foundation, the following may be used:

The chimney contractor shall furnish a concrete foundation of proper depth and spread to safely sustain the chimney. The foundation shall be not loaded to more than.....tons per sq. ft., which is the safe bearing value as determined for this work.

Excavating shall be done by contractor for foundation.

The concrete shall be composed of cement, sand, stone or gravel in the proportion of 1 part cement to 2½ parts sand and 5 parts of stone or gravel. It shall be deposited in the forms in layers not to exceed 6 in. in thickness and thoroughly rammed into place. Concrete shall be a wet mixture.

**DESIGN**—The design of the chimney shall conform to the following dimensions as shown on drawing attached:

Height above top of foundation.....ft.....ins.

Minimum internal diameter.....ft.....ins.

The wall of the column shall have one straight and true batter from top to bottom. The wall thickness and section lengths to be as shown on drawing. In case the contractor's standard wall thickness should not be exactly as shown, a variation of 3% will be allowed in either direction.

**BASE**—If chimney is to be built with base and column construction, use the following:

The base of the chimney shall be built [here fill in shape of base] in shape.....ft. high, of the dimensions shown on drawing, of straight, hard, well burned, well shaped common building brick laid in full bed of cement lime mortar as herein specified.

*Note*—If round for the entire height, specify as follows:

The chimney shall be built of perforated radial brick for the entire height, as hereinafter specified.

**RADIAL BRICK**—All radial brick shall be best quality, moulded from refractory clay, sound ringing, hard, well burned, well shaped, of reasonably even color and free from checks; made to closely conform with the circular and radial lines of the shaft, and shall be weatherproof and acidproof. They shall have a water absorption of not less than 5% nor more than 12% of their dry weight after immersion for a period of 24 hours; and shall have a crushing strength of not less than 6,000 lbs. per sq. in. The total amount of perforations shall not exceed one-fourth of the cross area of the brick. One cu. ft. of radial brickwork shall weigh not less than 120 lbs. The outside faces of the brick shall be of regular size, so that the general appearance of the brickwork will be neat and uniform.

**LINING**—The chimney shall have an expansion lining built of perforated radial fire brick 4¼ ins. thick,.....ft. high from a point 2 ft. below the bottom of the flue opening. The lining prevents flue gases from coming in contact with the solid masonry of which the shell is built, and shall be separated from same by an air space of not less than 2 ins.

The lining shall be built after the chimney is finished, and exceptional care must be taken to keep the air space clear and free of loose mortar and other dirt.

Rack out the shell of the chimney approximately 2 ins. above lining, to form a ledge for the purpose of diverting the falling soot when the chimney is in operation.

**MORTAR**—All brickwork shall be laid in cement lime mortar, as hereinafter specified, with courses level and with full joints throughout. Face brickwork and backing to be laid up at the same time with joints of reasonably even thickness, not exceeding ½ in. The mortar to be used in the chimney shall consist of 1 part Portland cement, 2 parts fresh burnt lime mortar and 5 parts clean, sharp sand. The cement to be added to the sand and lime mortar as the mortar is required, and no mortar having taken an initial set is to be used. The cement must not be added until the lime is cool. The sand shall be clean and sharp, free from loam, vegetable matter and large pebbles. If necessary, it must be both screened and washed.

**BOND**—All common brickwork shall have every fourth course a header course.

Radial brickwork shall be bonded every three courses.

**BREACHING OPENING**—One opening shall be provided in chimney. The opening to be lined on the reveals with refractory material. The masonry above the opening to be supported by heavy I-beams set on steel plates, with air spaces at each end for expansion. Under these I-beams a flat masonry arch shall be built to properly protect the beams from the effect of the gases. The flue opening shall be reinforced laterally by heavy tie rods and plates over the top and at the bottom.

Three-eighths by 3-in. steel bands to be placed in the masonry above and below opening.

The opening shall be.....wide by.....high, the bottom of which shall be approximately.....above foundation.

**REINFORCING RINGS**—The chimney contractor shall place in the brickwork at every change in wall thickness steel bands ¾ in. thick by 3 ins. wide.

If the contractor should furnish perforated radial brick having corrugated sides, these bands may be omitted.

**HEAD**—The head of the chimney shall be neatly corbeled out and fitted with a heavy annular retaining ring set in full bed of cement mortar.

**CLEAN-OUT DOOR**—Provide and place in base of chimney where directed by owner a cast iron clean-out door and frame properly hinged and fitted with latch. Said door to be approximately 24 ins. wide by 36 ins. high.

**LADDER**—Build on the interior of the chimney a ladder to consist of ¾-in. galvanized iron rungs, spaced approximately 15 ins. center to center and securely anchored to the masonry from top to bottom. These ladder irons to be in the shape of a "U" with hooked ends.

**LIGHTNING CONDUCTOR**—The lightning conductor is to consist of.....copper points, ¾ in. in diameter by 8 ft. long, with 1½-in. platinum tips. The points to be anchored to the top of the column and extend from the bottom of the corbeling upward. The lower ends of the points to be connected by a loop of copper cable encircling the chimney. From this loop there is to be 1½-in. 7-strand No. 10 Stubbs' wire gauge copper cable, carried down the side of the chimney and connected to copper ground plate of the 3-winged type as best for the proper distribution of charge. The points to be securely fastened to the top of the chimney and the cable to be anchored every 7 ft. in height with brass anchors, so designed that they will support the weight of the cable. The ground plate shall be buried by the contractor for the foundation when it is built.

**LETTERING (WHEN DESIRED)**—Work into the column on [one or two] sides as directed the letters [here insert the desired legend] to be made in permanently colored kiln burnt brick. Letters to be true to size and shape and to be in a true vertical line.

**TRIMMINGS (IF ANY)**—All necessary stone or terra cotta shown on drawing will be furnished without charge by the building contractor to the chimney contractor, who will set same. No one piece should weigh over 200 lbs.

**INSURANCE**—The chimney contractor shall carry at his own expense, during the entire period of construction, liability insurance, insuring the men in his employ and the public in general, in case of damage due to accidents.

**GUARANTEE**—The chimney contractor shall guarantee the chimney for a period of 5 years from date of completion. The guarantee shall cover any defects that may arise within this period due to faulty design, construction, material, weather, and the products of combustion up to 800° Fahr.; and shall further guarantee to make good at his own expense all defects that may arise from any of the above conditions within the specified period.

The chimney shall be designed for a wind velocity of not less than 100 miles per hour.

**NOTE**—The chimney shall be built according to THE M. W. KELLOGG COMPANY [or equal] system of construction.

The insertion of this clause would be greatly appreciated on account of the advertising value to us on future work.

1536 West Adams Street  
CHICAGO, ILL.

## Electrical Grounding Appliances and Terminals.

GUARANTEE—The contractor to guarantee a structure equipped with this system against damage by lightning for a period of

A complete specification, blue print and other valuable information mailed free on request.





# DENISON FIREPROOFING CO.

Manufacturers of Load Bearing Tile

MASON CITY, IOWA

## Products.

DENISON LOAD BEARING TILE, HOLLOW BUILDING TILE, PARTITION TILE, FLOOR TILE, FIREPROOFING, FURRING TILE.

## License and Patents.

Denison load bearing tile, licensed under the "Wilson System of Bearing Wall Construction."

United States Patent No. 1234990, July 31, 1917.

Canadian Patent No. 151165, October 14, 1913.

Other patents pending and allowed.



TRADE-MARK

## How Furnished.

In standard sizes. No specials required. Furnished with deep groove scoring or smooth one or two sides as desired.

Corners, jambs and dimension tile furnished at the same basis price.

## Specifications.

**HOLLOW TILE**—All hollow tile used in this building, except for non-bearing partitions, shall be Denison Load Bearing Tile, manufactured by the DENISON FIREPROOFING Co., Mason City, Iowa, and shall be laid according to specification for the "Wilson System of Bearing Wall Construction," which may be obtained from the manufacturers.

Where the tile is faced with brick, the brick of the facing shall be firmly bonded into the tile backing wall by a full brick header course (or header and stretcher course), not further apart than every fifth course of brick, and each header shall bond into the tile overlapping at least two bearing webs.

**STANDARD TILE ALTERNATE**—Contractor shall state in his bid the sum to be added to or deducted therefrom if a standard or ordinary building tile meeting the following specification is substituted for the hollow tile specified, giving description of, kind and size of tile proposed to be used.

The tile used under this alternate shall be capable of sustaining a load of not less than 700 lbs. per sq. in. of gross area in compression (gross area in compression to be computed without deducting area of voids), and shall be of such size that it will permit of being bonded into as specified where faced with brick, and shall not be loaded, including the weight of the construction, in excess of one-tenth of the crushing strength.

## Advantages of Denison Load Bearing Tile Walls.

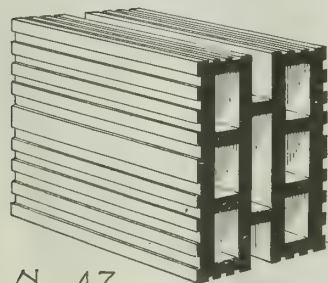
(1) Provide insurance against seepage of water or moisture through the wall by reason of the closed trough on top. (2) Two separate mortar beds at the top and bottom lying in the same horizontal plane. (3) No continuous mortar joints to carry frost and dampness through the wall. (4) Vertical bearing webs in alignment to withstand load pressures. (5) Replace common brick, working out to same heights and thickness; hence adaptable to any desired height of window ledge, cornice, etc. (6) Practical to apply plaster directly without use of furring. (7) No front or back to the block, thereby assisting in the laying of same. (8) It is a complete unit, which can stand on its own base in a stable condition any side up.

## Information and Estimating.

Engineering service to architects and estimates for contractors will be furnished without charge, all in accordance with conditions stated on the estimate.

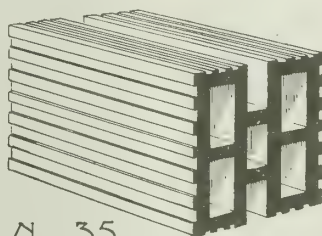
## Portfolio.

A portfolio of complete set of details and working drawings furnished on request.



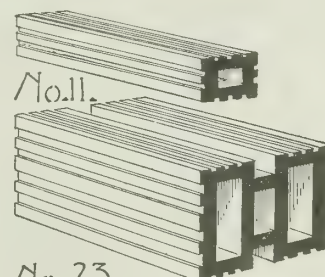
No. 47.

No. 47— $8\frac{1}{4}" \times 10\frac{1}{4}" \times 12"$   
4 brick and 3 mortar joints high



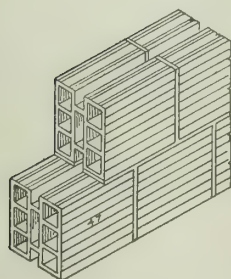
No. 35.

No. 35— $8\frac{1}{4}" \times 7\frac{5}{8}" \times 12"$   
3 brick and 2 mortar joints high  
DENISON LOAD BEARING TILE

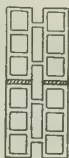


No. 23.

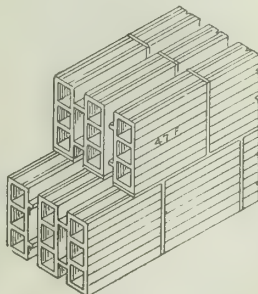
No. 23— $8\frac{1}{4}" \times 5\frac{1}{8}" \times 12"$   
2 brick and 1 mortar joint high



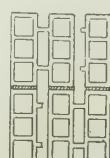
8 1/4" Tile Wall



13" Tile Wall



17" Brick Veneer Tile Wall



ISOMETRIC DETAILS OF DENISON LOAD BEARING TILE WALL CONSTRUCTION

1/2-in. scale

# DENISON INTERLOCKING TILE CORPORATION

EXECUTIVE OFFICES  
Guardian Building  
CLEVELAND, OHIO

35 FACTORIES AND 120 SALES OFFICES THROUGHOUT THE UNITED STATES AND CANADA

## Product.

INTERLOCKING TILE for Bearing Walls, Curtain Walls, Partitions, and Foundations.

Particularly adapted for use with Face Brick and with Stucco Exterior; also made with Rough Texture Face for exposed work.

## Design.

Owing to the special design of this tile, walls built with it have several distinct advantages found in no other type of wall construction.

## Vertical Webs Always Align.

The design of the tile is such that when laid in the wall every vertical web must stand directly over a corresponding web in the tile below. This feature of positive alignment of webs is protected by letters patent and is peculiar to this form of tile.

The 4-in. width of the mortar bed insures thorough bedding between webs; thus every square inch of vertical web section in the wall is available in computing bearing loads.

## No Through Mortar Joints.

A common fault of other forms of masonry walls is the through mortar joint, which readily conducts moisture, heat and cold through the wall.

In the wall of Interlocking Tile, the mortar beds are on different levels. An air pocket is thus provided in the mortar joint which prevents passage of moisture through the wall by capillary attraction, and insures ideal insulation.

## Triangular Reinforcement.

The lateral strength of the wall is materially increased by the triangular reinforcement due to this offsetting of the mortar beds. In addition to this, all the mortar beds are dovetail-grooved, holding the tile together in the firmest possible manner.

## Many Dead Air Spaces.

The air spaces are horizontal, and afford the perfect insulation which dead air gives. No convection currents can occur in such a wall.

In the 8-in. wall there are 3 air chambers, in the 12-in. wall 5, and in the 16-in. wall there are 7, etc.

## No Continuous Cross Webs.

None of the cross webs extend continuously through the wall, each being insulated by an air chamber.

## Strong Walls.

The interlocking feature gives the wall greater strength for bearing the weight of walls and floors in the buildings, and makes the wall stronger against side thrusts, such as the roof and wall loads.

## INTERLOCKING TILE

TRADE-MARK

## Non-conductive Walls.

Walls of this tile are, for practical purposes, perfect non-conductors of heat and cold. Buildings are therefore warmer in winter and cooler in summer.

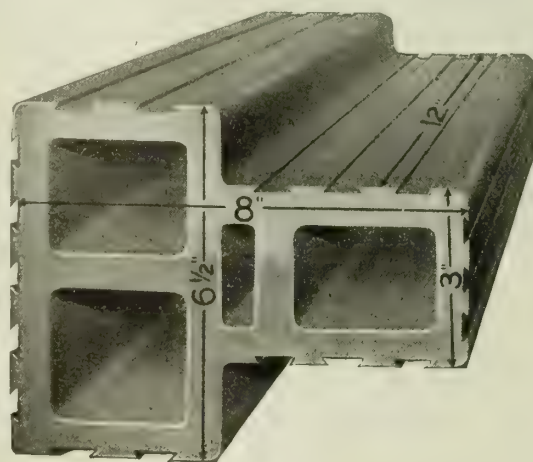
This feature makes the tile especially advantageous for walls in cold storage buildings, lumber dry kilns, warehouses and other places where non-conductive walls are necessary.

## Dry Walls.

Moisture and dampness quickly penetrate the ordinary masonry wall at the joint. This liability to injury is entirely overcome in the Interlocking Tile wall, because no mortar joint extends entirely through the wall.

## Bearing Strength.

The bearing strength of an Interlocking Tile wall is greatly enhanced by the fact that all bearing webs are continuous one above another from footing to sill. Thus every particle of strength of the individual tile is transferred to the wall. The web over web feature in this tile is not dependent on the skill or care of the mason; the tile can be laid no other way.



INTERLOCKING TILE

## Strength Tests.

The following tests on Interlocking Tile conducted by well-known engineering authorities show the bearing strength of the individual tile and of the completed wall.

AUTHORITY	LOCATION	MATERIAL	RESULT
United States Government Arsenal	Watertown, Mass.	Individual tile	5042 lbs. per sq. in. of vertical web section
Building Department	Tacoma, Wash.	12-in. wall	70.8 tons per sq. ft. of gross wall area
United States Bureau of Standards	Pittsburgh, Pa.	12-in. brick faced wall	64.8 tons per sq. ft. of gross wall area



### Fireproofing Qualities.

The design of Interlocking Tile makes them even more valuable than ordinary tile for fireproofing.

There are no vertical air spaces in the wall, and no furring is required, the plaster being applied directly to the tile, thus eliminating all vertical passages which might carry flames from floor to floor.

There are no through mortar joints to weaken under high temperatures. In case of injury to the outer shell of the wall, rendering it useless, there would still remain sufficient supporting webs to provide a safe wall for salvage.

### No Furring Required.

Owing to the non-conductive feature of the wall, no furring is required, plaster or stucco being applied directly to the tile itself.

### Builds Walls Any Thickness.

One shape and size of Interlocking Tile builds walls of any thickness. Regardless of thickness, the wall retains all the advantages outlined on the previous page.

Three or four different thicknesses of walls are required on practically every operation, and one size of Interlocking Tile takes care of them all.

There are no left over sizes, and the mason does not require three or four miscellaneous widths of block on his scaffold.

### Bonds Perfectly With Brick.

The illustration shows the ideal bonding of Interlocking Tile with face brick.

All other forms of hollow tile backing require a brick stretcher course back of the header, thereby destroying the insulating effect at each header course, and adding materially to the cost.

The brick facing on Interlocking Tile becomes an integral part of the wall, and will not shrink away, bulge or crack. It bears its share of the vertical load.

### An Ideal Base for Stucco.

The wall is always dry, and the hard burned body prevents absorption of water from the plaster coat.

The tile has practically the same expansion as the cement plaster, thus preventing cracking, and enabling it to withstand severe weather conditions.

The horizontal dovetailed grooves make a perfect mechanical key to hold the plaster or stucco.

### Lays Up Rapidly.

There is only one size and shape of Interlocking Tile. The shape is such that the mason easily handles

the tile with one hand, without laying down the trowel. All other tile of equal displacement require use of both hands.

Each tile is equivalent to 7 bricks (on basis of 21 bricks to the cu. ft.). The bricklayer thus lays the equivalent of 7 bricks in one operation. In addition to this advantage, only one-third as much mortar is required as in the solid brick wall.

### How to Order Interlocking Tile.

If the number of square feet in the face of the wall and in the thickness of the wall are known, the number of Interlocking Tile required to lay it can be easily computed from the following table:

2.2 tile lay 1 sq. ft. of 8-in. wall.  
3.4 tile lay 1 sq. ft. of 12-in. wall.

In ordering jamb or corner tile, the total linear feet (vertical) of jambs and corners should be given.

### Weight of Wall.

Including mortar, 60 lbs. per cu. ft.

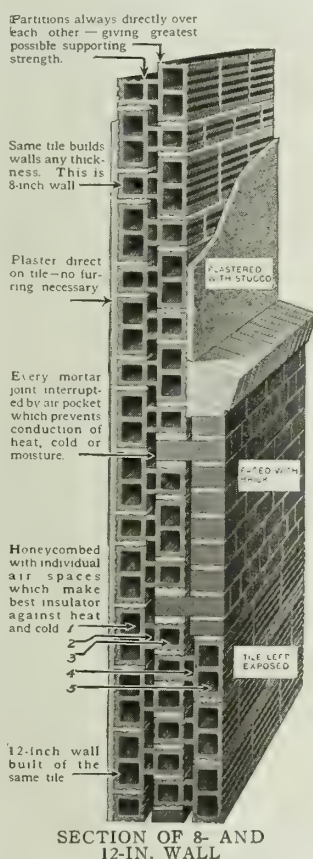
### Details, Catalogues and Data.

Each of the offices is in position to submit details and other data, and to give valuable assistance to the architect or engineer. Correspondence should be addressed to the main office.

### Some Typical Buildings.

The following buildings, each of which is well known in its own territory, give some idea of the wide approval with which Interlocking Tile has met for every class of building work throughout the United States and Canada.

BUILDING AND LOCATION	ARCHITECT
Hotel Statler, Cleveland, Ohio, and Detroit, Mich.	Geo. B. Post & Sons
Mt. St. Mary's Hospital, Niagara Falls, N. Y.	W. P. Ginther
Sacred Heart Academy, Vancouver, B. C.	Chas. G. Badgley
M. K. & T. Station, San Antonio, Tex.	Henry John Schlesk
Chamber of Commerce Building, New Haven, Conn.	Brown & Von Beren
Sante Fe Depot, San Diego, Cal.	Bakewell & Brown
Residence, Geo. McKesson Brown, Huntington, L. I., N. Y.	Clarence Luce
May Co. Department Store, Cleveland, Ohio	D. H. Burnham & Co.
Cleveland General Hospital Buildings, Cleveland, Ohio.	Myron B. Vorce
Pacific Coast Condensed Milk Co. Factory, Stanwood, Wash.	Mauran, Russell & Crowell
St. Louis Country Club, St. Louis, Mo.	John Carrigan
Elks Club, Seattle, Wash.	Esenwein & Johnson
Royal Connaught Hotel, Hamilton, Can.	Cram, Goodhue & Ferguson
Fourth Presbyterian Church, Chicago, Ill.	John Graham
Fleischmann Yeast Co., Sumner, Wash.	C. D. Hill & Co.
Municipal Building, Dallas, Tex.	S. S. Beeman
Christian Science Church, Toronto, Can.	Carl Siebrand
Ranier Brewery, San Francisco, Cal.	Hussey & Shattuck
Y. M. C. A. Building, Providence, R. I.	Rea & Garstang
Fruit Storage, Murphy Oil Co.	(R. R. Bartlett
Port of Astoria Docks	F. J. Walsh
Residence, John Hanan, Miami, Fla.	August Geiger
Rockefeller Institute, Plainsboro, N. J.	Coolidge & Shattuck



SECTION OF 8- AND 12-IN. WALL

ESTABLISHED SIXTY-TWO YEARS

# HENRY MAURER & SON

Manufacturers of Fireproof Building Materials Made of  
Hollow Terra Cotta

PHILADELPHIA OFFICE  
PENNSYLVANIA BUILDING

420 East Twenty-third Street  
New York, N. Y.

FACTORIES  
MAURER, NEW JERSEY

TELEPHONE: GRAMERCY 5050

## Products.

FIREPROOF BUILDING MATERIALS made of HOLLOW TERRA COTTA, Porous and Semiporous.

Among our many specialties are the "HERCULEAN" FLAT ARCH and "SIMPLEX" FLOOR ARCH.

"Phoenix" Hollow Tile Wall Construction and "Peerless" Floor Arch (patented).

All kinds of Fireproofing made of clay, for Arches (end and side construction).

Porous Terra Cotta Book Tiles, Partitions, Furring, Girder and Column Protection, Clay Roofing Tiles.

Fire Clay Flue Linings, Fire Brick.

## "Herculean" Flat Arch.

The "Herculean" Flat Arch (Fig. 1) is well adapted to wide spans up to 22 ft. eliminating entirely the use of steel beams, and is especially suitable where light weight in combination with great strength is essential.

The blocks, 12 by 12 ins., are of semiporous terra cotta, of uniform size and shape, with webs of from  $\frac{3}{4}$  in. to  $\frac{7}{8}$  in., and, according to the length of the spans, are 6, 8, 10 and 12 ins. in depth.

The reinforcement consists of T steel  $1\frac{1}{2}$  by  $1\frac{1}{2}$  ins. by  $\frac{3}{16}$  in. and of lengths to suit the spans required. They are embedded in grooves of the terra cotta blocks which have previously been filled with cement mortar, thus insuring the steel from corrosion; and, secured by the grooves in the blocks, absolutely preclude any shifting of the reinforcement. The T steel is further fireproofed, as shown, by being thoroughly protected by never less than 2 ins. of hollow terra cotta.

For arches of greater depth than 8 ins. 2 tees are used.

The weight of this construction per sq. ft., including necessary T steel, is as follows: 6 ins. deep, 30 lbs.; 8 ins. deep, 33 lbs.; 10 ins. deep, 42 lbs.; and 12 ins. deep, 54 lbs.

An arch measuring 20 ft. from wall to wall, loaded with 120,000 lbs. of hard brick, distributed over a surface of 200 sq. ft. (600 lbs. to the sq. ft.), showed no perceptible deflection.

OFFICIAL INDORSEMENT—"Herculean" Flat Arch Construction has been approved by the New York and Philadelphia Building Departments and by the Building Departments of many other cities, and by the United States Government Engineers.

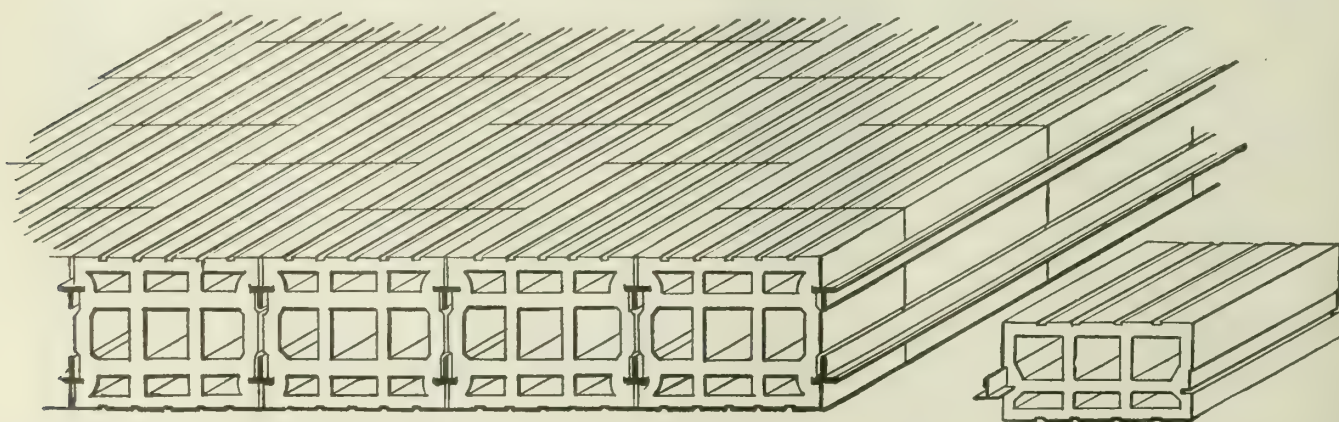


FIG. 1. "HERCULEAN" FLAT ARCH. SECTION SHOWING METHOD OF CONSTRUCTION (Patented)



**"Simplex" Floor Arch.**

Particular attention is called to the "Simplex," our improved fireproof construction for floors in buildings.

**HOLLOW TILE ADVANTAGES**—Hollow tile has for many years been recognized as the best material for the fireproofing of buildings. It possesses many superior points over any other material made for a similar purpose.

the bottom of the various members composing the arch, a "lug" is formed so that, when 2 or more tiles are placed together (as shown), a recess is created, and cement of the proper consistency is permitted to run in and fill this recess from the top, forming a full joint for each member of the arch, thereby creating a perfect fireproof construction. The cement can be grouted in these recesses by use of a trowel.

**INSTALLATION**—In the installation of the "Simplex"

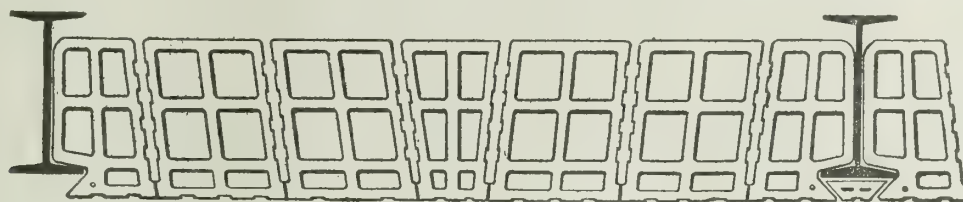


FIG. 2. "SIMPLEX" HOLLOW TILE FLAT ARCH

With joints between the members unfilled

Hollow tile is fireproof, resists moisture, is sound-proof and gives stability to the building by filling the spaces between the beams. Its hollowness makes its weight not excessive.

Hollow tile can be erected in any season of the year without danger. Low temperature does not affect it, nor does it disintegrate in freezing (or thawing) weather as numerous other materials do.

**INFERIOR MATERIAL**—Because it is cheaper to make and install, has persuaded many to its use in this part of the building. The unsatisfactory results are fast correcting this mistake.

**OUR LATEST CONSTRUCTION**—In presenting our latest construction attention is called to the pattern of the hollow tile members (shown in Fig. 2). Tiles so formed can be installed or erected in buildings for at least 40% less than the old method. Observe that near

arch, the various tiles can be laid on a wooden center, dry, and erected as stated above—a distinct advantage over the old method.

Still another advantage of the "Simplex" construction is that little or no cement adheres to the bottom of arch (forming the ceiling), thereby avoiding the risk of stains on ceilings where old methods are used.

The "Simplex" method is also used in the construction of segmental arches.

**A PROVED SUCCESS**—The "Simplex" floor arch is not an experiment, but a demonstrated success as a simple and excellent construction for all classes of buildings. The cost of installation is greatly reduced on account of the shape of the tiles, as explained above. Better workmanship is attained by its use. Large areas can be quickly erected, and save much time in the completion of a building.

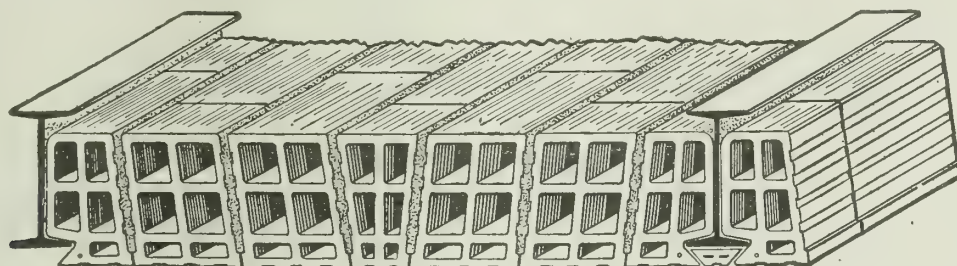


FIG. 3. "SIMPLEX" HOLLOW TILE FLAT ARCH

With joints between the members filled

# NATIONAL FIRE PROOFING COMPANY

ORGANIZED 1889

MAIN OFFICE  
Fulton Building  
PITTSBURGH, PA.

BRANCH OFFICES IN PRINCIPAL CITIES

Twenty-three factories in the United States and one at Hamilton, Ont.

## Products and Services.

Manufacturers of DENSE and POROUS HOLLOW TILE for fireproof floors, roofs, ceilings, partitions, wall furring, column and girder coverings; and for exterior walls of all kinds, including barns, silos, and other farm buildings; TEX-TILE.

Natco Lock Joint Sewer Tile, Medium No. 2 Fire Brick, Kiln Bottom Brick and Fire Clay.

Contractors for FIREPROOF CONSTRUCTION in both HOLLOW TILE and REINFORCED CONCRETE.

## Facilities.

The NATIONAL FIRE PROOFING COMPANY is the largest concern in the world devoted solely to the business of fireproof construction in both hollow tile and reinforced concrete. Its capital is \$12,500,000.00, with an output from 23 factories in the United States and 1 in Canada. These factories, conveniently located, insure cheap transportation and prompt delivery.

## Branding.

Attention is directed to the present policy, originated by this company, of branding all its hollow tile with the trade-mark name, Natco. The tile of special design will bear special marks of identification, as Natco, Natco XXX, Natco Backup, Natco Building Tile (glazed or unglazed), Natco Tex-Tile, Natco Lock Joint, to show the particular part of the construction to which they are adapted.

## Natco Floor Construction.

Floor arches of hollow tile can be set in winter, as the construction dries out in a few days. They are more nearly soundproof than solid construction.

Following are illustrations and descriptions of some of the forms in common use. Only typical sections are shown.

### Natco Segmental Arch (without Tie Rod).

This form of arch combines great strength with cheapness and lightness. It is suitable for warehouses, lofts, factories, sidewalks, or wherever a flat ceiling is not essential. Metal lath and plaster ceiling may be used in combination with it, as installed in the New York public schools, and in private houses, stores, etc. The 6-in. arch is used for all ordinary purposes.

Weight of 6-in. hollow tile arch is 27 lbs. per sq. ft. Weight of 8-in. hollow tile arch is 35 lbs. per sq. ft.



FIG. 1. TYPICAL SPAN OF NATCO SEGMENTAL ARCH

### Natco Flat Arches.

The flat arch is the accepted type of standard fireproof floor construction, meeting every requirement as to strength, fire protection, architectural appearance and minimum weight. The Natco hollow tile flat arch construction, as illustrated below, has been developed as the company's standard for this type.

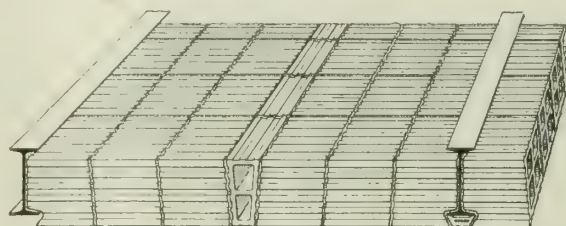


FIG. 2. PERSPECTIVE OF STANDARD NATCO FLAT ARCH

To find total dead load of any floor use the following weights: Tile, rock asphalt or cement finish weighs about 140 lbs. per cu. ft.; wood flooring, 3½ lbs. per sq. ft.; wood sleepers, 30 lbs. per cu. ft.; cinder concrete fill, 60 lbs. per cu. ft.; hollow tile arch, see table below; plastering, 5 lbs. per sq. ft.; steel I-beam, divide weight of beam by span in feet

TABLE OF WEIGHTS AND SPANS ..

Depth of arch, ins.	Weight, lbs. per sq. ft.	Maximum safe spans	
		ft.	ins.
6	26	4	0
7	30	4	6
8	32	5	0
9	36	6	0
10	38	6	6
12	44	8	0
14	50	9	0
15	54	9	6
16	55	10	0

The strength of any arch depends as largely on workmanship as on materials; therefore the maximum spans given can be used only where experienced workmen are employed and the work is guaranteed by a responsible contractor

### Natco Combination Floors (See next page).

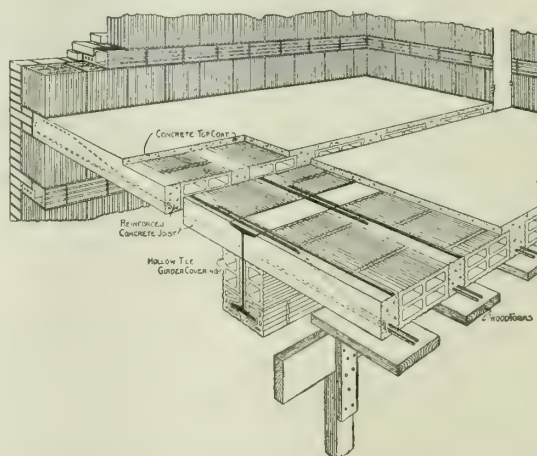


FIG. 3. PERSPECTIVE VIEW OF TYPICAL COMBINATION FLOOR  
Note economical wood centering used; 2 by 8 ins. or 2 by 10 ins. under each joist is sufficient



# **"Combination" Natco Hollow Tile and Reinforced Con- crete Long Span Floor Construc- tion (Continued).**

Used without girders for clear spans up to 25 ft. Rows of tile 12 ins. wide between reinforced concrete joists 4 to 6 ins. wide, monolithic with a concrete top coat 2 ins. thick, mixed 1 part cement, 2 parts sand, and 4 parts gravel. Eliminates beam forms and requires one-third to one-half less flat centering, effecting great economy in erection; 2 by 8-in. or 2 by 10-in. planks under each joist is sufficient.

For semicontinuous and continuous spans proper reinforcement must be provided in top of slab over supports to take care of negative bending moment.

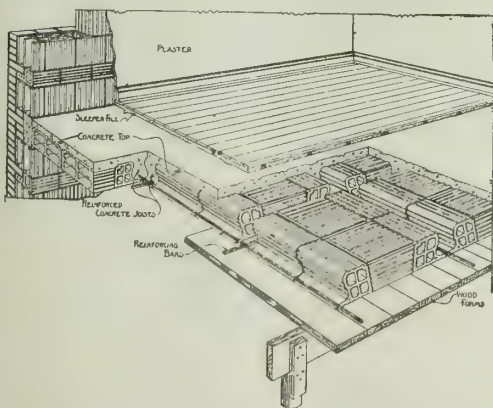
Where heavy loads and short spans are encountered, the vertical and longitudinal shear must be investigated.

## **Natco "Two-way" Floor System (Patented).**

A later development of the "Combination" floor, designed to carry loads to four sides in place of two, thus enabling designer to cut down thickness of slab and reduce depth of supporting girders. Most economical for bays, the ratio of whose sides does not exceed 1:1½; for long narrow spans "One-way" system is cheaper.

Tile is substituted for concrete, and approximately 54% of heavier and more expensive material is eliminated in an average slab built of a "Two-way" combination of 6-in. Natco hollow tile and reinforced concrete with a 2-in. top coat cast monolithic with joists.

Tile is so designed that spacing of same on flat centering is almost automatic. Bond between heavily scored hollow tile used in this floor system is increased by dovetailed slots in tops of



PERSPECTIVE VIEW OF NATCO "TWO-WAY" FLOOR SYSTEM

LOAD TABLE FOR COMBINATION FLOOR SLAB WITH 2-IN. CONCRETE TOP

TOTAL SAFE LOADS (DEAD AND LIVE) POUNDS PER SQUARE FOOT

The figures on left in tables denote the depth of tile in inches, the figures on right the area of reinforcing steel in each concrete joist in square inches.

fc. 650 lbs. per sq. in.  
fs. 16000 lbs. per sq. in.

$$\frac{E_c}{E_s} = \frac{1}{15}$$

¾-in. of concrete below reinforcement  
4-in. concrete joists 16 ins. o. c.

TOTAL LOAD	Continuous span	W L	150	165	180	195	210	225	240	260	300	335	375	450
		12												
	Continuous span	W L	125	135	150	160	175	185	200	220	250	280	310	375
		10												
Span, ft.	Semi-continuous span	W L	110	120	135	145	155	170	180	195	225	250	280	335
		9												
Span, ft.	Simple span	W L	100	110	120	130	140	150	160	175	200	225	250	300
		8												
Span, ft.	6							3/19	3/20	3/22	3/26	3/29	3/32	3/39
Span, ft.	7			3/19	3/21	3/23	3/24	3/26	3/28	3/32	3/35	3/38	3/44	4/42
Span, ft.	8		3/23	3/25	3/27	3/30	3/32	3/34	3/37	3/40	3/46	4/41	4/46	5/55
Span, ft.	9		3/29	3/32	3/35	3/37	3/39	3/41	3/43	4/40	4/46	4/52	4/58	5/71
Span, ft.	10		3/36	3/39	3/43	3/46	4/40	4/43	4/46	4/50	4/57	5/53	5/59	7/71
Span, ft.	11		3/43	4/47	4/42	4/45	4/48	4/52	4/55	4/61	5/57	5/64	5/72	6/73
Span, ft.	12		4/41	4/45	4/49	4/53	4/58	5/51	5/55	5/60	5/68	6/65	6/72	7/78
Span, ft.	13		4/48	4/53	4/58	5/52	5/56	5/60	5/64	5/70	6/68	6/77	7/76	8/80
Span, ft.	14		4/56	5/51	5/56	5/60	5/65	5/69	6/63	6/69	6/79	7/79	8/78	9/85
Span, ft.	15		5/53	5/58	5/64	5/69	6/63	6/68	6/72	6/79	7/81	8/81	8/89	10/88
Span, ft.	16		5/60	5/68	5/72	6/67	6/72	6/77	7/74	7/81	8/81	9/84	9/93	12/83
Span, ft.	17		5/68	6/64	6/70	6/75	6/81	7/78	7/83	8/80	9/84	10/84	10/94	12/83
Span, ft.	18		6/65	6/72	6/78	7/76	7/82	8/77	8/82	8/90	9/94	10/95	12/87	15/83
Span, ft.	19		6/73	6/80	7/78	7/84	8/80	8/86	9/84	9/92	10/95	12/87	12/97	15/93
Span, ft.	20		6/81	7/79	8/76	8/82	8/89	9/87	9/93	10/91	12/86	12/97	15/88	15/103
Span, ft.	21		7/79	8/77	8/85	8/91	9/89	10/86	10/92	12/83	12/95	15/85	15/94	
Span, ft.	22		7/77	8/74	8/84	9/81	10/88	10/94	12/83	12/91	15/83	15/93	15/104	
Span, ft.	23		8/84	9/84	9/91	10/89	10/96	12/85	12/91	12/99	15/90	15/102		
Span, ft.	24		9/84	9/92	10/90	10/97	12/87	12/93	12/99	15/90	15/99			
Span, ft.	25		9/91	10/89	12/81	12/87	12/94	12/101	15/86	15/94	15/107			

WEIGHT OF COMBINATION SLABS PER SQUARE FOOT

Tile	3 ins.	4 ins.	5 ins.	6 ins.	7 ins.	8 ins.	9 ins.	10 ins.	12 ins.	15 ins.
Weight	45 lbs.	50 lbs.	55 lbs.	60 lbs.	65 lbs.	70 lbs.	75 lbs.	80 lbs.	90 lbs.	105 lbs.

The load tables are for general information only as each particular operation should be designed in accordance with actual conditions. Other "Load Tables" and other types of floor systems shown in our literature on "Long Span" Floors. Our engineering department is at the entire disposal of anyone desiring further information.

the several tile forming sides of the long span of bay, and small amount of concrete forcing its way into small end openings of flanged tile.

When covered with concrete, the architect can feel satisfied that tile of the "Two-way" system are exactly where they were placed when he inspected them. Table of safe loads (live and dead) is given for general estimating purposes only, and every problem should be given special consideration. Consultation with our engineering departments is earnestly solicited.

Write for handbook of "Natco Combination Long Span 'One-way' and 'Two-way' Fireproof Floors," containing full details, photographs and other useful information.

TABLE SHOWING THICKNESS OF TILE FOR VARIOUS SPANS AND SAFE LOADS (LIVE AND DEAD)

fc = 700 lbs. per sq. in.  
fs = 18,000 lbs. per sq. in.

$$\frac{W}{L} = \frac{1}{12}$$

W = Part of load taken in each direction.

		TOTAL SAFE LOAD (LIVE AND DEAD)																					
Total load per sq. ft. rectangu- lar panel whose sides have ratio of	1:1.50																						
	1:1.40																						
	1:1.35																						
	1:1.30																						
	1:1.25																						
	1:1.20																						
	1:1.15																						
1:1.10	104	103	111	119	127	135	143	151	159	167	175	183	191	198	206	214	222	230	238				
1:1.00	110	114	123	132	141	149	158	167	176	184	193	202	211	219	228	237	245	252	260				
1:1.00	125	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300				
Short span	16'0"	3	3	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5
	17'0"	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	
	18'0"	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	
	19'0"	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	
	20'0"	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	
	21'0"	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	
	22'0"	4	4	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	23'0"	4	4	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	24'0"	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	25'0"	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	26'0"	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	27'0"	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	
	28'0"	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	
	29'0"	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	
	30'0"	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	

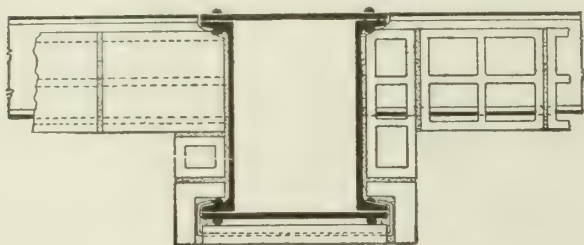
Example: To find thickness required for bay 20 by 25 ft., with a total load (live and dead), of 190 lbs. per sq. ft. Ratio of sides,  $\frac{25}{20} = 1.25$ . Run across the horizontal space marked 1:1.25 until vertical column marked 190 lbs. is reached. Run down this vertical column to the horizontal space marked 20'0" (short span). This gives thickness of tile as 6 ins., which, with 2 ins. for concrete top, makes total thickness of floor 8 ins.

**Natco Girder Covering.**

Hollow tile beam and girder covering is made in various forms to fit the flanges of all standard steel beams and girders. It is self-supporting except where the width to be covered is more than 12 ins.; then the soffit is supported by metal clips.



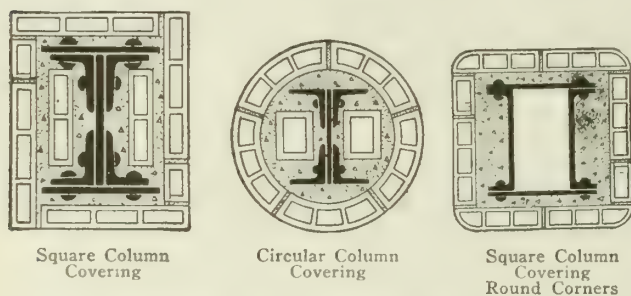
STANDARD NATCO BEAM COVERING

TYPICAL BOX GIRDER COVERING  
Hung on metal clips**Natco Column Covering.**

Steel and cast iron columns must be covered by at least 2 ins. of semiporous hollow tile.

For square columns Natco hollow tile can be furnished in 3-in. and 4-in. thicknesses, and with rounded corners if necessary.

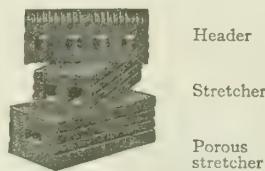
For circular columns segmental column covering can be furnished in 2-in., 3-in. and 4-in. thicknesses.



STANDARD NATCO COLUMN COVERING

**Natco Book Tile (for both Roofs and Ceilings).**

Natco book tile is used between and supported on T-irons to form flat mansard and hip roofs. It is also used for flat or hung ceilings, for which purpose the ends can be rabbeted so that book tile are flush with bottom of steel T-irons.



"HAVERSTRAW" BRICK

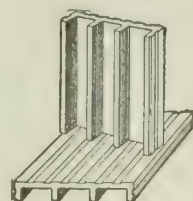
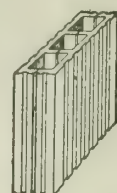
STOCK SIZES

Stretcher,  $2\frac{1}{2} \times 3\frac{1}{2} \times 8$  ins.  
Header,  $2\frac{1}{2} \times 3\frac{1}{2} \times 7\frac{1}{4}$  ins.

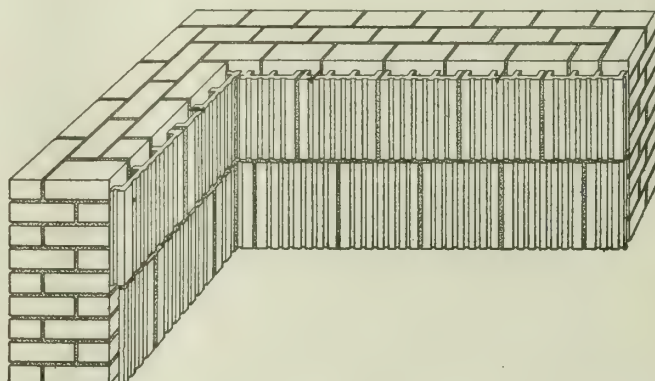
**Natco Wall Furring.**

Walls are furred to prevent the admission of moisture, either by lining the inside with Natco furring tile, or by building the inside face of the

wall with hollow brick, "Haverstraw" size. The former method is more effective.

Furring Split Ready  
to Lay Against  
Brick WallFurring as Man-  
ufactured and  
Shipped to Job

NATCO WALL FURRING



NATCO SPLIT FURRING TILE APPLIED TO INSIDE OF BRICK WALL

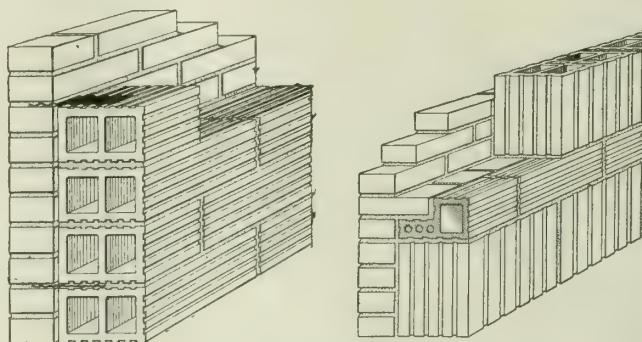
STOCK SIZES

$1\frac{1}{2} \times 12 \times 12$  ins., weight per sq. ft., 10 lbs.  
 $2 \times 12 \times 12$  ins., weight per sq. ft., 10 lbs.

**Natco Backup Tile.**

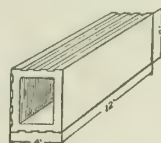
For backing up face brick. Sizes 8 by 5 by 12 ins., and 4 by 5 by 12 ins., displacing six and three bricks respectively in 13-in. and 9-in. walls; smooth on a 5-in. by 12-in. face and scored for mortar or plaster on other three sides, assuring decreased weight, an insulated wall and economy in material setting.

Eliminates furring.



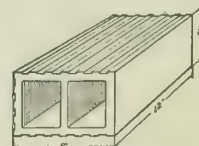
ISOMETRIC SECTIONS OF 13-IN. WALL

Showing two methods of backing face brick—Natco Backup Tile and 8-in. Natco XXX Hollow Tile with Header Backer Tile, respectively



4x5x12 ins.

Used in 9-in. Wall



8x5x12 ins.

Used in 13-in. Wall

NATCO BACKUP TILE

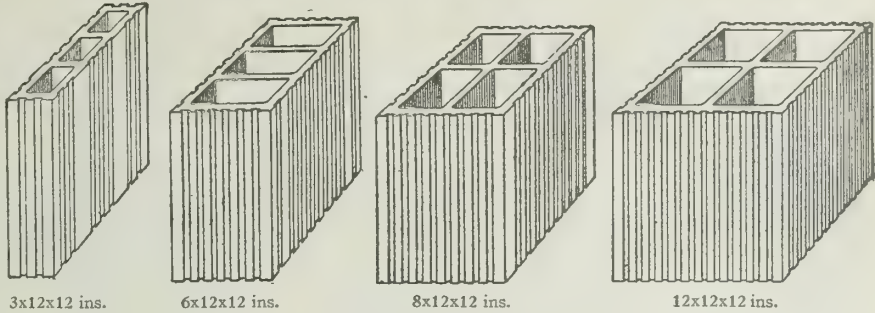


Natco Hollow Tile Partitions.

Fireproof, soundproof, easily erected, and the standard for stability, especially where called on to support plumbing fixtures, heavy picture frames, shelving, etc.

Stock sizes 2 to 12 ins. thick, laying up 1 sq. ft. of wall surface. Short lengths also furnished.

Hollow tile partitions are commonly built of dense material: 3-in. tile can be used safely to a height of 12 ft.; 4-in. to 16 ft.; 5-in. to 20 ft.; and 6-in. to 24 ft.

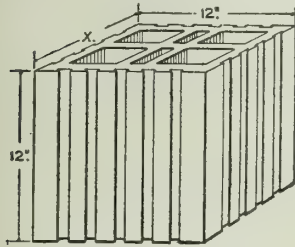


TYPICAL SHAPES OF NATCO HOLLOW PARTITION TILE

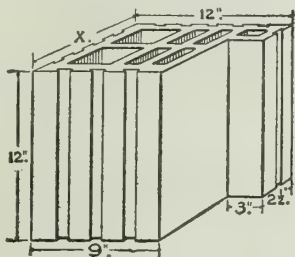
TABLE OF SIZES, WEIGHTS, ETC., OF NATCO PARTITION TILE

Sizes, ins.	No. of cells	Weight, lbs.	Sizes, ins.	No. of cells	Weight, lbs.
2 x 12 x 12	3	16	7 x 12 x 12	3	25
3 x 12 x 12	3	16	8 x 12 x 12	4	32
4 x 12 x 12	3	18	9 x 12 x 12	4	33
5 x 12 x 12	3	21	10 x 12 x 12	4	38
6 x 12 x 12	3	24	12 x 12 x 12	4	44

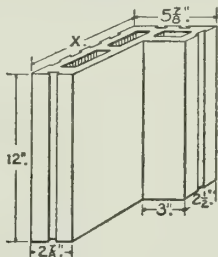
NOTE—Short lengths are also carried in stock and a reasonable percentage shipped on all orders.



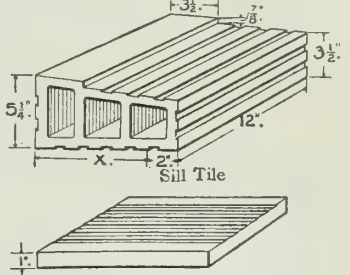
Standard Tile



Jamb Tile



Half Jamb Tile




Bearing Slab

DETAILS OF TYPICAL SHAPES OF NATCO XXX HOLLOW TILE

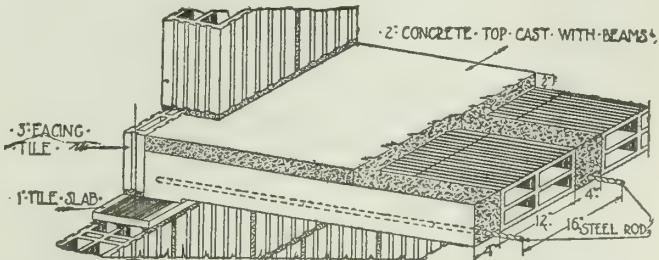
COMPARATIVE COST—

Natco XXX, with its superior qualities of extra heavy shells and webs, all in direct alignment when laid, and with its deep dovetail scoring which affords the best possible mechanical bond for the stucco, costs no more than the old style of tile, and for walls alone compares favorably in first cost with the ordinary type of frame construction.

TABLE OF SIZES, WEIGHTS, ETC., OF NATCO XXX HOLLOW TILE

Standard Sizes			No. of cells	Weight, lbs. per sq. ft.	Jamb Tile			Half Jamb Tile			Corners		
Thick-ness	Height	Length			Thick-ness	Height	Length	Thick-ness	Height	Length	Thick-ness	Height	Length
(Ins.—in wall)					(Ins.—in wall)			(Ins.—in wall)			(Ins.—in wall)		
3	12	12	3	18	..	..	..	..	..	..	..	..	..
4	12	12	3	20	..	..	..	..	..	..	..	..	..
5	12	12	3	23	..	..	..	..	..	..	..	..	..
6	12	12	6	29	6	12	12	6	12	5 7/8	6	12	12
8	12	12	6	34	8	12	12	8	12	5 7/8	8	12	2
10	12	12	6	40	10	12	12	10	12	5 7/8	10	12	4
12	12	12	9	52	12	12	12	12	12	5 7/8	12	12	6
Slabs					<p>NOTE—Manufactured and shipped with all orders a reasonable percentage of short pieces cut 3, 6 and 9 ins. in height to use with 1-in. slabs listed here in working up to story height.</p>  <p>2" CONCRETE TOP CAST WITH BEAMS</p>								
6	1	12	..	6									
8	1	10	..	8									
10	1	8	..	8									
12	1	12	..	12									
Sill tile													
10	5 1/4	12	3	21									
12	5 1/4	12	4	23									
14	5 1/4	12	4	25									

NOTE—Manufactured and shipped with all orders a reasonable percentage of short pieces cut 3, 6 and 9 ins. in height to use with 1-in. slabs listed here in working up to story height.

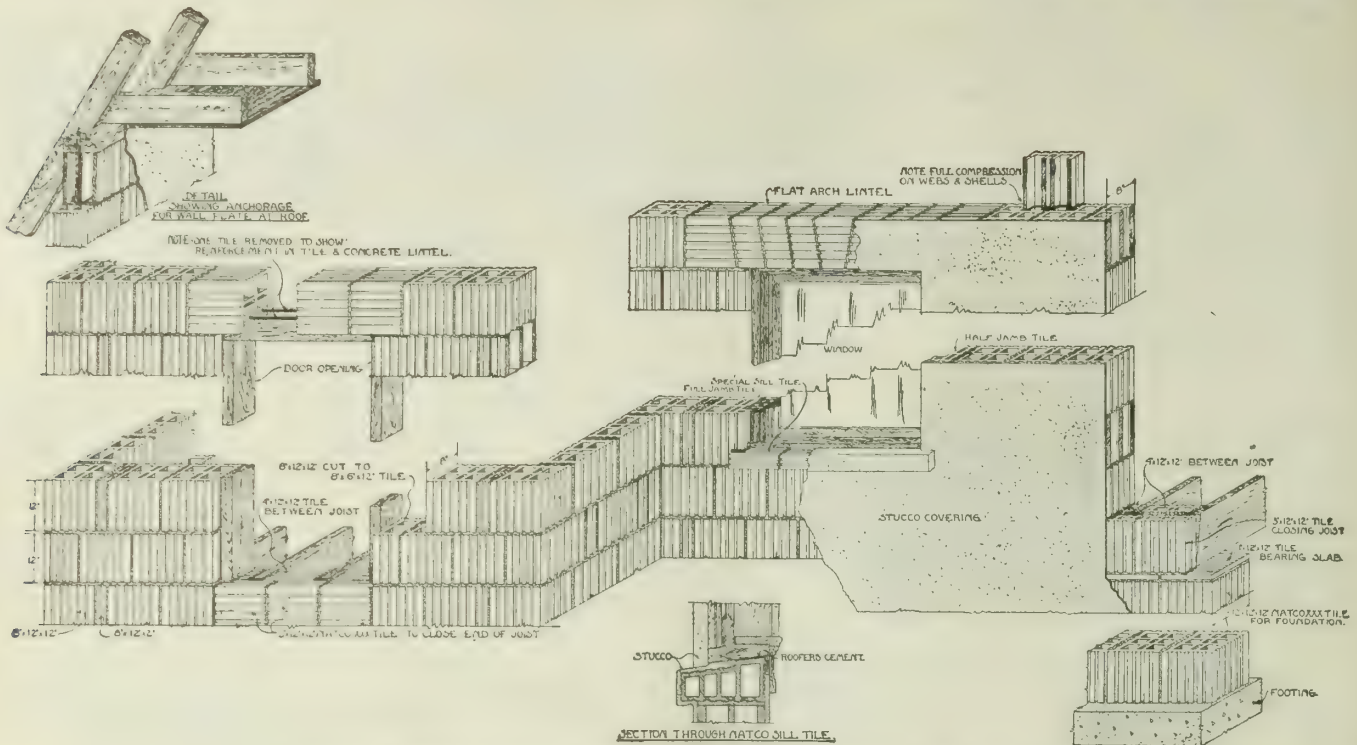


TYPICAL DETAIL OF NATCO XXX EXTERIOR WALL AND COMBINATION FLOOR OF HOLLOW TILE AND REINFORCED CONCRETE

By erecting interior partitions of Natco hollow tile in conjunction with this type of construction, it is possible to completely fireproof private residences, stores, apartments, school buildings, libraries, etc., at a cost of approximately from 20% to 30% over the ordinary frame construction

or curtain walls of industrial buildings, farm buildings, etc.

Full details, not easily furnished in limited available space, will be furnished on application.



TYPICAL EXTERIOR WALL CONSTRUCTION OF NATCO XXX HOLLOW TILE

### Materials and Methods.

The materials and methods illustrated and described herein have been determined by wide practical experience in Natco hollow tile construction, and have been approved by fireproofing engineers and architects generally.

### Specification Notes.

For the assistance of all those desiring to take full advantage of hollow tile construction, with its low initial cost and minimum expense of upkeep, this company offers the following specifications for wall construction, floor construction, and stucco finish, which have been carefully developed through years of use and may be regarded as the manufacturers' standard specifications. The adoption of these will insure equitable conditions in estimating, and produce results in accordance with best practice.

For the convenience of specification writers it is suggested that the first clauses of wall or floor specifications entitled "General" might be quoted in full in the estimating specifications, followed by clauses stipulating: (1) Which contractor applies cement coat to exterior of foundation walls of tile; (2) whether damp-proofing shall be integral or applied and by whom furnished and done; (3) whether door or window openings are to be calked by hollow tile layer, as specified, or by plasterer; (4) how and by whom fireplaces and chimneys shall be constructed; (5) by whom centering for any arched or clear openings shall be provided; (6) by whom centering and sleepers for floors shall be provided and set; (7) which system of floor construction is to be used, or whether alternate estimates are to be given, etc.; these to be followed by a clause similar to the following:

"The hollow tile work throughout is to be furnished, delivered, and set, in accordance with the typical details given and the manufacturers' standard

specifications printed on pages (so and so) of SWEET'S ARCHITECTURAL CATALOGUE, Thirteenth Edition."

For stucco work the same latter clause, modified, could be well used after describing the number of coats, the kind of waterproofing, and the nature of the finished surface.

NOTE—While 2 coats of stucco carefully applied, having a total thickness of not less than  $\frac{3}{4}$  in., are allowable for rough cast or pebble dash finish, much better results can be obtained when 3 coats are applied. Always apply 3 coats when a smooth or flat finish is desired.

### Specifications.

#### HOLLOW TILE WALLS

**General**—The contractor for this part of the work shall furnish, deliver and erect all materials required for exterior and interior bearing walls and any interior subdividing partitions, as indicated on plans, of hard burned hollow tile, together with all necessary special shapes required at corners, at joist level, in working around openings or to complete buildings as called for in this specification to approval of architect. All hollow tile shall be true and regular in size, manufactured of such design that all webs and shells are in direct compression when laid in the wall. Tile shall have all faces scored with special dovetail scoring to offer a good surface for the stucco and plaster finish. Tile cracked or broken on the outside shells will not be acceptable under this specification.

In general all exterior walls and interior bearing walls shall be of Natco XXX hollow tile; non-bearing, subdividing walls shall be Natco partition tile as manufactured by the NATIONAL FIRE PROOFING COMPANY.

**Laying**—All tile used in the exterior walls and any interior bearing partitions must be laid with the holes or voids vertical in the wall, in order to develop their full strength. Interior subdividing, non-bearing partition tile may be laid on side if desired, but must be started on the structural floor and wedged against the floor above. Care must be taken that the tops of all unfinished walls are thoroughly covered or protected against stormy weather.

The contractor for laying hollow tile is also to furnish and set all iron or steel or concrete incidental to the completion of the building as covered by these specifications—the materials in each case to be the best of their respective kinds to approval of architect.



**Mortar**—All mortar used for laying up the hollow tile shall consist of a standard Portland cement and clean sharp sand in the proportion of 1 part cement to 3 parts sand, well mixed to a smooth, moderately stiff mortar. Lime, not to exceed 10% of the cement by volume, will be allowed in the mortar.

**Foundation Walls**—Any foundation walls so indicated on plans from top of footings to the underside of first floor beams shall be constructed of proper combination of Natco XXX hollow tile to produce thickness shown. Care should be taken to use special Natco XXX hollow tile at the corners. Outside of walls from footing to a point above the ground shall be given a heavy coat of waterproofed cement or other approved dampproofing.

Where columns or piers supporting heavy loads rest on the foundation wall, the same shall be filled with concrete from footing to top of wall to prevent the possibility of failure due to compression.

**Jamb Tile**—Provide for all double hung windows Natco XXX jamb tile with rabbetted openings to receive the window frame box. Fill well with mortar the space between the tile and the frame box to within 1 in. of stop bead. The contractor for the setting of the tile is to call to stop bead of all doors and windows with roofers' cement or oakum, furnished and set by him, to prevent the passage of air or moisture.

**Lintels**—Openings not exceeding 5 ft. in clear span may be spanned with Natco XXX arch lintel tile or with Natco XXX tile reinforced with proper steel rods in lower cells and filled solidly with stone or gravel concrete.

Openings over 5 ft. in clear span to be spanned with reinforced concrete girder faced with tile, or with steel angles—size of structural or reinforcing steel variable with load and span; all to be furnished and set by the contractor for tile laying to approval of architect.

**Sills**—Form all sills of Natco special hollow sill tile. Special care must be taken to fill all joints so as to prevent moisture working through the same; wood sill of frame to be set in a heavy bed of roofers' cement.

**Arch Openings**—Build all arch openings shown on plans of two-course rowlock hollow brick header arches, carefully laid on substantial centers. Arches will spring from the hollow tile and must be well bedded on them.

**Porch Columns and Piers**—Construct any porch columns and piers, so indicated, of hollow tile to sizes as shown. Where column finish is round, build the same of 3-in. circular hollow tile column covering, filling the column with concrete when the second story walls are supported by them. If steel reinforcement is used, care should be taken to band the steel against lateral deflection. Square columns shall be built of the proper size Natco XXX tile.

**Floor Beam Bearings**—Provide and set tile slabs 1-in. thick under all floor beams as bearing plates for the same. These slabs shall also be used for working up to levels and story heights when the full or fractional tile do not work out correctly.

**Beam Courses**—Wood floor beams are to be framed into exterior walls as shown on detail, using Natco XXX hollow tile in accordance with the following: In 8-in. walls 3 x 12 x 12 ins. for facing ends of beams, and 4 x 12 x 12 ins. for filling between beams. In 10-in. walls 5 x 12 x 12 ins. for facing ends of beams, and 4 x 12 x 12 ins. for filling between beams. In 12-in. walls 6 x 12 x 12 ins. for facing ends of beams, and 5 x 12 x 12 ins. for filling between beams.

**Roof Plates**—Embed in cement grout in 2 upper courses of wall at intervals of 5 ft., ¾-in. bolts 24 ins. long. Bolt to project 6 ins. above the top of the wall, to allow of plate being fastened down with nuts.

#### FLOOR CONSTRUCTION

**General**—Floor construction shall be the type known as the combination hollow tile and concrete floor construction, consisting generally of 4-in. reinforced concrete beams spaced 16 ins. on centers with Natco hollow tile between, and covered with concrete top as shown, or the "Johnson" system of Natco tile laid on a 1-in. bed of 1 to 3 cement and sand with metal fabric bedded therein, all to have at least 4-in. bearing on walls.

**Concrete**—All concrete used in floor construction shall consist of 1 part Portland cement, 2 parts clean sharp sand, and 4 parts broken stone or gravel of such size as will pass through a ¾-in. ring. Concrete will be of wet mixture, and must be well tamped and worked around reinforcing steel after pouring.

**Reinforcing Steel**—Steel rods for floor construction must be of such type as will have a mechanical bond with the concrete. Corrugated, twisted or similar type will be accepted. Steel must have an elastic limit of not less than one-half the tensile strength. Rods must be clean and free from rust scales before placing in position, and must be placed not over 1 in. above bottom of floor.

**Tile**—Depth of Natco tile and size of steel reinforcement will be regulated by span and load to be carried, in accordance with standard tables of the manufacturers, and will be of size indicated on the plans. All tile must be wet before concrete is placed, so as to insure a proper bond with the concrete.

**Centers**—Centers must be of such size as to insure of their not deflecting under the weight of the wet concrete, and must be provided in such quantity as to insure speedy work. Centers must not be removed before the concrete has properly set, and under long spans a center line of supports must be maintained for at least 3 weeks after the concrete has been poured. In cold weather the centers must be left in place until directed by the architect to remove them.

#### STUCCO ON HOLLOW TILE

The stucco shall consist of the following materials and be mixed in the following proportions:

- (1) Portland cement which has met the requirements of the American Society for Testing Materials.
- (2) Sand free from organic matter or loam, and uniformly graded in size from coarse to fine.
- (3) Hydrated lime—any good brand of prepared hydrated lime or well burned slaked lime putty will be accepted.

First coat: 1 cement,  $\frac{1}{10}$  lime, 2 sand.

Second coat: 1 cement,  $\frac{1}{10}$  lime, 2½ sand.

Third coat: 1 cement,  $\frac{1}{10}$  lime, 3 sand.

All stucco should be applied immediately after being mixed; no re-tempered stucco shall be used. No stucco is to be applied when it is liable to freeze before it sets. All stucco work shall be kept thoroughly wetted down until cement has set, in hot or dry weather, as too rapid drying will cause cracking.

The tile surface shall be free from all foreign material, and shall be thoroughly wetted down before the first or scratch coat is applied. The first coat shall be applied with force so as to key behind the dovetail scoring, also to prevent air bubbles or holes, and shall be thoroughly scratched to insure proper bond with the next coat. The second coat should be applied as soon as the prior coat has sufficiently set to allow working upon the same, and should be straightened with darby and straightedge, then floated with cork or wooden float to prevent waves showing on the finished wall.

Should it be impossible to apply the second and last coats as soon as the former coat has become thoroughly set, wet down the coat already applied before applying others, to give a better bond between successive layers.

The finish coat should, as far as possible, be applied to the entire area of one side of structure to the corners at one operation.

Thickness of each coat should average from ¼ to ½ in. If only 2-coat work, the material must have a total thickness of not less than ¾ in., exclusive of the dovetail scoring.

Finish coat of stucco is to be waterproofed with an approved brand of integral waterproofing compound or other approved compound in accordance with directions of manufacturers.

#### Co-operative Services.

The branch engineering departments maintained in many of the larger offices of this company are fully equipped to make complete plans and details of the fire-proofing of buildings, estimate the cost, and give all possible help and information to patrons who wish to avail themselves of the advantages offered.



# THE HUMPHREY BRICK & TILE CO.

BROOKVILLE, PA.

## Products.

SCORED and SMOOTH HOLLOW TERRA COTTA BLOCKS, PARTITION BLOCKS, HOLLOW BRICK, BACK-UP BLOCKS, DRAIN TILE, and other Clay Products.

## Facilities.

The plant is located in a section where special advantages for the manufacture of terra cotta blocks, etc., are obtained, such as an abundance of material and water, railroad and shipping facilities and cheap fuel. All motive power in the plant is supplied by gas engines, natural gas being used exclusively for power and fuel, this company operating its own gas wells. The plant is constructed entirely of terra cotta blocks and is under ownership management, assuring owners' personal attention to all orders.

## Advantages of Hollow Terra Cotta Blocks.

Hollow terra cotta block construction insures the following advantages:

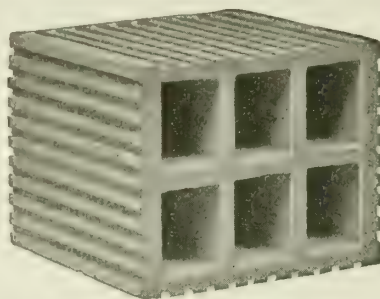
(1) Absolutely indestructible by fire. (2) A dry, warm and well insulated wall. (3) A positive saving in construction as compared with brick or stone. (4) A continuous saving in heating. (5) Less weight on walls. (6) No chance for mice or vermin in walls. (7) No metal lath to rust out. (8) No wood lath to rot or burn. (9) No furring strips to give trouble. (10) Saves space occupied by furring and lathing.

## Strength Test.

Tests conducted by the United States Government Arsenal at Watertown, Mass., showed Humphrey 6-cell wall blocks to have an ultimate crushing strength of over 111 tons per sq. ft. of 8-in. wall. As this is many times the weight that could be put on any ordinary wall ample strength of material is assured.

## Special 6-chamber Wall Block.

Recommended for exterior walls, floor arches, back-ups, pillars, or work where a specially strong block is required. Extra cost is small, and advantages of extra cell in insulation and strength make it well worth the small difference in price.



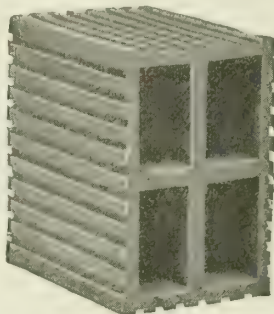
SPECIAL 6-CHAMBER WALL BLOCK

8 x 12 x 12 ins., 36 lbs.  
10 x 12 x 12 ins., 45 lbs.  
12 x 12 x 12 ins., 50 lbs.

## 4-chamber Wall Block.

The 4-chamber block illustrated is that generally used where construction is required to be kept to a competitive basis. No special corner blocks are required, the regular block turned on end making the proper closure at corner.

4-chamber blocks are standard for exterior walls, partitions, floors and back-ups.

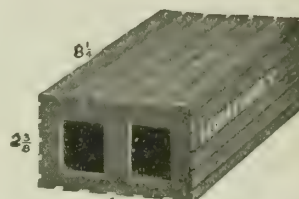


4-CHAMBER WALL BLOCK

6 x 12 x 12 ins., 26 lbs.  
8 x 12 x 12 ins., 32 lbs.

## Standard Hollow Brick.

Used as inside lining course, they insulate a wall without increasing its thickness.



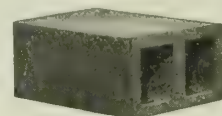
STANDARD HOLLOW BRICK

## Humphrey Smooth Faced Block.

These blocks are made (and carried in stock) with smooth faces and light red color, and are used for exterior walls without further finish. Can also be supplied in dark, fire flashed and light buff colors with either smooth or rough texture face, when quantity is sufficient to justify making special.

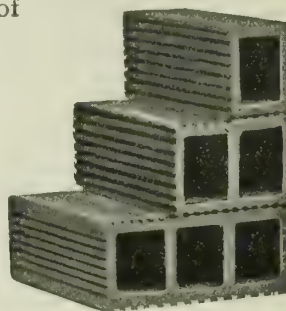
Two blocks lay 1 sq. ft. of wall surface; their use, in nearly all cases, will cut the cost of even common brickwork in two, besides making a warmer, drier building.

Over 4 lineal miles of wall 2½ stories high at the Baldwin Locomotive Works at Eddystone, Pa., are constructed of these blocks.



SMOOTH FACED BLOCK

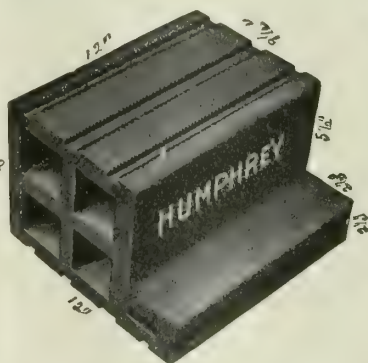
5½ x 8 x 12 ins.  
Also 5¼ x 4 x 12 ins.



5-INCH BACK-UP BLOCK

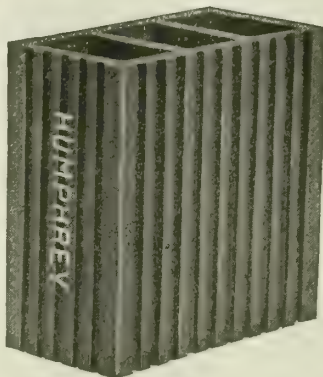
5 ins. ideal height for back-up block; equals 2 courses brick; wall ties can be used every second course

5 x 4 x 12 ins., 10 lbs.  
5 x 8 x 12 ins., 16 lbs.  
5 x 12 x 12 ins., 21 lbs.



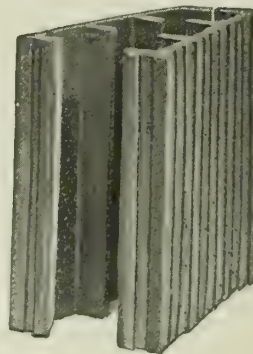
RECESSED WINDOW JAMB BLOCK

For proper finish around windows



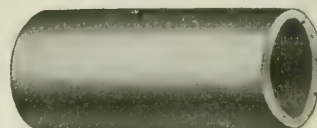
HOLLOW PARTITION BLOCK

3-in. size for non-bearing partitions where partition only is desired. 4-in. size for general partition work where load is moderate. Sizes are:  
3 x 12 x 12 ins., 16 lbs., for 3-in. par.  
4 x 12 x 12 ins., 18 lbs., for 4-in. par.  
6 x 12 x 12 ins., 22 lbs., for 6-in. par.  
8 x 12 x 12 ins., 32 lbs., for 8-in. par.



SPLIT FURRING

For lining exterior walls of brick or concrete. Easily separated on job with trowel.  
2 x 12 x 12 ins., 9 lbs.



ROUND HARD BURNT DRAIN TILE

Caliber	Length	Weight
3 ins.	12 ins.	6 lbs.
4 ins.	12 ins.	8 lbs.
6 ins.	12 ins.	16 lbs.
8 ins.	12 ins.	20 lbs.



# PENNSYLVANIA FIREPROOFING CO.

GENERAL OFFICES  
ERIE, PA.

## Products.

FIRE CLAY HOLLOW TILE, Hard Burned, Dense and Semiporous, for Fireproofing Steel Buildings and for Partition Walls.

"PENTEX SPLITS" HOLLOW TILE.

"Pentex" Hollow Tile.

"Elco" Hollow Block for exterior walls.

Hollow Brick for backing up solid brick walls.

Manufacturers of the well-known Denison Interlocking Hollow Tile, being exclusive licensees for New England, Pennsylvania, Delaware and Maryland. Denison Interlocking Tile are described elsewhere in this catalogue under the DENISON INTERLOCKING TILE CORPORATION.

## Pennsylvania Fireproof Tile.

The PENNSYLVANIA FIREPROOFING Co. operates one of the largest and best equipped fireproofing hollow tile factories in the United States. The capacity of the plant is more than 500 tons of hollow tile each working day.

This fireproof tile is a mixture of plastic clay with refractory clay (two distinct veins in the company's mines), producing an ideal hollow tile of a terra cotta shade after burning; mixture enables the tile to be burned very hard, leaving it entirely free from fire cracks.

Tile withstands action of water and fire under actual fire tests much better than if it were made from refractory clay alone, and the feature of brittleness—common to hollow tile made of refractory clay—has been thoroughly eliminated.

It will not stain or discolor stucco, or interior plaster decorations.

SCOPE OF USE—In addition to the uses set forth above (see Products) may be mentioned the following: Wall furrings, combination hollow tile and reinforced concrete floor arches, girder coverings, column coverings, partition nailing grounds, window jamb and sill blocks, etc.

## "Pentex Splits" Hollow Tile.

These products (made for 8-in. and 12-in. walls) give a hollow tile wall with rough texture exterior face, at low cost, combining the beauty and soft exterior color scheme of high grade face brick. Face of tile is not wire cut, but is produced by a process that insures a more pleasing effect. The horizontal air space, the best insulator against cold or heat, absolutely prevents passage of moisture through wall, via horizontal or vertical mortar joints.

COLORS—Varying shades of red, with shadows and lights of the rough surface, make an artistic wall exterior; buff shades also furnished.

SIZES—Each  $2\frac{1}{4}$  by 8 by 8-in. block represents 2 standard solid brick; 7 of these splits equaling 1 sq. ft. of 8-in. wall.

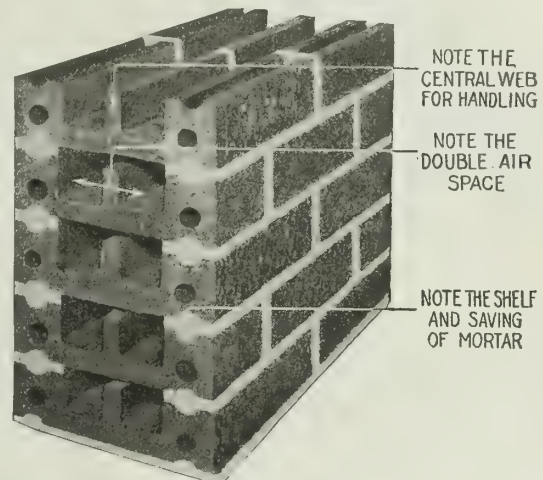
COST—The cost of a sq. ft. (exterior surface) of 8-in. wall is from 25% to 40% cheaper (by using "Pentex Splits") than a face brick wall of solid brick. Large savings accrue in freight, cartage and human energy in handling; also, in cost of steel framing where

"Pentex Splits" are employed, as curtain walls in large office, apartment or factory buildings.

Dead load on steel reduced 25%.

GUARANTEE AS TO COMPRESSION LOAD TESTS—This company guarantees that "Pentex Splits" will, when laid up in the wall in accordance with the standard specifications, meet the following compression load tests:

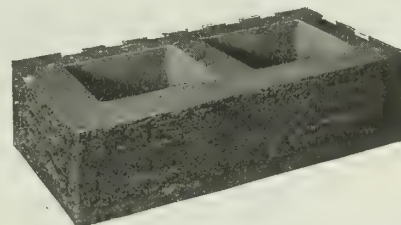
Maximum load in lbs. per lineal ft. of 8-in. wall or 96 sq. ins. gross, 75,000 lbs. Maximum load in lbs. per sq. in. net section under compression (48 ins.), 1,800 lbs. Maximum load in lbs. per sq. in., gross area 96 sq. ins., 780 lbs.



## "PENTEX SPLITS" INSTALLED IN A HOLLOW TILE WALL

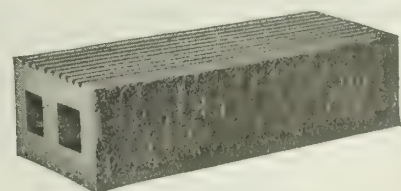
Note double horizontal air cells, which have twice the insulating value of a single tile. Note round holes in end of block. In buttering the ends of tile, a certain amount of mortar is forced into these round dowel holes; and in placing the tile in the wall, the adjacent tile receives a part of this mortar in the corresponding dowel hole, making a locked vertical mortar joint.

CORNER BLOCK AND HEADER—Very useful as a closure in turning corners or in jambs for doors and windows where plank frames are used. Can also be used in soldier courses over windows, water tables, belt courses or rowlock courses.



CORNER BLOCK AND HEADER  
 $2\frac{1}{4}$  by  $3\frac{3}{4}$  by 8 ins.

FILLER BLOCK—This standard size hollow brick with "Pentex" face is useful in facing the wall where floor joists rest on wall. Can also be used to fill in between joists.



FILLER BLOCK  
 $2\frac{1}{4}$  by 4 by 8 ins.

# THE CAMPFIELD RAGGLE BLOCK CO.

GENERAL OFFICES  
Colonial Building  
RICHMOND, IND.

## Products.

CAMPFIELD CLAY and TERRA COTTA RAGGLE BLOCK.

CAMPFIELD CLAY and TERRA COTTA WALL COPING.

CAMPFIELD PREPARED OAKUM.

CAMPFIELD RAGGLET CEMENT.

Campfield Terra Cotta Water Table, Campfield Air Cell Flue Lining, Campfield Air Cell Underground Conduit for steam pipes, Campfield Segmental Sewer Block and other clay products.

## Patents.

Manufactured under Campfield patents dated as follows:

August 30, 1910  
September 19, 1910  
September 26, 1910  
January 2, 1914  
January 21, 1914  
April 14, 1914

April 21, 1914  
October 24, 1916  
December 26, 1916  
December 26, 1916  
December 26, 1916  
July 3, 1917

## General Information.

The Campfield Catalogue covers details fully, explaining uses and giving much valuable information.

## Cost.

THE CAMPFIELD RAGGLE BLOCK Co.'s products are sold in all parts of the country at standard prices. See dealers, or write direct.

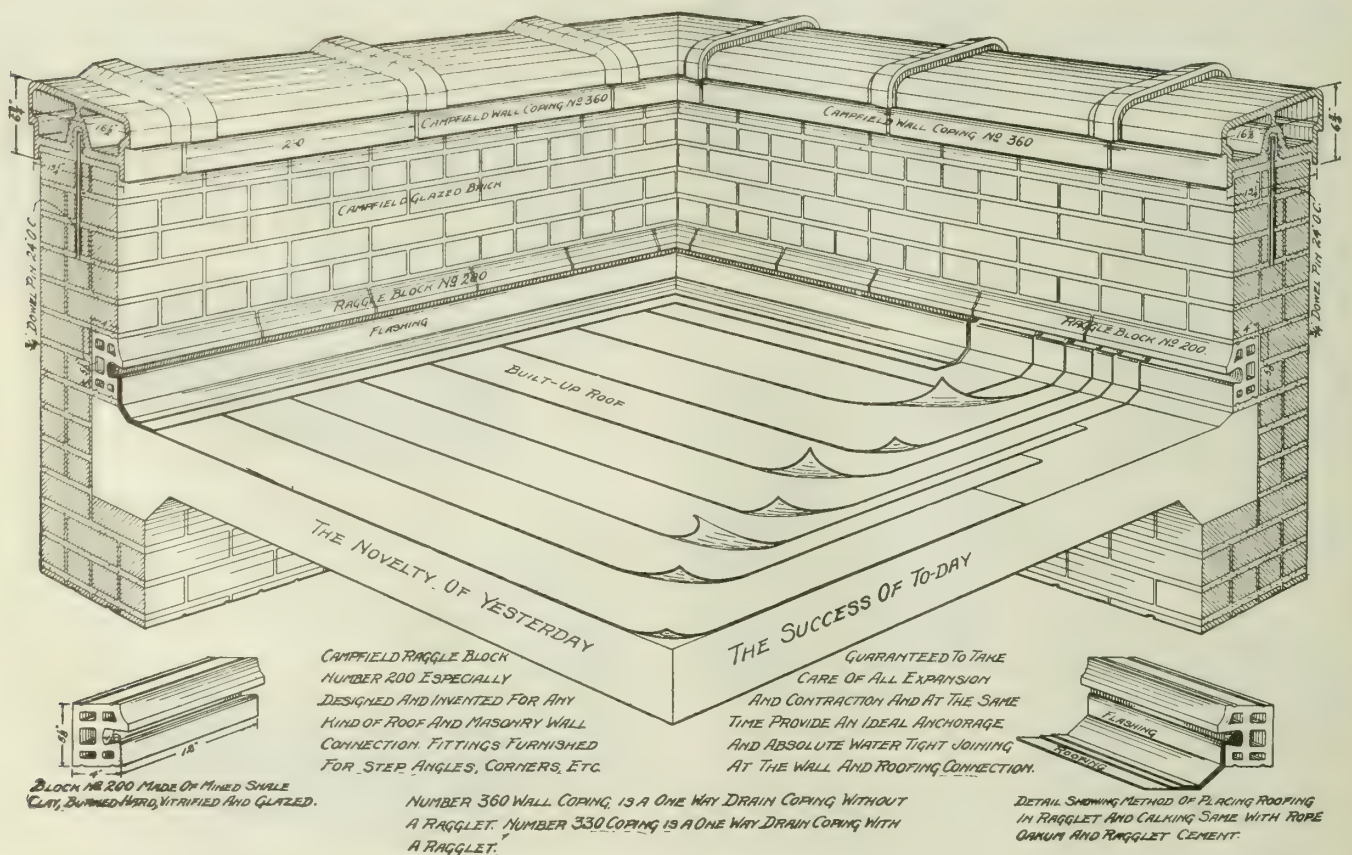
## Fastening Flashings.

Without doubt the raggle block provides an ideal manner for fastening the flashings to the wall, no matter whether the flashing is of felt or metal, and this is especially true if the wall is of brick or concrete. It will not only be easy on new work, but will lower the cost if flashings have to be renewed.

Write for guarantee.

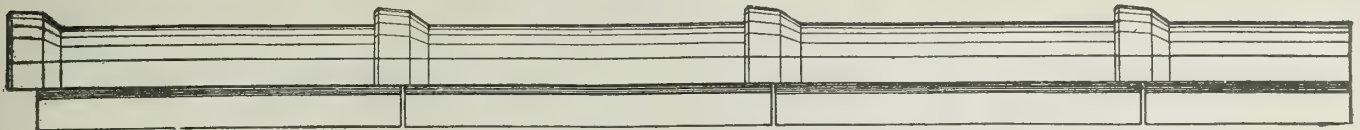
## Specifications.

Write for specifications and plans, which will be sent promptly. If a special drawing is desired, one will be furnished free of cost.

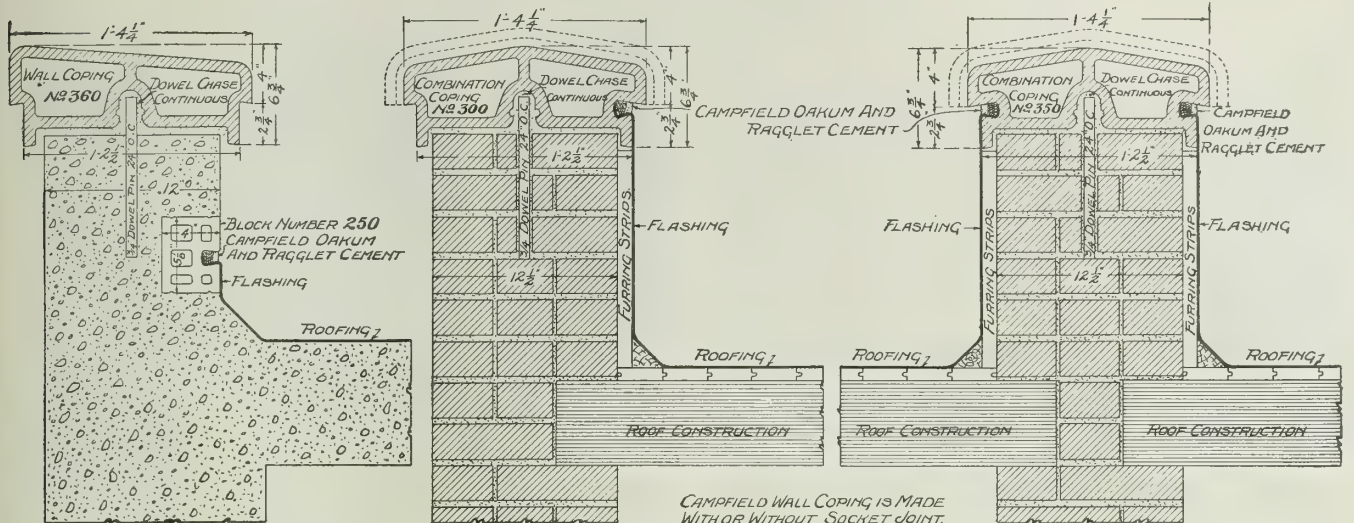


APPLICATIONS OF CAMPFIELD PRODUCTS





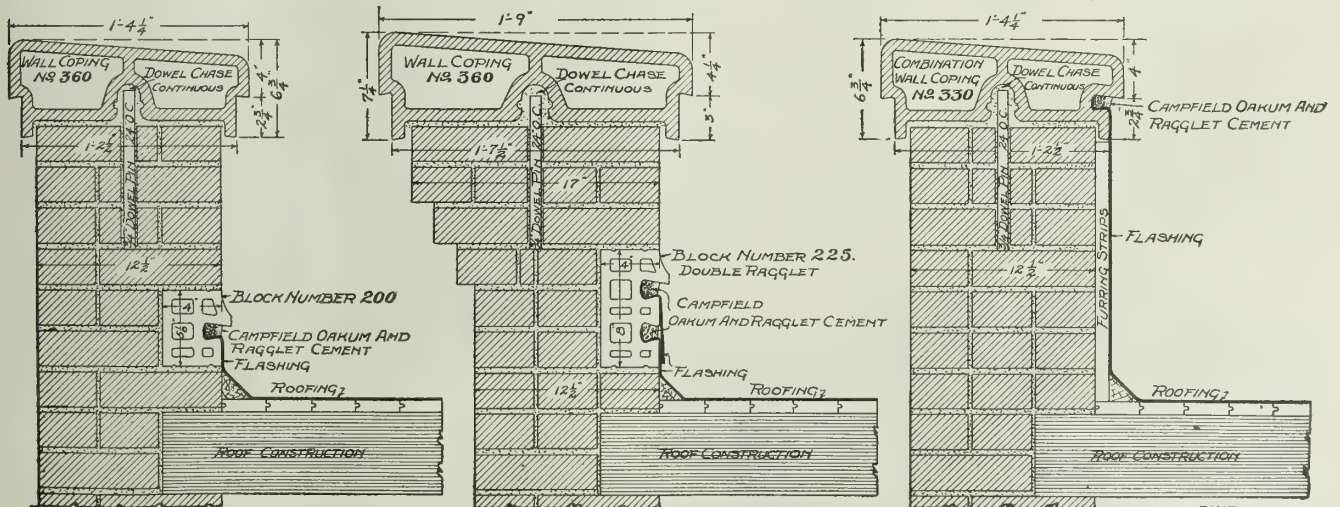
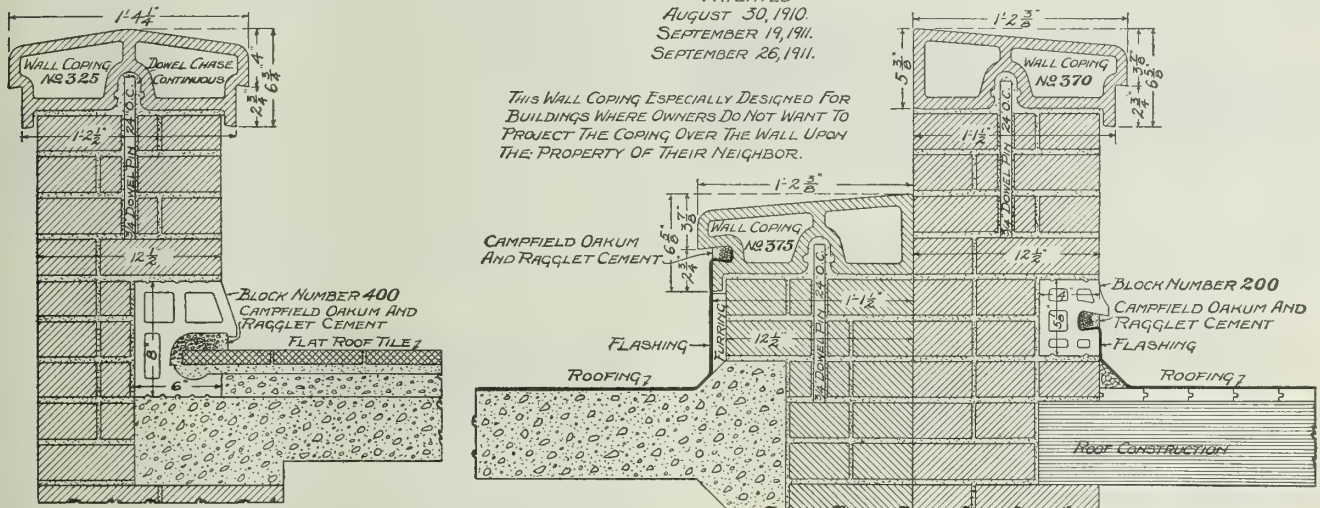
ELEVATION OF COMBINATION WALL COPING NO. 300



CAMPFIELD WALL COPING IS MADE WITH OR WITHOUT SOCKET JOINT.

PATENTED  
AUGUST 30, 1910.  
SEPTEMBER 19, 1911.  
SEPTEMBER 26, 1911.

THIS WALL COPING ESPECIALLY DESIGNED FOR BUILDINGS WHERE OWNERS DO NOT WANT TO PROJECT THE COPING OVER THE WALL UPON THE PROPERTY OF THEIR NEIGHBOR.



CAMPFIELD RAGGLE BLOCK AND WALL COPING

71117



# P. BANNON PIPE CO.

## Hollow Tile Fireproofing and Patent Lidded Pipe

528 West Jefferson Street  
LOUISVILLE, KY.

### Products.

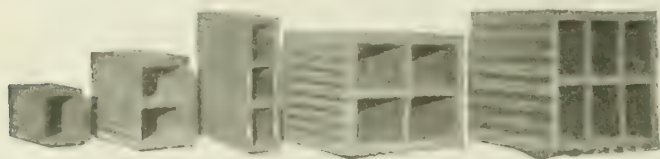
HOLLOW TILE FIREPROOFING; SHALE BRICK; FIRE BRICK; WALL COPING; FLUE LININGS; CHIMNEY TOPS; SEWER PIPES; PATENT LIDDED PIPE and EXPANSION PIPE SUPPORTS.

Vitrified Culvert Pipe; Drain Tile; Glazed Conduit Pipe (for underground work); Vitrified Paving Brick and Blocks; Boiler and Grate Tile.

### Hollow Tile and Shale Brick.

**HOLLOW TILE**—For fireproofing of every description. Made of shale. For partitions and furring tile, 1½- to 16-in.; building tile, 6- and 9-cell, 6- to 12-in.; book tile, back up blocks; column covering; standard arch floor tile, 6- to 16-in.

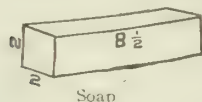
**SHALE BRICK**—Are manufactured hollow; with rough texture face, and common.



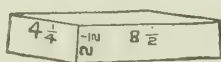
HOLLOW TILE SIZES

### Fire Brick.

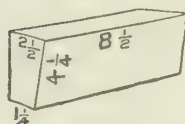
All shapes and sizes.



Soap



Square



Side Wedge

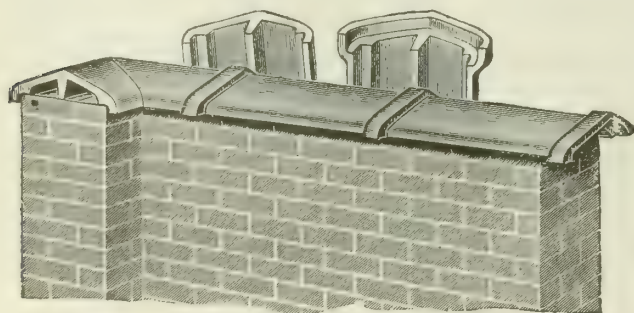


Circle, 36, 40 and 44

FIRE BRICK SIZES

### Wall Coping.

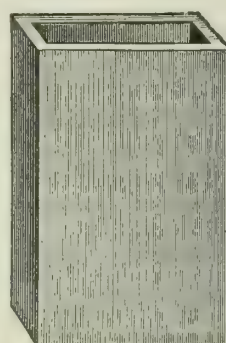
Made of best fire clay and shale, thoroughly vitrified, glazed to render surface as smooth as glass. Tile is shaped to fully cover wall, protecting same from action of the elements; also secures the top course of brick.



WALL COPING, HIP SHAPE  
With or without rib



8½ x 13 ins., pipe  
hole



13 x 13 ins.

FLUE LININGS



No. 14. CHIMNEY  
TOP

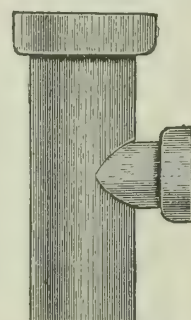
### Sewer Pipe and Fittings.

Made of vitrified salt glazed fire clay and shale.

The salt glazed surface, being smooth, clean and impervious, protects pipe and fittings from dampness, frost, all acids and sediments.

It is durable, low in cost, convenient for construction, and because of its smooth glazed surface has greater carrying capacity than any other material.

It can be laid by unskilled labor.



SEWER PIPE  
T-Branch



LIDDED PIPE

For conducting steam and water pipe

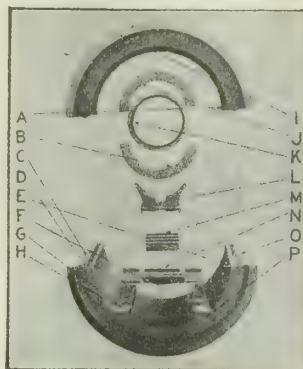


Plate E, Single Line

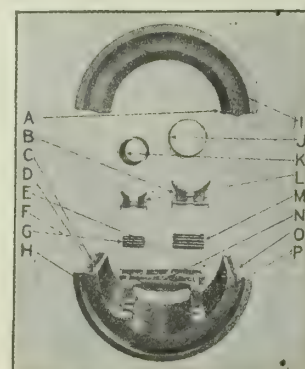


Plate F, Double Line

DETAIL OF CONDUIT

Reference letters point as follows:

**Plates E and F**—A, reinforcement inside along score cut on both sides of lid half; C, outer open scores; D, trench-like fracture; E, inner open scores; F, support anchoring pocket; H, drainage space; I, hub of lid half; O, cement shelf and outer reinforcement at each side of lower half; P, hub of lower half.

**Plate E, only**—B and J, standard covering; K, 6-in. iron pipe; L, saddle receiving K, direct; M, 4½x2-in. toothed roller (meshes in rack of saddle and cradle); N, No. 15-F-15 cradle (the finger supported style).

**Plate F, only**—B, saddle for main line; J, L, saddle for return line; K, G, roller for return saddle; M, roller for main line saddle; N, No. 16-P-15-D cradle (the rib supported, boss-anchored style).



# THE SEWER PIPE MANUFACTURERS ASSOCIATION

JOHN L. RICE, FIELD COMMISSIONER

ASSOCIATION OFFICE

519 Second National Bank Building  
AKRON, OHIO

TWENTY-TWO INDEPENDENT AND COMPETING COMPANIES

## Products.

VITRIFIED CLAY PIPE, VITRIFIED CLAY WALL COPING, FIRE CLAY FLUE LINING.

### Vitrified Clay Pipe.

Being unaffected by acids, electrolysis or any form of corrosion, vitrified clay is the ideal material for underground service, particularly where it must withstand contact with a great variety of corrosive substances, as in the case of sewage. Its glazed interior surface facilitates the flow and offers the minimum chance of stoppage.

Physical tests of vitrified clay pipe have shown it capable of withstanding a sand bed pressure of 1 to 7 tons per lin. ft., varying with the size.

**BUILDING DRAINAGE**—For building drains and building sewers, vitrified clay pipe offers the immunity to corrosion which is the best guarantee against ugly jobs of tearing up. It is the logical complement of the porcelain bathroom fixtures and other vitrified equipment which commands such general preference for sanitary purposes.

**JOINT CONSTRUCTION**—Careless installation has been responsible for whatever dissatisfaction exists with building drains of vitrified clay pipe. This has led to the development of many new joint materials, among which especially favorable mention may be given to G. K. Compound, manufactured by the Allas Company.

Research in the last year has shown, however, that a joint of Portland cement can be made rapidly and economically. It withstands every test without so much as seeping. The essential feature of such a joint is that the material is poured in a form while having about the fluid consistency of thick cream. The form is left on the pipe for 24 hours and then removed. It is highly important that sand and cement should be mixed in their dry state before water is applied—1 to 1 is the proper proportion. An added factor of safety is 2% of waterproofing compound.

Several joint forms have been invented. The one used by this association in demonstration of the poured joint is known as the Flexform and consists of a series of overlapping scales of sheet metal, strung together, clamped around the joint. Full directions for its use may be had by applying to the association.

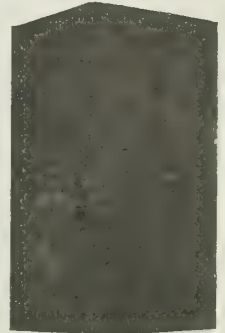
### Flue Linings.

Conflagrations starting in defective chimneys are numerous and destructive, especially in residence localities. Fire clay flue lining is the best insurance against such fires, which usually originate from the cracking of the mortar in the joint of the brick. Sometimes the whole brick drops out, giving flames uninterrupted access to the woodwork.

The function of flue lining is to "break joints." It has only one joint for every 24 ins. Compared

with an added thickness of masonry it is more effectual in breaking joints, more economical and occupies less space. It makes an ideal form around which to build the masonry and, when there are several flues to a single chimney, it solves the question of partitions between the flues. It has the added advantage of smoothness, which facilitates the draft. Rough masonry, on the other hand, frequently sets up eddies that seriously interfere with draft.

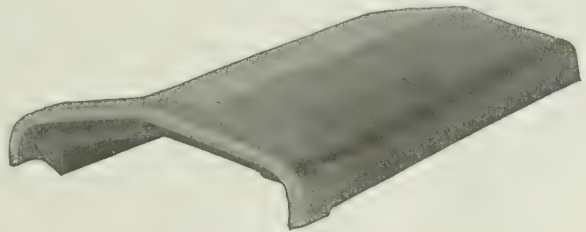
Natural gas is peculiarly destructive to masonry, as the condensed products of combustion have the property of dissolving mortar. Flue lining is indispensable to satisfaction where chimneys are used wholly, or in part, to conduct the fumes of natural gas stoves and furnaces.



FLUE LINING

### Wall Coping.

Wall coping of vitrified clay is the ideal protection for the parapet of masonry walls, as well as a neat and attractive finish, from the standpoint of appearance. It prevents the entrance of moisture into the inner recesses of the wall with its resultant destructive frost action.



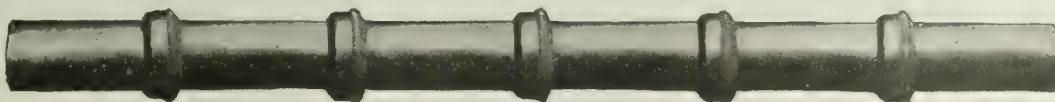
WALL COPING

Wall coping has all the splendid permanence of other vitrified clay products. It is unaffected by exposure to the weather.

### Distribution and Service.

Vitrified sewer pipe, wall coping, and fire clay flue lining are staple commodities handled by building supply dealers everywhere. Inability to obtain them in desired sizes and shapes will receive prompt attention if reported to this office.

The association offers its services as adviser to architects and builders in the use of vitrified clay products. Its handsomely illustrated volume, *Clay Products for Building Construction*, will be sent on application. Special questions involving the correct use of materials will receive the prompt attention of the engineering department.



SEWER PIPE

# ATLANTIC TERRA COTTA CO.

1170 Broadway  
NEW YORK, N. Y.

SOUTHERN BRANCH  
ATLANTA, GA., ATLANTA TERRA COTTA Co., Third National Bank Building

DISTRICT OFFICES  
ATLANTA, GA. DALLAS, TEX.  
Agencies in all Principal Cities of the United States and Canada

## PLANTS

PLANT 1: TOTTEVILLE, S. I., N. Y.  
PLANT 2: PERTH AMBOY, N. J.

PLANT 3: ROCKY HILL, N. J.  
PLANT 4: PERTH AMBOY, N. J.

SOUTHERN PLANT: EAST POINT, GA.  
Seven miles from Atlanta

## Products.

ARCHITECTURAL TERRA COTTA: Lustrous Glazed, Matt Glazed, Unglazed, Vitrotex, Smooth, Tooled, Bushhammered, Rough and Ordinary Surface, in any single color or combination of colors.

FAIENCE, polychromatic combination in a great variety of soft and brilliant colors.

GLAZED GARDEN POTTERY, exceptionally high grade in many colors.

FIREBRICK.

Specialties: Battery Slabs, Sanitary Fittings, Dairy Tile, Matt and Lustrous Glazed Brick, Faience Tile.

## Scope.

The ATLANTIC TERRA COTTA Co. is the largest Terra Cotta company in the world, and ships to all parts of the world.

## Service.

Atlantic service is particularly efficient in showing how terra cotta can best be applied to meet definite requirements. When desired, colored sketches and perspectives are made up to carry out the ideas of architects and owners, together with Standard Specifications for terra cotta construction.

Unless the architect inspects the models at the Atlantic plant, photographs are made and submitted to him for his approval.

The ATLANTIC TERRA COTTA Co. furnishes terra cotta construction drawings for the use of the builder,

showing every piece in complete detail. A schedule of the necessary iron rods and anchors for the contractor's use accompanies the drawings. With these drawings any mason builder can erect the terra cotta. On request, an experienced terra cotta setter will be furnished to expedite the erection of the work. The charge for this setter is approximately the same as a bricklayer's wages in the large cities, plus transportation expenses. Instead of being an extra expense, this service effects a saving, as the setter does the work otherwise assigned to a bricklayer and by his superior competency speeds up the operation and secures quick results with the best workmanship and at least cost.

## Setting.

The ATLANTIC TERRA COTTA Co. prefers to set its own work, because its interest to have the building look well is identical with that of the owner. Excellent results without increased cost are frequently obtained in this way.

Contracts for setting regularly include the following work: Cartage, scaffolding, hoisting, centering, temporary protection, mortar, light iron, cleaning and painting. They do not include backing up the terra cotta with brick nor filling the voids with concrete.

## Use of Terra Cotta.

Terra Cotta is an architectural decorative material used both for entire façades, as in the Woolworth Building, and the new Winfield Building, 40th St. and 5th



NEW YORK CITY'S TERRA COTTA SKYLINE

More than half the visible building material is Atlantic Architectural Terra Cotta. The largest unit, the Woolworth Building, is entirely of Atlantic Terra Cotta on all elevations from third story to tower roof. The basic color is a varying matt ivory; but 10 other Atlantic colors, including lustrous gold, are used in the background of modeled ornament.



Avenue, New York City, or in connection with other building materials such as brick, stone, concrete, etc., as in the McAlpin Hotel in New York City. It is also especially adapted to use in interiors, like lobbies, vestibules, ceilings, restaurants, hallways, etc. It lends itself readily to fountains, statuary, or other features requiring artistic decorative effects.

### Quality.

Atlantic Terra Cotta is a mixture of clay pressed to the desired shape and size in plaster moulds and then fired in a kiln to a temperature of 2250° Fahr. Its color depends on a covering slip or glaze applied before burning and thoroughly incorporated with the body during the burning process. The colors that may be produced are practically unlimited; they can be used alone or in combination with one another.

In addition to the beautiful color effects obtainable, the decorative properties of terra cotta are further emphasized by the beauty of the rich modeling possible in the plastic clay, ranging from delicate bas-relief to figure work in heroic size, effects that can not be gotten in any other material except at a tremendous cost.

Structurally, terra cotta is adapted to every form of frame construction. It is practically weatherproof, is durable, and very easy to clean; the high temperature it undergoes during manufacture makes it not only fireproof, but prevents its being affected by adjacent fires.

Atlantic Terra Cotta will bear any necessary compression; it protects the frame of the building completely and will outlast any other type of construction.

### Colors and Finishes.

**UNGLAZED ATLANTIC TERRA COTTA**—Made in a great variety of colors. It may have a smooth or a six- or eight-cut tooled surface. This type of terra cotta is appropriate for any architectural purpose.

**ATLANTIC VITROTEX TERRA COTTA**—Also made in a variety of colors and shades and may be smooth or tooled. This finish, made exclusively by the Atlantic factories, has a texture which imparts mellowness to moulding and ornamentation.

**GLAZED ATLANTIC TERRA COTTA**—Either matt or lustrous finish; is generally made with smooth surface and ranges in color from white to yellow. Other colors may be used, as faience in polychrome designs. The glazed surface recommends this type of material for store fronts, light courts, interiors, etc., where a brilliant light reflecting material is desirable, and also for swimming-pools, bakeries, dairies, kitchens, etc., where sanitary requirements are important.

**ATLANTIC GRANITE TERRA COTTA**—Made in various colors resembling the different granites. The unglazed may have smooth surfaces or a surface the same as bushhammered granite. The ATLANTIC TERRA COTTA Co. makes a specialty of manufacturing this type of material in large blocks to preserve the scale required by large structures. Glazed Atlantic Granite Terra

Cotta is identical in color and finish with polished granite.

### Cost.

To arrive at the cost of Atlantic Terra Cotta, architect's drawings, including floor plans, elevations, sections, scale details and specifications should be sent to the nearest agent or to the New York office of the company so that the cost may be estimated and an exact bid submitted. Unless the whole building is to be terra cotta, the terra cotta parts should be clearly marked on the drawings and the elevations should indicate the amount and character of the ornamentation. The color and surface treatment should also be given and, if more than one color is to be used, the polychromatic features should be indicated.

In general, plain work, such as sills, moulded courses, etc., in quantities of the same character, costs somewhat less than limestone delivered. Ornamental work, where there is a reasonable amount of duplication, will cost from 20% to 50% less than limestone, machine or hand carved. In comparison with marble or granite the difference is still greater. When the design lends itself to a reasonable amount of duplication, ornamental glazed terra cotta with additional polychrome colors is far less expensive than stone of the same design.

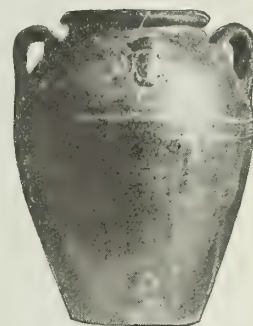
Bushhammered surface costs slightly more than the smooth surface, while glazed granite colors cost more than unglazed granite terra cotta. Atlantic Granite Terra Cotta costs usually one-half the price of granite.

### Garden Pottery.

The ATLANTIC TERRA COTTA Co. manufactures an exceptionally fine quality of garden pottery, made in many different colors, and following the antique in design. It is refined, decorative, and at the same time excellent for the growing of plants and small trees.

The colors ordinarily employed are marble white, antique green, limestone gray, Pompeian red and Colonial yellow.

All Atlantic Garden Pottery is made by hand; mechanical processes are not used, and the slightly indefinite lines and low relief of the antique are perfectly preserved.



GARDEN VASE

### Fire Brick.

Atlantic fire brick, fire brick shapes and fire blocks are made from the best obtainable refractory clay, and are suitable for use in all places where a high degree of heat resistance is essential, such as firebox construction for boilers, smelting furnaces, etc.

Special fire brick shapes are made from the same materials to meet special conditions of location and construction, as firebox arches for locomotives, caps over staybolts in boilers, incinerating furnace blocks, fireboxes for patent stokers, etc. These special shape blocks are coming more and more into favor, since their large size does away with many joints which would occur in ordinary brickwork, and makes them longer lived than fire resisting walls of the ordinary sized brick would be.



# CONKLING-ARMSTRONG TERRA COTTA CO.

MAIN OFFICE AND WORKS  
Wissahickon Avenue and Juniata Street  
PHILADELPHIA, PA.

## AGENCIES

BALTIMORE, W. T. CARSON, Law Building

WASHINGTON, LALLAY-ROHLADER Co., 234 Woodward Building

PITTSBURGH, JAMES R. PITCAIRN, 345 Fourth Avenue

DETROIT, DRESDEN BRICK Co., Hammond Building

## Products and Services.

ARCHITECTURAL TERRA COTTA of quality.  
All colors. All finishes.

Good service and prompt deliveries.  
Estimates given without delay.  
Consultation without obligation.



THE ATLANTIC REFINING COMPANY DISPLAY BUILDING, BROAD STREET AND NORTHEAST BOULEVARD,  
PHILADELPHIA, PA.

W. G. WILKINS Co., Architects

The building illustrated above is constructed entirely of polychrome glazed terra cotta, no less than twenty-nine different colors and shades being used in the color scheme



# FEDERAL TERRA COTTA CO.

Manufacturers of a Superior Grade of Architectural Terra Cotta

101 Park Avenue  
NEW YORK, N. Y.

PLANT  
WOODBIDGE, N. J.

BRANCH OFFICE: DETROIT, MICH., Book Building  
AGENCIES IN PRINCIPAL CITIES

## Products.

ARCHITECTURAL TERRA COTTA for exterior and interior use, in all shapes, colors and finishes.  
Fire Brick and Special Shapes.

and surface treatment reproducing exactly the natural granite.

Polychrome work in all combinations and colors.

## Specialties.

Granite and marble terra cotta, with colors, finishes

## Service.

Preliminary and final estimates rendered promptly.  
The use of this company's designing and drafting office is free to architects, builders and interested clients.

## Representative Work.

BUILDING	LOCATION	ARCHITECT	BUILDER
Studio Building	200 West 57th Street, New York, N. Y.	Cass Gilbert	Wells Construction Co.
Real Estate Exchange	Detroit, Mich.	Louis Kamper	Book Estate
McCreery Building	114 West 42nd Street, New York, N. Y.	Alfred C. Bossom	Chas. T. Wills, Inc.
Racquet and Tennis Club	Park Avenue, New York, N. Y.	McKim, Mead & White	Marc Eidlitz & Son
Public Service Building	Baltimore, Md.	Parker, Thomas & Rice	J. Henry Miller, Inc.
Equitable Building	New York, N. Y.	Graham, Burnham & Co.	Thompson, Starrett Co.
Jefferson County Bank	Birmingham, Ala.	William C. Weston	F. W. Mark Construction Co.
Chalif Studio	West 57th Street, New York, N. Y.	G. A. & H. Boehm	Murphy Construction Co.
Michigan Central Terminal	Detroit, Mich.	Warren & Wetmore	G. A. Fuller Co.
Steketee Building	Grand Rapids, Mich.	Robinson & Campau	Hauser, Owen, Ames Co.
Courthouse	Cincinnati, Ohio	Rankin, Kellogg & Crane	Chas. McCaul Co.



STUDIO BUILDING, 200 WEST 57TH STREET, NEW YORK, N. Y.  
CASS GILBERT, Architect      WELLS CONSTRUCTION Co., Builders

# THE NORTHWESTERN TERRA COTTA COMPANY

WORKS AND MAIN OFFICE  
2525 Clybourn Avenue  
CHICAGO, ILL.

BRANCH OFFICE: CHICAGO, ILL., Insurance Exchange

Address all correspondence to 2525 Clybourn Avenue

## Product.

All varieties of ARCHITECTURAL TERRA COTTA: ENAMEL, STANDARD, FAIENCE; in any color, granite effect, or polychrome.

## "Northwestern" Experience and Service.

Ours was the first architectural terra cotta concern in America, and we now own the largest plant of its kind in the world.

While throughout our 30 years' experience we have kept in touch with all European advances, ceramic and mechanical, the perfection of the product is due in great measure to our own persistent laboratory work. The fruits of this work may be found all over the United States and Canada, exteriors and interiors alike unaffected by age or climatic conditions.

Our terra cotta possesses all the good qualities listed in the next column: but one "Northwestern" specialty is not there scheduled, namely, the intelligent and helpful service which is recognized to be the keynote of our success.

Leading architects and engineers have welcomed our collaboration in the working out of their problems, and have adopted without question our systems of terra cotta construction in connection with steel and concrete.

At all times we are ready to give our clients the benefit of our experience.

Another "Northwestern" point to be remembered is that our enormous facilities and central location enable us to make prompt deliveries, regardless of the size of the contract.

## Technical Characteristics of Architectural Terra Cotta.

**PERMANENCE**—Terra cotta suffers no change from the action of the elements, and is virtually indestructible.

**STRENGTH**—Terra cotta withstands all reasonable pulling and crushing tests, and plays an important part in the protection of adjoining material.

**LIGHTNESS**—This feature, peculiar to terra cotta, is invaluable in large buildings and the designing of heavy projections; also an important factor in freight and handling.

**TEXTURE**—While terra cotta comes in an endless variety of natural surface treatments, it lends itself successfully to the imitation of other materials, such as marble, granite, bronze, etc.

**FORM**—The natural sequence of terra cotta manufacture—from a plastic beginning to a fixed completion—renders it capable of taking on any conceivable form.

**COLOR**—The architect finds in terra cotta a medium offering the widest choice of colors and tints, several of which may be obtained on one piece, if desired. All these colors are unfading, and the enameled surfaces are easily cleaned with soap and water.

**ORNAMENT**—For bold or delicate modeling in all styles, classic or modern, terra cotta is the ideal material. Thanks to its infinity of form and color, the designer of ornament may realize his finest conceptions.

**ECONOMY**—Although possessing all the good points listed above, terra cotta is not expensive. This feature of economy has a great deal to do with its ever increasing use.



CARTER H. HARRISON TECHNICAL HIGH SCHOOL, CHICAGO, ILL.  
A. F. HUSSANDER, Architect





FIRST NATIONAL BANK, KALAMAZOO, MICH.  
Designed and erected under the direction of the WEARY & ALFORD COMPANY  
OSCAR WENDEROTH, Supervising Architect



DETAILS IN GRANITE TERRA COTTA, HOTEL CLEVELAND, CLEVELAND, OHIO  
GRAHAM, ANDERSON, PROBST AND WHITE, Architects  
THOMPSON-STARRETT Co., Contractors



FIGURES IN TRANSOM BAR OVER MAIN ENTRANCE, ST. MARY'S OF THE ANGELS CHURCH,  
CHICAGO, ILL.  
WORTHMANN & STEINBACH, Architects  
MATH RAVEN, Contractor

## O. W. KETCHAM

Manufacturer of and Dealer in a Complete Line of Burnt Clay Products

24 South 7th Street  
PHILADELPHIA, PA.

### BRANCH OFFICES

BALTIMORE, MD., American Building  
NEW YORK, N. Y., 1170 Broadway—Telephone, Madison Square 4893

WASHINGTON, D. C., Home Life Building

### Products and Services.

Manufacturer of ARCHITECTURAL TERRA COTTA, and Hand-made "AGEART TERRA TILE" for Roofing.

Dealer in HOLLOW TILE FIREPROOFING, CLAY ROOFING TILE, MOSAIC TILE, FLOOR and WALL CERAMIC TILE, PROMENADE TILE.

Porcelain Brick, Faience and Ornamental Brick, Rough and Smooth Texture Brick, Bonding Brick, Paving Brick, Repressed Brick, Chimney and Flue Lining, Brick or Terra Cotta Chimney Caps and Tops, Fireplace Brick and Tile, Mantel Brick and Tile, Floor Brick; Wall Plugs and Ties.

Designer of BRICKWORK and INTERIOR BRICK FINISH.

Contractor for the ERECTION OF HOLLOW TILE FIREPROOFING.

### Terra Cotta.

We manufacture all kinds of plain, ornamental, glazed and polychrome terra cotta.

Finishes are standard, and variety of colors is extensive.

With an up-to-date plant, thoroughly fireproof and sufficiently large to meet any demands, patrons need not have any concern with regard to prompt service.

### Fireproofing.

Hollow tile of burned fire clay is one of our principal lines of products. This line consists of all forms known to the trade, such as floor arches, partitions, column coverings, book tile, girder coverings, and the heavy scored building blocks of various sizes; also, hollow building bricks for dampproofing.

### Facilities.

Our line of burnt clay products is complete. We deal in nothing else except metal wall ties, used in conjunction with brick, terra cotta and fireproofing. We have our own plant where all kinds of architectural terra cotta are manufactured, also a strictly hand-made roofing tile, known as the "Ageart Terra Tile."

The plants we represent are numerous and the best in the country, which insures a supply that is really inexhaustible. In our storage yards is carried a supply sufficient to start or finish contract on instant notice, thus preventing the serious delays that often occur through slow transportation or accident in transit.

### Co-operative Service.

Estimates furnished for these products either delivered to the operation or erected in the building, estimates being made from plans and specifications. Where special construction is necessary, the assistance of competent men can be had for the asking. Out of town parties please send plans and specifications to home office for estimates.

When possible, architects should make their own full sized details; but we have a large force of competent men to work these out when necessary.

Estimates made on request, and drawings and specifications sent from out of town will have immediate attention, and will be promptly returned with estimates.

### Samples, etc.

Samples sent by express on request of those interested in future work.

A cordial invitation is extended to those visiting Philadelphia to look over our works and become acquainted with the facilities.



POLYCHROME CARTOUCHE PANEL, THEIS THEATER, WILKES-BARRE, PA.  
HENRY MAIER, Architect, Wilkes-Barre, Pa.



# ALPHA PORTLAND CEMENT COMPANY

GENERAL OFFICES  
EASTON, PA.

BRANCH OFFICES  
PITTSBURGH, Oliver Building  
BALTIMORE, Builders' Exchange

BOSTON, Board of Trade Building  
SAVANNAH, National Bank Building

WORKS

CEMENTON, N. Y. (on Hudson River)  
MANHEIM, W. VA.

JAMESVILLE, N. Y.

NEW YORK, Hudson Terminal Building  
PHILADELPHIA, Harrison Building

ALPHA, N. J. MARTINS CREEK, PA.

## Product.

ALPHA PORTLAND CEMENT.

## Experience.

Alpha Cement is a pioneer American brand representing today twenty-seven years of experience in cement-making. The manufacture of Portland cement is, as an authority recently expressed it, "an extremely scientific proposition, requiring the exercise of the greatest care and long experience. It is a scientific and chemical procedure representing the antithesis of guesswork, or slipshod methods."



STANDARD SACK  
OF ALPHA PORT-  
LAND CEMENT

## Distinctive Features.

Alpha Portland Cement is manufactured under strict chemical supervision at all of the Alpha plants, samples from the rock borings being taken at regular intervals and hourly tests made to insure exact proportioning, thorough burning and fine grinding. The Alpha chemists and chemical engineers are men of real authority, and no zeal for large output or low operating cost can overrule their decisions. This enables the manufacturer not merely to assure the purchaser of uniform high quality, but to *guarantee* (every bag is now so stamped) that Alpha Cement will invariably meet the standard specifications as adopted by the American Society for Testing Materials and approved by the American Society of Civil Engineers and various other scientific bodies. Under the Alpha system of supervision, it is practically impossible for cement that lacks binding power to be shipped out.

## Low-alumina Cement of Distinctive Color.

Portland cement of a low-alumina content is preferred by some engineers for concrete exposed to the action of sea water. The ALPHA PORTLAND CEMENT COMPANY produces at its Cementon, N. Y., plant (directly on the Hudson River), a cement with a percentage of alumina running as low as .0635. Most Portland cements have an alumina percentage of from .07 to .0825. The product of the Cementon Alpha plant has, in addition to its low-alumina feature, an unusual record of strength on long-time tests; and, instead of producing the usual concrete surface effect, yields a light bluish gray tone that is ideal for stucco, floors, walks, walls, etc., where it is desired to secure a lasting artistic effect without the addition of coloring matter.

## Facilities.

The Alpha mills have a combined capacity of 25,000 barrels daily; storage for 2,000,000 barrels. Our private sidings connect directly with five of the main trunk lines of the country—Lehigh Valley, Delaware, Lackawanna & Western, Pennsylvania, Baltimore & Ohio, and the New York Central Lines. Through the

Lehigh & New England Railroad, connection is made with the Philadelphia & Reading, the Central Railroad of New Jersey, the Erie, and to New England points via Poughkeepsie Bridge route. These connections give us unusual facilities in car service, and we are, therefore, in a position, except under extraordinary conditions, to serve promptly the Eastern section of the United States. One of our plants also has private docks directly on the Hudson River, and is ideally situated for coast, canal and export shipments.

## Distinctive Use.

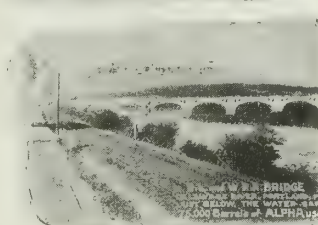
Large quantities of Alpha Cement have been used in such notable undertakings as the Pennsylvania Railroad Terminal and Tunnels, New York; New York Aqueduct (1,180,000 barrels); Detroit River Tunnels; Bush Terminal; Hudson Terminal; Allegheny River Dams; Galveston Sea Wall; Vanderbilt Hotel; Union Station at Washington; Central Park Roads, etc.

## Package.

Alpha Cement is shipped in the United States in cotton sacks or paper bags, containing 94 lbs. net. Export shipments are made in tongue-and-grooved barrels, made of staves full ½ in. thick, strongly reinforced and double lined with dampproof paper.

## Publications.

"Alpha Cement—How to Use It," is a practical 96-page illustrated handbook. The Alpha Blue Print Service Sheets give many valuable ideas on concrete barns, garages, porches, steps, walks, driveways, etc. Both free on application.



FOUR LARGE CONCRETE CON-  
STRUCTIONS USING ALPHA  
PORTLAND CEMENT



# ALSEN'S AMERICAN PORTLAND CEMENT WORKS

Manufacturers of Portland Cement

TELEPHONES:  
RECTOR 510, 511, 512

45 Broadway  
NEW YORK, N. Y.

W. P. CORBETT, GENERAL SELLING AGENT

## Products.

"ALSEN'S" PORTLAND CEMENT.

## Capacity.

Annual capacity is about 3,000,000 barrels.

## Description.

"Alsen's" has a fine uniform bluish tint. In sidewalk, artificial stonework and cement blocks it produces a most pleasing effect. The color is also an indication of the high quality of the cement. It is often called the "Waterproof Cement," because it makes such dense and impervious concrete.

Medium slow set is always the safest in the long run. Forced strength in cement (like forced growth in living things) is dangerous, and means less strength at maturity. Quick set is supplied only when required for special work.

Tests of old date, or from special samples, which some companies publish, are obviously unreliable, and not a criterion of regular quality. "Alsen's" almost invariably shows superior *long-time* tests when properly conducted under equal conditions, as proved in various countries:

### ANALYSIS OF "ALSEN'S" PORTLAND CEMENT

Silica .....	22.20	Magnesia .....	1.95
Alumina .....	6.74	Sulphuric Acid .....	1.10
Iron Oxide.....	3.44	Loss.....	1.17
Lime .....	63.40		
Specific Gravity.....		3.17	

## Quality.

What is good Portland cement? Most important is *durability* and *safety*; it should gain with time, not lose in strength. "Alsen's" shows good laboratory tests; but they, while most necessary and useful, can be misleading; alone they *can not prove durability under actual working conditions*. Concrete structures, existing many years in all climates, under severe temperature changes, etc., the best evidence. In this kind of long-time record of *actual work done* "Alsen's" has no superior.

This is due not alone to the general excellence of its manufacture, but to the chemically superior raw material from which it is made, a material low in magnesia and sulphuric

anhydride, those deleterious components which can be so injurious. Leading authorities agree on this from many years' exhaustive tests. Err on the safe side, if at all, viz.: The *less* of magnesia and sulphur the better. They are treacherous elements and not yet fully understood. Not one barrel of "Alsen's" leaves the mill until it passes all accelerated and other tests of United States Government and standard requirements.

## Advantages.

"Alsen's" Portland is scientifically prepared to stand the maximum of abuse. It is most durable and *uniform*. Liberal expenditure and close supervision throughout the process of manufacture by trained experts insure careful and intelligent attention in *every* detail.

## The Plant.

When the works were planned, the "Alsen's" engineers spent three years searching all sections for a *better raw deposit* than had yet been discovered.

This deposit was finally located at a special point on the Hudson River and its superior quality was attested by the highest chemical experts obtainable, and a property they had also bought in Lehigh Valley (second to none in that district) was then sold to a competitor not so extremely critical.

The "Alsen" brand is a standard of high quality throughout the world, being shipped to practically all countries where Portland cement is known and used.



ALSEN'S LABEL



UNITED STATES RIDING ACADEMY, WEST POINT, N. Y.  
17,000 bbls. of "Alsen's" Portland cement used



# THE ATLAS PORTLAND CEMENT COMPANY

NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, ILL.  
DES MOINES, IOWA

PHILADELPHIA, PA.  
ST. LOUIS, MO.

BOSTON, MASS.  
DAYTON, OHIO

MINNEAPOLIS, MINN.  
SAVANNAH, GA.

## WORKS

NORTHAMPTON, PA.

HANNIBAL, MO.

HUDSON, N. Y.

## Products.

ATLAS PORTLAND CEMENT.

ATLAS-WHITE PORTLAND CEMENT.

ATLAS-WHITE PORTLAND CEMENT MIXTURES NOS. 1, 2 and 3.

## Capacities.

Productive—18,000,000 barrels a year.

Storage—4,000,000 barrels.

The magnitude of production and of storage capacity—widely distributed mills and branch offices, commanding varied rail and water transportation facilities, and the fact that Atlas products are stocked by dealers, large and small, throughout the country, even in its most remote parts—all this assures prompt shipments and satisfactory handling of orders.

## Quality.

The quality of Atlas Portland Cement is such as to have won the distinction of being "The Standard by which all other makes are measured," and is guaranteed to pass all standard specifications, such as:

- The United States Government;
- The American Society of Civil Engineers;
- The American Society for Testing Materials;
- The American Institute of Architects;
- The American Railway Engineering Association.

## Packages.

Atlas Portland Cement is shipped in barrels of 400 lbs. gross or 376 lbs. net weight, and in duck and paper bags. In bags the weight is 94 lbs. net per bag, 4 bags to the barrel.

## Our Record.

During its 28 years, Atlas Portland Cement has gained and maintained a reputation far beyond the confines of the country in which it is manufactured.

The United States Government selected and used Atlas Portland Cement in the construction of the Panama Canal to the exclusion of every other brand, and to the extent of over 7,500,000 barrels.

Other great works scattered throughout the United States are indications of the character of this material.

## Publications.

For the benefit of those architects who desire to have a complete and authoritative reference file of concrete and stucco construction, the company has published the following books, all of which will be sent free.

- "Reinforced Concrete in Factory Construction."
- "Concrete on the Farm."
- "Early Stucco Houses," with stucco specifications.
- "Color Tones in Stucco," with specifications.
- "Mortar for Pointing, Setting, Backing," with specifications.
- "Cast Stone," with illustrations.
- "Well Designed Industrial Buildings," illustrated.

## Technical and Research Department.

THE ATLAS PORTLAND CEMENT COMPANY maintains a technical and research department for the purpose of assisting the users of its material in the solution of any problem that might confront them, whether



in the form of construction matters or the preparation of specifications for work of various characters; the examination of aggregates or the proper method for handling its material in any work. This service is offered free of charge, and correspondence and consultation are invited.

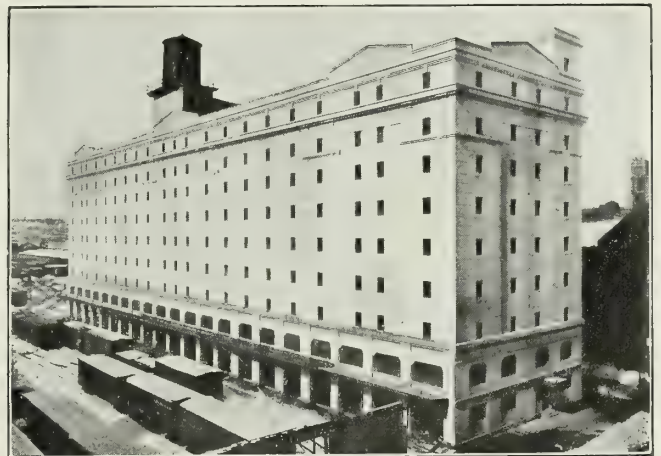
## Reinforced Concrete Service Department.

The use of reinforced concrete for industrial building is growing fast. It is more efficient than mill, and cheaper than steel construction. It is fire-proof, durable, low in maintenance and insurance, and very low in ultimate cost. Materials are quickly secured.

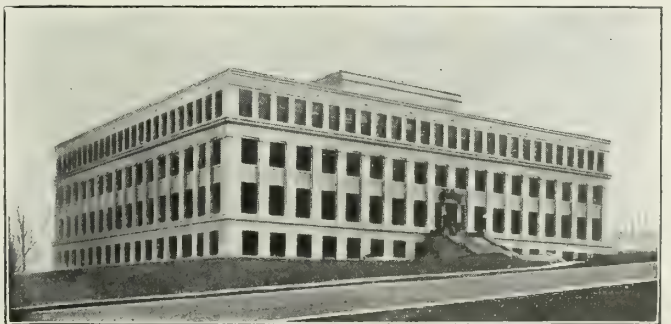
Concrete construction in cold weather is perfectly practicable, if proper precautions are taken.

Its architectural possibilities are just beginning to be developed, and promise a new contribution to our architecture—industrial buildings that are efficient, fire-proof and economical, yet architectural.

Many architects are giving keen attention to this most significant development. Atlas service department is equipped to assist architects with data and statistics. Send for information on factories, lofts, warehouses, terminals, hospitals, schools, garages, stables, etc.



BALTIMORE & OHIO R.R. TERMINAL WAREHOUSE, NEW YORK  
M. A. LONG, Architect      TURNER CONSTRUCTION Co., Contractors  
Atlas Portland Cement used exclusively

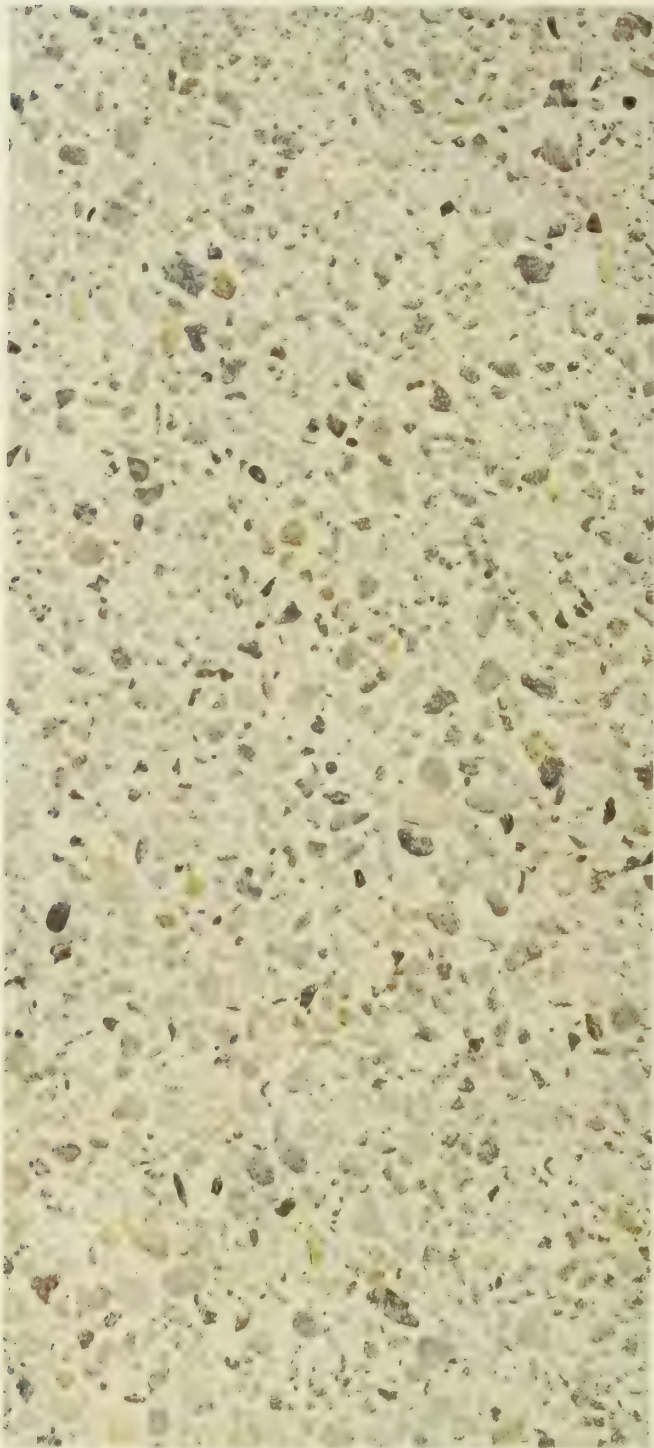


YOUNGSTOWN SHEET & TUBE CO., YOUNGSTOWN, OHIO  
GRAHAM, BURNHAM & Co., Architects  
STONE & WEBSTER ENGINEERING CORP., Contractors  
Atlas Portland Cement used exclusively



**Color Stucco Plate II.**

One part Atlas-White Portland cement, 1 part white sand and 2 parts gravel of a naturally variegated color, mixed integral with cement and sand.



COLOR STUCCO PLATE II

**Color Stucco Plate III.**

One part Atlas-White Portland cement, 2 parts white sand and 1/10 part hydrated lime. Yellow gravel grit thrown on and pressed in.



COLOR STUCCO PLATE III

Other plates of colored aggregate stucco experiments are illustrated in full scale and color, and described in "Color Tones in Stucco," sent upon request  
This monograph also contains a list of sources of colored aggregates for these new stucco effects



**Non-staining Atlas White.**

Atlas-White is a Portland Cement of highest quality. It possesses the strength and physical characteristics of Portland Cement and passes all standard specifications for this material; and in addition, is *white* and *non-staining*.



TRADE-MARK

Atlas-White is packed in paper bags inside of duck bags, and in barrels. Net weight, 94 lbs. per bag; 4 bags to the barrel.

Architectural possibilities with the use of Atlas-White are unlimited, as it is used for exterior as well as interior decorative work, as follows:

For stucco work; in preparation of mortars for setting marble, tile, brick and stone; for facing concrete blocks; for laying terrazzo floors; for manufacture of decorative concrete stone; for wainscoting for bathrooms, kitchens, etc., and in fact for any work requiring use of Portland Cement where a white color is desired.

Atlas-White Portland Cement is absolutely non-staining, and, therefore, a most excellent material for laying up limestone, marble, or any fine textured stone.

As Atlas-White is pure white, its use is indicated for color stucco to give proper color values, either when mineral pigment is used, or for the aggregate-toned stucco, which is described in the monograph "Color Tones in Stucco," and is illustrated on the preceding page.

As sand affects to a great extent the color of finished stucco work, Atlas-White mixtures, composed of Atlas-White Portland Cement mixed with pure white sand, have been prepared ready for use with the addition of water. The proportions of the mixtures are 1 to 1, 1 to 2, and 1 to 3, and are intended not only for convenience of the trade, but for use in localities where a white sand is not obtainable.

**Atlas-White Mixture No. 1.**

This is composed of 1 part Atlas-White Portland Cement and 1 part pure white silica sand, thoroughly and intimately mixed.

The sand in this mixture is of fine, even grain, and the mixture can be used as a mortar for plastering on

concrete walls, exterior or interior; for floor surfacing where a rich mixture is required; in making mortar for laying terrazzo and tile floors, it is more satisfactory than neat cement; and for setting ceramic mosaic tile, marble and wall tile of any description.

**Atlas-White Mixture No. 2.**

This is composed of 1 part Atlas-White Portland Cement in 2 parts pure white silica sand thoroughly and intimately mixed.

The sand in this mixture is graded in such a manner as to make a dense mortar.

This is the mixture recommended in the Standards of the American Concrete Institute for surfacing concrete sidewalks and floors; also, for facing concrete blocks. It is also the mixture recommended by the Associated Tile Manufacturers for tile setting, and for floating and buttering wall tile and in foundations for terrazzo floors.

It is also recommended for cast stone work of every description, such as window sills and lintels, balustrades, vases, garden furniture and decorative work.

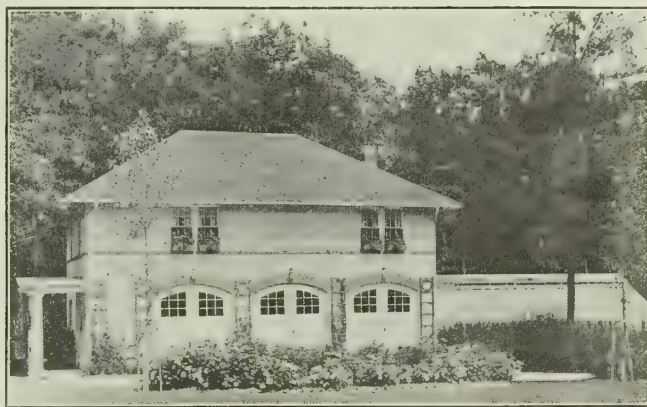
**Atlas-White Mixture No. 3.**

This is composed of 1 part Atlas-White Portland Cement and 3 parts pure white silica sand, thoroughly and intimately mixed.

The sand in this mixture is graded similarly to that in mixture No. 2, the mortar being weaker on account of additional sand.

This mixture is recommended for ordinary work such as for mortar for laying up brick.

It can be used for the manufacture of cement brick.



ATLAS-WHITE GARAGE, HIGHLAND PARK, ILL.

W. D. MANN, Architect

CHAS. ENMARK, Contractor

Atlas-White Portland Cement used



WISCONSIN STATE CAPITOL

GEO. B. POST &amp; SONS, Architect.

WOODBURY GRANITE CO., Contractors

Atlas-White Portland Cement used for pointing and setting granite



ATLAS-WHITE RESIDENCE, KINGSVILLE, TEX.

ADAMS &amp; ADAMS, Architects

SOUTHERN CONSTRUCTION CO., Contractors

Atlas-White Portland Cement used

## Specifications for Stucco in Color.

The purpose of the forms on this and the following pages is to furnish the architect with a convenient guide for the preparation of stucco specifications. They have been drafted with special reference to the use of colored aggregates. The three types of construction covered are: Stucco on Masonry Walls, Stucco on Sheathed

Frame Walls, and Stucco on Skeleton Frame Walls. Materials and methods are to be understood as common to all three forms of construction unless specially stated to be peculiar to one or two particular forms. Variable parts are in italics. For convenience of reference, all notes have been placed immediately following the specification paragraph of which they are explanatory.

## STUCCO WORK

	BRICK AND HOLLOW TILE WALLS	SHEATHED FRAME WALLS	SKELETON FRAME WALLS
Scope	(1) The work required under this <i>section of the specification</i> comprises the stuccoing of all exterior wall and chimney surfaces, as shown on the drawings and hereinafter described. NOTE—When a separate specification is written for the stucco work, the words in italics will be omitted.		
General Conditions	(2) Attention is called to the General Conditions, in the fore part of this specification, which apply equally to all trades. NOTE—When a separate specification is written for the stucco work, the general conditions governing the work will be placed here instead of the reference in paragraph 2.		
Protection	(3) All materials shall be properly protected while stored at the site, and shall not be placed on the ground. Fresh stucco shall be protected against the weather. No stucco in which cracks, pits, streaks, discolorations, or other defects may occur will be accepted.		
Cement	(4) Cement shall be Atlas Portland Cement for undercoats and Atlas-White Portland Cement for finish coat.		
Aggregate	(5) Aggregate for undercoats shall be thoroughly clean sand, graded from fine to coarse grains, with the coarse predominating, and shall be free from loam, salt, vegetable and other deleterious matter. NOTE—The binding qualities of the cement are adversely affected unless sand is as above described; and if the sand is not naturally clean, it should be washed after its removal from the bank. By grading sand from fine to coarse, a more dense and more waterproof mortar is obtained.		
	(6) Aggregate for finish coat shall be thoroughly clean <i>yellow gravel grit</i> . NOTE—Alternatives for the material in italics are: yellow and red marble screenings, gravel grit of variegated color, pink and green granite screenings, etc.		
Lime	(7) Lime shall be (state brand) hydrated lime. NOTE—The admixture of a small quantity of hydrated lime in stucco mortar does not materially decrease its strength, and it does, to a marked degree, increase its plasticity, making it work more freely under the trowel. As lime is an inert void filler, it renders the stucco substantially moistureproof.		
Waterproofing Compound	(8) Waterproofing compound shall be (state brand, etc.). NOTE—Under extensive experiments, hydrated lime has proved so generally successful as a waterproofer of stucco, that its use is advocated in place of the so-called waterproofing compounds. In the coat or coats in which any of these compounds are used, the hydrated lime should be omitted.		
Color Pigments	(9) Coloring matter shall be (state brand) dry color pigments. NOTE—When color is to be produced other than by the use of colored aggregate, mineral colors only should be employed. They should be of the highest degree of purity, of substantially the same specific gravity as the cement, and unaffected by lime, cement or the action of the elements.		
Hair	(10a) Hair shall be first quality long cattle or goat hair.		(10b) Hair shall be first quality long cattle or goat hair.
Water Furring	(11) Water shall be clean and free from acids or strong alkalis.		
	(12a) Galvanized $\frac{1}{2}$ -in. crimped furring, not lighter than No. 22-gauge, shall be fastened over the sheathing paper and directly along the line of the studs, using $1\frac{1}{4}$ -in. No. 14-gauge galvanized staples, placed 12 ins. apart.	(12b) Galvanized $\frac{1}{2}$ -in. crimped furring, not lighter than No. 22-gauge, shall be fastened directly to the stud-ding, using $1\frac{1}{4}$ -in. No. 14-gauge galvanized staples, placed 12 ins. apart.	
	(13a) (Expanded Metal) Lath shall be (give maker's name) expanded metal of No. 24-gauge, weighing not less than 4 lbs. per sq. yd., galvanized after expansion.	(13b) (Expanded Metal) Lath shall be (give maker's name) expanded metal of No. 24 gauge, weighing not less than 4 lbs. per sq. yd., galvanized after expansion.	
Lath	(14a) (Wire Cloth) Lath shall be (give maker's name) No. 19-gauge wire, woven $2\frac{1}{2}$ meshes to the inch, galvanized after being woven. NOTE—Paragraphs 13a and 14a are alternatives. An improved form of construction, taking the place of the furring (paragraph 12a) and the lath (paragraph 13a or 14a), is an expanded metal lath combining furring in the form of an integral stiffening rib, or a wire cloth with a V-stiffening.	(14b) (Wire Cloth) Lath shall be (give maker's name) No. 19-gauge wire, woven $2\frac{1}{2}$ meshes to the inch, galvanized after being woven. NOTE—Paragraphs 13b and 14b are alternatives. An improved form of construction, taking the place of the furring (paragraph 12b) and the lath (paragraph 13b or 14b), is an expanded metal lath combining furring in the form of an integral stiffening rib, or a wire cloth with a V-stiffening.	
	(15a) Place lath horizontally over the furring, driving $1\frac{1}{4}$ -in. No. 14-gauge galvanized staples 8 ins. apart over the furring. The sheets of lath shall be locked or lapped at least 1 in. and tied at joints between studs, both vertically and horizontally, with No. 18-gauge wire. The lath shall be folded around the corners at least 3 ins.	(15b) Place lath horizontally over the furring, driving $1\frac{1}{4}$ -in. No. 14-gauge galvanized staples 8 ins. apart over the furring. The sheets of lath shall be locked or lapped at least 1 in. and tied at joints between studs, both vertically and horizontally, with No. 18-gauge wire. The lath shall be folded around the corners at least 3 ins.	



	BRICK AND HOLLOW TILE WALLS	SHEATHED FRAME WALLS	SKELETON FRAME WALLS
Mortar	<p>(16) Mortar for first and second coats shall be composed of 1 part of Portland cement, 3 parts of sand and 1/10 part of hydrated lime, by volume.</p>		
		<p>(17a) Hair may be added to the first coat mortar, but in quantity only sufficient to bond the mortar.</p> <p>NOTE—Hair is added to the first coat of mortar on metal lath to hold the mortar together on the lath, otherwise there would be considerable waste due to the mortar dropping behind the lath; but no greater quantity than is necessary to accomplish this purpose should be used, as an excessive amount of hair will prevent the mortar from going through the lath sufficiently to thoroughly embed the metal and so preserve it from corrosion.</p>	<p>(17b) Hair may be added to the first coat mortar, but in quantity only sufficient to bond the mortar.</p> <p>NOTE—Hair is added to the first coat of mortar on metal lath to hold the mortar together on the lath, otherwise there would be considerable waste due to the mortar dropping behind the lath; but no greater quantity than is necessary to accomplish this purpose should be used, as an excessive amount of hair will prevent the mortar from going through the lath sufficiently to thoroughly embed the metal and so preserve it from corrosion.</p>
	<p>(18) Mortar for finishing coat shall be composed of 1 part of White Portland Cement, 3 parts of aggregate, and 1/10 part of hydrated lime, by volume.</p> <p>NOTE—If a waterproofing compound is to be used, the reference to lime in paragraph 18 should be stricken out and a description of the waterproofing compound inserted.</p> <p>(19) The finishing coat shall be brought to a tone selected by the addition of dry color in quantity not exceeding 10% of the weight of the cement.</p> <p>NOTE—An excess of color weakens the mortar. Stucco made with White Portland Cement responds more quickly to color tones.</p>		
Mixing	<p>(20) Proportions stated are by volume, and 1 bag (94 lbs.) of cement is to be considered as 1 cu. ft.</p> <p>(21) Mixing shall be done on a watertight platform, the different constituents thoroughly mixed dry to a uniform color, water then added to obtain the proper consistency, and the whole turned over until the mass is uniform in color and consistency.</p> <p>(22) There shall not be mixed at one time more mortar than will be used within 30 minutes. No re-tempered mortar shall be used under any circumstances.</p> <p>NOTE—Cement is likely to take its initial set within 30 minutes after mixing and in even less time during the hot summer months. The practice of re-tempering mortar, after it has taken its initial set, can not be too strongly condemned.</p> <p>(23) The dry color in the finishing coat shall be very carefully weighed or measured and thoroughly mixed with the sand. The cement and lime shall then be added, and the entire mass thoroughly mixed by shoveling, from one side of the platform to the other, through a ¼-in. mesh screen; when the batch is of uniform color, the water shall be added.</p> <p>NOTE—The water as well as the other constituents should be carefully measured, so that each batch will be of the same consistency.</p>		
Mortar Application	<p>(24) The stucco shall be applied in 3 coats, each coat not less than ¼ in. or more than ⅜ in. in thickness, the whole finishing ⅜ in. thick beyond the normal masonry line. The plastering shall be carried on continuously in one general direction, without allowing the mortar to dry at the edge. Where this is impossible, the joints shall be made at a break, an opening or other natural division of the surface. Stucco shall not be applied when the temperature is below freezing. Masonry surfaces shall be cleaned and thoroughly saturated with water just before the first coat of mortar is applied.</p> <p>See Note following "28"</p> <p>(25) The first coat shall be applied under pressure to secure a good bond.</p>	<p>(24a) The stucco shall be applied in 3 coats, each coat not less than ¼ in. or more than ⅜ in. in thickness, the whole finishing 1 in. thick over the furring strips. The plastering shall be carried on continuously in one general direction, without allowing the mortar to dry at the edge. Where this is impossible, the joints shall be made at a break, an opening or other natural division of the surface. Stucco shall not be applied when the temperature is below freezing.</p> <p>(25a) The first coat shall be applied under pressure so that the mortar will be forced through the lath and completely embed the metal on both sides. This can not be done if excessive quantity of hair is used. Special care shall be taken to fill all voids around furring strips and where lath laps.</p>	<p>(24b) The stucco shall be applied in 3 coats and back plastered 1 coat, the whole finishing 1½ ins. thick, with the outside face 1 in. beyond the face of studs. The finishing coat shall be not less than ¼ in. in thickness. The plastering shall be carried on continuously in one general direction, without allowing the mortar to dry at the edge. Where this is impossible, the joints shall be made at a break, an opening or other natural division of the surface. Stucco shall not be applied when the temperature is below freezing.</p> <p>(25b) The first coat shall be applied under pressure to secure good key, and after it has set shall be back plastered on the inside or back surface of the lath to a thickness of ½ in.</p>
	<p>(26) After the first coat has set, but before it has dried, the second coat shall be applied and floated to a true plane with wood screeds placed at 5 ft. intervals and about openings.</p> <p>NOTE—Where a surface having irregularities is desired, the words in italics should be omitted.</p> <p>(27) After the second coat has set, but before it has dried, the finishing coat shall be applied and finished as hereinafter specified.</p> <p>(28) The undercoats shall be cross scratched before the initial set has taken place, and shall be thoroughly wetted before the succeeding coats are applied. The finishing coat shall be kept moist for at least 4 days, either by gently spraying with water after the mortar has hardened sufficiently to permit it or by hanging wet burlap or other fabric over the surface.</p> <p>NOTE—To fully develop its binding properties, cement requires moisture continuously during the period of crystallization. For this reason masonry surfaces and undercoats are saturated so that they will not absorb the water from succeeding coats, and the finish coat is kept moist either by gently spraying the stucco itself or by soaking burlap curtains hung about 6 ins. away from the stucco. The latter provision is particularly necessary during the hot summer months in order to prevent the evaporation of the water in the finished surface, which is the cause of crazing or hair cracks.</p>		

	BRICK AND HOLLOW TILE WALLS	SHEATHED FRAME WALLS	SKELETON FRAME WALLS
Surface Finish	<p>(29) <i>Exposed Aggregate (Integral Method)</i>—The finishing coat shall be <math>\frac{3}{8}</math> in. thick and, within 24 hours after it has been troweled to an even surface, shall be scrubbed with a stiff brush until the aggregate has been uniformly exposed. Should the cement be too hard to be readily removed by water, a solution of 1 part muriatic acid to 5 parts of water may be used; but as soon as the aggregate has been exposed, particular care shall be taken to remove all trace of acid by spraying thoroughly with clean water from a hose.</p> <p>(30) <i>Smooth Troweled</i>—Finishing coat shall be smoothed with a metal trowel, with as little rubbing as possible.</p> <p>(31) <i>Stippled</i>—Finishing coat shall be smoothed with a metal trowel, with as little rubbing as possible, and then shall be lightly patted with a brush of broom straw to give an even stippled surface.</p> <p>(32) <i>Sand Floated</i>—Finishing coat, after being brought to a smooth, even surface, shall be rubbed in a circular motion with a wood float. This floating shall be done when mortar has partially set.</p> <p>(33) <i>Rough Cast or Spatter Dash</i>—After the finishing coat has been brought to an even surface and before attaining its final set, it shall be uniformly coated with a mixture of 1 part <i>white</i> cement to 2 parts <i>white</i> sand, thrown forcibly against the wall in such a manner as will produce a rough surface of uniform texture.</p> <p>(34) <i>Pebble Dash</i>—After the finishing coat has been brought to an even surface and before attaining its initial set, clean pebbles shall be forcibly thrown against the mortar and embedded therein. Pebbles shall vary in size from <math>\frac{1}{4}</math> in. to <math>\frac{3}{8}</math> in., shall be well wetted before being cast, and shall be uniformly distributed over the surface. They may be pressed into the mortar with a clean wooden paddle, but the surface shall not be otherwise disturbed.</p> <p>NOTE—The above surface finishes are alternatives. Under no circumstances should the stucco be worked after it has attained its initial set.</p>		
Samples	(35) Samples of the surface finish shall be laid up well in advance of the work, and the approved sample shall be carefully preserved during the prosecution of the work and used as a standard.		
Notes	NOTES FOR OTHER SECTIONS OF SPECIFICATIONS		
Framing	<p>The success of stucco on wood frame construction is as dependent upon the character of the framework as it is of the stucco itself. A well braced and rigid framework is absolutely essential. The following provisions are presented as a standard of good practice in this regard:</p> <p>The studs should be spaced 12 ins. on centers and be continuous from main sill to rafter plate, with 1 x 6-in. ribbons housed into studs to support the floor joists and tie the studs together. No grits or other horizontal grained members should intervene. The floor joists should be securely spiked to the studs.</p>		
Bridging	No bridging is required.	Once in the height of each story, the stud walls should have a row of 2 x 3-in. bridging cut in diagonally between the studs and securely spiked to them.	
Sheathing	Matched or ship-lap sheathing, dressed one side to a thickness of $\frac{7}{8}$ in. not less than 6 ins. or more than 8 ins. wide, should be laid diagonally over the studs and fastened with 2 nails at every bearing.	No sheathing is required.	
Waterproofing	Sheathing boards should be covered with a felt, thoroughly waterproofed by impregnation with tar or asphalt—not a sheathing paper—well lapped and tacked at joints and well flashed and tacked about openings.	The outer face of studs, and the sides for a distance of 2 ins. back from the face, should be thoroughly coated with a pitch or asphalt compound, to interpose waterproofing between the stucco and the framework.	
Insulation	When greater insulation than the waterproof felt affords is desired, such as quilting or corrugated paper, this insulation should be placed between the waterproof paper and the sheathing.	After the stucco lath has been back plastered, the air space between the studs may be divided by applying, between the bridging and the inside plastering, quilting or other insulating material, fastening it in place by nailing wood strips, over the fold in the paper, on the sides of the studs.	
Furring	Unless metal furring is used, or a lath of which metal furring forms an integral part, the wall should be furred over the waterproofing paper with 1 x 2-in. strips placed vertically 12 ins. on centers and about openings.	Unless metal furring is used, or a lath of which metal furring forms an integral part, the wall should be furred with 1 x 2-in. strips placed vertically on the studs and about openings.	
Sills	Sills of openings should have ample slope and projection and undercut drips.	Sills of openings should have ample slope and projection and undercut drips.	



# LEHIGH PORTLAND CEMENT CO.

ALLENTOWN, PA.

CHICAGO, ILL.

SPOKANE, WASH.

## BRANCH OFFICES

NEW YORK, N. Y. PHILADELPHIA, PA. BOSTON, MASS.  
JACKSONVILLE, FLA. MINNEAPOLIS, MINN. MASON CITY, IOWA  
OMAHA, NEBR.

BUFFALO, N. Y. PITTSBURGH, PA.  
NEW CASTLE, PA. RICHMOND, VA.  
KANSAS CITY, MO.

## MILLS

FOGELSVILLE, PA. MITCHELL, IND. METALINE FALLS, WASH.  
IOLA, KANS. WEST COPLAY, PA.

ORMROD, PA. MASON CITY, IOWA  
NEW CASTLE, PA. OGLESBY, ILL.

## Product.

LEHIGH CEMENT — Guaranteed to conform in every respect to the Standard Specifications for Portland Cement as adopted by the American Society for Testing Materials when tested by methods recommended by the American Society of Civil Engineers.



TRADE-MARK

## Marketing and Shipping Facilities.

Lehigh mills are located at strategic points from the Atlantic to the Pacific. In principal marketing centers, branch offices have been established for the convenience of our customers.

Lehigh Cement is marketed in cloth or paper bags, or in bulk for domestic trade, and in barrels for export trade. The bags contain 94 lbs. net (4 bags to the barrel), and the export barrel contains 376 lbs. net. These barrels are made in our own cooperage plant and are tongued and grooved to withstand the rough handling necessary in export trade.

## Use.

In practically every type of modern construction the use of cement is required. In great engineering works, concrete is an essential material.

The careful selection of the ingredients for concrete is an important factor in the success of the finished

work. The selection of Lehigh Cement is a warranty for the most important material used in concrete.

Perhaps the best guarantee on future promise is past performance. The great New York Connecting Railroad; the Municipal Building, New York; the Girard Point Elevators, the League Island Dry Docks, Philadelphia; the Boston Braves' Ball Park; the Chicago and Northwestern Railway Terminal; the Quay and Sea Walls, Charleston, S. C.; the Galveston Causeway—these are a few of the structures where Lehigh was used.

The most noteworthy conflagrations, quakes and storms have proved the strength and permanence of concrete. Another feature of concrete that recommends its consideration to engineers is its adaptability to every form and class of engineering.

## For Architects' Convenience.

To any architect writing us on the stationery of his firm and mentioning SWEET'S ARCHITECTURAL CATALOGUE, we will send our celluloid computing scale, giving the amounts of cement, sand and stone required per cubic yard of rammed concrete of different proportions.

Further discussion of items of particular interest to any architect may be entered into by communication with any of our offices.



THE NEW YORK CONNECTING RAILROAD

One of the greatest engineering works of today, made possible through the use of concrete

## THE SANDUSKY CEMENT CO.

CLEVELAND, OHIO

BAY BRIDGE, OHIO

FACTORIES  
SYRACUSE, IND.

DIXON, ILL.

YORK, PA.

**Products.**

MEDUSA PORTLAND CEMENTS: Medusa Gray and Medusa White Portland Cements; Medusa Waterproofed Gray and Medusa Waterproofed White Portland Cements.

For Medusa Waterproofing see page 56.

**Output.**

Annual production, 2,500,000 bbls.

**Quality.**

Medusa Portland Cements are guaranteed to pass standard and United States Government specifications. Every carload is tested before being shipped. A record of laboratory test will be furnished on request.

**Description.**

Medusa Portland Cements are slow setting and quick hardening, absolutely uniform and unsurpassed in fineness and strength.

Medusa White Portland Cement is perfectly white in color and non-staining; a product of unlimited artistic possibilities.

Medusa Waterproofed Cements are our regular gray and white brands waterproofed with our celebrated Medusa Waterproofing (see our page in Waterproofing Section), and ready for use.

**Uses.**

Medusa White Portland Cement is particularly suitable for exterior as well as interior work. It is unexcelled for stucco, concrete bridges, floors, building trim and ornamentation, interior decoration, parks and grounds, colored concrete, stainless mortar for setting terra cotta, marble, etc.

Medusa Waterproofed Portland Cement is highly recommended for basement walls and floors, swimming pools, reservoirs, elevator pits, and in a multitude of other uses in which resistance to percolation of water is required.

**Specifications.**

Specify "According to Manufacturers' Specifications." Write for specification booklet.

**Catalogues and Samples.**

Send for samples, and catalogues illustrating and



TRADE-MARK

describing work in which Medusa has been used, and containing tests and testimonials.

**References.**

Medusa White Portland Cement.

U. S. Post Office, New York, N. Y.  
U. S. Post Office, Canandaigua, N. Y.  
U. S. Post Office, North Tonawanda, N. Y.  
U. S. Post Office, Bristol, Conn.  
U. S. Post Office, Wallingford, Conn.  
U. S. Post Office, Frankfort, Ky.

U. S. Post Office, Wooster, Ohio  
U. S. Post Office, Marion, Ohio  
U. S. Post Office, Delaware, Ohio  
U. S. Post Office, Athens, Ohio  
U. S. Post Office, Ironton, Ohio  
U. S. Post Office, Cornersville, Ind.  
U. S. Post Office, Wabash, Ind.  
U. S. Post Office, Peru, Ind.  
U. S. Post Office, Jeffersonville, Ind.  
U. S. Post Office, Watertown, Wis.  
U. S. Post Office, Pontiac, Mich.  
U. S. Post Office, Mt. Clemens, Mich.  
U. S. Post Office, Asbury Park, N. J.  
U. S. Post Office, Washington, D. C.  
U. S. Post Office, Ottumwa, Iowa  
U. S. Post Office, Temple, Tex.  
U. S. Post Office, Lake Charles, La.  
U. S. Post Office, Athol, Mass.  
U. S. Post Office, Fairmont, W. Va.  
U. S. Post Office, Carlisle, Pa.  
Buckingham Palace, London, England  
New Parliament Building, Winnipeg, Man., Non-staining Mortar, Victor Horwood, Provincial Architect  
U. S. Custom House, Boston, Mass., Setting Marble, Peabody & Stearns, Architects  
National Museum, and Senate and House Office Buildings, Washington, D. C.  
National McKinley Birthplace Memorial, Niles, Ohio, McKim, Mead & White, Architects  
Woolworth Building, New York, N. Y., Setting Terra Cotta, Cass Gilbert, Architect  
Dime Savings Bank Building, Detroit, Mich., D. H. Burnham & Co., Architects  
Oakland, Cal., City Hall, Palmer, Hornbostel & Jones, Architects  
Perry Memorial, Put-in-Bay, Ohio, Laying Granite, J. H. Freedlander and A. D. Seymour, Jr., Architects  
Charleston, S. C., Library, Exterior Finish, McGoodwin & Hawley, Architects  
Monterey Hotel, Asbury Park, N. J., Exterior Stucco, Watson & Huckel, Architects  
August Heckscher Building, New York, N. Y., Jardine, Hill & Murdock, Architects  
Hamilton County Court House, Cincinnati, Ohio, Rankin, Kellogg & Crane, Architects  
St. Mary's Hospital, San Francisco Cal., Willis Polk, Architect



UNIVERSAL FILM COMPANY'S PLANT, UNIVERSAL CITY, CAL.

Medusa White Portland cement used for exterior stucco finish. Designed in drawing rooms of Universal Film Company



ESTABLISHED 1883

# CARNEY'S CEMENT COMPANY

MANKATO, MINN.

DISTRICT REPRESENTATIVES FOR

OHIO AND THE EAST: BUILDERS-SALES Co., Leader News Building, Cleveland, Ohio

MICHIGAN AND WISCONSIN: JAMES QUINN, JR., Stevens Building, Detroit, Mich.

ILLINOIS AND INDIANA: BUILDERS-SALES Co., Chamber of Commerce Building, Chicago, Ill.

KANSAS AND OKLAHOMA: LUMBERMEN'S SUPPLY Co., Wichita and Topeka, Kans.

## Product.

CARNEY'S CEMENT.

## Features.

A special cement; mined, burned, ground and sold expressly for brick mortar.

Mined from a cement rock containing the highest percentage of carbonate of lime. Burned and ground by a process perfected by nearly 35 years of production.

It makes a slow setting and plastic brick laying cement that does not require the addition of lime to make it work smoothly under the trowel.

It has a long established record of accomplishment.

## Advantages.

An unusual labor saver, especially when the trouble and expense of slaking lime are considered.

Carney's cement can not be oversanded, as any oversanding makes its use impractical by the effect on the plastic properties of the mortar.

Tests by Robert W. Hunt & Co., engineers, show the mortar to become harder than the brick in 90 days, with a crushing strength per sq. in. of 2567 lbs.

Carney's cement mortar requires no lime in order to work smoothly under the trowel, and Portland cement mortar does not work smoothly *unless lime is added*. Lime paste added to cement mortar delays setting but reduces the strength.

It does not harm Carney's cement to stand in the box over night, and mortar not used up at quitting time does not have to be thrown away. To break the initial set of this mortar does not affect its quality in the slightest.

## Specification Data.

All brick should be laid up in cement mortar composed of 1 part Carney's Cement and 2½ parts clean sharp sand, with no addition of lime putty unless same shall be authorized where mortar colors are added to the mixture.

If the mortar is machine mixed, use 3 parts sand to 1 part Carney's Cement. Any style of mixer will give good results in preparing Carney's Cement mortar.

All sand should be clean, sharp and free from loam. No beach sand should be permitted.

Three parts of sand and 1 part cement should be received by the machine at the same time, first thoroughly mixing them dry and then adding sufficient water to produce a very thin mass. The mixture to be run from the machine to a large box where it must be allowed to stand about ½ hour, until the water is thoroughly absorbed and the mixture is of proper consistency to be workable from the trowel. When the proper consistency is reached, turn the mass well over before delivering to the masons.

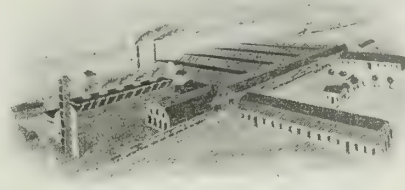
If the mortar is hand mixed, use two clean boxes so that mortar can be soaking in one and used from the other, and mix thoroughly in the proportions (2½ parts clean, sharp sand and 1 part Carney's Cement) as above.

In ordinary weather sufficient mortar may be mixed one day and left standing over night for the next day's requirements. In cold weather the sand and water should be heated and the mortar used immediately after mixing.

Brick should be well wet down in dry weather before being laid, and laid dry in wet or frosty weather. All brick should be laid in a full bed of mortar and pressed or rubbed into the bed.

In laying pavers or hard shale brick in freezing weather, add to every 3 bags Carney's Cement in the mortar, 1 bag Portland cement. This is done only to quicken set of mortar when used in laying impervious brick in freezing weather.

When used in connection with Bedford stone, the stone should be made stainproof.



PLANT OF CARNEY'S CEMENT COMPANY

## Estimating Data.

Carney's cement is put up in sacks of approximately 1 cu. ft. each. 4 sacks equal 1 barrel.

1½ barrels Carney's cement in a 1 to 2½ mixture will lay 1000 brick with an average ¼-in. joint.

One man with a ½-yd. mixer can supply 25 bricklayers.

Average cost, \$1.00 per barrel, f.o.b. Mankato, Minn.

Weight per barrel in bags, 240 lbs. (though same volume as Portland cement).

## Identification and Directions.

Illustration herewith shows style of label used. To each bag of Carney's cement a tag is attached giving directions for mixing.



CARNEY'S CEMENT BAG

## References.

Some of the recent work on which Carney's cement mortar has been used includes:

Pennsylvania Freight Terminal, Chicago. Pennsylvania R.R. Engineers; Geo. A. Fuller Co., Contractors. 14,000 barrels Carney's cement used. (11,000,000 brick)

All substations for the Chicago, Milwaukee & St. Paul Railway Co. in their electrified zone through Montana and Idaho

Hill Building (general offices of Great Northern and Northern Pacific Railways), St. Paul, 13 stories high, covering three fourths of a square block, costing \$3,500,000.00. Charles S. Frost, Architect; Grant Smith Construction Company, Contractors

Field Museum of Natural History, Chicago. Graham, Anderson, Probst & White, Architects; Thompson-Starrett Co., Contractors. (15,000,000 brick)

Butler Brothers Warehouse, Chicago, 384 by 154 feet, 25 acres of floors, costing \$2,000,000.00. D. H. Burnham & Co., Architects; Wells Brothers, Contractors

Soo Railway Building, Minneapolis, 19 stories. R. W. Gibson, Architect; Thompson-Starrett Co., Contractors

Penobscot Building, Detroit, 25 stories. Donaldson & Meier, Architects; Geo. A. Fuller Co., Contractors

Morrison Hotel, Chicago, 22 stories. Marshall & Fox, Architects; John Griffiths & Son Co., Contractors

Chamber of Commerce Building, Pittsburgh, 18 stories. Thompson-Starrett Co., Contractors

Winton Hotel, Cleveland. N. Max Dunning, Architect; Wells Bros. Co., Contractors

# THOMAS CONNELLY COMPANY

## Hydraulic Cement

TELEPHONE:  
MAIN 609

118 North LaSalle Street  
CHICAGO, ILL.

### Product.

Sole distributors of UTICA HYDRAULIC CEMENT.



### Description.

Utica hydraulic cement is a high quality cement manufactured of natural cement rock of unusual uniformity of composition, such as is found only in deposits along the Illinois River at Utica, Ill. It differs from Portland cement in method of manufacture, the basic principles being the same.

Utica hydraulic cement is manufactured under conditions of supervision and by methods and equipment which insure superiority and complete uniformity of the product.

### Distinctive Features.

**NON-STAINING**—Utica hydraulic cement, because it contains a minimum of iron oxide, is positively non-staining; it will not discolor or stain delicate stone, brick or tile work, provided it is used neat or mixed with thoroughly clean sand.

**COLOR**—Utica hydraulic cement has a uniform light buff color, pleasing in effect in mortar for brick or stone work.

**WEIGHT**—Utica hydraulic cement weighs 265 lbs. net per barrel of 3.8 cu. ft. Its weight, therefore, is about 29% less than standard weight of Portland cements.

### Uses.

Utica hydraulic cement has been extensively used since 1838, and is particularly adapted to construction work as follows:

In mortar of brick or stone masonry of buildings. In mortar of brick sewers, manholes and catchbasins. In non-staining mortar for setting of Bedford stone and in mortar of the brick or tile work backing up same. In laying of marble, terrazzo, ceramic mosaic and similar tile.

In mass concrete of foundations for buildings, bridge piers, etc. In mass concrete of dam, lock, retaining wall, slope and sea wall construction.

In concrete base of street and highway pavements. In concrete base of sidewalks and floors.

In the manufacture of gypsum plaster.

For nearly every purpose requiring a good cement of economic cost, excepting reinforced concrete construction and top wearing surfaces of streets and sidewalks, for which this cement is not adapted.

The use of Utica hydraulic cement is not recommended without discrimination. It is not the best cement for every use, but where it is appropriate, it is emphatically (and demonstrably) the one *best* cement.

### Advantages.

**UNIFORMITY**—Utica hydraulic cement is noted for the uniformity of its strength and fineness.

**SMOOTH WORKING**—Utica hydraulic cement mortar works exceedingly smooth and "buttery" because of its great plasticity, thereby saving material and labor, and no admixture of lime is required.

**INCREASING STRENGTH**—Utica hydraulic cement continues to grow in strength and hardness steadily and without retrogression, as proved by tests extending over a period of 16 years and by existing works built more than 50 years ago.

**NO REMIXING**—Utica hydraulic cement mortar requires no remixing or further preparation. One mortar mixer only and regular crew are sufficient.

**SPREADING QUALITY**—Brickmasons prefer Utica hydraulic cement because of its spreading quality and freedom from grit.

**CONSTANCY OF VOLUME**—Utica hydraulic cement is subject to less movement in expansion and contraction than any other cement, during setting, or when exposed to variations of temperature or of moisture content.

**HYDRAULIC QUALITY**—Utica hydraulic cement has a high hydraulic index and positively will set and continue to harden under water. Therefore it is splendidly adapted to foundation work in damp ground or when continuously in contact with water.

**RELATIVE COST**—Utica hydraulic cement is noted for its *reasonably low cost*, which, in addition to the qualifications herein stated, logically and mathematically places it within the front rank as the most economical and efficient cement for the construction purposes herein stated.

Properly proportioned Utica hydraulic cement mortar costs very appreciably less per unit than lime and Portland cement mortar of equal strength. To this cost difference may also be properly added the further saving of mortar itself and of labor.

Likewise is the cost of properly proportioned Utica hydraulic cement concrete very appreciably less than that of Portland cement concrete of equal strength.

**NON-STAINING QUALITY**—Utica hydraulic cement is absolutely non-staining if used neat or mixed with clean silica sand; otherwise, this non-staining quality may be considerably affected or offset by an impure or unclean sand. For this reason, mixtures of cement and pure silica white sand, ready for gaging with water, in proportions of 1 to 1 and 1 to 2, or in other proper proportions as required, will be supplied on demand.

Such mixtures will prove especially advantageous in localities where a good sand is not obtainable, and for such special work as the laying of marble, terrazzo, ceramic mosaic or similar fine grained tile in floors and walls.

### Tests.

Owing to space condition, but a few authentic tests indicative of the quality of Utica hydraulic cement are here quoted, and those interested will, on application, receive copies of original test reports.

ANALYSIS, PER CENT		ACTIVITY	
Silica .....	27.72	Initial set.....	26 min.
Iron oxide.....	.48	Final set.....	1 hr. 38 min.
Alumina .....	23.59	BOILING TEST—O. K.	
Lime .....	34.02	FINENESS	
Magnesia .....	6.72	Passing 100-mesh sieve,	88.9%
Loss on Ignition.....	7.22	Passing 200-mesh sieve,	77.6%



AVERAGE TENSILE TESTS

Neat 1 Cement to 3 Sand  
7 days, 219; 28 days, 241 7 days, 154; 28 days, 229

MORTAR CRUSHING AND SHEARING TEST—1 part cement to 1 part sand:

	STRENGTH IN POUNDS PER SQUARE INCH	
	Crushing	Shearing
28 days.....	1,093.5	50.3

CRUSHING TEST OF BRICK BONDED WITH UTICA HYDRAULIC CEMENT MORTAR—Mix: 1 cement to 2 torpedo sand by volume. Both test specimens cut from warehouse walls about 5 years after construction, one built of vitrified and the other of common clay brick:

	STRENGTH IN POUNDS PER SQUARE INCH	
	Vitrified Brick	Common Clay Brick
Mortar.....	1,730	(Brick failed first)
Brick.....	4,890	875

CONCRETE CRUSHING TESTS (AVERAGE RESULTS)—Mix: 1 part Utica hydraulic cement to 1½ parts torpedo sand and 3 parts crushed limestone.

	STRENGTH IN POUNDS PER SQUARE INCH	
	3 months, 786	6 months, 935 1 year 1,083

CONCRETE CRUSHING TEST—From concrete, deposited about the year 1904 in the foundation of one of the abutments of Aqueduct No. 7 on the Illinois and Mississippi Canal, a specimen was removed in 1914 and subjected to a crushing test by R. W. Hunt & Co., when it showed a crushing resistance of 1,276 lbs. per sq. in. As nearly as could be ascertained, the proportions used in this concrete were 1:2½:5, coarse aggregate being crushed limestone.

Specification Data in Brief.

Utica hydraulic cement should be used for all mortar in brick, stone and tile walls. In ordinary walls, proportions should be 1 part Utica hydraulic cement to 2 or 2½ parts of clean sharp sand, free from clay and organic matter.

Piers, columns and face brick should be laid up with a mix of 1 part Utica hydraulic cement to 1 or 1½ parts of clean, sharp sand, free from clay or organic matter. No addition of lime is required; the mortar will be smooth and "buttery" without lime addition. About 5% of lime may be used in cold weather as protection against freezing.

Utica hydraulic cement mortar should be used in the construction of brick, vitrified clay segment block, and vitrified clay pipe sewers, manholes and catchbasins. A mix of 1 part of cement to 2½ parts of clean sand will give good results.

Utica hydraulic cement should be used in concrete for foundations of walls, piers, columns and heavy machinery, in so far as such foundations are laid in contact with the ground. A mix in proportions of 1:2½:5, properly prepared, proves satisfactory for all such purposes, provided all aggregate is clean, free from clay and organic matter, and is carefully selected in sizes and proportions to provide greatest density.

Utica hydraulic cement should also be used in concrete of base of pavements of streets, alleys, areaways, sidewalks and basement floors, provided a wearing surface of asphalt, brick or Portland cement mortar is laid on top of the Utica cement concrete. A mix of 1:2½:5, about 5 to 6 ins. thick, will prove durable and satisfactory in every respect. Top facing of Portland cement mortar will positively and thoroughly bind with the Utica cement concrete base if flowed onto same immediately after tamping into place of concrete, and before initial set of concrete.

Packages.

Utica hydraulic cement is packed in cotton sacks, 4 to the barrel, each 67 lbs. gross, which are repurchased when returned to the mill in good condition. Paper sacks are furnished if preferred, at corresponding cost reduction.



BAG MARK

Co-operative Service.

Interested parties are invited to correspond regarding specific information as to the adaptation and relative cost of Utica hydraulic cement for their particular requirements. Prompt attention will be given in competent technical manner.

Partial List of Important Works Built with Utica Hydraulic Cement.

BUILDINGS

CHICAGO

Parkway Hotel, 2100 Lincoln Parkway; non-staining Utica hydraulic cement in mortar of all Bedford stone and brickwork. Chicago Cold Storage Co., 16th and State Streets; immense cold storage warehouse, occupied by Fox River Butter Co. All brick laid up with Utica hydraulic cement mortar during cold season of 1916-1917; now in perfect condition.

Mayfair Pumping Station of City of Chicago; all brick walls laid up with Utica hydraulic cement.

Studebaker Building	Board of Trade Building
Royal Insurance Building	Art Institute
Illinois Trust & Savings Bank	The Auditorium
Marshall Field & Co., Wholesale	Monadnock Block
Chicago Public Library	The Rookery
Western Union Building	Chamber of Commerce

DETROIT, MICH.

Detroit Refrigerating Co.; in mortar of all brick walls.

MINNEAPOLIS, MINN.

Union Depot New York Life Building

ST. PAUL, MINN.

Residence of late Jas. J. Hill	Germania Life Building
United States Customs House	New York Life Building
General Offices of Great Northern Railway Co.	Ryan Hotel and Annex
Endicott Block and Arcade	The Auditorium
	Union Depot

DULUTH, MINN.

Spaulding Hotel St. Louis Hotel

KANSAS CITY, MO.

Y. M. C. A. Building Midland Office Building

CINCINNATI, OHIO

Jewish Temple Auditorium; Utica Hydraulic cement mortar in all brick walls and setting and backing of Bedford stone. University; City Electric Light and Power Co.; Riverside Malting and Elevator Co.; Laidlow Dunn Power Co.'s Building.

OMAHA, NEBR.

City Hall and Court House New York Life Building

DENVER, COLO.

Colorado State House; Windsor Hotel; Denver Building; Equitable Insurance Co.'s Building; Union Depot.

WATER TUNNELS

Chicago Avenue Water Tunnel, connecting Lake Crib with Pumping Station; constructed in 1872.

Water Supply Tunnels under Lake Michigan at 68th Street, at Polk Street, at 12th Street and at Montrose Avenue, Chicago, Ill.

Above tunnels vary in diameter from 6 to 8 ft., and in length from 1 to 6 miles. All constructed of brick laid with Utica hydraulic cement mortar.

SEWERS

Nearly all sewers, including thousands of manholes and catchbasins, in city of Chicago, now under construction and constructed during past 50 years, are laid with Utica hydraulic cement mortar. These sewers range up to 16 ft. in diameter.

CANALS

Chicago Drainage Canal, 1892-1900: Utica hydraulic cement used in massed concrete of retaining walls.

Illinois and Michigan Canal from Chicago to Illinois River; locks, dams, retaining walls and bridge piers. Some of these have seen from 60 to 79 years of service.

Hennepin Canal; locks, retaining walls and bridge piers constructed with Utica hydraulic cement.

BRIDGES

Illinois Central Railway Bridge across Illinois River at La Salle, Ill.; mortar in construction of stone piers and approaches.

Highway Bridge across Illinois River at Utica, Ill.; mortar in stone masonry of piers.

Railroad and highway bridge at Rock Island, built under United States supervision; mortar in stone piers and retaining walls.

Broadway bridge at St. Paul, Minn.; mortar in stone piers. High bridge over Mississippi River at Dubuque, Iowa; mortar in stone piers.

STREET AND HIGHWAY PAVEMENTS

Utica hydraulic cement used in concrete base of many street and highway pavements. Details on application.

ESTABLISHED 1887

# FOWLER & PAY

Manufacturers of Cement, Lime, Plaster and Stone Products

MANKATO, MINN.

## AGENCIES

KANSAS CITY, MO., BODWELL BRICK & TILE Co.  
DES MOINES, IOWA, RELIANCE BRICK Co.  
FORT DODGE, IOWA, FOWLER & PAY  
ST. LOUIS, MO., F. A. CAMMANN BUILDERS SERVICE Co.

DETROIT, MICH., AUSTIN BRICKLAYERS CEMENT Co.  
CHICAGO, ILL., AUSTIN BRICKLAYERS CEMENT Co.  
MINNEAPOLIS, MINN., FOWLER & PAY  
CLEVELAND, OHIO, AUSTIN BRICKLAYERS CEMENT Co.

## Products.

AUSTIN BRICKLAYERS CEMENT; BROWN HYDRAULIC LIME.

Albion White Lime, Jasper Hardwall Plaster, Mankato Stone Quarries.

## Manufacturing Plants.

Austin bricklayers cement is made at Austin, Minn.; Brown hydraulic lime and Mankato stone products are made at Mankato, Minn.; Albion white lime at LeRoy, Minn.; and Jasper hardwall plaster at Fort Dodge, Iowa.

## Austin Bricklayers Cement.

Austin bricklayers cement is quarried at Austin, Minn., from a cement rock which in chemical analysis discloses properties almost identical with Portland cement. With this rock is mechanically mixed, in exact proportions, hydraulic lime and a small percentage of raw gypsum. It is ground by the ring roll mill process, the mass being lightly steamed while grinding. Austin bricklayers cement then passes over Newago screens and comes out 95% fine through a 100-mesh sieve.

Its natural color is buff. It will take any kind of mortar color.

It gets its initial set in from 30 to 45 minutes, and bonds perfectly with all kinds of brick or stone.

It requires no tempering with Portland cement to bond with paving brick; nor should lime be added under any circumstances, as it is, without adulteration, a *bricklayer's* cement.

Austin bricklayers cement can not be oversanded, as it will then work short.

Freezing does not injure the set.

A wall built with Austin cement mortar becomes harder and harder, increasing in strength each year.

Mixed 1 to 3, estimate  $1\frac{1}{2}$  bbls. of Austin cement to lay up 1,000 bricks.

COMPRESSION TESTS—Austin bricklayers cement was laid up between bricks by Robert W. Hunt & Co., engineers. At the end of three months they made compression tests showing average crushing strength per square inch of mortar as follows:  $\frac{3}{8}$ -in. mortar joint, 1,298 lbs.;  $\frac{1}{2}$ -in. mortar joint, 1,168 lbs.

DIRECTIONS FOR MIXING—Austin bricklayers cement should be mixed 1 of cement to 3 of sand; add sufficient water to make a thin slush, allow the batch to stand until thick and re-mix for use. This cement requires plenty of water.

How SHIPPED—In either paper or cloth sacks, containing 80 lbs. each, three sacks to the barrel. Weight per barrel, 240 lbs.; 4 cu. ft. per bbl.

## Brown Hydraulic Lime.

Has inherent setting qualities similar to hydraulic cement, and would be a cement but that the lime is in excess of the proper proportion for cement to be used under water. Brown hydraulic lime answers the same purpose as common or white limes with a certain portion of cement added to them, and saves the extra expense for cement.

Brown hydraulic lime mortar in parapet and fire walls and chimneys is better than a lime and cement mortar because the latter is a purely mechanical mixture; while Brown hydraulic lime mortar, although containing practically the same proportion of constituent parts as the lime and cement mixture, is a chemical combination, in short, a true silicate of lime—a substance that should not be confounded with caustic or quick lime. A true silicate of lime is the only mortar making material that can endure for ages the effects of sudden and extreme variations of temperature and other climatic changes.

Subjected to intense heat, Brown hydraulic lime will glaze over and will only serve to cement the bricks all the more closely together.

Brown hydraulic lime does not pop or blister when used for plaster upon brick or tile walls. It will gather moisture from the atmosphere which will assist in hardening the plaster.

The color of Brown hydraulic lime when slaked is a rich cream. It spreads easily from the mason's trowel, does not work at all short and will go as far as white lime.

AIR SLAKING.—Air slaking does not affect the quality of Brown hydraulic lime on account of the cement properties it contains, and it can be used when the lime is as fine as powder, only a little more time being required to slake.

DIRECTIONS FOR SLAKING—Place a quantity of water in the slake box, then put in a sufficient amount of lime so that the lime is covered with water, and allow it to remain there and soak until it heats the water and commences to slake. Run the mortar into a mixing bed, thin to cool, then add sand and temper for different kinds of work.

Putty can be mixed either in a machine or by hand.

How SHIPPED—In bulk and barrels.



# AMERICAN MATERIALS CO., INC.

## Manufacturers of Magnesite Stucco

101 Park Avenue  
NEW YORK, N. Y.

CHICAGO, ILL., U. S. MATERIALS Co., Weed Street and Sheffield Avenue

### Products.

ELASTICA STUCCO, a Standard Magnesite Stucco.

Plastic-Linoleum Flooring and Amflorite Composition Flooring.

**ELASTICA**  
The Standard Magnesite Stucco  
TRADE-MARK

Unlimited range of color and finish.

Easy to apply and economical. Bonds perfectly on wooden lath or patented wooden sheathing.

### Elastica Stucco.

Elastica stucco is a magnesium oxy-chloride cement. Magnesite is the cementing ingredient, as Portland cement is in Portland stuccos. The mixing compound, chloride of magnesium, serves the same purpose in Elastica that water does with Portland.

Chloride of magnesium is a salt compound which has an affinity for, reacts with, and causes the set with magnesium oxide, commonly known as magnesite cement.

**SCRATCH COAT**—The scratch coat is of magnesite, which is the cement; pure white, washed and graded silica glass sand, which serves as a fill; granulated cork, which is used for insulation and filler; long fibered asbestos, the binder, which takes the place of hair used in Portland cement. Asbestos is a mineral matter and will not deteriorate or lose its binding value as does hair. It makes the material "fatty"; makes easier working under the trowel and prevents creeping.

**FINISH COAT**—Composed of magnesite cement, short-fibered asbestos, pure white, washed and carefully graded silica glass sand and various oxide mineral colors, as desired.

**DASH COAT**—The dry rock dashes which form the last coat, are made from solid granite, quartz and other stones. They are ground to a size from  $\frac{1}{8}$  to  $\frac{1}{4}$  in. and will not deteriorate under weather conditions.

### Freedom from Cracks or Breaks.

Elastica stucco is guaranteed not to crack or break, and will not crack or break *except under very extraordinary* strains, or unless the studding, sheathing or lathing is very improperly secured or nailed. This is because of the nature and chemical properties of the materials used in Elastica.

As it is a magnesium oxy-chloride cement with magnesite as the cementing ingredient just as Portland cement is in Portland stuccos, the two are therefore entirely different in chemical ingredients, and for this reason Elastica is four or five times stronger than the strongest Portland or limestone cement stucco.

Elastica and Portland cement are also entirely different in their chemical action. Elastica expands slightly when it sets; Portland cement contracts and pulls away from the door and window casings.

### Advantages of Elastica Stucco.

It adheres perfectly and will not crack or break.

It is absolutely waterproof and fireproof.

Will not freeze and may be applied in zero weather.

Always uniform, being carefully mixed at the factory—there can be no experimental mixing on the job.

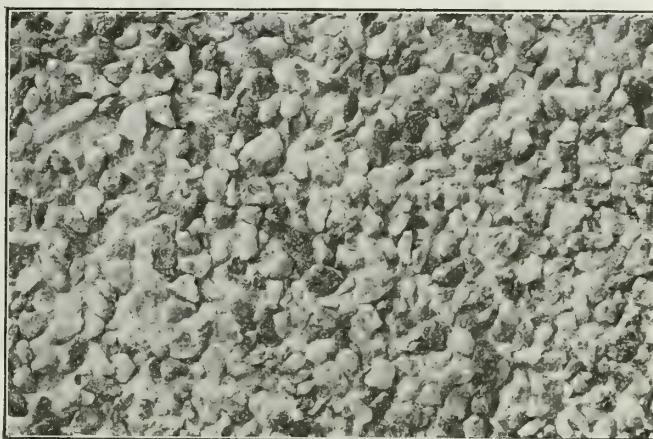


ILLUSTRATION OF ELASTICA STUCCO WITH QUARTZ DRY ROCK DASH COAT

### Application.

Elastica may be applied over any construction now being used for buildings. May be used with perfect satisfaction over brick, hollow tile, wood or metal lath, or patent sheathings. Wood lath or patent sheathing is suggested because Elastica gives perfect satisfaction with these less expensive wood constructions.

### Covering Capacity.

One ton of Elastica, 2 coats, each coat  $\frac{1}{4}$  in. thick, will cover between 85 and 100 yds. to the ton, depending on the construction over which it is used: over  $1\frac{1}{2}$ -in. wood lath,  $\frac{1}{8}$  in. apart, about 90 yds. to the ton, or better, will uniformly be obtained; over patent sheathings, about 85 or 95 yds. to the ton; and over tile or brick, between 75 and 90 yards, depending entirely upon the way the job is lined up.

The dry rock dash will uniformly cover about 200 yds. to the ton. In figuring covering capacity, no allowance is made for openings, unless a single opening contains 36 sq. ft. or more, in which case it is deducted.

Elastica can be applied a great deal cheaper per square yard for labor than other stuccos, because it is entirely a factory mixed product, eliminating a great deal of labor on the job in mixing ingredients, and because it works easily under the trowel and covers many square yards more than other stuccos, giving a big saving in tonnage.

### Estimates.

Send for additional facts about this extraordinary material. Estimates of cost and finish suggestions, etc., will be given.



# THE GARDEN CITY SAND CO.

Manufacturers of Portland Cement Exterior

708-711 Chamber of Commerce Building

CHICAGO, ILL.

TELEPHONES:

MAIN 4827, AUTO 33304

## AGENCIES

ARLINGTON, MINN., ARLINGTON CEMENT STONE WORKS  
ATLANTA, GA., V. H. KRIEGSHABER & SON  
ATLANTIC, IOWA, GREEN BAY LUMBER CO.  
BLOUNT COUNTY, TENN., CHANDLER & Co. (Knoxville, Tenn.)  
CANTON, S. D., BRAGSTEAD CONCRETE MACHINERY CO.  
CARROLL COUNTY, IOWA, LAKE VIEW SAND & GRAVEL Co. (Lake View, Iowa)  
CEDAR FALLS, IOWA, C. A. WISE & SONS CO.  
CHARLOTTE, MICH., COLBURN-FULTON LUMBER CO.  
CINCINNATI, OHIO, MOORES CONEY CO.  
CLEVELAND, OHIO, CUYAHOGA BUILDERS' SUPPLY CO.  
COLUMBUS, OHIO, HAMILTON-PARKER FUEL & SUPPLY CO.  
DAVENPORT, IOWA, JOHN BENEDICT  
DECATUR, ILL., V. H. PARKE & SON CO.  
DES MOINES, IOWA, CONTRACTORS' MACHINERY CO.  
DETROIT, MICH., A. J. SMITH CONSTRUCTION CO.  
FORT RECOVERY, OHIO, EMIL WAGNER  
GRAND RAPIDS, MICH., S. A. MORMAN & CO.  
HOUSTON, TEX., VANDAVEER CLAY PRODUCTS CO.  
HUNTINGTON, W. VA., C. S. BROWN  
JACKSON, MICH., I. N. DELAMATER  
JACKSONVILLE, ILL., D. E. SWEENEY  
KNOX COUNTY, TENN., CHANDLER & Co. (Knoxville, Tenn.)  
KNOXVILLE, TENN., CHANDLER & Co.

LAKE VIEW, IOWA, LAKE VIEW SAND & GRAVEL CO.  
LIMA, OHIO, FIDELITY COAL & SUPPLY CO.  
LINCOLN, NEBR., NEBRASKA MATERIAL CO.  
MANSFIELD, OHIO, VOEGLER BROS.  
MEMPHIS, TENN., JOHN A. DENIE'S SONS CO.  
MILWAUKEE, WIS., HENRY MAYER & CO.  
MITCHELL, S. D., ROBERT BURNS LUMBER CO.  
MOLINE, ILL., JOHN BENEDICT (Davenport, Iowa)  
NEW ORLEANS, LA., FRITZ JAHNCKE  
OMAHA, NEBR., OMAHA CONCRETE STONE CO.  
OSHKOSH, WIS., COOK & BROWN LIME CO.  
PORTSMOUTH, OHIO, PORTSMOUTH CLAY PRODUCTS CO.  
PRIMGHAR, IOWA, J. C. RUDLOFF & SONS  
ROCHESTER, IND., MARSHALL HILL  
ROCK ISLAND, ILL., JOHN BENEDICT (Davenport, Iowa)  
ROCKFORD, ILL., CRUMB-COLTON CO.  
ST. PAUL, MINN., S. P. SPATES & CO.  
SAX COUNTY, IOWA, LAKE VIEW SAND & GRAVEL CO. (Lake View, Iowa)  
SIOUX CITY, IOWA, H. C. MCNEIL & SON  
SIOUX FALLS, S. D., W. C. BUCHANAN LUMBER CO.  
SOUTH BEND, IND., STAPLES-HILDEBRAND CO.  
SPRINGFIELD, ILL., PETER VREDENBURGH LUMBER CO.  
STURGIS, MICH., R. L. WEBB LUMBER CO.  
TOLEDO, OHIO, THE TOLEDO BUILDERS' SUPPLY CO.

## Products.

"STONEKOTE," Plastic Portland Cement Products, prepared in any color, waterproofed or not, and in special mixtures for the following applications, ready for use by addition of water:

For Scratch Coat. For Rough Cast.  
For Second Coat. For Trowel Surfacing.  
For Float Coat. For Polished Surfacing.  
To apply as Mortar. To apply as Stucco.  
For Casting in Ornamental Work, Garden Furniture, Stone Mantels.  
For Surfacing for Concrete, Brick, Tile, Stone, or Steel Framework.

"STONEKOTE," for making Blocks in place of artificial stone; "STONEKOTE," for colored Floor Finish, Terrazzo; "STONEKOTE," as "Plastic Marble" Cement; CURTISS PORTLAND CEMENT PAINT; BRICK BRUSH COAT; WATERPROOFED BRICK MORTAR; AMERICAN CAEN STONE CEMENT; CHINA WALL FINISHES, in Colors; SELF-DECORATING WALL PLASTER.

## Description of "Stonekote."

"Stonekote" is a ready to use Portland cement made plastic without the use of any lime or hydrated lime, waterproofed where desired; colored any shade of gray, brown, red, buff, cream, tan or white; containing quartz, marble or spar aggregates that will sparkle when acid washed. It is the most practical material ever placed on the market for all kinds of exterior cement surfacings.

With "Stonekote" the architect can give his artistic dream full play. It is not necessary to use any wood in making water-tables, belt courses, or panel frames. All such trim can be part of the concrete wall with the surface coat of any desired color, with the panels of a different shade of color and style of finish.

The combination of finish and colors gives the same



effect as contrasting color for trim in painting. In designing a house, therefore, if an architect will send a water-color rendering of his artistic conception regarding the color and texture of each part, actual samples can be made and submitted for approval, matching the colors as near as such shades can be reached in colored Portland cement. This will not in any way obligate the architect.

## "Stonekote" Undercoats.

"Stonekote" Scratch Coat and Second Coat are made with white silica sand as the aggregate, and accept the finish coat, forming a chemical clinch with it. Over wood lath, metal lath, brick or tile walls 100 lbs. of Scratch Coat and 100 lbs. of Second Coat are needed on each 2½ yds. of net surface. This gives a perfect surface over which to apply the colored waterproofed finish coat desired. The Scratch and Second Coats should be used for the very best of work, as they are combined in the right proportions to expand and contract to the same extent as the finish coat.

## Finishes.

There are many styles of finish coats. "Stonekote" Book gives full description of them all.

WET ROUGH CASTING—This is a standard method of finishing. The fine grained surface makes the best looking wall and is easily kept clean.

DRY ROUGH CASTING—This is very striking in effect. The brilliant aggregates are upon the surface, and over colored waterproofed butter coat they make a sparkling surface.

FLOAT, STIPPLED, TOOLED AND SPONGED SURFACES—These are all secured by different ways of manipulating the same material. These finishes are furnished in a line of plain colors, making a finish like cut sand stone.

In the line of "plastic marble" by acid washing the finished surface, the sparkling aggregates are exposed.

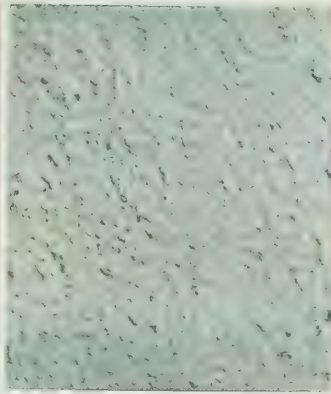




Caen Stone No. 689



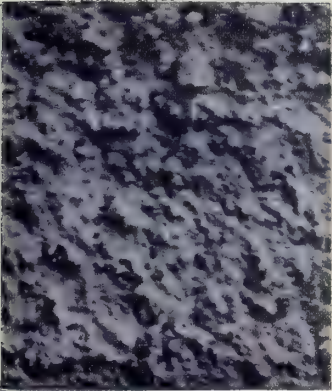
Granite Float Finish



Marble Float Finish



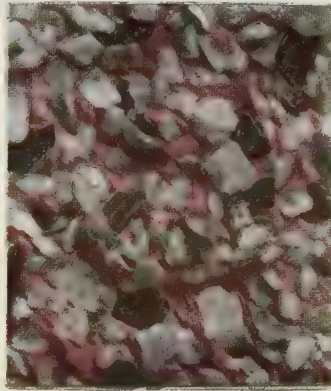
Terrazzo Floor Finish



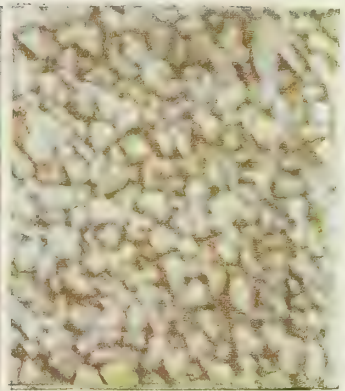
Fine Wet Rough Cast



Medium Wet Rough Cast



Coarse Dry Rough Cast



Medium Dry Rough Cast

SAMPLES OF GRAIN SURFACE OF "STONEKOTE," FURNISHED IN WHITE AND FIFTY COLORS



THE RAVISLOE COUNTRY CLUB HOUSE, HOMEWOOD, ILL.

Stuccoed with "Stonekote"

GEORGE C. NIMMONS & Co., Architects, Chicago, Ill.



Any of the foregoing finishes can also be used to good advantage for ornamental panel inserts on brick walls, breaking the monotony of the plain wall with panels that are of the right proportion to the size of the building.

### **Curtiss Portland Cement Paint.**

There are many concrete buildings, both new and old, whose surfaces can be improved in appearance by a coat of paint. It is never best to cover such a wall with a coat of oil paint, which will dry and peel. The Curtiss Portland Cement paint is a colored Portland cement wash and becomes an integral part of the original Portland cement surface. It will never peel off, and does not in any way interfere with the application of any other Portland cement finish coat desired later—a very cheap coating as it takes only 100 lbs. on 200 sq. yds. of surface.

While a certain amount of waterproofing is incorporated in this paint, its use is not advised for the purpose of giving a waterproofed surface, but rather to rectify discolorations from poor workmanship and to change from one color to another, giving a uniform shade of color to an unsightly wall.

### **Brick Brush Coat.**

"Stonekote" Brick Brush Coat is a waterproofed Portland cement to be applied over common brick, or concrete walls, using a paint brush in applying. Surface can be left smooth or can be stippled showing a special surface. Used over a rough cast surface, gives a soft stippled finish. This makes the cheapest and a satisfactory way to refinish stuccoed work that has become soiled. Architect should decide on color and style of finish, before completing specifications.

### **Colored Cement Floors.**

Terrazzo, as well as plain colored Portland cement floors, would be in common use if the contractors could make the proper material and secure an even shade of color. The "Stonekote" floorings are especially made for use by the ordinary cement worker.

It is not necessary to call in the terrazzo floor contractor, for with "Stonekote" flooring and direction sheet any mechanic can secure a highly polished cement floor.

### **Various Uses of "Stonekote" Flooring Material.**

The density of the "Stonekote" flooring material makes it suitable for shower baths, tanks, swimming pools, etc. By a combination of colors or using one color for the field and another for the border, an artistic rug effect can be obtained for porches, vestibules, wainscoting, etc. On account of the little care required to keep such floors clean, this material is very suitable for drug stores, barber shops, restaurants, garages, dancing floors and tennis courts.

It is best for the architect to select color and style of floor from samples, before completing his specifications.

### **Garden Furniture, Ornamental Castings, Stone Mantels.**

Cast stone for trim of the Ravisloe Country Club building is a pink "Stonekote" Casting material, making a pleasing contrast with the field which is a White Wet Rough Cast. Colonel George Fabyan has over 300 "Stonekote" castings on the lawns of his summer home at Geneva, Ill. As the texture, grain and color can be so varied, it is best for the architect to see samples and settle on what is desired, before completing his specifications.

### **Waterproofed Brick Mortar.**

There is a demand for waterproofed mortar for laying pressed and tapestry impervious brick.

"Stonekote" Brick Mortar is made to match or contrast both in texture and color with facing brick or paving brick.

Where both brick and mortar are impervious to water there is no danger of efflorescence showing on the face of any wall. Acid washing to clean such a wall will not damage the "Stonekote" Mortar, as it contains no lime.

The architect should see samples and decide on shade of color and size of joint, before completing his specifications.

### **American Caen Stone Cement.**

Has the smoky buff color of imported genuine Caen stone. It is suitable for interior walls and for moulded ornaments. The proper dressing of the surface of Caen stone is very important. Poor mechanical workmanship will condemn the best of material. Caen stone surface should be properly finished by rubbing with carborundum cloth, and cleaned when necessary by rerubbing. Where a variation of shades of the different stones is desired, brush over the surface of the stones that are to be darkened with buttermilk, then use the carborundum cloth until the desired shade is secured.

American Caen Stone Cement makes the hardest finish coat known.

### **Self-decorating Wall Plasters.**

It is just as practical to apply a colored plaster finish coat on the wall as it is to apply a white finish and decorate the surface later. The saving in both time and money is very marked. It is especially adapted for use in churches, theatres, schools, public buildings and halls, where it costs a fortune to put up high scaffolding, for one plastering finishes the work.

### **Mechanics Can Work It.**

As any good mechanic can secure perfect results with "Stonekote" by following "Stonekote" Book of Instructions, architects can contract with home mechanics.

### **Colors and Samples.**

It is not possible to show shades and finishes from a flat colored print of ink or paint. Send in a little water color, showing shade of color desired. Let us know the finish desired—rough cast, fine, medium, coarse, float, troweled, moulded, floor surface. Sample and "Stonekote" specifications will be submitted.

### **Guarantee.**

"Stonekote" is guaranteed as follows:

Where all 3 coats are "Stonekote," manufactured ready to use by adding water only and the full quantity is used as directed in "Stonekote" book of specifications and working directions, we will furnish, f.o.b. Chicago, new material to replace the following classes of breaks:

*On metal lath that is embedded in the "Stonekote," where the lath rusts out in 10 years.*

*On wood lath with  $\frac{3}{8}$ -in. clinch and  $\frac{3}{8}$ -in. between ends of lath,  $\frac{7}{8}$ -in. grounds above face of lath, where the "Stonekote" comes off the lath.*

*On properly built common clay brick or deep-scored tile walls, where the "Stonekote" comes off without its bringing a layer of the brick or tile with it.*



**Specifications.**

**CAUTION**—In writing specifications for "Stonekote" that will give customers the lowest bids, there are several things to consider and decide on:

- (1) Clay tile construction requires 3 coats—scratch coat, second coat and finish coat.
- (2) Brick construction requires 3 coats.
- (3) Concrete monolithic construction requires finish coat.
- (4) Metal lath construction requires 3 coats.
- (5) Wood lath construction requires 3 coats.
- (6) The use of 3 coats of "Stonekote" secures our guarantee.
- (7) Use of neat first and second coats reduces material cost.
- (8) Use of home made first and second coats reduces quality.
- (9) There are 10 styles of finish and 1000 shades of color. Different finishes take different quantities. Different shades of color are different prices. Important work is worthy of preliminary consideration; and the decision of the above items, and the embodying of the exact shade and finish number desired in the specifications before going to the contractor.

**FOR UNDERCOATS OF GUARANTEED WORK**—Over face brick, tile, metal lath, or wood lath allow  $\frac{3}{4}$  in. for the "Stonekote" material. Apply 100 lbs. "Stonekote" Scratch on each  $2\frac{1}{2}$  yds. of net surface. Roughen surface with broom. Apply 100 lbs. "Stonekote" Second Coat on  $2\frac{1}{2}$  yds. net surface, leaving surface under float without cat faces.

**FOR UNDERCOATS BOUGHT NEAT**—Apply 1200 lbs. neat Scratch Coat and 3000 lbs. fine sand, and 1200 lbs. neat Second Coat and 3000 lbs. fine sand on 100 yds. net surface. (Either of the above ways makes the wall ready for the finish coat.)

**FOR WET ROUGH CASTING**—Apply No. .... Wet Rough Cast waterproofed on to a dry surface (in July and August dampen surface to cool it), leaving true even surface without scaffold joinings or markings. (This applies to all finish coats.)

Wet Rough Cast takes 1300 lbs. fine grain, 1600 lbs. medium grain, or 2000 lbs. coarse grain on 100 net yds. Quantity needed according to roughness desired. Marble aggregate can be acid washed.

**FOR DRY ROUGH CASTING**—Apply No. .... "Stonekote" Butter 1500 lbs. on 100 yds. net surface.

Dry rough cast this surface with Marble or Spar No. .... No. 94 Marble takes 500 lbs.; No. 93, 750 lbs.; No. 92, 1000 lbs. on 100 net yds. of Butter surface.

No. 84 Spar takes 500 lbs.; No. 83, 750 lbs.; No. 92, 1000 lbs., on 100 net yds. of Butter surface.

**FOR PLAIN FLOAT FINISH**—Apply 100 lbs. of No. .... Waterproofed Plain Float Finish on 5 sq. yds. net surface.

**FOR PLASTIC MARBLE FLOAT**—Apply 100 lbs. of No. .... Waterproofed Finish on 5 sq. yds. Acid wash the surface in 24 hours.

**FOR TROWEL SURFACE**—Same as for float surface. Float to make color all even. While in the putty stage, trowel smooth without raising fat to surface.

**FOR BLOCK FACINGS**—Face blocks, when making, with  $\frac{1}{4}$ -in. "Stonekote" No. .... waterproofed.

Quantity needed, 3 lbs. for 1 sq. ft. of surface.

**FOR INTERIOR WORK**—Scratch coat and second coat must be either "Stonekote" or Portland cement mortar. Thickness of these coats can be reduced to 100 lbs. on each  $3\frac{1}{3}$  yds. of net surface. Finish with No. .... "Stonekote" Plastic Marble, 100 lbs. on 5 yds of net surface.

**FOR COLORED CEMENT FLOORS**—Leave concrete floor with 1 in. for top dressing. Use bonding cement if surface has dried. Apply  $\frac{3}{4}$  in. of 1 lb. cement with 2 lbs. torpedo sand, trowel well into place, float, and at once apply  $\frac{1}{4}$  in. "Stonekote" Floor Surfacing No. .... waterproofed, troweling it in thin coats. Float surface, trowel well down without raising fat to the surface. Do not let surface dry out before underwork has cured and dried. Polish terrazzo surface.

**FOR AMERICAN CAEN STONE CEMENT**—Hard wall plaster or Keene's cement plaster to be used for the base coats; they to be dried out (to prevent staining through). Apply  $\frac{1}{4}$ -in. American Caen Stone Cement and leave under the float. Or water float in 24 hours. After this has dried out, to be rubbed to a smooth surface with a fine carborundum brick, or sandpapered.  $2\frac{1}{2}$  lbs. will cover 1 sq. ft.  $\frac{1}{4}$  in. thick.

**FOR CHINA WALL FINISHES**—Same treatment as American Caen Stone.

**FOR SELF-DECORATING WALL PLASTER, FLOAT FINISH**—A cheap colored Keene's cement mortar of soft shades; used  $\frac{1}{4}$  in. thick over lime mortar or hard wall plaster undercoat; stays soft, for cutting into stone. When plaster is on, room is decorated. Color must be settled on to complete specification.

**Acid Washing.**

Any "Stonekote" waterproofed surface can be acid washed at any time. (See "Stonekote" Book.)

**Working Instructions, Catalogues and Distribution.**

Catalogues on "Stonekote," "American Caen Stone," "Hard Wall Plaster" and Toch Bros.' Waterproofing will be sent to any inquirer. See that your working mechanic has a copy of the illustrated "Stonekote" Specification and Instruction Book.

Active agencies are listed on third page preceding. In towns where we have no agent, any contractor can be supplied by any material dealer, or can order direct.

**Prices.**

There are 10,000 finishes of "Stonekote." Prices are always kept as low as they can consistently be, during these troublous times. Prices will be quoted on request.

**References.**

One family has "Stonekote" on four buildings costing \$600,000.00. Several architects each have "Stonekote" on buildings costing \$1,000,000.00.

A partial list of the 200 architects who are regular users of "Stonekote" goods on buildings in different cities:

- G. W. Maher, 208 S. LaSalle St., Chicago, Ill. Buildings in Chicago and Kenilworth, Ill.; Winona, Minn.; and Daytona, Fla.
- F. W. Perkins, 332 So. Michigan Ave., Chicago, Ill. Buildings in Decatur, Taylorville and Lake Forest, Ill.; and Duluth, Minn.
- Otis & Clark, 6 N. Michigan Ave., Chicago, Ill. 16 buildings Municipal Tuberculosis Hospitals, Chicago, Ill.
- A. T. Hawk, Rock Island Lines, LaSalle St. Station, Chicago, Ill. Buildings in Joliet and River Forest, Ill.; Mason City, Iowa; and Searcy, Ark.
- C. W. Bradley, 520 Brown Block, Rockford, Ill. Buildings in Beloit, Wis.; Savanna, Freeport and Rockford, Ill.
- H. H. Waterman, 10 S. LaSalle St., Chicago, Ill. Buildings in Wausau and Appleton, Wis.; Grand Rapids, Mich.; and Peru, Ind.
- L. E. Stanhope, 111 W. Monroe St., Chicago, Ill. Buildings in Chicago and 4 residences in Winnetka, Ill.
- C. F. Jobson, 79 E. Adams St., Chicago, Ill. Buildings in St. Louis, Mo.; LaGrange, Highland Park and Chicago, Ill.
- Perkins, Fellows & Hamilton, 814 Tower Court, Chicago, Ill. Buildings in Winnetka, Evanston and Moline, Ill.; and Saugatuck, Mich.
- Chatten & Hammond, 64 E. Van Buren St., Chicago, Ill. Buildings in Chicago, Lake Forest, Hinsdale and Evanston, Ill.
- Perry & Thomas, 140 S. Dearborn St., Chicago, Ill. Buildings in Chicago, Ill.; and apartment building sun parlors in Aurora, Nebr.
- J. R. Fugard and G. A. Knapp (Associated Architects), 111 W. Monroe St., Chicago, Ill. Buildings in Newton and Fremont, Iowa; Longwood, Ill.; Princeton, N. J.
- E. S. Hall, 3230 West Monroe St., Chicago, Ill. Buildings in Berwyn and Glencoe, Ill.; Princeton, N. J.; and Lake Geneva, Wis.
- Spencer & Powers, 5 N. LaSalle St., Chicago, Ill. Buildings in Wheaton, Ill.; Indianapolis, Ind.; Knoxville, Tenn.; and Delevan, Wis.
- Wm. G. Barfield, 58 W. Washington St., Chicago, Ill. Buildings in Hinsdale, Oak Park, LaGrange and Aurora, Ill.
- J. S. Van Bergen, 6802 S. Boulevard, Oak Park, Ill. Residences of C. P. Skillen, Wilmette, and R. Cluever, Maywood, Ill.
- H. K. Holsman, McCormick Building, Chicago, Ill. Buildings in Ackley, Iowa; Oak Park and 9425 Pleasant Ave., Chicago, Ill.
- W. W. Abell & Son, Home Bank Building, Elgin, Ill. Buildings in Elgin and Arlington Heights, Ill.; Dodgeville and Fond du Lac, Wis.
- A. L. Pillsbury, Peoples Bank Building, Bloomington, Ill. Buildings in Bloomington and Normal, Ill.
- J. W. Royer, Flat Iron Building, Urbana, Ill. Buildings in Urbana, Champaign, Centralia, Ill.; and Attica, Ind.
- C. L. Inscho, Brunson Building, Columbus, Ohio. A number of residences in Columbus, Ohio.



# NATIONAL KELLASTONE CO.

Manufacturers of Stucco, Composition Flooring and Plaster

GENERAL OFFICES

5 South Wabash Avenue  
CHICAGO, ILL.

BRANCH OFFICE: NEW YORK, N. Y., 299 Broadway

PLANTS: ARGO, ILL., WAUKEGAN, ILL.

AGENCIES THROUGHOUT THE UNITED STATES

## Products.

KELLASTONE IMPERISHABLE STUCCO; KELLASTONE FIREPROOF ADHESIVE PLASTER; KELLASTONE COMPOSITION FLOORING.

## Kellastone Stucco.

The principal ingredients used in the manufacture of Kellastone products are magnesite, magnesium, chloride combined with asbestos, terra alba and such other fillers of known value as are necessary to meet the special requirements for which our goods are produced.

**ADAPTABILITY**—Kellastone stucco may be used in all forms of new construction for exterior protection and is equally valuable in *overcoating* and remodeling *old buildings*. It may be applied over all kinds of building surfaces such as wood lath, metal lath, hollow building tile, brick walls, concrete and all standard forms of stucco board. It is also perfectly suited to cover bevel or drop siding, old painted or unpainted brick surfaces, concrete blocks, etc.

Moreover, Kellastone, possessed of great beauty as well as insulating properties not equalled by any other exterior coating, produces walls that are fireproof and free from cracking, checking or bulging.

**MIXING COMPOUND**—Kellastone is not mixed with water as is the case with cements or other ordinary plastic material; this mixing compound is a combined chemical solution, principally of magnesium chloride; it is a dense non-inflammable liquid that will not freeze except at temperatures lower than 20° below zero; and stipulated quantities of this mixing compound accompany all shipments of Kellastone powder products.

**PERMANENCE**—Kellastone, composed entirely of mineral ingredients, can be destroyed by neither frost, water, fire nor time. It contains absolutely no Portland cement, lime, gypsum or plaster of Paris. No plastering hair or wood fiber is used in its manufacture; it sets up dense and compact—hard as granite; can not rot and is impermeable to moisture; facts proved by engineers, architects and builders who have used Kellastone during many years.

**STRENGTH**—Kellastone is 3 to 5 times stronger than the best cement stuccos and gains in strength indefinitely; *its breaking strength in 60 days is 600 lbs. per sq. in.*, according to the standard cement testing briquet machine; in the case of all cements, they will attain a breaking strength of 275 lbs. per sq. in. under the most favorable circumstances only. The breaking strength of cement stuccos mixed haphazardly by the ordinary contractor will vary greatly in each individual application, and will rarely exceed 150 lbs. per sq. in.

**FIREPROOFNESS**—Magnesite (chief ingredient of Kellastone) is used to line the great furnaces in steel mills, blast furnaces and smelters. The tremendous



WHITNEY RESIDENCE, 20 AND B STREETS, LINCOLN, NEBR.

FISK & MCGINNIS, Architects

Kellastone applied by G. L. WRIGHT, Stucco Contractor. Solid white. All moulded work

heat required to melt steel, iron, copper and similar ores has but slight effect on magnesite furnace linings—therefore, in Kellastone, the effect of fire is practically harmless. The other principal ingredient, magnesium chloride, is an efficient fire extinguisher. The fire resisting properties of Kellastone are unsurpassed by stone, brick or tile.

**WATERPROOFNESS**—*Kellastone vs. Cement Stucco*—The Kellastone powder and the liquid (mixing compound or chemical solution) unite, resulting in a solid mass of great density; in setting up, the mixing liquid crystallizes with the powder, forming a very hard, stony, dry mass, unaffected by heat or cold. The chemical action in setting up contracts or draws closely together all the particles; the finished article becomes dense, non-porous and a non-absorbent. In tests it has been conclusively shown that, after 48 hours of immersion, the average absorption by Kellastone is less than 2%.

Cement stuccos are porous and absorb large quantities of moisture which penetrates to the base, causing deterioration; further, the hair or wood fibers used in base coat of cement stucco are rotted by the moisture, causing weak and broken keys and, consequently, the stucco to fall off.

**EXPANSION AND CONTRACTION**—Kellastone is not affected by temperature changes; its density prevents absorption of moisture; it clings to window and door casings, framing, cornice work, brick pilasters and panel work, thus preventing rain and snow from getting between stucco and the material on which it is applied. Cement stuccos will crack in various directions.

**RESILIENCE**—Immunity to expansion and contraction, and the resilience of magnesite compositions are proved by many tests and investigations conducted by a number of leading universities and engineers' societies.



**ADHESIVENESS**—Kellastone, applied over dry surfaces, will bond and stick tenaciously, *without suction or keying*; it bonds equally well with brick, stone, tile or rough wood surfaces; withstands all vibration or other rough usage (see railroad station illustration opposite). Samples for trial purposes furnished for parcel post charges (25¢).

**INSULATION**—Kellastone is a non-conductor; will not readily transmit heat, cold, electricity or sound; is used to cover built-in boilers in large power plants and as an insulation for large refrigerating chambers; repels cold in winter and heat in summer; prevents dampness; and will not freeze at 25° below zero.

**APPLICATION**—Kellastone may be applied over surfaces of new and old painted brick, hollow building tile, stone, cement blocks, roughened concrete, wood lath, galvanized metal lath, Byrnett patent sheathing and many forms of stucco board, patent lath, etc. Any competent plasterer may successfully use Kellastone, if he will carefully follow the printed directions and specifications; and *same may be applied regardless of the season or temperature.*

**FINISHES**—All kinds of stucco finishes are possible with Kellastone; those generally used are dash, sponge and float finishes. Color effects are secured. The coat finishes are a part of the surface and will not peel off.

**SPECIFICATIONS**—A book of complete specifications, containing full directions for preparing buildings and surfaces to receive Kellastone, as well as directions to correctly mix, apply and produce the various finishes, will be mailed to any address on request.

**COVERING CAPACITY**—One ton of Kellastone, when applied 2 coats a total thickness of  $\frac{1}{2}$  in. in accordance with specifications, usually covers the respective surfaces (openings not deducted) mentioned in table hereunder:

Over wood lath, applied per specifications.....	60 yds.
Over metal lath, applied per specifications.....	60 yds.
Over hollow tile, well laid up.....	50 to 55 yds.
Over brick walls, studded with nails.....	65 yds.
Over old siding, lathed diagonally.....	60 yds.
Over old siding, metal lathed.....	50 to 55 yds.
Over Byrnett patent sheathing lath.....	55 yds.

**GUARANTEE**—This company guarantees that all Kellastone products (including Kellastone plaster and Kellastone flooring) are correctly manufactured of select raw ingredients, fully up to standard quality at time of shipment.

**PRICE**—The cost of Kellastone varies, depending upon whether the material is ordered in local or carload lots, and also on the rates of freight to various points to which shipment is to be made.

Prices will be promptly quoted on request.

### Kellastone Interior Plaster.

A hard, strong and durable plastering material, its strength averaging 900 lbs. per sq. in. It is an ideal interior finish, forms a tight bond with floors, prevents fire from spreading, confines sound, is not injured by steam or moisture and adheres tenaciously to concrete walls and ceilings.

**ADAPTABILITY**—This plaster is unequalled for use in construction of large arched and uncased openings in fine residence work, cathedrals, in rooms to be oil tinted or hand painted; also, for use in rough service, such as



DEPOT OF THE SEABOARD AIR LINE RAILWAY CO.,  
BRADENTOWN, FLA.

Kellastone stuccoed on exterior walls

in depots, hotels, clubs, hospitals, public building corridors, schools and factories subject to excessive heat, steam and vibration.

### Kellastone Flooring.

The NATIONAL KELLASTONE CO. manufactures a high grade magnesite composition flooring, similar to tile terrazzo and other sanitary durable floor surfacings, at lower cost. The materials are in powder and liquid form; when mixed and spread, a chemical reaction ensues, all ingredients combining into a tough seamless mass. Kellastone flooring is light, warm, resilient and quiet in use under all conditions.

**APPLICATION AND ADAPTABILITY**—Two coats—an under fibrous coat, of great strength and pliability and a top coat of fine grained texture, immune to abrasive wear and adapted to heavy trucking and machinery vibration, etc.; therefore, used extensively in machine-shops and manufacturing establishments, office and public buildings, hospitals, asylums, theaters, schools, etc.

Kellastone flooring can be laid with borders, in designs and in terrazzo effects.

**INSTALLATION**—The NATIONAL KELLASTONE CO. will contract to install anywhere. This company maintains a contracting department for installation of its composition flooring. The contracts are executed by skilled men who possess many years of experience and a large degree of proficiency in this peculiar mechanical art.

On receipt of plans and specifications showing areas to be covered—wood or concrete bases—estimates for the flooring work in any part of the country will be gladly submitted for the consideration of architects and other interested persons.



KELLASTONE FLOORING  
LADIES' RECEPTION ROOM, CASINO CLUB, CHICAGO, ILL.  
W. E. WALKER, Architect

### References.

Lists of satisfied users of Kellastone products will be furnished on application.



# ACME CEMENT PLASTER COMPANY

Manufacturers of Cement Plaster, Keene's Cement and Gypsum Blocks

GENERAL OFFICES  
ST. LOUIS, MO.

SHIPPERS OF GYPSUM PRODUCTS FROM

ACME, TEX.  
LARAMIE, WYO.  
CEMENT, OKLA.

GRAND RAPIDS, MICH.  
ACME, NEW MEX.  
LOS ANGELES, CAL.

FORT DODGE, IOWA.  
GLADYS, OKLA.  
ACME, OKLA.

WINSLOW, ARIZ.  
LIME, ORE.  
GYPSUM, ORE.

## Products.

ACME CEMENT PLASTERS; ACME KEENE'S CEMENT; ACME WOOD FIBERED PLASTERS; ACME GYPSUM BLOCKS.

Acme Prepared Finish; "Apex," "Climax," "Royal," "Laramie Standard," "Independent" and "Mission" Cement Plasters; Moulding and Finishing Plaster, and Gypsum Building Products.

## Reputation and Guarantee.

The Acme products have a national reputation and are always sold under a guaranteed trade-mark, to meet every requirement of the most discriminating Standards for Testing Materials as to tensile strength, crushing strength, and fire resisting, covering, spreading, working qualities and endurance.

## Acme Cement Plaster.

The original natural cement plaster first introduced in the United States. It is guaranteed a perfect stock-keeper; it works very even and uniform; its working qualities make it a great favorite with architects and contractors.

COVERING CAPACITY—2,000 lbs. of Acme will cover 200 sq. yds. on lath, and 250 sq. yds. on Acme plaster blocks.

## Acme Wood Fibered Plaster.

The addition of wood fiber to Acme transmits toughness and elasticity, making plastered walls that will bend without cracking, and preventing lath cracks. An extra good material for finishing concrete ceilings.

Ideal for use where good sand is not available at reasonable cost; and can be made so that an equal measure of inferior quality of sand may be gauged with it, giving good results.

COVERING CAPACITY—Without sand, 2,000 lbs. will cover 80 to 120 sq. yds., depending upon thickness of grounds and spacing of lath. With sand, 2,000 lbs. will cover 130 to 160 sq. yds.

## Acme Keene's Cement.

A slow setting, even and smooth working cement for interior finish, gauged for plastering mortar by mixing with hydrated lime or lime putty and sand; the only plastering material which can always be troweled to an even and true surface, making perfect angles and joinings; the very best obtainable material for interior finish. It has a tensile strength, neat, 700 lbs. per sq. in.; crushing strain, ten times the tensile strength.

Metal will carbonize and rust when exposed to air. Thoroughly embedded in plaster it will endure forever. Cheese cloth or burlap holds Acme walls in place just as well as metal.



TRADE-MARK

COVERING CAPACITY—Gauged with lime, 500 lbs. will cover 100 sq. yds. 2 coats. Used neat, 300 lbs. will finish 100 sq. yds. Gauged with lime, 100 to 150 lbs. will finish 100 sq. yds.

## Specifications for Acme Cement Plasters.

GENERAL INFORMATION—Acme Cement Plasters are cement and must be handled like cements to get results. They must be protected from dampness by being stored in a dry place, never on the ground, against a damp wall, or in any damp place when delivered to the building.

Acme Cement Plasters "set" and can not be re-tempered after the "set" begins. A very little "set" plaster in cement plaster mortar, whether from the mortar boxes, the water-barrel in which tools have been washed, or droppings from the floor, will cause all of the plaster mortar to "set" too quickly.

Acme Cement Plaster mortar will "set" quick and work short if there is delay in tempering with water after sand has been mixed with it. It will spread a little easier if allowed to stand a few minutes after it has been tempered. To get the maximum tensile strength from Acme Cement Plasters they should be tempered as stiff as the mortar can be conveniently worked.

If finished walls are soft and chalky, it is because the water in the mortar has been evaporated before the plaster has "set." Spraying the walls with clean water, or with brush and water having powdered alum dissolved in it, is the remedy.

After Acme Cement Plaster mortars are well "set," open doors and windows and dry as quickly as possible.

## GENERAL REQUIREMENTS

**Grounds**—To be  $\frac{3}{4}$  in. for Wood or Metal Lath; for Plaster Block, Brick, Stone and Tile,  $\frac{1}{2}$  in.

**Plaster Board**—According to the manufacturer's directions for using.

**Lath**—Should be good grade; free from knots, sap and bark; spaced not less than  $\frac{3}{8}$  in.; securely nailed with 3d galvanized nails. Joints broken every fifth lath, leaving space at end of lath.

**Sand**—Use only clean, sharp sand of good voidage, free from loam, dirt, or impurities. Avoid quicksand.

**Wet the Lath**—Thoroughly swell wood lath with hose and water, if necessary, at least two hours before applying mortar.

**Suction**—Wet all gypsum block, brick, stone, tile and concrete walls with water, to reduce suction, before applying plaster.

**Mixing**—Thoroughly mix all cement plaster with sand before adding water. At once add sufficient clean water and temper to the consistency of good stiff plasterers' mortar and allow to "set" a few minutes.

**Gauging for Wood or Metal Lath and Plaster Board**—To Fibered Acme Cement Plaster add sand as per manufacturer's specifications.

**On Gypsum Block, Brick, Stone and Tile Walls**—To 1 part Unfibered Cement Plaster add 2 parts sand.

**On Concrete Walls, Beams, Ceilings and Columns**—To 1 part Unfibered Cement Plaster add  $\frac{2}{3}$  part sand.

## DIRECTIONS FOR APPLYING

**On Wood Lath**—First Coat: Mortar to be applied promptly with sufficient pressure to fill keys and spread a good coat over lath, leaving surface rough; scratch with broom or rice-root brush and allow plaster to "set" hard.

**Second Coat**: When first coat is two-thirds dried, to be applied with strong pressure, even with grounds. Straighten with rod and darby ready for finish coat. Must not be floated.

**On Metal Lath**—First Coat: Mortar to be applied promptly with sufficient pressure to fill keys and cover lath with a thin coat of plaster, leaving rough surface to receive second coat



of plaster, applied in same way as second coat is applied on wood lath.

*On Brick and Tile*—All crooked, uneven walls to be straightened by filling the low places. After this has "set" hard, apply 1 coat with strong pressure, even with grounds, and leave ready for finish coat. May be floated before mortar begins to "set."

*On Plaster Board*—According to the Plaster Board Manufacturer's directions for using.

*On Acme Gypsum Blocks*—Apply 1 coat with strong pressure and sufficient to make walls even with grounds, straighten with rod and darby and leave ready to receive finish coat.

*On Concrete*—Thoroughly brush all walls and ceilings with steel brush; hack all smooth surfaces; thoroughly wash with brush and water, or hose, all loose substances, efflorescence, dust, dirt and oil from walls and ceilings. While walls are still damp, apply sufficient cement plaster to fill out grounds and bring to straight and even surface, ready to receive finish coat.

### Specifications for Acme Wood Fibered Plasters.

ACME WOOD FIBERED PLASTERS, NEAT—Grounds to be  $\frac{5}{8}$  in. for wood lath; laths spaced  $\frac{1}{4}$  in. apart, leaving space at end of lath; joints broken every fifth lath; use no sand; temper with clean water to consistency of thin plasterers' mortar; apply 1 coat with strong pressure sufficient to bring to straight and even surface, flush with grounds and leave ready for finish coat.

ACME WOOD FIBERED PLASTERS WITH SAND—Equal parts Wood Fibered Plaster and sand. Same directions for using as Acme Cement Plasters.

### Specifications for Acme Keene's Cement.

#### GENERAL REQUIREMENTS

*Grounds*—Lath and sand same as Acme Cement Plasters.

#### DIRECTIONS FOR APPLYING

*Gauging for Wood Lath—First Coat*: Equal parts Acme Keene's Cement and finely strained, well-seasoned lime putty, making 1 part; to this mixture add 2 parts clean, sharp sand. Fiber well with cattle hair or other equally good fiber, and add sufficient water to temper to proper consistency. Scratch or broom and then let dry.

*Second Coat*: When scratch coat is bone dry, dampen with clean water before applying second coat. Equal parts Acme Keene's Cement and finely strained, well-seasoned lime putty, making 1 part; to this mixture add 3 parts clean, sharp sand for ceilings (add 5 parts sand for walls). Add sufficient water to temper to proper consistency. Droppings may be re-tempered and used if done promptly.

*For Metal Lath*—Apply first coat with sufficient pressure to fill all keys and cover all metal with a light coat of mortar. Gauge in same proportions and apply in same manner as on wood lath.

*For Acme Gypsum Block, Tile or Brick*—Equal parts of Acme Keene's Cement and finely strained, well-seasoned lime putty, making 1 part; to this mixture add 3 parts clean, sharp sand for ceilings (add 5 parts sand for walls). Add sufficient water to temper to proper consistency.

#### ACME KEENE'S CEMENT FINISHES

*For Smooth Finish*—Mortar box to be clean. When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Acme Keene's Cement and finely strained, well-seasoned white lime putty, making 1 part; to this mixture add  $\frac{1}{6}$  part clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

*For Float or Sand Finish*—Mortar box to be clean. When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Acme Keene's Cement and finely strained, well-seasoned white lime putty, making 1 part; to this mixture add 2 parts clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

*For Trowel Sand Finish*—Mortar box to be clean. When brown coat is bone dry, dampen with clean water before applying finish coat. Equal parts Acme Keene's Cement and finely strained, well-seasoned white lime putty, making 1 part; to this mixture add  $\frac{1}{2}$  part clean, sharp sand, screened through a No. 12 sieve. Add sufficient water to temper to proper consistency.

*For Wainscoting*—Mortar box to be clean. When brown coat is bone dry, dampen with clean water before applying finish coat. One part Acme Keene's Cement and  $\frac{1}{2}$  part finely strained, well-seasoned white lime putty; to this mixture add sufficient water to temper to proper consistency. In laying off wainscoting in imitation of tiling, brick or stone, the finish must be sufficiently hard for the tools to cut sharply defined

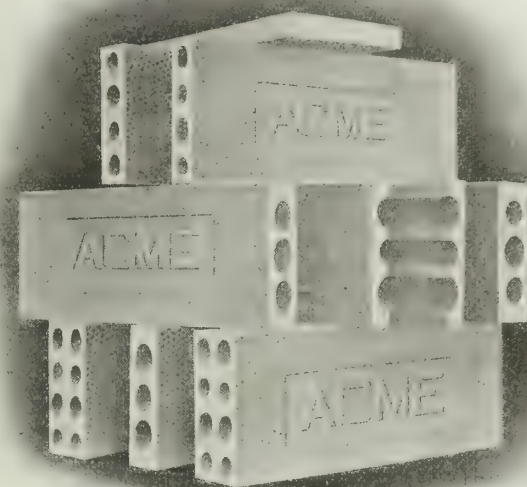
lines without tearing the walls. Do not draw the lines deep; only deep enough to show distinctly.

#### GENERAL DIRECTIONS FOR MIXING FINISH COAT

First add some clean water to the Acme Keene's Cement, and quickly break up the initial set; then add other ingredients as required for the different finishes, as given above.

### Acme Gypsum Blocks, and Lintels.

For all fireproof partitions, corridors, column covering and wall furring. The most economical, lightest and fireproof material made from pure gypsum and fiber.



ACME BLOCKS

### Specifications for Acme Gypsum Blocks, and Lintels.

#### GENERAL REQUIREMENTS

All rough bucks for openings to be exact size of openings; set in place by the carpenter, securely braced and left plumb and true for the masonry contractor. All bucks to be exact size of abutting partitions and 2 inches thick, and have grounds  $2\frac{1}{2}$  ins. wide by  $\frac{1}{2}$  in. thick nailed thereon to receive the ends of the Acme Gypsum Blocks.

#### DIRECTIONS FOR APPLYING

*Furring*—Fur outside walls with 2-in. hollow back Acme Gypsum Blocks, laid up against the walls and securely spiked to the walls with 20d nails.

*Interior Columns*—All exposed interior columns to be covered with 2-in. solid or 3-in. hollow Acme Gypsum Blocks, securely bonded with gypsum mortar.

*Mortar*—Set all Acme Gypsum Blocks in a mortar composed of 1 measure Unfibered Acme Cement Plaster, 3 equal measures clean, sharp, coarse sand, and tempered with clean water to the consistency of bricklayers' cement.

*Ceiling Heights*—Use sizes of blocks for ceiling heights as provided by the National Board of Fire Underwriters, or as follows:

Non-bearing corridor and room partitions, not exceeding 13, 17 and 22 ft. in height, 3-, 4- and 5-in. hollow blocks, respectively; 6-in. hollow block to ceilings over 22 ft. and up to 30 ft.; 8-in. hollow block when over 30 ft. and up to 40 ft.

*Acme Gypsum Lintels*—Over all openings less than 5 ft. in width, place an Acme Gypsum Lintel of the same thickness as the wall. This lintel to be 12 ins. longer than the width of the opening, and to have not less than 6 ins. bearing on wall on either side, well bedded in Gypsum mortar and kept  $\frac{1}{2}$  in. above wood buck or jamb. Over all openings more than 5 ft., place the iron channels supplied for these openings by the general contractor.

### Co-operative Service.

Representatives of the company will call on request, or any information concerning Acme Products will be furnished by mail.

# THE AMERICAN GYPSUM COMPANY

Manufacturers of Wall Plasters and Other Gypsum Products

PORT CLINTON, OHIO

## Products.

WALL PLASTERS and GYPSUM PRODUCTS which include:

"Anchor," "Monarch," "20th Century" and "White Rock" (Neat) Cement Hair Fibered Plasters.  
"Anchor," "Monarch," "20th Century" and "White Rock" Wood Fiber Plasters.

"20th Century" Genuine Pulp Plasters.

"Anchor," "Monarch" and "20th Century" Asbestos (Neat) Plasters.

Bond Plasters for concrete walls.

"Anchor," "Monarch," "20th Century" and "White Rock" Prepared Sanded Wall Plasters (machine-mixed).

"Anchor," "Monarch," "20th Century" and "White Rock" Prepared Sanded Wood Fiber Plasters (machine-mixed).

"Anchor," "Monarch," "20th Century" and "White Rock" Prepared Sanded Asbestos Plasters (machine-mixed).

"Anchor," "Monarch," "20th Century" and "White Rock" Prepared Sand Finish Plasters.

"Anchor," "Monarch," "20th Century" and "White Rock" Regular Grade Plaster Paris for White Coat.

"Anchor," "Monarch," "20th Century" and "White Rock" Superfine Grade Plaster Paris for White Coat.

"Anchor" Moulding and Casting Plaster.

"20th Century" Special Prepared White Finish.

"Anchor" Gypsum Partition Blocks and Roof Tile.

Keene's Cement.

Hydrated Lime.

"Monarch" Plaster Board.

## Location and Facilities.

Centrally located in that part of the United States east of Chicago, Ill., on the main lines of the New York Central Railroad, which, with its numerous systems, lines and connection roads, enables shipment in any direction.

Strictly up-to-date. Electrically operated machinery and modern reinforced concrete fireproof buildings.

Capacity, 700 tons per day, or 35 twenty-ton cars.

## Reputation.

THE AMERICAN GYPSUM COMPANY's products have been on the market for 10 years and their merits are well known, having been used on many of the largest buildings in our territory.

## Guarantee.

All these products are guaranteed to be of the best quality, and to give first class results if used in accordance with this company's instructions.

## Specifications for The American Gypsum Company's Cement Plasters.

**GROUNDING**—To be  $\frac{3}{4}$  in. for plaster boards, wood lath, wire and metal lath;  $\frac{1}{2}$  in. for gypsum blocks and  $\frac{5}{8}$  in. to  $\frac{3}{4}$  in. for clay tile and brick walls.

**LATHING—Wood Lath**—They should be of a good grade, free from knots, sap and bark; to be spaced not less than  $\frac{1}{4}$  in. apart and well nailed with not less than two 3d lathing nails for each stud to each lath, and driven well home. Half green lath are best, as dry lath will buckle and crack plaster unless thoroughly soaked with water 8 to 10 hours before plaster is applied. Lath must have  $\frac{1}{4}$  in. space between ends, and must not project through partitions.

**MORTAR**—To be any brand of THE AMERICAN GYPSUM COMPANY's Cement Plaster, and to be mixed and applied according to manufacturer's directions.

**DIRECTIONS FOR MIXING**—Use a clean, tight box,  $3\frac{1}{2}$  ft. by 7 ft. by 12 ins. deep. The box should be thoroughly cleaned after each mixing and kept free from dirt and lumps of old plaster. Raise one end of the box about 4 ins.

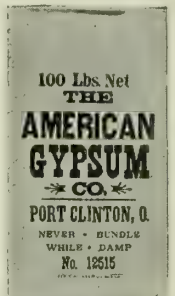
First put in 1 layer of sand, then 1 of plaster; hoe dry from one end of box to the other, then back again, working the sand and plaster until thoroughly mixed; now mix with water immediately. Draw the material to the high end of the box, put the water in the lower end of the box and hoe the plaster into the water. Mix water and plaster thoroughly. Mix thin at first, then add sufficient dry plaster and sand to bring to proper consistency for applying. Let the mortar stand 10 minutes after mixing with the water.

Always use clean water, free from alkali, salt and other impurities. Never wash tools in water to be used in mixing plaster; have a separate barrel of water for this purpose. Do not mix more material at one time than can be used in 1 hour. Never re-temper plaster after it has commenced to set. Do not mix one gaging with another.

**Sand**—Use only clean, sharp sand free from loam, dirt or frost. Use sand which passes through a 10-mesh and remains on a 30-mesh sieve. Avoid quicksand.

**Quantity**—When using AMERICAN GYPSUM COMPANY's Cement plasters on plaster board and wood lath, mix 2 parts by weight of clean, sharp, dry sand and 1 part of plaster. For brick, clay tile, or gypsum blocks, mix 3 parts by weight of clean, sharp, dry sand with 1 part of plaster. For metal lath or expanded metal, use  $1\frac{1}{2}$  parts to 2 parts clean, sharp, dry sand by weight, to 1 part of plaster.

**GENERAL INSTRUCTIONS FOR APPLYING—Plaster Board**—First fill all joints between the boards. When this is set, apply the base or browning coat, filling out to grounds and darbying to a straight and even surface, ready to receive finish coat. Darby lightly and use water sparingly. Do not wet boards before applying plaster



STANDARD 100-LB. SACK



"20TH CENTURY" PLASTER BAG



"MONARCH" BRAND BAG



"ANCHOR" CEMENT PLASTER BAG



**Wire and Expanded Metal Lath**—Apply a scratch coat lightly, covering the lath and filling meshes. After the scratch coat has set hard, but before it is dry, apply the second coat, bringing it to a straight and even surface with rod and darby, ready to receive the finish coat. Darby lightly and use water sparingly.

**On Wood Lath**—If lath are dry, soak thoroughly; give them all the water they will take. This should be done 8 to 10 hours before applying plaster, so that lath will have a chance to swell and buckle. This will prevent their doing so after plaster is applied and insure a first class hard wall, which is often lacking where plaster is applied to dry lath.

Lay plaster on, using sufficient pressure to force through lath and form a good key and fill up grounds as the work progresses. Darby lightly, so as not to force mortar through lath spaces, and use water sparingly. Never apply at one time more than can be darbied before material begins to set.

**On Brick Tile or Gypsum Block Walls**—First soak walls thoroughly, to reduce the suction; apply sufficient mortar to fill out the grounds, bring to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

### Specifications for The American Gypsum Company's Wood Fiber Plasters.

**Grounds**—Same as specified for Neat Cement Plasters.

**Lathing**—Same as specified for Neat Cement Plasters.

**Mortar**—To be any brand of THE AMERICAN GYPSUM COMPANY's Wood Fiber or Genuine Pulp Plasters, and to be mixed and applied according to manufacturer's directions. Only water is to be added to this plaster in sufficient quantity to temper to proper consistency for applying to walls, and under no circumstances will contractor be allowed to add sand or other solid material.

**Note**—Wood Fiber is also manufactured under a special formula, allowing the use or addition of sand on the job in proportions of equal parts sand by weight, which makes a good hard wall, but not as good as the Wood Fiber used without sand.

**DIRECTIONS FOR MIXING AND APPLYING**—First put water in box, then throw in such amounts of Wood Fiber Plaster as could be used in about 1 hour, spreading it out so the water can soak in. Allow the plaster to soak for 10 or 15 minutes without mixing. This is necessary, owing to the fact that this plaster requires lots of water, and if not allowed to soak it will mix hard and also work hard. After this period of soaking has elapsed hoe the material back and forth thoroughly, adding sufficient water to bring mortar to right consistency for application, and if before mortar is all used up it becomes too stiff in the box, re-temper with water.

By observing these instructions, plaster will work much easier and give the best results. General directions for applying are the same as given for Neat Cement Plasters.

### Specifications for The American Gypsum Company's Prepared Wall Plasters.

**Grounds**—Same as specified for Cement Plasters.

**Lathing**—Same as specified for Cement Plasters.

**Mortar**—To be any brand of THE AMERICAN GYPSUM COMPANY's Prepared Wall Plasters, and to be applied according to the manufacturer's direction.

**DIRECTIONS FOR MIXING AND APPLYING**—Nothing but water to be added to this plaster, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

Put plaster in raised end of box and water in low end. Hoe plaster into water, mixing thoroughly. Mix thin at first, as this permits free chemical action and prevents lumps forming. Add sufficient dry plaster to bring to proper consistency for application. The best results are obtained by allowing mortar to stand 10 or 15 minutes after mixing.

**Note**—Pelee Island, Lake Erie, sand is used in all brands of Prepared Plasters; conceded to be the best plastering sand in this territory. It is dried, then graded and blended to insure uniform grade, and accurately weighed, to insure proper quantities, and mechanically mixed to insure proper distribution with plaster.

### Covering Capacity of The American Gypsum Company's Plasters.

The depth of grounds, uniform thickness of plaster, the skill of the mechanic, and the many different kinds of walls to which plaster is applied necessarily affect

the amount of square yards of surface 1 ton of plaster will cover. But for estimating purposes and for general average results 1 ton of cement plaster with 2 parts sand added, when applied to wood or metal lath, will cover 200 yds.; and with 3 parts sand added, on brick, tile or gypsum block, will cover 200 yds.

Wood Fiber and Genuine Pulp Plasters will average 220 yds. per ton. Prepared, ready mixed, sanded plasters will average 60 to 70 yds. per ton; and under favorable conditions either kind will cover 25% more.

### Specifications for The American Gypsum Company's Prepared Sand Float Finish.

Finish to be any brand of THE AMERICAN GYPSUM COMPANY's Prepared Sand Finishes, and to be mixed and applied according to the directions of the manufacturer. This finish is prepared so that nothing but water need be added, and under no circumstances will contractor be allowed to mix sand or other solid matter.

**DIRECTIONS FOR MIXING**—Same as for Prepared Plaster.

**GENERAL DIRECTIONS FOR APPLYING**—The best results are obtained with float finish, by first allowing base coat to set firm and hard and while still green apply finish, which should be done in about 12 hours after base coat is put on.

Lay on with a trowel, and then use cork carpet or felt float, working material to a true and even surface, free from float marks and cat-faces. Use as little water as possible while floating, to avoid killing surface of finish. Best to use only a damp brush. Never attempt to float after finish commences to or has set.

### Specifications for The American Gypsum Company's Prepared Troweled Finish.

Trowel finish to be THE AMERICAN GYPSUM COMPANY's "20th Century" Special White Finish, and to be mixed and applied according to the directions of the manufacturer. These finishes are prepared so that nothing but water need be added, and under no circumstances will contractor be permitted to add sand or any other solid materials.

**DIRECTIONS FOR MIXING**—Mixing box and board to be perfectly clean, and clear water used in mixing. Place finish in high end of box and water in low end. Hoe into water and mix fairly thin, and allow to stand for 4 to 6 hours before using. If stiff when ready to use, thin by adding water, and mix same thoroughly to the proper consistency and carry in buckets.

**GENERAL DIRECTIONS FOR APPLYING**—Base coat must be thoroughly dry before applying finish, so that any cracks will be filled with finish. If suction is too strong, sprinkle or brush with water. Apply surface in 3 coats. For first coat apply enough finish to cover surface filling, using it very thin, and press it firmly on base coat. Allow this to dry a few minutes to prevent blistering, then apply the second coat, bringing surface up level; then apply third coat, using material thin as can be handled on the hawk and fill in the cat-faces and imperfections. After finish has stiffened sufficiently for troweling, trowel to a smooth surface, using water sparingly.

**Note**—"20th Century" Finish, like Keene's Cement, can not be killed by mixing or working after it commences to set. In fact, it can be broken down as often as desired, and each time done it improves its working qualities. It makes a very white, uniform color and is exceptionally hard. It can be blocked off to imitate tile if desired. When walls are dirty, can be washed with clean water. Pronounced by mechanics the best Prepared Finish on the market.

### Specifications for The American Gypsum Company's Bond Plaster.

Undressed lumber should be used for concrete forms, so that walls will be left rough. Paraffin or oil should never be used on forms. Concrete walls must be thoroughly dry and never contain frost. All dust must be removed; also any oil, greases or paraffin before plaster is applied.

**Grounds**—To be on side walls  $\frac{3}{8}$  in. and on ceilings of sufficient thickness to bring on an even surface.

**Mortar**—To be THE AMERICAN GYPSUM COMPANY's Bond Plaster for concrete walls, to be mixed and applied in accordance with the instructions of the manufacturer's expert, who will be on the ground when the job is started, to personally inspect the work and consult with architect and contractor.



**Anchor Hollow and Solid Gypsum Blocks.**

Are made of pure calcined gypsum. They are very light, but are tough. Have been approved by the underwriters. Are fireproof, verminproof and practically soundproof. They are rapidly being recognized as the nearest to the ideal material for partitions and wall furring known, and are filling a long felt want of architects and engineers for a material that possesses such qualities; and, in addition, are so light that they make material reductions in building loads.

DATA, GYPSUM BLOCKS

Size, ins.	Ceiling heights, ft.	Weight per sq. ft., lbs.	Mortar required per sq. ft., lbs.	Weight plastering 1 side, sq. ft., lbs.	Total weight plastered 1 side, sq. ft., lbs.	Weight plastering 2 sides, sq. ft., lbs.	Total weight plastered 2 sides, sq. ft., lbs.
2-in. Hollow 2 x 12 x 30	Furring	6.4	1	3	10.4	6	12.4
2-in. Solid 3 x 12 x 30		9.4	1	3	13.4	6	15.4
3-in. Hollow 3 x 12 x 30	10	9.9	1.2	3	14.1	6	15.9
3-in. Solid 3 x 12 x 30	13	12.4	1.2	3	16.6	6	18.4
4-in. Hollow 4 x 12 x 30	15	13	1.63	3	17.63	6	19
5-in. Hollow 5 x 12 x 30	17	15.6	2.04	3	20.64	6	21.6
6-in. Hollow 6 x 12 x 30	24	16.6	2.45	3	22.05	6	22.6
8-in. Hollow 8 x 12 x 30	28	22.4	3.26	3	28.66	6	28.4

**Anchor Solid Reinforced Gypsum Roof Tile.**

Are made of the same material as the Hollow Gypsum Blocks, and are reinforced with special mesh reinforcing material. The lightest roofing material on the market, which very naturally reduces weights and cost of steel roof supports.

They are the most effective fire resistant known. Will not disintegrate, and also prevent condensation or sweating, which is so objectionable in all factory buildings; neither will they transmit heat to interior of building. Such a combination makes them an ideal material for roof decks. Unskilled labor can be used in erection.

These tiles are made plain white or dampproof black. Sizes are all standard, 29½ ins. long, and have T-iron supports placed 30 ins. on center.

Anchor gypsum roof tile made in the following sizes:

- 2 x 12 x 29½ ins.—reinforced weight per sq. ft., 10 lbs  
3 x 12 x 29½ ins.—reinforced weight per sq. ft., 13¼ lbs.

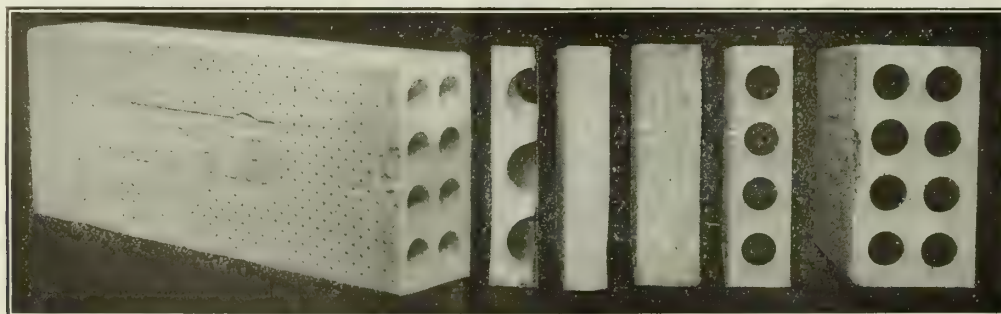
**References.**

THE AMERICAN GYPSUM COMPANY's products have been used on many of the largest buildings erected in the Central States territory in the last ten years, by the

United States, state and municipal governments, and other public, fraternal and private interests.

A miscellaneous partial list is here given, and a complete classified list will be mailed to those receiving "SWEET'S" ARCHITECTURAL CATALOGUE 1918 Edition as soon as certified list is received from publishers.

Dime Savings Bank, Detroit, Mich.  
Miners' Bank, Wilkes Barre, Pa.  
Union Trust Co., Cincinnati, Ohio  
Courthouse, Danville, Ind.  
Courthouse, Mercer, Pa.  
Courthouse, Norwalk, Ohio  
City Hall, Cleveland, Ohio  
City Hall, Youngstown, Ohio  
Wanamaker's Department Store, Philadelphia, Pa.  
Halle Bros., Cleveland, Ohio  
Jenkins' Arcade, Pittsburgh, Pa.  
Woodward Arcade, Detroit, Mich.  
New Michigan Central Depot, Detroit, Mich.  
Whitney Building, Detroit, Mich.  
Leader-News Building, Cleveland, Ohio  
Daily News, Canton, Ohio  
Sherman Hotel, Chicago, Ill.  
Statler Hotel, Detroit, Mich.  
Ponchatrain Hotel, Detroit, Mich.  
Tuller Hotel, Detroit, Mich.  
Gibson Hotel, Cincinnati, Ohio  
Ohio State Normal School, Kent, Ohio  
Ohio State University Museum, Columbus, Ohio  
Ohio State Tuberculosis Hospital, Springfield Lake, Ohio  
Dilworth High School, Pittsburgh, Pa.  
Mason's High School, Akron, Ohio  
Timpkins' \$1,000,000 Residence, Canton, Ohio  
U. S. Post Office, Ashtabula, Ohio  
U. S. Post Office, Fairmount, W. Va.  
U. S. Post Office, Mattoon, Ill.  
U. S. Post Office, Greensburg, Pa.  
Masonic Temple, Erie, Pa.  
Elk's Temple, Terre Haute, Ind.  
Elk's Temple, Marion, Ohio  
U. S. Barracks, Sheridan, Ind.  
U. S. Post Office, Winchester, Ohio  
U. S. Post Office, Middlesboro, Ky.  
U. S. Post Office, Mansfield, Ohio  
Marion High School, Marion, Ohio  
Gibbs Avenue High School, Canton, Ohio  
Richmond High School, Richmond, Va.  
West High School, Akron, Ohio  
McKelvey High School, Pittsburgh, Pa.  
Andrew Hospital, Muncie, Ind.  
St. Elizabeth Hospital, Youngstown, Ohio  
Ohio State Institution for Feeble Minded, Columbus, Ohio  
School for Deaf, Flint, Mich.  
University Chemical Laboratory, Cincinnati, Ohio  
Ohio State Normal, Bowling Green, Ohio  
Phoenix Hotel, Lexington, Ky.  
Lawrence Hotel, Erie, Pa.  
Miami Hotel, Dayton, Ohio  
Casey Hotel, Scranton, Pa.  
National Cash Register Co., Dayton, Ohio  
Ford Building, Detroit, Mich.  
City Hall, Alliance, Ohio  
City Hall, Huntington, W. Va.  
Second National Bank, Ashland, Ky.  
Parkersburg National Bank, Parkersburg, W. Va.



VARIOUS FORMS AND THICKNESSES OF ANCHOR GYPSUM BLOCKS



# CLEVELAND BUILDERS SUPPLY CO.

Manufacturers and Distributers of Caen Stone Cement

Leader-News Building  
CLEVELAND, OHIO

## Products.

EXCELSIOR CAEN STONE CEMENT, prepared ready for use, for interior walls and ceilings, cornices and ornaments, mantels, fountains, flower boxes and garden furniture.

## Excelsior Caen Stone Cement.

Excelsior Caen Stone Cement is a successful equivalent for French Caen stone. After being applied and jointed off, it is in every important respect an exact reproduction of the quarried stone, absolutely fulfilling the essential requirements of durability, texture and color.

The color of Excelsior Caen Stone Cement is a light buff or cream, obtained solely by the use of a finely powdered stone as one of its principal ingredients. No artificial coloring is used. This ground stone is mixed in proper proportions with other materials necessary to secure a correct combination for imitating the texture and color of natural Caen stone.

The entire output of this ground stone is under the control of the CLEVELAND BUILDERS SUPPLY CO. The uniformity of color and texture of Excelsior Caen Stone Cement is assured, provided instructions are followed explicitly.

## Application.

Excelsior Caen Stone Cement is a free working, plastic material that can be applied readily by any competent plasterer. The directions given herewith have been worked out carefully. They are practical, simple and easy to follow. The finished surfaces are secured by floating and sandpapering.

## Features and Advantages.

Excelsior Caen Stone Cement produces the same soft and pleasing effect as is obtained by the use of the natural Caen stone, and at only a fraction of the cost. Displaces marble at a great saving.

It is perfectly adapted for casting into moulds and for running cornices. Its strength increases with age; and its durability will practically equal that of the natural Caen stone. Requires no decoration nor tinting; saves cost of painting. Can be easily cleaned.

## Scope of Use.

Excelsior Caen Stone Cement is especially designed for a finish coat for walls and ceilings in churches, colleges, courthouses, post offices, banking rooms, railway stations, club rooms, hotel and theater lobbies, schools and libraries; for corridors and vestibules of office buildings and residences; for wainscotings, columns, pilasters, caps, brackets, cornices and ornaments; for casting mantels, garden seats, flower boxes, fountains and other decorative features.



TRADE-MARK

## "Slow Set" and "Quick Set" and "Exterior."

For interior work, Excelsior Caen Stone Cement "Slow Set" is made slow setting for finishing plain surfaces, and "Quick Set," quick setting for running cornices and casting into moulds. For running cornices, the "Slow Set" is gaged with the "Quick Set" by the usual method. For casting into ornaments, use "Quick Set" only.

For casting mantels, garden furniture, flower boxes, etc., where great strength and resistance to exposure from the elements is required, use "Exterior" Excelsior Caen Stone Cement.

## Covering Capacity.

To cover approximately 50 sq. ft. of surface,  $\frac{1}{4}$  in. in thickness, 100 lbs. of Excelsior Caen Stone Cement are required.

## Specifications for Architects.

**DAMP-PROOFING**—When Excelsior Caen Stone Cement is to be used on the interior of outside brick or tile walls, first apply 2 heavy coats of any approved brand of damp resisting paint. This is to keep dampness from coming through and staining the finished Caen Stone coat.

**SCRATCH COAT ON METAL LATH**—Apply an approved brand of gypsum hard wall plaster, or lime mortar containing plenty of hair, gaged in proportions of 2 parts of mortar to 1 of Best Bros. [or equal] Keene's Cement.

**BROWN COAT**—To be used as a doubling up coat over scratch coat on metal lath, or as a first coat on brick or tile walls. Mortar shall consist of an approved brand of gypsum hard wall plaster, or lime mortar mixed as above specified, except that hair is not required. Scratch brown coat well. Let stand until thoroughly dry.

**CAEN STONE COAT**—Shall be Excelsior Caen Stone Cement ("Slow Set" or "Quick Set" as required), manufactured by the CLEVELAND BUILDERS SUPPLY CO., Cleveland, Ohio.

**CLEAN BOX**—Use a clean watertight mixing box that has not been used for mixing any other kind of materials. Clean box thoroughly after each mixing.

**SUCTION**—Before applying Caen Stone Finish Coat, soak brown coat thoroughly with clean water to take out suction, using a hose.

**APPLYING CAEN STONE COAT**—Apply Caen Stone Finish Coat not less than  $\frac{1}{4}$  in. thick, and preferably  $\frac{3}{8}$  in. thick. All according to manufacturer's directions.

**CUTTING AND FILLING JOINTS**—After Caen Stone Cement has set thoroughly, cut out joints to size specified, straight and true, uniform in width and depth. When filled joints are desired, fill flush with Best Bros. [or equal] Keene's Cement.

**SANDPAPERING**—After joints are filled, let Caen Stone stand until thoroughly dry, then rub down with sandpaper. Use No. 2½ garnet sandpaper for rubbing the plain surfaces and No. 2 for rubbing the finished joints.

**Note**—Sandpapering is essential. It is absolutely necessary to sandpaper the entire Caen Stone surface to get a uniform texture and color, and thus bring out the true beauty and effect of Excelsior Caen Stone Cement.

# THE BEST BROS. KEENE'S CEMENT CO.

MEDICINE LODGE, KANS.

BRANCH OFFICES

NEW YORK, N. Y., 30 East 42nd Street

CHICAGO, ILL., Insurance Exchange Building

## Products.

Manufacturers of BEST BROS. KEENE'S CEMENT of the following grades:

BEST BROS. KEENE'S "REGULAR," for general plastering purposes.

BEST BROS. KEENE'S "FINE" for wainscots, columns and extra white finish; also, for Caen Stone finish, and for backing artificial marble.

BEST BROS. KEENE'S "SUPERFINE," for facing artificial marble.

BEST BROS. KEENE'S "QUICKSET," for castings and mouldings.

## Description.

The various grades of Best Bros. Keene's Cement are manufactured from the only pure gypsum so far found in the United States. The purity of this gypsum has been determined by analysis of the United States Geological Survey and Bureau of Standards. Best Bros. Keene's Cement has been manufactured in the United States since the year 1889.

## Advantages.

Best Bros. Keene's Cement forms absolutely the hardest and whitest wall it is possible to obtain, and



can be troweled to a marblelike finish. It is non-resonant, fireproof and sanitary. Best Bros. Keene's Cement is entirely free from acid, and will not affect the most delicate colors.

## Specifications for Use of Best Bros. Keene's Cement.

The following specifications are alternative. The first form may be employed when hydrated lime is used in the mixture, and the second form when lump lime is used.

### NO. 1 WITH HYDRATED LIME

THREE-COAT WORK, ON WOOD OR METAL LATH—

(A) *Scratch Coat*—Shall consist of equal parts of dry hydrated lime and Best Bros. Keene's "Regular" in proportions of 1 cu. ft. of hydrated lime, 1 cu. ft. of Best Bros. Keene's "Regular" and not to exceed 5 cu. ft. of sand, in which shall be thoroughly and evenly incorporated plenty of good, well-beaten, water soaked, long, winter slaughtered cattle hair.

(B) *Brown Coat*—Shall consist of equal parts of dry, hydrated lime and Best Bros. Keene's "Regular" in proportions of 1 cu. ft. of hydrated lime, 1 cu. ft. of Best Bros. Keene's "Regular" and not to exceed 7 cu. ft. of sand.

(C) *Finish Coat*—Shall be mixed in the proportions of 400 lbs. Best Bros. Keene's "Regular" and 100 lbs. of dry, hydrated lime.



NEW UNITED STATES POST OFFICE, WASHINGTON, D. C.

D. H. BURNHAM & Co., Architects

Plastered throughout with Best Bros. Keene's Cement



## TWO-COAT WORK, ON TILE AND BRICKWORK—

*Brown Coat*—Use brown coat (B), omitting scratch coat.  
*Finish Coat*—Shall be mixed in proportions of 400 lbs. Best Bros. Keene's "Regular" and 100 lbs. of dry, hydrated lime.

## ONE-COAT WORK, ON CONCRETE—

*Finish Coat*—Shall be mixed in proportions of 300 lbs. Best Bros. Keene's "Regular" and 100 lbs. of dry, hydrated lime.

## NO. 2. WITH LUMP LIME

## THREE-COAT WORK, ON WOOD OR METAL LATH—

(A) *Scratch Coat*—Shall be mixed in the following proportions: To 1 barrel of lime paste add 3 barrels of sand and plenty of good, well-beaten, water soaked, long, winter slaughtered cattle hair. Gage each cubic yard of this mixture with 3 bags of Best Bros. Keene's "Regular" of 100 lbs. each. Keene's cement and sand to be mixed dry before adding lime paste.

(B) *Brown Coat*—To 1 barrel of lime paste add 4 barrels of sand, and gage each cubic yard of this mixture with 3 bags of Keene's cement, as above. Keene's cement and sand to be mixed dry before adding lime paste.

(C) *Finish Coat*—To each 100 lbs. of Best Bros. Keene's "Regular" add 1 pail of lime paste.

## TWO-COAT WORK, ON TILE AND BRICKWORK—

*Brown Coat*—Use brown coat (B), omitting scratch coat.  
*Finish Coat*—To each 100 lbs. of Best Bros. Keene's "Regular" add 1 pail of lime paste.

## ONE-COAT WORK, ON CONCRETE—

To each 100 lbs. of Best Bros. Keene's "Regular" add 2 pails of lime paste.

## ALTERNATIVE FINISHES—

*Smooth, Hard Finish*—For bathroom wainscots and similar work.

Use Best Bros. Keene's "Regular" neat. No lime to be added. If an extra fine white finish is desired, use Best Bros. Keene's "Fine."

*Sand Float Finish*—To 1 barrel of lime paste add 4 barrels of sand, and gage with 3 bags of Best Bros. Keene's "Regular" of 100 lbs. each. Keene's cement and sand to be mixed dry before adding lime paste.

## BRICK AND TILE SURFACES—

All brick and tile surfaces shall be thoroughly broomed off and washed before the mortar is applied, and shall be damp when it is applied.

## CONCRETE SURFACES—

Concrete or cement surfaces shall be washed and scrubbed with a steel brush so as to remove all dust and loose particles. The surface shall then be thoroughly washed with a 10% solution of muriatic acid in water. The concrete must be thoroughly dampened while the plaster is applied. The one-coat finish plaster applied to this shall be a thin coat thoroughly troweled and worked into the surface of the concrete to make adhesion perfect.

## LIME—

Hydrated lime shall be soaked in watertight boxes for 24 hours before using.

Lump lime shall be prepared and run through a fine sieve, 1/16-in. mesh, and properly stored and protected for a sufficient time before using, to insure all particles being thoroughly slaked.

## References.

The following is a partial list of important buildings in which Best Bros. Keene's Cement has been used:

BUILDING	LOCATION	ARCHITECT
United States Senate Office Building	Washington, D. C.	Elliott Woods, and Carrère & Hastings
New Union Station	Kansas City, Mo.	Jarvis Hunt
New York State Educational Building	Albany, N. Y.	Palmer & Hornbostel
New Terminal Station	Detroit, Mich.	Reed & Stem, and Warren & Wetmore
Continental-Commercial Bank Building	Chicago, Ill.	D. H. Burnham & Co.
Henry Ford Residence	Dearborn, Mich.	W. H. Van Tine
Massachusetts Institute of Technology	Boston, Mass.	W. W. Bosworth
Wanamaker Building	Philadelphia, Pa.	D. H. Burnham & Co.
National City Bank	New York, N. Y.	McKim, Mead & White
United States Penitentiary	Atlanta, Ga.	Eames & Young
United States Naval Station	North Chicago, Ill.	Jarvis Hunt
State Capitol	Jackson, Miss.	Theo. C. Link
State Capitol	Santa Fé, N. M.	I. H. & W. M. Rapp
State Asylum	Yankton, S. D.	L. C. Mead
State Asylum	Bangor, Me.	J. Calvin Stevens
Hartford State Library and Supreme Court Building	Hartford, Conn.	Donn Barber
National Museum	Washington, D. C.	Hornblower & Marshall
Art Institute	Chicago, Ill.	Shepley, Rutan & Coolidge
City Hall Building	Chicago, Ill.	Holabird & Roche
First National Bank	Cleveland, Ohio	J. Milton Dyer
First National Bank	Lynchburg, Va.	Lewis Burnham
Western National Bank	Pittsburgh, Pa.	Geo. Orth & Bro.
H. W. Hellman Building	Los Angeles, Cal.	A. S. Rosenheim
Pope Building	Boston, Mass.	Peabody & Stearns
Fifth Avenue Office Building	New York, N. Y.	Maynicke & Franke
Pacific Building	San Francisco, Cal.	C. F. Whittelsey
People's Gas Co. Building	Chicago, Ill.	D. H. Burnham & Co.
Pioneer Building	Seattle, Wash.	A. Wethersham
Wells, Fargo & Co. Express Building	San Francisco, Cal.	Meyers & Ward
Denver Gas & Electric Building	Denver, Colo.	F. E. Edbrooke
Gloyd Building	Kansas City, Mo.	Jno. W. McKecknie
St. Luke's Hospital	Cleveland, Ohio	F. W. Striebinger
Lake Side Hospital	Cleveland, Ohio	G. H. Smith
Sacred Heart Hospital	Spokane, Wash.	Albert Held
St. Francis Hospital	Pittsburgh, Pa.	S. F. Heckert
New German Hospital	San Francisco, Cal.	Herman Barth
Albright Art Gallery	Buffalo, N. Y.	Green & Wicks
Buffalo Historical Society Building	Buffalo, N. Y.	Geo. Cary
Convent of the Sacred Heart	St. Louis, Mo.	J. H. McNamara
Chicago & North Western Station	Chicago, Ill.	Frost & Granger
Wisconsin Central Station	Chicago, Ill.	A. H. Lowden
Hudson Terminal Building	New York, N. Y.	Clinton & Russell
New York Central Terminal	New York, N. Y.	Reed & Stem, and Warren & Wetmore
Zoological Laboratories	W. Philadelphia, Pa.	Cope & Stewardson
Elliott Memorial Hospital	Minneapolis, Minn.	Wm. M. Kenyon
Hotel Kimball	Springfield, Mass.	Samuel Green, Inc.
New Onondaga Hotel	Syracuse, N. Y.	Esenwein & Johnson
Kansas City Star Building	Kansas City, Mo.	Jarvis Hunt
Santa Fé General Office Buildings	Topeka, Kans.	Root & Siemens
St. John's Hospital	St. Louis, Mo.	Barnett, Haynes & Barnett
City Hall Building	Portland, Me.	Carrère & Hastings

# GRAND RAPIDS PLASTER COMPANY

Manufacturers of Wall Plasters and Other Gypsum Products

Sales Agent for Sackett Plaster Board

GRAND RAPIDS, MICH.

## Products.

### WOOD FIBER PLASTERS:

Climax Wood Mortar  
Superior Wood Fiber Plaster  
Blue Rock Wood Fiber Plaster  
Crystal Wood Fiber Plaster  
Elephant Wood Fiber Plaster

### HAIR FIBERED PLASTERS:

Hercules Wall Plaster  
Gypsum Wall Plaster  
Blue Rock Cement Plaster  
Crystal Cement Plaster  
Elephant Wall Plaster

### CALCINED PLASTERS:

Hovey's Eagle  
Acorn  
Green A  
H. R. M.

### FINISHING PLASTERS

### SACKETT PLASTER BOARD

### HYDRATE LIME

Land Plaster and Plaster Block.

## Climax Wood Mortar.

This product is the result of our experiments during 50 years in improvements and developments of wall plasters and coverings. When applied, it contributes toughness, strength and lightness to any wall.

Climax Wood Mortar is all plaster, mixed with finely fibered, tough wood and such other ingredients as are necessary to make it plastic and easy spreading. Its density prevents vermin; it is absolutely fireproof and is not affected by water. Fiber adds one-third to the bulk, thus covering greater area with less weight and maximum solidity and tensile strength.

**ADAPTABILITY**—Recommended for ceilings, arches and domes where plaster must be self-supporting; also, for Portland cement concrete ceilings and walls.

**COVERING CAPACITY**—One ton will cover 125 to 150 sq. yds. of wall surface  $\frac{5}{8}$ -in. grounds.

**SPECIFICATIONS FOR USE**—*Grounds*—Should be  $\frac{5}{8}$  to  $\frac{3}{4}$  in. on wood lath,  $\frac{1}{8}$  to  $\frac{3}{16}$  in. apart;  $\frac{1}{2}$  in. on brick or tile;  $\frac{3}{8}$  in. over face of wire or metal lath.

*Sackett Plaster Board*—Set grounds  $\frac{5}{8}$  to  $\frac{3}{4}$  in., drive nails home firm and tight. Do not wet boards. Apply plaster same as on wood lath.

*Lathing*—For wood lath, use a good grade free from knots, sap and bark; to be spaced not less than  $\frac{1}{8}$  in. to  $\frac{3}{16}$  in. apart and securely nailed with 3d galvanized lathing nails. Break joints every fifth lath and leave space of  $\frac{1}{4}$  in. between ends of lath. Half green laths are best. Dry lath must be thoroughly soaked from 2 to 5 hours before plaster is applied. This will avoid buckling. Do not extend lath through a partition wall.

*Mixing*—Place plaster in mixing box and add nothing but clean water. Mix water and plaster thoroughly, bringing it to

proper consistency for applying. Let the mortar stand 10 minutes after mixing with the water. Always use clean water, free from alkali, salt and other impurities. Never wash tools in water to be used in mixing plaster. Keep tools and mortar board clean. Have a separate barrel of water for washing tools. Do not mix more material at one time than can be used in 1 hour. Never re-temper plaster after it has commenced to set. Do not mix one gauging with another.

**GENERAL SPECIFICATIONS**—*Plaster Board*—First thoroughly fill joints between the boards. When this has set, apply the base or browning coat, filling out to grounds and darbying to a straight and even surface, ready to receive the finishing coat. Darby lightly and use water sparingly.

*Plaster Block, Brick, Tile or Concrete Walls and Ceilings*—First soak the walls thoroughly to reduce the suction. Apply sufficient mortar to fill out grounds. Bring to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

### FOR TWO-COAT WORK

*White Trowel Finish or Gray Finish*—Apply base coat of Climax Wood Mortar, using only enough to fill out to grounds; make walls plumb and straight; rod and darby to a rough surface, making all angles and corners true. When base coat is dry, apply Eagle Trowel Finish, or a finish composed of lime putty gauged with Calcined Plaster, and work to a smooth, hard finish, free from trowel or brush marks.

### FOR THREE-COAT WORK

*White, Gray or Sand Float Finish, on Wire or Metal Lath*—Apply base coat of Climax Wood Mortar, using enough to fill the meshes of the lath full. When set, apply second coat, using enough to fill out to the grounds and make walls straight and plumb; rod and darby to a rough surface, making angles and corners true. Apply finish coats as directed in two-coat work.

### GRAY HARD FINISH

For bathrooms, hospitals, wainscoting or kitchens, where a very hard or durable finish is required. Use our Gray Hard Finish, but apply this when base coat is about half dry, and trowel well and smooth, using as little water as possible. This finish can be left smooth, or may be marked off in squares if so desired.

### SAND FLOAT FINISH

First apply base coat of Climax Wood Mortar, using enough to fill out grounds; make walls straight and plumb; rod and darby to a rough surface, making angles and corners true. For a sand float finish, use equal parts Climax Sand Finish Plaster and Hydrate Lime and add 2 parts clean, sharp sand. Sand must be sharp, clean and dry, sifted through a fine sieve and mixed thoroughly with the Sand Finish Plaster and Hydrate Lime while dry. Then add water, using only enough to make the float coat work freely and easily. Apply before base coat is dry, but after it is well set, as otherwise suction will be too great to trowel smooth. Do all the sides, top and bottom, and avoid joining coats when possible. Add 1 part lime putty, if desired.

### CARE OF PLASTER UNTIL SET

During the summer months protect the walls and ceilings from hot and dry winds, by closing up openings until plaster has fully set and become hard. This will prevent drying, causing the plaster to turn soft and chalky.

In winter, keep the plaster from freezing until it has fully set and become hard. In all cases, after the plaster has thoroughly set and become hard, allow free circulation of air to cause quick drying.



**"Hercules" Wall Plaster.**

Gypsum rock is the base of this product. It is a very high grade of plaster rock—almost a pure sulphate of lime. Our system of drying enables us to grind and calcine it to a perfect uniformity. Every particle of plaster is calcined to an absolute certainty, and not by guess, perfect fineness being necessary to secure the best results.

Our formula for mixing and retarding this plaster is the result of years of chemical experience and thorough testing.

"Hercules" Wall Plaster is strictly a modern wall plaster, and makes a wall that is durable, tough, hard; will last as long as the house; will not of itself crack, swell or shrink; will not fall off, even if wet by leaking roofs, or imperfect plumbing; and will admit the carpenters immediately after the plasterer has finished his work—weeks earlier than with ordinary lime plaster.

For decoration or papering, it makes the most durable and fine surface; is fireproof and regarded by underwriters as a remarkable fire retarder.

Because of the density of this material, it makes a building warmer in winter and cooler in summer; and, being hard and tough, rats or vermin can not penetrate its surface and disease germs fail to live within it.

The use of this plaster permits a healthy occupation of the house at once.

It works smoothly, is very plastic, and its covering capacity is large.

Full plain directions for use accompany each bag of "Hercules" Wall Plaster, and, when strictly followed, perfect satisfaction is guaranteed.

**COVERING CAPACITY**—1 ton of "Hercules" Wall Plaster, when mixed with 2 parts clean, sharp sand, will cover from 225 to 250 yds.; 800 to 900 lbs. will cover 100 yds.

**AMOUNT OF "HERCULES" WALL PLASTER REQUIRED**—For 100 yds. on wood lath,  $\frac{3}{4}$ -in. ground, on an average, eight 100-lb. bags, ten 80-lb. sacks, mixed with proper amount and quality of sand, will brown 100 yds.; but, if grounds are heavy and walls crooked, it will naturally require more.

For 100 yds. on metal or wire lath,  $\frac{1}{2}$ -in. ground, ten 100-lb. bags, or twelve to thirteen 80-lb. sacks. Mix with 2 parts of sand to 1 of cement plaster.

**DIRECTIONS FOR USE**—In using "Hercules" Wall Plaster it is absolutely necessary, in order to attain first class work, to have the lath spaced sufficiently far apart to permit the material to form a good clinch behind the lath.

It is also necessary to have the ground set sufficiently deep to insure a proper thickness of material being applied.

**Grounds**—Should be  $\frac{3}{4}$  in. on wood lath;  $\frac{1}{2}$  in. on brick or tile;  $\frac{3}{8}$  in. over face of wire lath.

**Lathing**—Wood lath should be No. 1 white pine, spruce or yellow poplar, free from knots or bark. Space lath  $\frac{1}{4}$  in. apart and drive nails home. If lath are dry they should be well sprinkled before mortar is applied, as this will prevent trouble from buckling. Half green lath are best. Apply same as any mortar.

**For Base Coat on Wood or Wire Lath**—Mix 2 parts of clean, sharp sand to 1 of plaster.

**For Brick or Tile Walls**—Mix 3 parts of sand to 1 of plaster.

Use a clean and tight mortar box, about 3 x 7 x 1 ft., raised about 3 ins. at one end. Put in first a layer of sand, and then a layer of plaster, and when ready hoe dry from one end of box to the other and back again, working together thoroughly in the operation. Leave material in raised end of box and pour water in lower end. Then hoe mortar gradually

into water, allowing it to thoroughly absorb same, working to proper consistency.

**GENERAL SPECIFICATIONS—****TWO-COAT WORK ON WOOD LATH**

First apply "Hercules" Wall Plaster, mixed as we suggest, well rubbed in, using enough base coat to fill out to grounds, and make the walls straight and plumb.

**White Finish**—Apply "Eagle White" Trowel Finish as soon as base coat has become thoroughly dry and trowel to a smooth, hard finish, free from trowel or brush marks, or use a finish composed of lime putty gauged with Calcined Plaster.

**Gray Finish**—For bathrooms, wainscoting, kitchens, or for hospitals. Apply base coat, and when about one-half dry, apply gray finish mixed with one-third lime putty, with a little water.

**Sand Float Finish**—First apply base coat of "Hercules" Wall Plaster, mixed with 2 parts of sand, using enough to fill out to ground, etc.

For sand float finish, take 4 pailfuls of clear, sifted, sharp sand and add to 100 lbs. of unfibred "Hercules" Wall Plaster. Mix sand thoroughly with plaster, dry. Mix with water enough to make the float coat work free and easy. Apply before base coat gets dry. Add 1 part lime putty, if desired.

**THREE-COAT WORK ON METAL OR WIRE LATH**

First apply "Hercules" Wall Plaster, mixed with proper amount of sand (as directed by manufacturers), sufficient to fill up meshes of the lath, and when well set (but not dry) apply second coat, using enough to fill out ground, etc.

**White Finish**—Apply "Eagle" Trowel Finish or a finish composed of lime putty gauged with Calcined Plaster as soon as base coats have become thoroughly dry and trowel to a smooth, hard finish, free from trowel or brush marks.

**Gray Finish**—When 2 base coats are about one-half dry, apply gray finish with about one-third lime putty, using as little water as possible.

**Sand Float Finish**—First apply "Hercules" Wall Plaster, mixed with the proper amount of sand (as directed by manufacturers), sufficient to fill up the meshes of lath full, and when well set (but not dry) apply second coat.

For sand float finish, take 4 pailfuls of clean, sharp sand and add to 100 lbs. of unfibred "Hercules" Wall Plaster, and mix thoroughly, dry. Add sufficient water to make finish work free and easy from float. Apply before the base coat gets dry. Add 1 part lime putty, if desired.

**TWO-COAT WORK ON BRICK OR TERRA COTTA**

First apply "Hercules" Wall Plaster, mix with 3 parts of good sharp sand, mixed into a mortar. Apply sufficient to fill out and make straight walls and true angles and corners. Apply white, gray or sand coat finishes as directed on lath work.

**ONE-COAT WORK ON WOOD OR METAL LATH FOR CELLAR CEILING**

Apply a good heavy coat of "Hercules" Wall Plaster, mixed with 2 parts of good sharp sand, made into mortar, which, after bringing to true, even surface, trowel until smooth and hard, free from cat faces or other imperfections.

**Sackett Plaster Board.**

Used instead of wood and metal lath, Sackett plaster board is the foundation for the ideal modern wall. It is highly recommended by leading architects and builders for use in edifices of every type. It makes a warmer wall than wood lath, is cheaper than metal, and resists fire better than either.

Sackett plaster board consists of alternate layers of felt and stucco rolled into sheets which are nailed to studding. Plaster adheres perfectly. Boards are about  $\frac{1}{4}$ -in. thick and cut into sheets 32 ins. by 36 ins. They can be sawed and nailed like wood.

**Prices.**

Prices quoted on all products f.o.b. any place east of the Mississippi River.

# THE KELLEY ISLAND LIME & TRANSPORT CO.

Manufacturers of Hydrated Lime (White Rock Finish)

CLEVELAND, OHIO

## Product.

TIGER HYDRATED LIME (WHITE ROCK FINISH) for white coat plastering, sometimes called the putty or finishing coat; and also for scratch and brown coat plastering and other uses.



TRADE-MARK

Such troubles are caused by the use of lime that has not been completely slaked or screened.

Days and weeks of slaking and screening are not necessary when Tiger Hydrated Lime is used. This material is delivered ready for use and it is necessary only to soak it over night (or 24 hours is better). It can be soaked in the room in which it is used. There is no loss of material by air

slaking or deterioration by long storage.

Tiger Lime spreads like butter and does not work short under the trowel. This is the reason it covers more surface and requires less material than putty made from lump lime.

Because of the saving of time in slaking and screening, the labor cost is greatly reduced in using Tiger Hydrated Lime.

The cost of lump lime putty and hydrated lime putty, pound for pound, is approximately the same; but Tiger brand requires about one-third less calcined plaster for gauging.

## Preparation for White Coating.

In preparing Tiger brand for application, it is necessary only to soak it 24 hours in an ordinary mortar box in sufficient water to give it the proper consistency—15 to 16 gals. of water to 100 lbs. of hydrate.

## Covering Capacity in White Coating.

This depends upon the evenness of the brown coat, the thickness in which the finish coat is to be applied, and upon the skill of the plasterer.

On jobs where a straight, first class finish is desired, it will cover 700 sq. yds. per ton.

On jobs where a first class finish is not an essential factor, a ton will cover 800 to 1,000 sq. yds.

## Manufacture.

Tiger White Rock Finish Hydrated Lime is a very high grade lump lime that has been scientifically slaked under mechanical control; that is, hydrated by adding the exact quantity of water necessary to complete the slaking. The material is in the form of a soft, white, dry powder, in packages of suitable size for convenient handling.

It is manufactured from limestone in the famous White Rock district of Ohio, the only locality in the United States that produces a lime that can be hydrated and used for white coat plastering.

All limes manufactured in other localities, upon being hydrated, produce a putty that works short and rolls up under the trowel, so that it can not be used for finishing purposes.

## Deliveries.

Tiger Hydrated Lime is sold by builders' supply dealers in all parts of the United States.

The freight rate is not prohibitive.

It is packed in 50-lb. paper sacks, and always bears the trade-mark.

## Advantages for White Coat Plastering.

Tiger Hydrated Lime, being perfectly slaked and afterward ground fine and air floated, produces a wall that will be absolutely free from pits, pops or blisters.



SOUTH SHORE COUNTRY CLUB, CHICAGO, ILL.

MARSHALL & FOX, Architects

Tiger Hydrated Lime used for finishing the entire interior



**Specifications.****FOR WHITE COAT PLASTERING.**

*Finish Coat*—The finish coat is to be applied when the second coat is dry. The second coat is to be sprinkled generously with clean water before applying the finish coat.

*Materials*—Tiger Hydrated Lime; best grade of finely ground calcined plaster; best grade of marble dust or washed sand.

Soak the Tiger Hydrated Lime over night (or 24 hours is better) before using. Add small proportion of sand or marble dust on the mortar board. Form the putty into a ring on the mortar board and add 25 lbs. of calcined plaster to each 100 lbs. of Tiger Hydrated Lime, then work thoroughly.

Finish coat is to be applied in a first class, workmanlike manner and troweled to a smoothly polished surface free from brush marks.

**FOR SCRATCH AND BROWN PLASTERING.**

A mixture of Tiger Hydrated Lime and sand, in proportions of 1 lb. of Tiger Lime to from 3 to 4 lbs. of sand (depending on the quality of sand) for the base coats produces a porous, sound deadening wall, superior in every way to gypsum hard wall plastered walls. On wood or metal lath add 3 lbs. of hair to the ton of sanded material.

It can be applied and straightened easily; eliminates buckling of wood lath, and is protection against corrosion of metal lath. It does not discolor or otherwise cause deterioration of decorations.

The sand can be mixed by the contractor on the job, or it can be mixed at a mixing plant and delivered prepared ready for the addition of water.

Complete specifications for plastering mailed on request.

**WATERPROOFING CONCRETE**

From 5% to 15% of Tiger Hydrated Lime (by weight of cement) added to Portland cement concrete fills the voids in the concrete and makes it dense and watertight. It also makes the concrete more plastic, so that it flows freely through chutes without the use of excess water, eliminating segregation. It makes the concrete easy to work around steel reinforcement. Eliminates honeycombing, and gives the surface a smooth finish, and lighter in color than plain concrete.

Specifications for using Tiger Hydrated Lime in concrete sent on request.

**FOR USE WITH CEMENT IN BRICK MORTAR.**

Mortar composed of 1 part of Portland cement, 1 part of Tiger Hydrated Lime and 6 parts of clean sand (all measurements by volume) gives highest results from standpoint of strength and lowest from standpoint of expense. It is much stronger than straight cement mortar in masonry.

Send for our booklet, "The Ideal Mortar."

**WITH CEMENT FOR EXTERIOR STUCCO PLASTERING.**

80 lbs. Tiger Hydrated Lime, 380 lbs. Portland cement, 1,200 lbs. sand makes an ideal exterior stucco.

White Portland cement can be used, and white sand or marble dust may take the place of ordinary sand where a white color is desired.

For scratch coat add 3 lbs. of hair to the ton of the sanded material.

**Catalogues, Data, etc.**

Complete data and specifications on scratch brown and white coat plastering will be sent on request, by addressing Dept. "S."



COUNCIL CHAMBER, CITY HALL, CLEVELAND, OHIO

J. MILTON DYER, Architect

5,000 tons Tiger Brand Hydrated Lime used for plastering this building



RESIDENCE, LAKE FOREST, ILL.

FREDERICK WAINWRIGHT PERKINS, Architect

Tiger Hydrated Lime used for all white coat



MANUFACTURERS & TRADERS BANK, BUFFALO, N. Y.

FURNESS, EVANS & Co., Architects

Tiger Brand Hydrated Lime used for finishing



# EMPIRE GYPSUM COMPANY

Manufacturers of Gypsum Wall Plasters

318-319 Cutler Building  
ROCHESTER, N. Y.

MILLS AND MINES  
GARbutt, N. Y.

## Products.

EMPIRE NEAT CEMENT PLASTER; RELIANCE WOOD FIBER PLASTER; EXCELSIOR SANDED WALL PLASTER; EMPIRE CONCRETE PLASTER; EMPIRE EXTERIOR PLASTER.

## Gypsum Hard Wall Plasters.

Gypsum is the basis of all hard wall plasters made by this company. Through the use of these plasters, *harder and firmer walls are obtained with lighter grounds*, thus removing enormous weight from the construction. The adhesive and formative properties permit of a solid wall in two or three hours after tempering. Plastering repairs are eliminated. Iron-clad formulae, based on established facts, are followed in the process of manufacture, and utmost care is exercised in the mixing, each batch being accurately timed. Delivered on the job *ready for use*. The brands of Empire Gypsum Plaster are:

### Empire Neat Cement, or Hair Plaster.

Manufactured under a formula that demands sand under all conditions; with 1 part of Empire Neat Plaster (haired mortar), 2 parts of sand on lath, and 3 on brick or tile are required to be mixed.

### Reliance Wood Fiber Plaster.

Contains *wood pulp* as a binder, giving it a light, stretchy, working action. Used in neat condition to a great extent, but will carry 1 part of sand on wood and metal lath work, and 2 parts on brick or tile. It sets in 2 hours and dries out rapidly.

### Excelsior Sanded Plaster.

Used in localities not having sand in immediate vicinity. Sand is clean and sharp, screened to proper mesh for plaster work and thoroughly dried.

### Empire Concrete Plaster.

To be applied direct to concrete interior walls and ceilings. Ready for use, water only is to be added. Grounds to be  $\frac{1}{2}$  in.

See that concrete work is thoroughly dry before base coat is applied.

Concrete plaster should be allowed to soak in the water for about 10 minutes before hoeing; after which it is to be mixed the same as any other hard plaster. Concrete plaster may be trowel or float finished as any other hard plaster. Before applying finish, be sure base coat is dry and hard.

It is very important that concrete surface be rough, and under no circumstances should oiled boards be used for casting forms.

### Empire Exterior Plaster.

For stucco exteriors. Ready for use, water only to be added: Grounds to be  $\frac{3}{4}$  in.

### Grounds.

The grounds required for all the above brands are as follows:  $\frac{1}{2}$  in., for brick or tile;  $\frac{3}{4}$  in., for plaster boards, wood lath, wire or expanded metal lath.

### General Specifications.

LATH—Wood space  $\frac{1}{8}$  to  $\frac{1}{4}$  in. Spray in warm weather if exceedingly dry. Nail lath firmly. Break joints. Wire or metal must be rigid to insure results. Too much give, means sagging.

BRICK OR TILE—Wet surface before application. Do not apply any brand of plaster to brick or tile which does not contain sand. The correct proportions are: Wood fiber, 1 part; sand, 2 parts; neat, 1 part; sand, 3 parts. Weight, not volume.

SAND—Clean, sharp sand free from gravel must be used.

MIXING—Sand and plaster must be thoroughly mixed before adding water. Use clean tools and clean water. Mix only that amount which will be applied in one hour. Do not re-temper. Work the material to a light consistency for best results.

APPLICATION—Hard wall plaster can be applied to any surface—wood or metal lath, brick, tile, plaster board. Use a firm but even pressure to secure clinch. Apply a light coat first on all surfaces. Scratch or darby same for doubling up or second coat. Fill out to grounds and run an even surface with darby. Permit walls to dry before finish coat is applied; then wet down lightly. Use water sparingly in applying finish coat.

## Buildings Plastered With Empire Plaster.

### BUILDING AND LOCATION

Convent and Chapel, Catskill, N. Y.  
Y. W. C. A., Troy, N. Y.  
Apartment Building, Holyoke, Mass.  
Putnam Memorial Hospital, Bennington, Vt.

Rockefeller Institute, Princeton, N. J.

Store and Office Building, Allentown, Pa.  
Lafayette School, Bethlehem, Pa.

Hotel Langwell Addition, Elmira, N. Y.

Traylor Hotel, Allentown, Pa.  
Eldred Residence, Locust Valley, L. I., N. Y.

Herald Building, Syracuse, N. Y.

High School, Newton, N. J.

Public School, Mineville, N. Y.  
Strand Theater, Allentown, Pa.  
Public School, Lyndhurst, N. J.

Municipal Building, Tyrone, Pa.  
Parish House, Little Falls, N. Y.  
Public School, Pompton Lakes, N. J.

### ARCHITECTS

M. W. Del Gaudio, New York, N. Y.  
Chas. C. Grant, New York, N. Y.  
Oscar Blanchemin, Holyoke, Mass.  
Henry Leslie Walker, New York, N. Y.

Coolidge & Shattuck, Boston, Mass.

Ephraim Pickin, Allentown, Pa.  
Edward R. Bitting, South Bethlehem, Pa.  
Gibb & Waltz, Ithaca, N. Y.

Ruhe & Lange, Allentown, Pa.  
Bertram Goodhue, New York, N. Y.

Starrett & Van Vleck, New York, N. Y.

Rasmussen & Wayland, New York, N. Y.  
Tooker & Marsh, New York, N. Y.  
Ruhe & Lange, Allentown, Pa.  
Ernest Sibley, Grantwood, N. J.

W. F. Wise, Tyrone, Pa.  
M. L. & H. G. Emery, Albany, N. Y.  
Rasmussen & Wayland, New York, N. Y.

### CONTRACTORS

Day Labor  
R. H. Howes Construction Co.  
Lucien Chretien, Holyoke, Mass.  
McDermott & Hanigan, New York, N. Y.

Matthews Construction Co., Princeton, N. J.  
Ritter & Smith, Allentown, Pa.

H. E. Stoudt, Bethlehem, Pa.  
Alfred Mitchell & Sons, Elmira, N. Y.

S. W. Traylor, Allentown, Pa.  
Chas. T. Wills, Inc., New York, N. Y.

Michael Power, New York, N. Y.

Chas. R. Preston, Dover, N. J.  
A. J. Dubee, Glens Falls, N. Y.  
Ritter & Smith, Allentown, Pa.  
J. E. Vroman Co., Town of Union, N. J.

J. Van Hildebrand, Tyrone, Pa.  
Hallinan Bros., Little Falls, N. Y.  
A. W. Crone & Son, Jersey City, N. J.



# J. B. KING & COMPANY

## Nova Scotia Gypsum Products

### GYPSUM MINES

WINDSOR, NOVA SCOTIA  
AVONDALE, NOVA SCOTIA  
HILLSBOROUGH, NEW BRUNSWICK

### GENERAL OFFICES

17 State Street  
NEW YORK, N. Y.

### FACTORY

NEW BRIGHTON, NEW YORK

### BRANCH OFFICES AND WAREHOUSES

BOSTON, MASS.  
PROVIDENCE, R. I.

HARTFORD, CONN.  
BUFFALO, N. Y.

PHILADELPHIA, PA.  
NORFOLK, VA.

WILMINGTON, N. C.  
CHARLESTON, S. C.

### Products.

KING'S WINDSOR ASBESTOS CEMENT (Neat and Ready Prepared); KING'S SUPERFINE WINDSOR CEMENT; KING'S "DIAMOND" BRAND FIBROUS PLASTER BOARD; KING'S "DIAMOND," "HILLSBOROUGH" and "SNOWFLAKE" BRANDS PLASTER OF PARIS.

King's Special Windsor Cement (for plastering on concrete); King's Ready Finish; King's Windsor Gypsum Blocks; King's Windsor Pulp Plaster; King's Wood Fiber Plaster; King's Land Plaster; King's Marble Dust; King's Marble Flour; King's Terra Alba; King's Gypsum Plates; King's Perfected Cold-Water Paint; J. B. White & Bros.' "Keene's Cement" and Portland Cement Dry Mortars.

### King's Windsor Asbestos Cement.

King's Windsor asbestos cement is a perfected plastering material. It is composed of calcined plaster, manufactured from the finest quality of selected gypsum rock imported from the world-famed district of Windsor, Nova Scotia, incorporated with the correct proportion (determined by our 38 years' experience) of other high grade plastic ingredients, asbestos, fiber, etc. It is made in two forms, namely, Neat (to be mixed with local sand) and Ready Prepared (requiring only water to be added).

### King's Superfine Windsor Cement and Other Finishes.

King's Superfine Windsor cement, a specially prepared hard finish, is designed to produce a very hard, smooth, white and elastic surface that will resist hard usage, and will present a perfect surface for painting, tinting or papering. Its slow setting properties enable the plasterer, by a little additional troweling, to produce a high polish. It is extensively used for imitating tile and brickwork in bathrooms, etc. When used for hard finishing it is to be mixed with equal parts of lime putty.

King's "Diamond," "Hillsborough," and "Snowflake" brands of calcined plaster are all standard finishing plasters, cool working, pure white, and very strong.

### Reputation.

King's Nova Scotia gypsum products are examples of the highest art in plaster manufacture in America. That they are deemed the standard of excellence is shown by architects and contractors throughout the country in selecting them for use in the most expensive public and private buildings.

### King's "Diamond" Brand Plaster Board.

King's "Diamond" brand fibrous plaster board is a practical fire resisting substitute for wood and metal lath, for interior walls and ceilings; a non-conductor of sound, heat and cold. Other uses

are: For protection against fire in mills, factories, warehouses, stables, etc., when the boards are to be nailed directly to the surface to be protected, placing them as close together as possible; for deadening sound, when they are to be used between the rough and finished floors; and for keeping out heat and cold, when the boards may be used for exterior sheathing of frame houses.

COMPOSITION—King's "Diamond" brand fibrous plaster board is composed of Nova Scotia gypsum and fiber compressed into a solid fibrous sheet, reinforced on both sides with specially prepared felt.

SIZES—Size of boards, 32 by 36 ins.;  $\frac{5}{16}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$  in. in thickness; adapted for use on 8-, 12-, 16- and 18-in. centers.

$\frac{5}{16}$ -in. A board, dark felt.

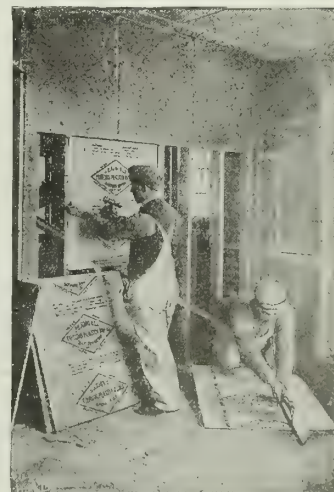
$\frac{3}{8}$ -in. A board, dark felt.

$\frac{1}{2}$ -in. A board, dark felt.

$\frac{5}{16}$ -in. C board, light paper.

The dark felt boards are for use where plastering is required. The light paper board is adapted particularly for papering and burlaping.

ADVANTAGES—King's "Diamond" brand fibrous plaster boards make strong solid walls. They produce quick drying plastering. They protect the wood frame from moisture. By their use there is no confined dampness in partition walls and no corrosion by rust (as when metal is used). They save time in construction. Their incombustible properties insure protection to human life and property.



KING'S "DIAMOND" BRAND  
FIBROUS PLASTER BOARD  
BEING APPLIED

# THE PLYMOUTH GYPSUM CO.

FORT DODGE, IOWA

CHICAGO, ILL., 5040 St. Lawrence Avenue

BRANCHES

MINNEAPOLIS, MINN., 1015 Lumber Exchange

## Products.

**CEMENT PLASTERS:** "Plymouth," "Hardernell," "Iowa Special," "Acolite," "Wood Fiber" (fibered and retarded), "Plymouth" (unretarded), "Concrete," "Sanded"; **PLYMOUTH FIREPROOF GYPSUM TILE;** **PLASTER BOARD.**

"Moulding Plaster"; "Stucco"; "Keene's Cement"; and "Plymouth" Exterior Waterproof Stucco.

## "Plymouth" Cement Plaster.

**ADVANTAGES OF HARD WALL PLASTER**—The recognized ideal for interior walls and ceilings. "Plymouth" cement plaster sets hard in 2 hours after being applied and its tensile strength is 200 times greater than lime. It dries quickly, thus enabling the contractors to proceed with the finishing of the buildings. "Plymouth" cement plaster can be applied to wood and metal lath, brick, tile and plaster board. It is strongly recommended for its fire resisting qualities, enduring intense heat before disintegrating.

Its smooth, hard surface lends itself most pliantly for decorating purposes. Its great adhesiveness and strength render the walls practically indestructible from its great density and non-conductive properties. Buildings are warmer in winter and cooler in summer than with any other plastering material known. Costs no more than lime plaster and is 200% better.

**MANUFACTURE**— "Plymouth" gypsum rock is taken from a new mine, the finest in the Fort Dodge district.

The rock is taken from the center of a stratum 20 to 25 ft. thick, crushed in a large gyratory crusher and transported to mill. Here it is put through a rotary dryer where considerable moisture is evaporated, ground and calcined until practically all moisture is evaporated, and finally re-ground, mixed with hair and retarder, and is then ready for market.

"Plymouth" product is packed as follows:



OTIS BUILDING, CHICAGO  
"Plymouth" plaster used

Container	Capacity, lbs.	Credit, each
Jute bags	100	\$0.15 } Not returnable
Paper bags	80	
Barrels	250	

## Specifications, Cement Plaster.

**CARE OF PLASTER**—Plaster must be stored in a dry, cool place and circulation of air through warehouse avoided. Never place on ground, against damp wall, or in any damp place when delivered to building.

**GROUND**—For plaster board, wood lath, wire and metal

lath, grounds to be not less than  $\frac{3}{4}$  in. For plaster blocks, brick or tile walls, grounds to be not less than  $\frac{1}{2}$  in.

**PLASTER BOARD**—To be applied according to manufacturer's directions.

**LATHING**—For wood lath, use the best marketable grade. Space not less than  $\frac{1}{4}$  in. apart and nail securely with 3d galvanized lath nails. Break joints every fifth lath and leave space of  $\frac{1}{4}$  in. between ends of lath. Half-green laths are best. Dry laths must be thoroughly soaked the day before or not less than from 2 to 5 hours before plaster is applied.

**SAND—Quality**—Use only clean, sharp sand free from loam, dirt and frost. Avoid quicksand. Sand should pass through a 10- and remain on a 30-mesh sieve.

**Quantity**—For plaster board, wood lath, wire and metal lath, use 2 parts sand, of above quality, to 1 part fibered plaster. For plaster blocks, brick or tile walls, use 3 parts sand, of above quality, to 1 part unfibered plaster.

**Proportions**—The following is a convenient way to arrive at the above proportions:

Two to one: Use eight 10-qt. buckets of sand, struck measure, to 100 lbs. of plaster.

Three to one: Use ten 10-qt. buckets of sand, struck measure, to 100 lbs. of plaster.

If other than above quality and quantities of sand are used, the manufacturer will not be responsible for results obtained.

**MIXING**—Mix with water immediately after sand and plaster are dry mixed. Always use clean water, free from alkali, salt and other impurities.

**GENERAL DIRECTIONS FOR APPLYING—On Plaster Board**—First thoroughly fill joints between boards. By doing this, a perfect bond is formed between plaster in board and base coat. When this has set, apply base or browning coat, filling out to grounds and darbying to a straight and even surface, ready to receive finishing coat. Darby lightly and use water sparingly.

**On Wire and Metal Lath**—Apply scratch coat, lightly covering lath and filling meshes, thoroughly brooming it before it sets. After scratch coat has set firm and hard, but before it is dry, apply second coat, bringing it to a straight and even surface with rod and darby, ready to receive finishing coat. Darby lightly and use water sparingly.

**On Wood Lath**—Lay on scratch coat lightly, but with sufficient pressure to obtain a good key, and follow with second coat, filling up to grounds. Darby lightly and use water sparingly. Do not apply more at one time than can be darbied before material begins to set.

**On Plaster Block, Brick or Tile Walls**—First soak walls thoroughly to reduce suction. Apply sufficient material to fill out grounds. Bring to a straight and even surface with rod and darby, ready to receive finishing coat. Darby lightly and use water sparingly.

**On "Plymouth" Concrete Plaster**—For concrete walls and ceilings, use "Plymouth" concrete plaster already prepared by addition of water.

**CARE OF PLASTER UNTIL SET**—During summer months protect walls and ceilings from hot and dry winds by closing up openings until plaster has fully set and become hard. This will prevent drying out before plaster has set and causing it to turn soft and chalky. In winter, exercise the same caution against freezing. In all cases, after plaster has thoroughly set and become hard, allow free circulation of air to cause quick drying.

## Specifications, "Plymouth" Finishes.

**MIXING**—In mixing finishes, keep mixing box, mortar board and tools perfectly clean, and use clean water. In applying,



work top and bottom together whenever possible, and thus avoid joinings. In troweling finishes, do not use any more water than necessary, to avoid killing the surface.

**WHITE HARD FINISH**—Use 1 part "Plymouth Superfine," "Gilt Edge," or "Iowa Finishes," with 2 parts lime putty thoroughly mixed. These finishes are used the same as stucco or plaster of paris, but are slower in setting and give ample time to be worked to a finer surface. The base coat should be dry before using a finish of this kind, so that lath cracks or other imperfections will be covered. Where a white finish is not desired, second coat can be troweled down smooth for papering.

**Covering Capacity**—100 lbs. of above finishes, stucco or plaster of paris mixed with 2 parts lime putty will cover 100 yds. of wall surface. If walls are unusually trim and even, above amounts may cover a little more than 100 yds.

**SAND FLOAT FINISH**—Walls should be left the same as for white coating. Our prepared sand float finish should be mixed rather thin and applied after walls have set firm and hard, but before entirely dry. Use a carpet or cork float and bring material to a true and even surface, free from float marks and cat faces. Do not use any more water than possible on face while floating. Do top and bottom of side walls together whenever possible, and thus avoid joinings. On brick walls, follow closely after base coat. (For covering capacity, see table.)

**EMPIRE FINISH**—A prepared finish, ready for use after mixing with water. Base coat must be thoroughly dry in order to secure a white wall. Mix material very thin and apply in 2 or 3 coats. Apply a light coat the first time over, just filling in pores, grinding in wall and allowing to draw a few minutes. For 2-coat finishing, second coat should be laid on perfectly level, filling in cat faces and imperfections; when partly set, trowel well, using a damp brush. Later it can be troweled or brushed with a dry brush to bring out a glassy surface. For 3-coat finishing, last coat should be mixed as thin as can be handled on hawk, troweled and finished the same as 2-coat work. Mix material thoroughly in a mortar box, but same must be as near perfectly clean and free from foreign matter as possible. (For covering capacity, see table.)

**No. 4 FINISH**—A light gray finish and used for wainscoting, especially in bathrooms and basements. Prepared finish and is ready to use after mixing with water only.

**PLYMOUTH "WOOD FIBRE" PLASTER**—This is a prepared plaster and is ready for use after mixing with water only. It is mixed in the same manner as Plymouth cement plaster; and in order to get a first class wall, strong and elastic, no sand should be added, as the wood fiber takes the place of sand and hair. One ton of this plaster will cover from 120 to 140 yds. The cost is about 3¢ more a yard than "Plymouth" or "Hardernell," and is preferred by some contractors and builders, especially in places where good sand is impossible to get. The same finishes that are used on our other brands of plaster can be applied to the "Wood Fiber."

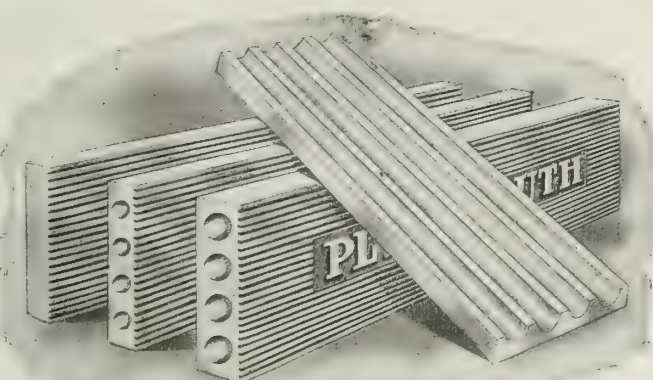
#### COVERING CAPACITIES "PLYMOUTH" FINISHES

Finishes	How used	Covering cap., lbs. to 10 yds. wall surface
"Plymouth" and "Gilt Edge"	2 parts lime putty to 1 part finish	100 to 150
"Plymouth Empire" (a white no-lime finish)	Ready for use by addition of water	400 to 500
"Plymouth No. 4" (a light gray finish for wainscoting)	Ready for use by addition of water	400 to 500
"Plymouth White" (sand float)	Ready for use by addition of water	400 to 500

#### "Plymouth" Fireproof Partition Tile.

Made from pure gypsum mixed with a special fiber, "Plymouth" fireproof tile are moulded into blocks of uniform width and length. Thicknesses, 2, 3, 4, 5, 6, to 8 ins., according to size required.

The "Plymouth" fireproof tile has been tested and approved by the National Board of Fire Underwriters, and on application any architect, builder, or contractor will be furnished a full report of this test. Will also furnish names of architects, contractors or builders, who have used "Plymouth" tile for years.

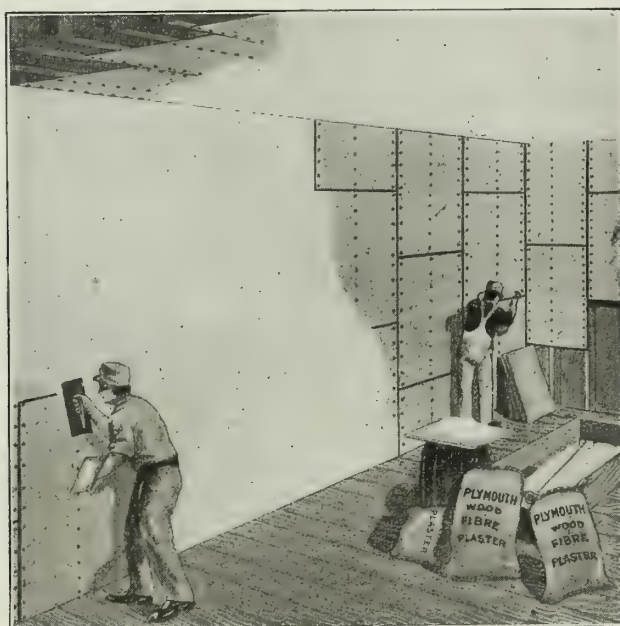


"PLYMOUTH" FIREPROOF PARTITION TILE

#### Plaster Board.

Plaster board, used for several years with varied results, has now come to be one of the staple building materials.

Results obtained depend on quality of board used.



PLASTER BOARD  
Showing method of application



Y. M. C. A. BUILDING, DES MOINES, IOWA  
"Plymouth" fireproof partition tile used



# NIAGARA GYPSUM COMPANY

## Manufacturers of Plasters and Gypsum Products

### BUFFALO, N. Y.

MINES AND MILLS  
OAKFIELD, N. Y.

#### Products.

NIAGARA PLASTERS and GYPSUM PRODUCTS as follows: NEAT CEMENT PLASTER (unsanded); WOOD FIBER PLASTER (wood pulp); SANDED MORTAR (haired); "KON-KREET" PLASTER (for plastering concrete); GRAY FINISH PLASTER; READY FINISH PLASTER; PLASTER BOARDS; GYPSUM BLOCKS.

Finishing Limes, Plaster of Paris, etc., in mixed car shipments.

#### Facilities.

The mines and mills of this company are located at Oakfield, N. Y., on the West Shore Railway (New York Central & Hudson River Railroad), convenient for the rapid filling of orders and shipment without delays. Mines and mills electrically operated, with a daily capacity of 500 tons.

#### Gypsum Rock.

Report of state geologists, which is available on request, shows our rock to be of high analysis and uniform run. The deposits are extensive and insure many years' supply.

#### Neat Cement Plaster.

Requires the addition of sand at the work. Economical on large operations. Used largely in localities where good sand is available. When mixed according to directions below, 1 ton should cover as much surface as 3 tons of sanded mortar.

How to USE—Grounds should be  $\frac{3}{4}$  in. for 2-coat work and  $\frac{7}{8}$  in. for 3-coat work. Wood lath should be free from sap, bark and knots. Spaced about  $\frac{3}{8}$  in. apart, joints broken every seventh lath. Thoroughly swell the lath, and do not let them shrink before application of plaster. Use 2 parts sand to 1 part plaster for wood lath, and 3 parts sand to 1 of plaster for brick, tile, or gypsum block surfaces, by measure, mixing materials well together before adding water.

#### Wood Fiber Plaster (Wood Pulp).

Characteristic ingredient is wood fiber, which gives the plaster toughness, flexibility and bulk. Spreads easily. Especially suitable for use in plastering over



TRADE-MARK

plaster board. Special mixtures prepared for particular cases.

How to USE—Ready to apply by adding water only; if desired, equal weight of sand may be added. On account of greater bulk should cover more surface per ton than other grades of wall plaster.

#### Sanded Mortar.

Splendid working qualities. For use on wood or metal lath, brick, tile or gypsum block, 3 grades are manufactured. Ready for use. Add water only.

#### Prepared Finishes.

Gray skim coat; economical for giving a smooth, hard surface for papering. Also, a ready finish for hard, glossy body coat, and sand finish for walls to be tinted.

How to USE—Add water only. Mix in small batches, as required, while being applied.

#### "Kon-Kreet" Plaster.

Increasing use of reinforced concrete construction calls for a specially manufactured plaster with strongest possible bonding features, to insure thorough adhesion when applied to these surfaces. Used by addition of water only. Light gray color. Can be finished by troweling.

#### Plaster Board.

A better material than lath. Plaster applied directly to the board, which is nailed direct on studding and on 2-in. furring strips set on 12-in. or 16-in. centers on joists.

A fire retardant and sound deadener. Made in sheets 32 by 36 ins. Thicknesses,  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$  in. Use large flat headed galvanized nails,  $1\frac{1}{4}$  ins. long, which are supplied for the purpose, spaced 6 ins. apart around the board.

#### Gypsum Blocks.

For laying up partitions. Used in fireproofing. Light in weight. Surface sizes, 12 by 30 ins. and  $13\frac{1}{2}$  by 32 ins. Thicknesses, 2, 3, 4 and 6 ins., and 2-in. furring.

#### Buildings of Prominence Plastered with Niagara Plaster.

BUILDINGS	LOCATION	ARCHITECTS	CONTRACTORS
Academic Building, Johns Hopkins University	Baltimore, Md.	Parker, Thomas & Rice, Baltimore, Md.	M. F. Boring, Baltimore, Md.
Widener Memorial Library Building, Harvard College	Cambridge, Mass.	H. Trumbauer, Philadelphia, Pa.	Klee, Thomson Co., New York, N. Y.
Springfield Municipal Buildings	New York, N. Y.	Pell & Corbett, New York, N. Y.	A. E. Stephens Co., New York, N. Y.
Grand Central Terminal	New York, N. Y.	Reid & Stein, New York, N. Y.	Klee, Thomson Co., New York, N. Y.
Ritz-Carlton Hotel	Philadelphia, Pa.	H. Trumbauer, Philadelphia, Pa.	J. J. Roberts Co., New York, N. Y.
Otis Building	New York, N. Y.	Clinton & Russell, New York, N. Y.	P. J. Durcan, Inc., New York, N. Y.
Addition to Hudson Terminals	New York, N. Y.	Clinton & Russell, New York, N. Y.	P. J. Durcan, Inc., New York, N. Y.
Manry High School Building	Norfolk, Va.	Neff & Thompson, Norfolk, Va.	East & Hobbs, Norfolk, Va.
Edison Electric Building	New York, N. Y.	(Own Architects)	McNulty Bros., New York, N. Y.
National Biscuit Co. Building	New York, N. Y.	(Own Architects)	J. J. Roberts Co., New York, N. Y.
Baltimore Medical College and Laboratory	Baltimore, Md.	Mottu & White, Baltimore, Md.	J. H. Warthen, Baltimore, Md.
State Normal School	Oswego, N. Y.	N. Y. State Architects	McNulty Bros., New York, N. Y.
Hotel Bancroft	Worcester, Mass.	Esenwein & Johnson, Buffalo, N. Y.	Monahan Bros., Chicago, Ill.
Oaklyn School Building	Camden, N. J.	Wm. T. Towner, New York, N. Y.	D. H. Sharpe, Camden, N. J.
New York Telephone Co. Building	Binghamton, N. Y.	Private	Parsons Bros. Construction Co., Binghamton, N. Y.
Masonic Homes	Elizabethtown, Pa.	C. Emlen Urban, Lancaster, Pa.	Supervision of F. W. Roberts



# M. A. REEB CORPORATION

## Manufacturers of Wall Plasters and Products of Gypsum

### BUFFALO, N. Y.

MILLS AT  
BUFFALO, N. Y. (N. Y. C. & H. R. R. R.) OAKFIELD, N. Y. (WEST SHORE R. R.)

#### Products.

PEERLESS PLASTERS and GYPSUM PRODUCTS as follows: NEAT CEMENT PLASTER (sand to be added), WOOD FIBER PLASTER, SANDED PLASTER (add water only), CONCRETE PLASTER, PLASTER BOARD, GYPSUM PARTITION BLOCKS, PORTLAND CEMENT MORTAR and ASBESTOS MORTAR.

Finishing Limes and Plaster of Paris for mixed car shipments.

#### Facilities.

Mills are situated at Oakfield, N. Y., on the West Shore R. R. and at Buffalo, N. Y., on the New York Central & Hudson River R. R., with excellent manufacturing and shipping arrangements at each point, insuring prompt and efficient service to customers. Extensive daily capacities to take care of large jobs.

#### Quality of Gypsum.

The gypsum, which is the base of all the materials, is of highest grade. It is mined and calcined at one of the most extensive deposits of gypsum rock in the country. Analysis is high and uniform, as New York State geologist's records will show.

#### Neat Cement Plaster.

It is a material used on big work and in localities where a good clean, sharp sand can be readily obtained. Economical and makes strong job. Requires addition of sand at the work. When mixed according to directions below, 1 ton with sand added will cover three times as much surface as 1 ton ready sanded plaster.

**DIRECTIONS**—Grounds should be  $\frac{7}{8}$ -in. for three-coat work or  $\frac{3}{4}$ -in. for two-coat work. Thoroughly swell wood lath. Do not let them shrink before plaster is applied. Lath should be free from sap, bark and knots and should be spaced  $\frac{3}{8}$ -in. apart, and joinings broken every seventh lath. For lath, 2 parts sand to 1 part plaster. For brick, tile or gypsum block surfaces, 3 parts sand to 1 part plaster. Materials well mixed together before adding water.

#### Wood Fiber Plaster.

As the name implies, largely composed of wood fiber. Makes a light, tough and elastic plaster; easily applied.

Particularly desirable as a material for applying

#### Partial List of Prominent Work Done with "Peerless."

BUILDING	LOCATION
New Vendig Hotel	Philadelphia, Pa.
Chamber of Commerce	Buffalo, N. Y.
The Electric Building	Buffalo, N. Y.
65th Regiment Armory	Buffalo, N. Y.
Emergency Hospital	Washington, D. C.
Columbian Hospital	Washington, D. C.
Stearns Building	Springfield, Mass.
Albany Theater	Albany, N. Y.
TenEyck Hotel	Albany, N. Y.
New York State Normal School	Buffalo, N. Y.
Bank of Buffalo	Buffalo, N. Y.
Masten Park High School	Buffalo, N. Y.
Technical High School	Buffalo, N. Y.
New York Telephone Building	Buffalo, N. Y.
John B. Cary School	Richmond, Va.
Stuart Circle Hospital	Richmond, Va.



TRADE-MARK

over plaster board. Ready to apply with the addition of water only. If desired, equal parts good clean sand may be added at the work. More bulky than other grades of wall plaster and covers more surface per ton.

#### Sanded Plaster.

This material is ready to use with the addition of water only. The sand is clean and sharp, and the sanded plaster of this company is noted for its easy and smooth working qualities. Three grades,

for use on wood, metal lath and brick, are manufactured.

#### Asbestos Mortar.

An asbestos mortar required by architects and contractors for particular work is also manufactured. Further information on request.

#### Concrete Plaster.

A material especially manufactured for application to interior concrete walls and ceilings. It has strong bonding features in connection with concrete.

#### Portland Cement Mortar.

A mortar made of standard Portland cement and clean sharp sand in exact proportions. Shipped in dry form, ready for water only at the job.

This material is also shipped in neat form, so that sand may be added at the job.

Special formulas prepared and waterproofed for exterior stucco work.

#### Plaster Board.

A substitute for wood and metal lath. Comes in sheets 32 by 36 ins. and in thicknesses as follows:  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$  in. Applied directly to studding on side walls and to 2-in. furring strips set on 12-in. or 16-in. centers or joists. A splendid sound deadener and fire retardative. Plaster is applied directly to the board with perfect bond between the two. Use large flat headed galvanized nails about  $1\frac{1}{4}$ -in. long, spaced about 6 ins. apart around the board.

#### Gypsum Partition Blocks.

For partitions and furring of other walls. Made in 12 by 30 ins. and  $13\frac{1}{2}$  by 32 ins. surface measurements, and in following thicknesses: 2, 3, 4 and 6 ins., and 2-in. furring.

CONTRACTOR	ARCHITECT
P. J. Durcan, Inc., New York	Esenwein & Johnson, Buffalo, N. Y.
Metz Bros. Co., Buffalo, N. Y.	Green & Wicks, Buffalo, N. Y.
John Gill & Sons, Cleveland, Ohio	Esenwein & Johnson, Buffalo, N. Y.
Mosier & Summers, Buffalo, N. Y.	George J. Metzger, Buffalo, N. Y.
A. Bussard & Co., Washington, D. C.	N. C. Wyeth, Washington, D. C.
R. F. Barber, Washington, D. C.	N. C. Wyeth, Washington, D. C.
D. W. Mellen	Samuel L. Green
P. J. Durcan, Inc., New York	Francis H. Kimball
John W. Kissell Co.	Esenwein & Johnson, Buffalo, N. Y.
James G. Davis, Buffalo, N. Y.	State Architect, Albany, N. Y.
James G. Davis, Buffalo, N. Y.	McKim, Mead & White
Metz Bros. Co., Buffalo, N. Y.	Esenwein & Johnson, Buffalo, N. Y.
Mosier & Summers, Buffalo, N. Y.	M. C. Miller, Buffalo, N. Y.
Geo. C. Rossell, Rochester, N. Y.	McKenzie, Voorhees & Gmelin
Wise Granite Co.	Charles M. Robinson
A. M. Walkuf	C. M. Robinson, Inc.

# SOUTHERN GYPSUM COMPANY, INC.

Manufacturers of Gypsum Wall Plasters, Plaster Finishes and Plaster Boards

GENERAL OFFICE AND PLANT  
NORTH HOLSTON, VA.

CHICAGO OFFICE, 1642 West Lake Street

## Products.

CEMENT (neat) WALL PLASTERS:  
"Cherokee," "King's Mountain," "Boone,"  
"White Top," "Watauga."

WOOD FIBER GYPSUM PLASTERS: "Cherokee,"  
"King's Mountain," "Boone," "White Top," "Watauga."

PLASTER FINISHES: "Carara" (clear white),  
"Pearl Gray," "Natural," "White Quartz Sand  
Finish."

PLASTER BOARD: "Economy."

"CONCRETE SPECIAL" for concrete interior walls  
and ceilings.



TRADE-MARK

Letting mortar stand a few minutes after it is tempered before using it tends to make mortar spread easier.

Mortar mixed and worked stiff will be harder and stronger when set than it will be if too much water is used.

A very little set plaster mixed in plaster mortar greatly hastens the set of the mortar.

If the mortar box is not kept clean and free from set and partly set mortar, or if water dirtied with plaster by washing tools in it is used for mixing mortar, the set of the mortar will be greatly hastened.

We recommend the use of two mortar boxes, so that tenders can thoroughly clean the box after each batch of mortar is mixed before putting in the sand and plaster for the next batch, and thoroughly mix the sand and plaster and temper the mortar, without delaying the plasterers.

## Quality.

Our plasters are made of the purest gypsum rock, treated with the greatest care in grinding, calcining and mixing. Maximum strength, toughness, uniformity and covering capacity guaranteed.

## Specifications for the Use of Wall Plasters.

### GENERAL INSTRUCTIONS

**Grounds**—To be  $\frac{3}{4}$  in. for "Economy" plaster boards, wood lath, wire and metal lath;  $\frac{1}{2}$  in. for gypsum block, brick and tile.

**Lathing, "Economy" Plaster Boards**—To be spaced  $\frac{1}{4}$  in. apart with edges at ends bearing not less than  $\frac{3}{4}$  in. on studs; to be well nailed to studs with  $1\frac{1}{4}$ -in. wire nails with flat  $\frac{3}{8}$ -in. heads, set 4 ins. apart. Joints to be broken.

**Lathing, Wood Lath**—To be of good quality, free from knots, sap and bark; to be well nailed with 3d lathing nails at each stud; to be spaced  $\frac{3}{8}$  in. apart with not less than  $\frac{1}{8}$ -in. space between ends, and joints broken every fifth lath.

**Plaster**—To be ..... brand manufactured by SOUTHERN GYPSUM COMPANY, INC., mixed and applied according to the manufacturer's directions. Plaster must not be stored on the bare ground or where it will get damp.

**Sand**—To be of good quality, clean, sharp and free from clay, soil, salt and alkali.

**WALL PLASTER PROPORTIONS: HAIR FIBERED, AND NOT FIBERED**

**On "Economy" Plaster Boards**—To be 1 measure of plaster to 2 measures of clean, sharp sand.

**On Wood Lath, Wire and Metal Lath**—First coat to be 1 measure of plaster to  $1\frac{3}{4}$  measures of clean, sharp sand; second coat to be 1 measure of plaster to 2 measures of clean, sharp sand.

**On Gypsum Blocks, Brick and Tile**—Mortar to be 1 measure of plaster to  $2\frac{1}{2}$  measures of clean, sharp sand.

**NOTE**—For making extremely light, tough ceilings and walls, we recommend our wood fiber plaster used neat, or without sand.

Wood fiber plaster may be used with equal parts of sand; but if it is intended to be mixed with sand, notice should be given at the time the order is sent, as otherwise it is retarded only sufficiently for use without sand.

### MIXING MORTARS

All mortar to be mixed in clean, tight boxes; the plaster and sand first to be thoroughly mixed dry, then to be thoroughly tempered immediately with water enough to make good stiff mortar.

One gauging of mortar is not to be mixed with part of another gauging, and no mortar is to be used or worked after it has partly set.

**NOTE**—Letting plaster mixed with sand stand long before adding water and tempering tends to make mortar set quickly and work short.

### DIRECTIONS FOR APPLYING

**On "Economy" Plaster Boards**—The plaster boards are not to be wet before mortar is applied to them. All spaces between plaster boards are to be filled with neat plaster mortar. The browning coat to be straightened ready for the finish coat with rod and darby, using no more water than is necessary, and must not be floated.

**On Wood Lath**—If lath are dry, they are to be thoroughly wet at least 4 hours before mortar is applied, so that they will not swell, warp nor buckle after the mortar is on them.

**Three-coat Work on Wood Lath**—The first coat is to be applied with sufficient pressure to form good keys, leaving a light coat of mortar over the lath, with surface rough. The second coat is to be applied after the first coat has set hard and has about two-thirds dried. The second coat is to be applied with strong pressure, filling up to grounds, and straightened ready for the finishing coat with rod and darby, using no more water than is necessary, and must not be floated.

**Two-coat Work on Wood Lath**—The first coat is to be applied with sufficient pressure to form good keys; after the first coat sets, but before first coat dries, the second coat is to be applied, straightened with rod and darby, using no more water than is necessary, and troweled smooth. Must not be floated.

**On Wire and Metal Lath**—The first coat to be applied so as to fill the meshes and lightly cover the lath; the second coat to be applied when the first coat is set hard, but before the first coat is dry. To be straightened with rod and darby, using no more water than is necessary, and must not be floated.

**On Gypsum Blocks**—The blocks to be wet before the mortar is applied, to reduce suction. First coat, sufficient mortar to fill out to grounds, to be applied with strong pressure, and straightened ready for the finish coat. May be floated, but not after mortar is partly set.

**On Brick and Tile**—Brick and tile to be wet before mortar is applied, to reduce suction. Crooked, uneven walls to be first straightened by filling the low places with mortar. After mortar used to straighten walls has set, sufficient mortar to fill out to grounds to be applied with strong pressure and straightened ready for the finish coat. Walls may be floated, but not after the mortar has partly set.

## Specifications for the Use of "Concrete Special" on Concrete.

### GENERAL INSTRUCTIONS

**Casting Forms**—Rough boards to be used. No dressed lumber. Oiled boards must not be used under any circumstances.

**Condition of Concrete**—Must not be smooth, but dry and free from dust, oils, and efflorescence, before base coat is applied.

**Grounds**—To be  $\frac{1}{2}$  in. on side walls;  $\frac{3}{8}$  in. on ceilings or sufficient thickness to bring to a true and even surface.



## MIXING

Water only to be used in the mix. No sand or solid matter of any sort. Use watertight box  $3\frac{1}{2}$  by 7 ft., raised about 4 ins. at one end. Box must be free from dirt and every vestige of old cement or plaster.

After the load of water has been put in the lower end of the box, dump in the upper end one mix of Concrete special plaster. Hoe plaster into the water and allow it to soak for at least 10 to 15 minutes. Then work up in the usual way, adding water as needed to bring to the proper consistency.

## DIRECTIONS FOR APPLYING

Remove any efflorescence or frost with a wire brush, and if necessary wash also with a solution (1 to 5) of muriatic acid.

*Side Walls*—After removing dust, use rod and darby to bring to a true and even surface ready for the finish coat.

*Ceilings*—After removing dust, apply a scratch coat and immediately broom slightly. When it has had time to draw a little, follow up with a second coat and bring out under the darby to a true and even surface, leaving rough to receive the finish coat. Under no circumstances darby after the material begins to set.

*Trowel Finish*—As soon as it has set so as to develop sufficient suction, apply the finish in the customary way. Base coat must not be dry when this is done.

*Float Finish*—Apply as soon as base coat is thoroughly set. Use damp brush only and do not drench with water. Where a finish coat is not desired, the work may be left under the trowel for papering.

**CAUTIONS**—Mix no more than will be used in an hour. Never re-temper mortar after it has begun to set. Do not mix one gauging with another. Do not wash tools in water to be used for gauging. Keep all tools, vessels, etc., clean. Be sure temperature is above freezing. See that it is not exposed to hot blasts, but give plaster after it has set free circulation of air. Dry out damp rooms, if necessary; and work that shows soft white spots wet up with a clean brush and water until these spots set up and harden.

## Specifications for Finishing Plaster.

## GENERAL INSTRUCTIONS

*Plaster for Finish Coat*—To be ..... brand, manufactured by SOUTHERN GYPSUM COMPANY, INC., mixed and applied according to the manufacturer's directions.

*For Smooth White Finish*—Use "Carara," which is a complete finish plaster made out of the highest grades plaster of Paris and hydrated lime in proper proportions and requiring only the addition of water.

*"Pearl Gray" Finish*—A complete finish requiring only the addition of water.

## DIRECTIONS FOR MIXING

Mortar box and tools must be kept scrupulously clean. Use only clean water, free from alkali and impurities. Put material in raised end and water in lower end of mixing box. Hoe material with water, mixing thoroughly.

Work the material until there are no bubbles or lumps left in it. Always mix the material very thin and carry in buckets instead of in the hod.

## CARE OF MORTAR AFTER IT IS ON THE WALL

In hot, dry, windy weather, walls and ceilings to be protected from wind, and, if necessary, to be sprinkled to prevent the mortar drying too much before it has set.

In freezing weather, mortar to be protected from frost until it has set hard.

When mortar has set, doors and windows in building to be opened so as to dry the walls quickly.

## "Economy" Plaster Board.

For fireproof lathing, sheathing, etc., "Economy" plaster board is fire resistive, a non-conductor of heat, a non-conductor of sound, and is sanitary.

Standard size of boards, 32 by 36 ins. and 24 by 32 ins.;  $\frac{5}{16}$  in. thick.

## Specifications for Putting on "Economy" Plaster Board.

**STUDS**—Studs to be set 12 or 16 in. centers.

**PLACING**—Boards to be spaced  $\frac{1}{4}$  in. apart with edges bearing not less than  $\frac{3}{4}$  in. on studs, with horizontal joints broken.

**DIRECTIONS FOR LATHING**—Space boards not less than  $\frac{1}{4}$  in. apart on all sides and nail directly to studding or furring with

$1\frac{1}{4}$ -in. wire nails with flat  $\frac{3}{8}$ -in. heads, using at least 18 nails to each board. Break joints every other board horizontally on walls and at right angles with furring on ceilings.

To cut boards, score with knife or hatchet and break, or use saw.

1 lb. of  $1\frac{1}{4}$ -in. nails will fasten 9 boards. Nails will be shipped with boards if desired.

**POINTING**—The spaces between boards to be filled with neat mortar. Do not wet boards before applying mortar.

## Co-operative Service.

It will be a pleasure to have our representatives call at any time and the office force stands ready to discuss any subject that may be presented.

## References.

Partial list of prominent buildings plastered with SOUTHERN GYPSUM COMPANY's products:

Fulton County Court House, Atlanta, Ga.  
 Georgian Terrace, Atlanta, Ga.  
 Howell Apartment, Atlanta, Ga.  
 Conley Building, Atlanta, Ga.  
 Y. M. C. A. Building, Atlanta, Ga.  
 Ponce De Leon Apartments, Atlanta, Ga.  
 Residence of John W. Grant, Atlanta, Ga.  
 Clark County Court House, Athens, Ga.  
 University Hospital, Augusta, Ga.  
 Chronicle Building, Augusta, Ga.  
 City Hospital Building, Augusta, Ga.  
 Plaza Hotel, Augusta, Ga.  
 United States Post Office, Augusta, Ga.  
 Residence of John W. Adair, Atlanta, Ga.  
 High School Building, Bluefield, W. Va.  
 Rainey Hospital, Burlington, N. C.  
 Y. M. C. A. Building, Birmingham, Ala.  
 West End High School, Birmingham, Ala.  
 Day and Night Bank Building, Charleston, W. Va.  
 Commercial National Bank Building, Charlotte, N. C.  
 Masonic Temple, Charlotte, N. C.  
 Y. M. C. A. Building, Columbia, S. C.  
 Gresham Hotel, Columbia, S. C.  
 Chick Springs Hotel, Chick Springs, S. C.  
 Home of E. H. Hardaway, Columbus, Ga.  
 Hamilton County Court House, Chattanooga, Tenn.  
 Chattanooga Golf and Country Club Building, Chattanooga, Tenn.  
 First National Bank Building, Durham, N. C.  
 Geer Building, Durham, N. C.  
 City Hall, Decatur, Ala.  
 State Normal School for Women, East Radford, Va.  
 Eagles' Home, Front Royal, Va.  
 United States Post Office, Gadsden, Ala.  
 City Hall, Huntington, W. Va.  
 Rhodes Building, Jacksonville, Fla.  
 East Tennessee State Normal School, Johnson City, Tenn.  
 Southern Railway Station, Lynchburg, Va.  
 Rockbridge Bank Building, Lexington, Va.  
 Hillside Cotton Mills, LaGrange, Ga.  
 Virginian Hotel, Lynchburg, Va.  
 Municipal Building, Martinsville, Va.  
 Ellisonia Apartment, Macon, Ga.  
 Mobile High School, Mobile, Ala.  
 Residence of Carl Fisher, Alton Beach, Miami, Fla.  
 Martin Building, Norfolk, Va.  
 United States Post Office, Opelika, Ala.  
 Y. M. C. A. Building, Petersburg, Va.  
 Y. M. C. A. Building, Roanoke, Va.  
 Thurman & Boone Building, Roanoke, Va.  
 City Hall Building, Roanoke, Va.  
 Bainbridge School, Richmond, Va.  
 Murphy's Hotel, Richmond, Va.  
 Rueger's Hotel, Richmond, Va.  
 Wake County Courthouse, Raleigh, N. C.  
 Dr. King's Sanitarium, Radford, Va.  
 Grubb's Office Building, Salisbury, N. C.  
 Y. M. C. A. Building, Spartanburg, S. C.  
 Savannah Hotel Co., Savannah, Ga.  
 Holy Cross Academy, Washington, D. C.  
 Department of Commerce, Washington, D. C.  
 Real Estate Trust Building, Washington, D. C.  
 United States Post Office, Wytheville, Va.  
 Wauchovia National Bank Building, Winston-Salem, N. C.  
 Wilmington Hotel, Wilmington, N. C.  
 United States Post Office, Winston-Salem, N. C.

# ROCK PLASTER MANUFACTURING CO.

GENERAL OFFICES  
381 Fourth Avenue  
NEW YORK, N. Y.

FACTORY: NEW YORK, N. Y., 150th Street and East River

GYPSUM QUARRIES: WALTON, NOVA SCOTIA



FACTORY OF THE ROCK PLASTER MANUFACTURING CO., 150th STREET AND EAST RIVER, NEW YORK, N. Y.

## Products.

MANUFACTURERS OF GYPSUM PLASTERS:

- "Rock" Wall Plaster—Sanded.
- "Blue Seal" Neat Cement Plaster.
- "Walton" Flexible Wood Fiber Plaster.
- "Riverside" Plaster of Paris.
- "Walton" Slow Set Plaster.
- Concrete Plaster.
- Superfine Finish.
- Gauging Plaster.
- "Rock" Plaster Board.
- "Bell" Plaster Block.
- Hydrated Lime.
- Portland Cement Sanded Dry Mortar.

and of the highest standard of quality.

This company claims superiority for uniformity, ease in applying and economy.

## Shipping Facilities.

Direct rail connection with the New York, New Haven & Hartford R. R. siding on premises. Steam lighterage service to all railroads and vessels leaving New York, and dock delivery. Convenient location for hauling from factory by team or motor vehicle.

## Catalogues.

Descriptive catalogue or detailed information will be furnished on request.

## Quality.

Manufacturers of Nova Scotia gypsum products exclusively. Source of supply is our own quarries at Walton, Nova Scotia, which are conceded to be the best and most extensive in that region noted for the purity and whiteness of its gypsum deposits.

Our mill is equipped with the most approved and up-to-date machinery and appliances for the manufacture of a product scientifically and uniformly prepared

## References.

The building trade generally. The leading architects specify our products.

Most of the prominent office buildings, hotels, apartment houses and residences in Greater New York have been plastered with our materials. Extensively used throughout the Eastern States. A detailed list will be sent if desired.



# TEXAS CEMENT PLASTER CO.

SALES OFFICE  
OKLAHOMA CITY, OKLA.

MILL: PLASTERCO, TEX.

## Products.

TEXAS CEMENT PLASTER; FINISHING PLASTER.

## Texas Cement Plaster.

Texas cement plaster is cement and must be handled like cement to get results. It must be protected from dampness by being stored in a dry place, never on the ground, against a damp wall, or in any damp place when delivered to the building.

Texas cement plaster can not be re-tempered after the "set" begins. A very little "set" plaster in cement plaster mortar, whether from the mortar boxes, the water barrel in which tools have been washed, or droppings from the floor, will cause all of the plaster mortar to "set" too quickly.

Texas cement plaster mortar will "set" quick and work short if there is delay in tempering with water after sand has been mixed with it. It will spread a little easier if allowed to stand a few minutes after it has been tempered. To get the maximum tensile strength from Texas cement plaster it should be tempered as stiff as the mortar can conveniently be worked.

If finished walls are soft and chalky, it is because the water in the mortar has been evaporated before the plaster has "set." Spraying the walls with clean water, or with brush and water having powdered alum dissolved in it, is the remedy.

## Specifications for Texas Cement Plaster.

**STUDS AND JOISTS**—To be spaced not more than 16 ins. between centers.

**FOUNDATIONS**—To be  $\frac{3}{4}$  in. for plaster board, wood lath and metal lath;  $\frac{1}{2}$  in. for gypsum blocks;  $\frac{3}{4}$  in. for clay tile.

**PLASTER BOARDS**—To be spaced  $\frac{1}{4}$  in. apart; with nailing edges bearing at least  $\frac{3}{4}$  in. on stud or joists; with horizontal joints in walls and joints at right angles with ceiling joists, broken at each board; and with vertical joints on opposite sides of partitions, not on the same studs; to be well nailed to studs, joists or furring, with  $1\frac{1}{4}$ -in. No. 11½-gauge, 7/16-in. head wire nails, spaced not more than 6 ins. apart; all of the center of each board to be nailed before the edges are nailed.

**WOOD LATH**—To be of good quality, straight grained, and free from knots, bark and sapwood. To be spaced  $\frac{3}{8}$  in. apart with not less than  $\frac{1}{8}$ -in. space between ends; with joints broken every fifth lath. To be well nailed to each stud and joist with 3d lathing nails.

If lath are dry, they are to be thoroughly wet at least 4 hours before mortar is applied to them, so that they will not swell or warp after the plaster is on them.

**GROOVED SHEATHING LATH**—To be well nailed to studs spaced not more than 16 ins. between centers; to be spaced at least  $\frac{1}{8}$  in. apart, and to be thoroughly wet at least 4 hours before plaster is applied to them, so that they will not swell and warp after plaster is on them.

**BRICK AND TILE**—To be dampened before plaster is applied to them.

**CONCRETE**—The surface to be cleaned free from all efflorescence, dust, dirt and oil and, where very smooth, to be well hacked before mortar is applied.

**SAND**—To be clean, sharp and free from clay, soil, alkali, salt and quicksand.

**MORTAR—Hair Fibered and Unfibered Plasters on Plaster Board**—To be 1 part plaster and 2 parts sand.

**On Wood Lath and Metal Lath**—First coat to be 1 part plaster to  $1\frac{1}{2}$  parts sand; second coat to be 1 part plaster to 2 parts sand.

**On Brick and Tile**—To be 1 part plaster to  $2\frac{1}{2}$  parts sand.

**On Concrete**—To be equal parts plaster and sand.

**MORTAR—Wood Fiber Plaster**—For making extremely light,



TRADE-MARK

tough plastering, it is recommended that the wood fiber plaster be used without sand, but it will make excellent plaster when the mortar is equal parts of the wood fiber plaster and clean sharp sand.

**MIXING SANDED MORTAR**—All mortar to be mixed in clean, tight boxes; the plaster and sand to be first thoroughly mixed dry, then immediately tempered with sufficient water to make good stiff mortar. No part of one batch of mortar is to be mixed with another batch in the mortar box or on the mortar board, and no mortar is to be used or worked after it has partly set. Mortar box, tools, hods, mortar board and water to be kept clean and free from set and partly set plaster, unless quick setting mortar is desired.

**APPLICATION—Mortar to Plaster Board**—The boards not to be wet before mortar is applied. All spaces between boards to be well filled with mortar, either by pointing the joint with quick setting neat plaster, or by carefully pressing the mortar used for first coat into the spaces between the boards as the first coat is put on. The second coat to be straightened with rod and darby ready for the finish coat, and must not be floated.

**To Wood Lath**—First coat to be applied with sufficient pressure to form good keys, leaving a light coat of mortar over the lath, with surface rough. The second coat to be applied with strong pressure, when the first coat has set hard, but before the first coat is dry, and is to be straightened with rod and darby, broomed ready for finish coat, and must not be floated.

**To Metal Lath**—The first coat to be applied so as to fill the meshes and lightly cover the lath. The second coat to be applied when the first coat is set hard, but before the first coat is dry.

**To Brick and Clay Tile**—Crooked, uneven walls to be first straightened by filling the low places with mortar. After mortar used to straighten walls has set, sufficient mortar to fill out to grounds to be applied with strong pressure and straightened ready for finish coat.

**To Concrete**—Where work can be straightened with 1 light coat of mortar, sufficient mortar to fill out to grounds is to be applied in 1 coat with strong pressure, and straightened ready for the finish coat. Where work can not be straightened with 1 light coat 2 coats are to be applied; the first coat to be set hard before applying second coat.

## Specifications for Finishing Plaster.

**MORTAR—For Smooth White Finish**—To be 1 measure of Plaster Paris finishing plaster to not more than 3 measures of perfectly slaked lime putty; the plaster and lime to be thoroughly and uniformly mixed.

**For Cement Finish**—To be 3 measures of unfibered cement plaster to not more than 1 measure of perfectly slaked lime putty, thoroughly and uniformly mixed.

**For Sand Float Finish**—To be unfibered cement plaster, perfectly slaked lime putty, and clean, sharp sand, thoroughly mixed in the proportions of 4 measures of plaster, 1 measure of lime and 5 measures of sand.

**APPLICATION—Finish Coat**—Trowelled finish coat to be applied after base coat has set and dried, the base coat to be slightly dampened to reduce suction, before finish coat is applied.

**Sand Float Finish Coat**—The base coat to be set hard, but not dry, when finish is applied.

## Care of Plaster.

In hot, dry and windy weather, plastering is to be protected from wind, and, if necessary, sprinkled with water, to prevent the plaster drying out too much before it is set.

In freezing weather, plaster to be protected from frost until open, so that the plastering will dry quickly.

## Guarantee.

All products are fully guaranteed to be of the best quality, and to give the best of results when used in accordance with above specifications.

# UNITED STATES GYPSUM CO.

Williams Building, Wells and Monroe Streets

CHICAGO, ILL.

## SALES OFFICES

NEW YORK, N. Y., 1170 Broadway  
CLEVELAND, OHIO, Schofield Building  
KANSAS CITY, MO., Railway Exchange Building

CHICAGO, ILL., 205 West Monroe Street  
MINNEAPOLIS, MINN., Lumber Exchange  
SAN FRANCISCO, CAL.

Mills at All Principal Gypsum Producing Centers, Affording National Distribution

## Products.

GYPSUM CEMENT PLASTER, GYPSUM WOOD FIBRE PLASTER, GYPSUM PREPARED (SANDED) PLASTER.

ADAMANT WALL PLASTERS (Interior and Exterior).

U. S. G. KEENE'S CEMENT.

PREPARED NO-LIME TROWEL and SAND FLOAT FINISHES.

U. S. G. GAUGING PLASTERS (including Pure White Plasters), for Lime Putty Finishes.

U. S. G. BOND PLASTER, for plastering Interior Concrete Surfaces.

U. S. G. MOULDING and CASTING PLASTERS.

SACKETT PLASTER BOARD, a Fire Resistive, Heat Insulating and Sound Deadening Lathing Material.

ADAMANT PLASTER BOARD.

JESTER-SACKETT HOLLOW and SOLID PARTITIONS and SUSPENDED CEILINGS; consisting of Sackett or Adamant board applied to metal channels.

SACKETT SOFFIT CEILINGS, Plastering Base under concrete joist floors.

PYROBAR GYPSUM TILE, for Partitions, Furring, Column Covering and Vent Ducts.

PYROBAR GYPSUM FLOOR TILE for Long Span Reinforced Concrete Joist Floor Construction.

Also, Structolite (gypsum for structural purposes); Ivory Hydrated Lime (high magnesia); Simplex Floor Screed; Pyrofill, a substitute for cinder fill; U. S. G. Pottery Plaster, Land Plaster, and Dental Plaster.

For Reinforced Gypsum Roof Tile, see pages 438-39; for Wall Board, see page 175.

## Service.

This company is represented in all parts of the country, and will be glad to confer with architects on the use and application of its products.

An engineering department is maintained for the purpose of furnishing, without obligation, technical information and estimates.

Contracts will be accepted for the installation of Pyrobar partitions, Pyrobar roof tile, and Jester-Sackett systems.

Lists of representative installations will be furnished on request.

## Quality and Mill Inspection.

UNITED STATES GYPSUM Co.'s products are built on the sure foundation of pure raw materials and highly developed processes of manufacture.

All products are rigidly inspected by experts at every stage of production. They must come up to the "U. S. G." standard of perfection, or they are promptly rejected at the mills.



TRADE-MARK

## U. S. Gypsum Hard Wall Plasters.

U. S. Gypsum plasters, made from calcined gypsum rock, set up uniformly hard throughout within 2 or 3 hours after application; inside of 36 hours the walls are dry with no further possibility of dampness or sweating, as with lime mortars. The building is immediately rendered habitable from a hygienic stand-

point. U. S. G. wall plasters resist fire and possess several times the strength and durability of lime plaster.

## Package.

Unless otherwise stated, all powdered materials are shipped in 100-lb. jute bags and 80-lb. paper sacks.

## Brands and Classes.

United States Gypsum wall plasters are furnished in three general classes:

U. S. Gypsum cement plaster (neat), U. S. Gypsum wood fibre plaster, and U. S. Gypsum prepared (sanded) plaster.

*Each class is marketed under the various brands listed below; all brands of each class, except Adamant, being of the same standard of quality.*

BRANDS		
Adamant	Eldorado*	Ivory
Alabaster	Flint	O. K.*
Baker	Golden Seal	Pyramid *
Big Four	Granite	Rock
Buckhorn	Imperial	Zenith

\*Brands marked with a star (\*) are Gypsite cement plasters—popularly known as "dark plasters."

## U. S. G. Cement Plaster (Neat).

Supplied in both hair fibred and unfibred; sand to be added at the job. Made for use where good sand is available at reasonable cost, and where purchaser prefers to sand his own mortar. See specifications on page 166.

## U. S. G. Wood Fibre Plaster.

This plaster requires the addition of water only to prepare it for use. It contains finely shredded wood fibre, uniformly distributed. No sand need be added, so that there is no danger of poor sand or of oversanding.

It makes a dense, durable wall, of almost half the weight of a sanded mortar wall, and has superior fire resisting, insulating and sound deadening qualities.

Its "tough" nature renders it more capable of withstanding knocks and vibrations. See specifications on page 166.



## U. S. G. Prepared (Sanded) Plaster.

Consists of gypsum cement and clean, sharp silica sand, machine mixed in mathematically correct proportions. Needs only water to fit it for application; it may be readily and quickly mixed inside the building, saving time and labor. There is no possibility of poor sand or of oversanding. See specifications on page 167.

## Adamant Wall Plaster (Interior and Exterior).

Adamant is in the class of "prepared plasters" and is the highest quality of wall plaster produced. It embodies in a prepared plaster unequalled fire resisting and spreading qualities. It meets a demand in high class building construction where *maximum* wall strength and rigidity are desired. See specifications for "Prepared Plasters," page 167.

### CLASSES OF INTERIOR ADAMANT WALL PLASTER

Adamant No. 2B, for base coat on brick or tile.  
Adamant No. 2, for base coat on wood lath or Sackett board.  
Adamant No. 2W, or LF, for scratch coat on wire lath.  
Adamant No. 2BW, for second coat on wire lath.

### CLASSES OF ADAMANT EXTERIOR PLASTER (STUCCO)

Adamant No. 2C, for first and second coat.  
Adamant No. 2D, for special purposes.

These stuccos have been extensively used for over 20 years and are peculiarly fitted to withstand weather conditions. Can be furnished integrally waterproofed at slightly additional expense.

**PACKAGE**—Sold by the barrel; a barrel consisting of two cloth bags of 130 or 140 lbs. each.

**NOTE**—To guard against substitutions, architects should always specify without alternative: "Adamant Wall Plaster, made by the UNITED STATES GYPSUM Co."

## U. S. G. Keene's Cement.

U. S. G. Keene's cement is made from the pure gypsum found at Southard, Okla., which is an outcrop of the Medicine Lodge vein. The gypsum is carefully hand-selected, and our up-to-date manufacturing processes and rigid inspection insure maximum strength and perfect uniformity.

U. S. G. Keene's cement is made in two grades—the "Regular" and the "Fine." The "Fine" grade is equal to any imported "Keene's" for scagliola work.

Shipped in new 100-lb. cloth sacks. See specifications on page 167.

## U. S. G. Prepared No-Lime Gypsum Plaster Finishes.

These are made in two general groups as tabulated. Group 1, Adamant finishes, are of exceptional quality and hardness. Group 2 finishes are very high grade materials that have been developed to supply the demand for a moderate cost prepared finish, superior to and free from the imperfections and uncertainties of lime plaster finishes. See specifications on page 167.

COVERING CAPACITIES U. S. G. HARD WALL PLASTERS PER 100 SQ. YDS.  
Material mixed and used as per Specifications.

Surface	Cement Plaster, Neat, Number 100-lb. bags	Wood Fiber Plaster, Number 100-lb. bags	Prepared (Sanded) Plaster, Number 100-lb. bags
Wood lath	9 to 11 (sanded 2 to 1)	14 to 17 unsanded	24 to 26
Metal lath	17 to 20 (sanded 2 to 1)	22 to 27 unsanded	45 to 50
Sackett plaster board	8 to 9 (sanded 2 to 1)	13 to 16 unsanded	22 to 24
Brick and clay tile	14 to 17 (sanded 3 to 1)	18 to 20 (equal parts sand to be added)	35 to 40
Pyrobar gypsum tile	10 to 12 (sanded 3 to 1)	14 to 16 (equal parts sand to be added)	27 to 30

All conditions equal, U. S. G. Plasters are guaranteed to cover as much surface as any similar material made.

## U. S. G. Gauging Plasters for Lime Putty Finishes.

These are made from carefully selected raw materials, uniformly calcined and ground to just the right fineness to insure rapid mixing and spreading qualities. See specifications on page 167.

**SLOW SET BRANDS**—Star, Challenge, Golden Seal, N. Y. Finishing, Michigan A. Pure white brand: White Star.

**QUICK SET BRANDS**—Champion, Quality Calcined Plaster, Michigan Perfection, Plaster of Paris. Pure white brand: Champion White.

DATA U. S. G. PREPARED NO-LIME GYPSUM PLASTER FINISHES

Finish	Color and description	Package and covering capacity
<b>GROUP No. 1</b>		
Adamant IXXX Adamant No. 1 Adamant No. 40	White, trowel Gray, trowel Slate, trowel	110-lb. cloth bags (2 bags to bbl.). Ton covers 350 to 400 yds. 140-lb. cloth bags (2 bags to bbl.). Ton covers 250 to 300 yds.
Adamant IXX Adamant IX	White, float Gray, float	
<b>GROUP No. 2</b>		
Universal No. 3 Universal No. 1 Imperial Ivory Rock Silico Imperial Ivory Rock	White, trowel Grayish white trowel finishes Light gray sand float finishes	100-lb. cloth and 80-lb. paper bags. Ton covers 350 to 400 yds. 100-lb. cloth and 80-lb. paper bags. Ton covers 250 to 300 yds.

## U. S. G. Bond Plaster.

The safest and best plaster made for direct application to interior concrete surfaces. Has superior adhesive and cohesive properties; is constant in volume during process of setting and hardening, and its bond with the concrete is not disturbed by the expulsion of surplus water during the process of crystallization. U. S. G. Bond plaster is dense, durable and fire resisting; works well under tools, and needs only water to fit it for use. Average covering capacity, 120 to 140 yds. to the ton. See specifications on page 167.

## U. S. G. Moulding and Casting Plasters.

These are very carefully manufactured from specially selected gypsum rock, resulting in smooth working and uniform setting qualities. U. S. G. Moulding No. 1 and No. 2 are exceptionally pure and fine ground.

Other brands: Golden Seal Moulding, New York City Mills, and Terra Cotta Moulding.

## Sackett Plaster Board.

A fire resisting lathing material, superior to wood or metal lath. Composed of seven alternate layers of calcined gypsum and strong, fibrous felt. To be nailed direct to studs or joists and plastered over. See specifications on pages 167-68.

**SIZES AND WEIGHTS**—For application on wood studs, Sackett board is made in sheets 32 by 36 ins.—8 sq. ft.—in the following thicknesses:

Thickness	Weight per sq. ft.	Weight per board
$\frac{1}{4}$ in. (named "Standard")	1½ lbs.	12 lbs.
$\frac{3}{8}$ in. (named "Perfected")	2 lbs.	16 lbs.
$\frac{1}{2}$ in. (special to meet requirements of certain building laws)	2½ lbs.	20 lbs.



ALL GENUINE SACKETT BEARS THIS TRADE-MARK

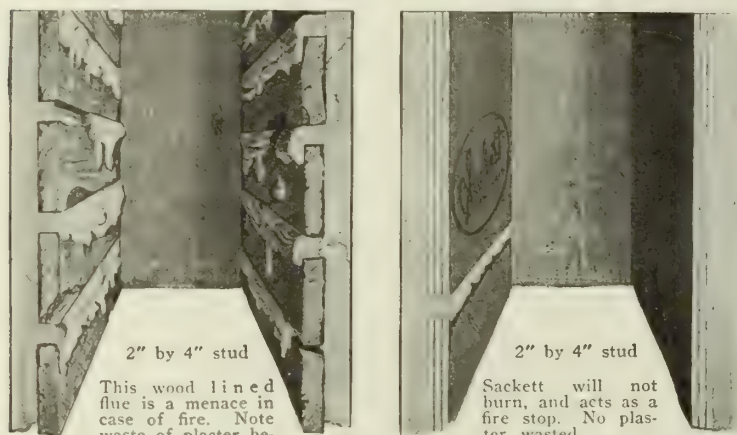


SACKETT NAIL  
Actual size



**ADVANTAGES**—Combines lathing and fire resisting construction in one inexpensive commodity. Non-conductor of heat and cold; sound deadener. Easily and rapidly applied. Reduces fuel expense. No contraction nor expansion; avoids buckling lath, stains and other defects of wood lath construction. Uniform backing gives a stronger and denser plaster coat.

Keeps the moisture in plastering away from the woodwork; no warping of framing or trim. *The bond between plaster and board is perfect.*



SECTIONAL VIEWS WOOD LATH WALL AND SACKETT PROTECTED WALL

Instead of weak, flimsy, inflammable wood lathing that swells and cracks plaster, Sackett provides a solid continuous Gypsum sheet to which plaster adheres perfectly and that positively does not swell, contract nor warp, thus eliminating the principal cause of plaster cracks. Exhaustive tests prove Sackett walls over  $3\frac{1}{2}$  times more soundproof than walls made with wood lath.

**OTHER USES OF SACKETT**—Instead of lumber for sheathing under weatherboarding to insulate against heat and cold, and as a fire stop; over roof boards, in hot air flues, dry kilns, etc., as an insulator and fire stop; between floors as a sound deadener and fire-stop; on exposed wooden surfaces in mill and warehouse construction as a fire retardant.

**COST**—Sackett-built walls cost less than metal lath and plaster walls, and in most markets little more than wood lath and plaster walls.

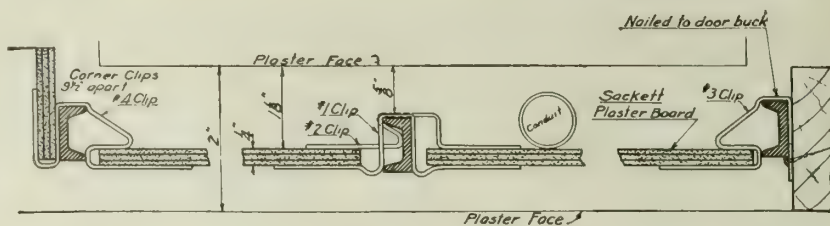
#### Adamant Plaster Board.

Consists of a sheet of gypsum between two heavy cardboards. Advantages, uses, etc., similar to "Sackett" above described.

#### Jester-Sackett Solid and Hollow Partitions.

These consist of Sackett plaster board attached to Sharon or hot rolled channel irons by means of metal clips, providing a solid, rigid plastering base; incombustible and very economical. For sizes of board used, centers, etc., see specifications on page 168.

**ADVANTAGES**—These partitions are light in weight, easily and quickly erected and occupy minimum floor space—the plastered solid partition being but 2 ins. and the thinnest hollow partition  $2\frac{1}{2}$  ins. thick.



Cross Section through Wall.

**JESTER-SACKETT 2-IN. SOLID PARTITION**  
Sackett board, size 24 by 36 ins. Studs,  $2\frac{3}{4}$ -in. centers

Partitions are strong, durable, and better sound deadeners than metal lath partitions, the hollow partition being a specially effective sound deadener.

The space within the hollow partition can be used to enclose pipes, etc., and with this partition no metal is exposed to the plaster except the rustproof clip.

**COST**—Jester-Sackett partitions cost less than metal lath and channel iron construction. They are more quickly erected, take less plaster, and the plaster is more quickly applied. Hollow partition requires but  $\frac{1}{2}$  in. of plaster on each side.

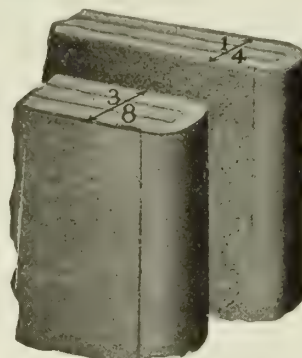
Wood grounds may be wired to the channels; or when grounds are required on opposite sides of partitions, they may be wired or nailed together through the partition.

The company will erect Jester-Sackett partitions. See "Co-operative Service."

There are other meritorious types of steel stud and Sackett plaster board partitions; for example, the Burson system of fabricated steel stud.

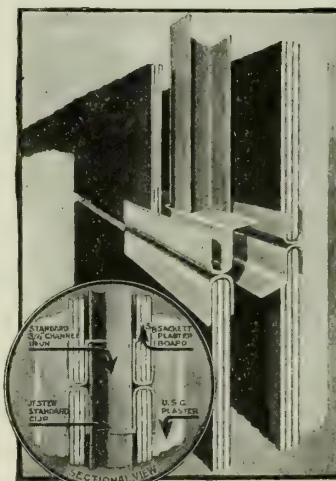
Jester-Sackett hollow partitions can be constructed in various thicknesses (including plaster), as shown by the accompanying table:

Finished thickness, ins.	Hollow space between boards, ins.	Size channels used, ins.
$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
3	1	1
$3\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
4	2	2
5	3	$\frac{3}{4}$ (two)
6	4	$\frac{3}{4}$ (two)



SACKETT ACTUAL THICKNESS

Shows folded edge; also alternate layer construction, which arrests absorption when plastering and gives flexibility



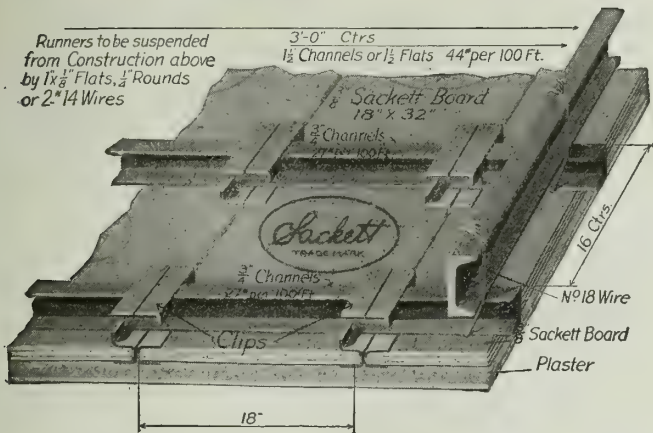
JESTER-SACKETT HOLLOW PARTITION

#### Jester-Sackett Suspended Ceilings.

Consist of  $\frac{3}{8}$ -in. Sackett plaster board attached to  $\frac{3}{4}$ -in. channel irons by rustproof metal clips,  $\frac{3}{4}$ -in. channels being attached to  $1\frac{1}{2}$ -in. channels and suspended by hangers to the structure above. See illustration. Specifications on page 168.

The Jester-Sackett suspended ceiling affords a solid, rigid, uniform plastering base, which effects a great saving in plaster over metal lath construction, only  $\frac{1}{2}$  in. of plaster being required. Due principally to this saving in plaster, the completed cost of the Jester-Sackett suspended ceiling is less than a metal lath suspended ceiling, while the former is fully equal to the latter in quality and fire protection, and is a superior sound deadener. Method of attaching clip allows for expansion and contraction stresses.



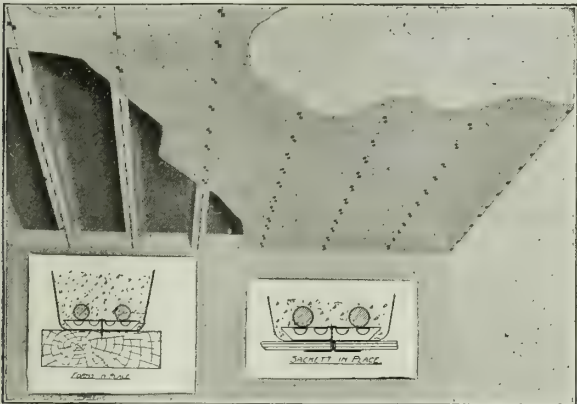


JESTER-SACKETT SUSPENDED CEILING

The company will install Jester-Sackett suspended ceilings. See "Co-operative Service."

Sackett Soffit Ceilings.

Sackett plaster board possesses distinct advantages over metal lath for flat ceilings with reinforced T-beam or ribbed concrete floor construction; it can be used where wood, or where permanent or removable metal forms are employed. Sackett board is quickly and securely attached to the concrete joists by means of an inexpensive, easily installed metal clip, which also serves as a chair or spacer for the reinforcement. Sackett plaster board is incombustible, a non-conductor of sound, and will form an effectual barrier to sound transmission over partitions. Bond between the plaster and plaster board is perfect. See specifications, page 168.



SACKETT SOFFIT CEILING

Sizes of Sackett Used		Maximum Joist centers
Thickness	Size	
1/4 in.	16 x 36 ins.	16 ins.
3/8 in.	24 x 36 ins.	24 ins.
1/2 in.	30 x 36 ins.	30 ins.

Cost—While the cost of Sackett plaster board, including installation and clips, is approximately the same as the cost of metal lath with tie wires and pencil rods, there is a saving in labor and in plaster amounting to at least 10¢ to 15¢ per sq. yd.

The company will erect Sackett soffit ceilings. See "Co-operative Service."

Pyrobar Gypsum Tile.

This very light, tough, Underwriter-approved, fireproof tile is made of the highest grade calcined gypsum. Used for fireproof partitions, steel column

protection, wall furring, stair and elevator enclosures, warehouse partitions, pipe chases, heating and vent ducts, etc. See specifications on page 168. FIRE RESISTANCE—Pyrobar has been accepted by the National Board of Fire Underwriters as a fireproofing material having successfully passed all tests. In contact with fire, less than 5% of the heat is transmitted through the tile. No spalling, and no disintegration in any other way to a point where it ceases to be a fire stop during progress of the fire. Owing to its remarkable features of calcination, the heat transmitted through the tile never exceeds 212° Fahr.

STAINPROOF—Pyrobar is made from pure gypsum that can not produce stains, or otherwise mar decorations.

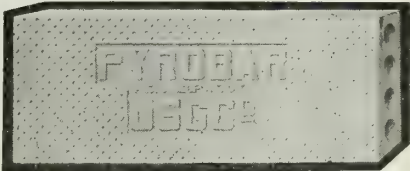
SOUNDPROOF—Due to the peculiar dead-air cellular structure of the tile, Pyrobar is the most effective non-conductor of sound available. Tests prove that over 60% less sound is transmitted through a plastered Pyrobar gypsum tile partition than through a plastered clay tile partition of same thickness.

DISTINCTIVE ECONOMY—Pyrobar tile are large units—2½ times the size of clay tile—are light and easily and quickly handled. Every Pyrobar tile is straight and true. Requires 33% less plaster to finish than clay tile. Partitions require not over 1/2 in. of plaster on a side to finish.

Pyrobar partitions are easily removed and rearranged as desired. Can be sawed, cut and fitted to suit any building requirement.

REDUCTION IN DEAD LOAD—Pyrobar partitions are 40% lighter than hollow clay tile, affording an opportunity for lighter steel members and consequent saving in cost.

SIZES—Pyrobar gypsum tile is regularly made in thicknesses from 1½ to 8 ins. (hollow or solid), with face dimensions 12 by 30 ins. Sizes kept in stock are indicated in table following:



PYROBAR HOLLOW PARTITION TILE

SIZES AND WEIGHTS OF PYROBAR GYPSUM TILE

Size	Ceiling height, ft.	Weight tile, per sq. ft., lbs.	Weight mortar in joints, per sq. ft., lbs.	Weight plaster, 1 side, per sq. ft., lbs.	Total weight plastered 1 side, per sq. ft., lbs.	Weight plaster, 2 sides, per sq. ft., lbs.	Total weight plastered 2 sides, per sq. ft., lbs.
1½-in. split 1½"x12"x30"	Furring	4.9	1	3	7.9	6	10.9
2-in. split 2"x12"x30"	Furring	6.4	1	3	9.4	6	12.4
2-in. solid 2"x12"x30"	10	9.4	1	3	12.4	6	15.4
3-in. hollow 3"x12"x30"	13	9.9	1.2	3	12.09	6	15.9
3-in. solid 3"x12"x30"	15	12.4	1.2	3	15.40	6	18.4
4-in. hollow 4"x12"x30"	17	13.0	1.63	3	16.00	6	19.0
5-in. hollow 5"x12"x30"	25	15.6	2.04	3	18.60	6	21.6
6-in. hollow 6"x12"x30"	28	16.6	2.45	3	19.60	6	22.6
8-in. hollow 8"x12"x30"	40	22.4	3.26	3	25.40	6	28.4

Special Pyrobar gypsum tile will be made to order in any size, thickness or shape required.

Cost—Its extreme lightness and large true units



secure economy in freight, of labor in handling, erecting and plastering, and of material in laying up and plastering. When cost of finished work is considered, Pyrobar gypsum tile will compete with clay tile or other materials used for fireproofing, and show a lower cost in the finished wall.

This company will erect Pyrobar partitions. See "Co-operative Service."

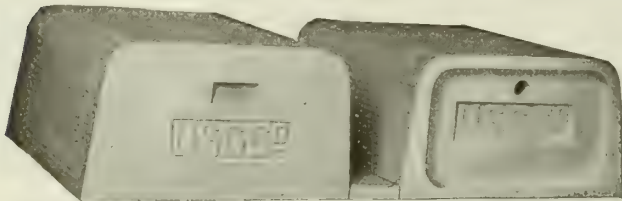
### Pyrobar Floor Tile.

Pyrobar gypsum floor tile, made of Structolite (structural gypsum), reinforced with steel fabric, are used as voids in reinforced concrete floor construction. They are fireproof and are sufficiently strong to withstand handling and wheeling upon during construction. Pyrobar floor tile are spaced 24 ins. on centers; are about one-half the weight per square foot of clay tile, thus reducing the dead load. The dead load of Pyrobar tile construction being not in excess of metal dome construction, the tonnage of reinforcing steel required is about the same.

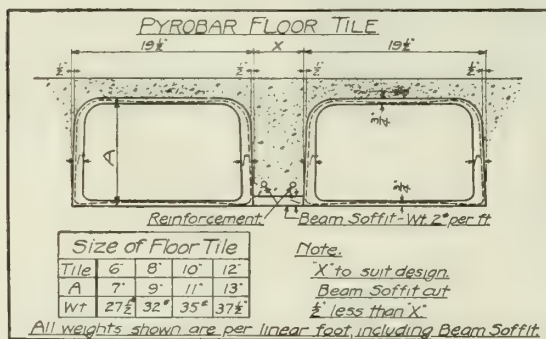
Pyrobar gypsum floor tile are cast in moulds and are consequently uniform in size and shape. They have ends cast in place, minimizing loss in concrete. When used with spacers, perfect alignment, beam size and joist size are assured, and displacement of voids is impossible. Concrete quantities are no more than for metal domes 24 ins. joist centers.

Pyrobar floor tile provide a smooth, uniform gypsum plastering base. Compared with metal dome construction having metal lath ceilings, there is a saving in plastering cost of 10¢ to 15¢ per yard. The use of spacers furnishes an all gypsum plastering base.

See "Co-operative Service."



PYROBAR GYPSUM FLOOR TILE, WITH SPACER BETWEEN



PYROBAR FLOOR TILE, WITH TABLE OF SIZES

### U. S. G. Plaster Specifications.

The following general directions apply to all brands of U. S. G. cement, wood fibre and prepared plasters:

#### GENERAL DIRECTIONS

Use a clean, tight mixing box, about 3½ by 7 ft., raised about 4 ins. at one end. Mix with a hoe; the manufacturer disclaims all responsibility if mixing is done by machine.

Use only clean water, free from alkali and impurities; keep tools clean. Never rinse tools in gauging water.

Do not mix more material than can be applied in about 1 hour.

Do not mix one gauging with another; and never re-temper

plaster after it has commenced to set. Clean the mixing box after each gauging.

Keep plaster from freezing for 24 hours after application. In hot, dry weather, close all openings while plastering to prevent drying out of the material before it has set. Should this happen, however, and the work show soft, white spots, it can be remedied by sprinkling with clean water with a clean brush until the material sets up and hardens.

After the plastering has set, open the windows and permit the wall to dry out as quickly as possible.

Keep plaster in a dry place; never store it on the bare ground.

### Specifications for U. S. G. Cement Plasters.

#### GENERAL REQUIREMENTS

**Grounds**—To be not less than ¾ in. for "Standard" Sackett plaster board, wood, wire, or expanded metal lath; ⅞ in. for ⅝-in. "Perfected" Sackett plaster board; ½ in. for Pyrobar gypsum tile; ⅝ in. for brick or tile.

**Lathing**—Preferably to be standard (¼ in.) Sackett plaster board. If wood lath, it should be a good grade, free from knots, sap and bark; to be spaced ¼ in. apart at sides and ends, and well nailed with not less than two 3d lathing nails at each stud. Half green lath are best, as dry lath will buckle unless thoroughly wet before plastering.

**Mortar**—To be any brand of UNITED STATES GYPSUM Co.'s Cement Plaster, and to be mixed and applied according to directions of the manufacturer.

#### DIRECTIONS FOR MIXING

First put in a layer of sand, then one of plaster in raised end of box. Hoe dry from one end of the box to the other, then back again, working sand and plaster thoroughly together to a uniform color. Put water in the other end of the box; hoe plaster into the water, mixing thoroughly. Mix thin at first, then add sufficient dry plaster and sand in right proportions to bring it to the proper consistency for application.

Do not mix sand and plaster until ready to add the water. Use only dry, clean, sharp sand, free from loam and dirt. Screen through a 6-mesh screen. Avoid quicksand.

See "General Directions" above.

**For Sackett Plaster Board, Wood, Wire and Expanded Metal Lath**—Mix 2 parts by weight of clean, sharp, dry sand with 1 part of plaster.

**For Brick, Pyrobar Gypsum Tile, Clay Tile and Second or Browning Coat**—Mix 3 parts by weight of clean, sharp, dry sand with 1 part of plaster.

#### DIRECTIONS FOR APPLYING

**On Sackett Plaster Board**—Do not wet board. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be ½ in. thick. Straighten all angles and base ready to receive finish.

**On Wood Lath**—If lath are dry, soak thoroughly the day before or several hours before applying the plaster, so that they will absorb all the water they can hold. Lay plaster on lightly, but with sufficient pressure to obtain a good key, and fill up grounds. Darby lightly, and use water sparingly.

**On Wire or Expanded Metal Lath**—Apply a scratch coat, lightly covering the lath and filling meshes. After the scratch coat has set firm and hard, but before it is dry, apply the second coat, bringing it to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

**On Brick, Pyrobar Gypsum Tile, or Clay Tile Walls**—Soak brick or clay tile walls thoroughly—and if necessary sprinkle Pyrobar lightly—to reduce the suction. Apply sufficient material to fill out grounds. Bring to a straight and even surface with rod and darby, ready to receive the finishing coat. Darby lightly and use water sparingly.

### Specifications for U. S. G. Wood Fibre Plasters.

#### GENERAL REQUIREMENTS

**Grounds and Lathing**—Same as specified for cement plasters.

**Mortar**—To be any brand of the UNITED STATES GYPSUM Co.'s Wood Fibre Plaster, to be mixed and applied according to directions of the manufacturer.

Only water is to be added to this material to fit it for application, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

**Note**—The company also manufactures wood fibre plaster under a formula allowing the use of an equal amount of sand



by weight, but recommends the use of the neat material, as the addition of sand destroys the flexibility and toughness and adds weight.

#### DIRECTIONS FOR MIXING

Place the plaster in upper end of box and water in lower end. Hoe the plaster into the water and allow it to soak from 10 to 20 minutes. Then mix to correct consistency.

See "General Directions" on preceding page.

#### DIRECTIONS FOR APPLYING

**For Sackett Plaster Board**—Do not wet board. Plastering to be 3-coat work, scratch coat to be allowed to set before brown coat is applied. Plaster is to be  $\frac{1}{2}$  in. thick. Straighten all angles and base. Leave base coat rough to receive finish.

**Wood Lath**—If lath are dry, soak thoroughly the day before or several hours before plastering. Apply first a thin coat of mortar, following up at once before it sets with sufficient material to fill out the grounds. When the wood fibre is to be troweled down smooth for a finish, it should be used neat. When a float or troweled finish coat is desired, the surface of base coat must be broomed—left rough—to receive the finish. Broom before the plaster begins to set.

**For Wire and Metal Lath**—Apply the mortar a little stiff. Scratch a thin coat on the lath. Soak walls to reduce suction. After this coat is set hard, apply a second coat mixed same as for brick, straightening up the walls. The second coat should be left rough or broomed to receive the finish.

**For Pyrobar Gypsum Tile, Brick or Clay Tile**—Mix equal parts plaster and clean, sharp sand by weight. Apply plaster in usual manner. Material must be retarded for use with sand.

### Specifications for U. S. G. Prepared Wall Plasters.

#### GENERAL REQUIREMENTS

**Grounds and Lathing**—Same as specified for cement plasters.

**Mortar**—To be any brand of the UNITED STATES GYPSUM Co.'s Prepared Wall Plaster.

#### DIRECTIONS FOR MIXING AND APPLYING

Nothing is to be added to this material but water, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

Put plaster in one end and water in the other end of box. Hoe plaster into water, mixing thoroughly. Mix thin at first, then add a sufficient amount of dry material, and work to proper consistency for application.

See "General Directions," on preceding page.

Apply same as specified for cement plaster.

### Specifications for U. S. G. Keene's Cement.

For a smooth, hard finish, add water only, mix thoroughly, bring to working consistency, and apply. In applying, follow directions for Prepared Trowel Finishes. A smooth, highly polished surface may be produced by rubbing the walls with a cloth after the cement is dry.

In cases where extra plasticity is desired, 1 pail of lime putty may be added to each 100-lb. bag of U. S. G. Keene's Cement.

### Specifications for U. S. G. Prepared Trowel Finishes.

#### GENERAL REQUIREMENTS

**Trowel Finish**—To be Adamant, Imperial, Ivory, Rock or Universal Trowel Finish, to be mixed and applied according to directions of manufacturer.

These finishes require nothing added but water to fit them for application, and under no circumstances will the contractor be allowed to mix in other material.

#### DIRECTIONS FOR MIXING

Observe "General Directions," on preceding page, except use a small mixing box, about 2 ft. 6 ins. by 4 ft. 6 ins. by 10 ins. deep.

Put material in raised end of mixing box and water in lower end. Hoe the material into the water (using approximately 1 part of water to 2 parts of material measured by volume). Allow the material to soak and draw in the water without heing for at least 10 minutes. Then, after all the material has soaked and shows no further signs of air bubbles, mix thoroughly and, with particular care, break down the mix to a smooth, even, creamy consistency.

Bring the mix finally to a very thin consistency.

The mixture is too thin to carry in a hod; use a bucket.

#### DIRECTIONS FOR APPLYING

Base coat must be dry before finish is applied. If suction is too great, sprinkle lightly with clean water from a clean brush.

**Apply in 3 coats.** The first time over, put on enough material to cover the surface completely, using material as thin as possible, and grinding it thoroughly into the base coat. Allow this to draw a few moments, to avoid blistering.

The second time over, lay the material on perfectly level; and the third time, make the material as thin as can be handled on the hawk and fill in cat faces and imperfections. After it has drawn a few moments, trowel to smooth surface, applying water with a damp brush. Do not drench with water, as it will kill the face of the material.

Work top and bottom of the wall at the same time, to avoid joinings.

**Caution**—Never apply a finish coat on a base coat which contains frost, and keep from freezing for 24 hours after it is applied.

### Specifications for U. S. G. Prepared Sand Float Finishes.

#### GENERAL REQUIREMENTS

**Sand Float Finish**—To be Adamant, Imperial, Ivory, Rock, or Silico Sand Float Finish, and to be mixed and applied according to directions of the manufacturer.

These finishes require nothing but water to be added to fit them for application, and under no circumstances will the contractor be allowed to mix in sand or other solid material.

#### DIRECTIONS FOR MIXING

Same as for prepared trowel finishes.

#### DIRECTIONS FOR APPLYING

To obtain best results float finish should be applied after base coat has set firm and hard, but while still green and within 12 hours after base coat is applied.

Lay on with trowel and then use cork, carpet or felt float (cork float is best), working material to a true and even surface, free from float marks and cat faces.

Use as little water as possible while floating, so as to avoid killing the surface. Use damp brush only.

Do not attempt to float after the material begins to or has set.

**Caution**—Same as for trowel finishes, above.

### Specifications for U. S. G. Gauging Plaster.

**TROWEL FINISH**—Mix 3 parts of lime putty by measure with 1 part of dry UNITED STATES GYPSUM Co.'s Gauging Plaster (equal to 2 parts of dry hydrated lime and 1 part dry gauging plaster by weight). Lime putty must stand 24 hours before mixing in the plaster. Mix thoroughly together and apply in customary manner.

**FLOAT FINISH**—Use 1 part UNITED STATES GYPSUM Co.'s Unfibred Gypsum Cement Plaster to 1 part clean, sharp sand. Screen sand through No. 12 screen. Mix thoroughly and apply in usual manner.

### Specifications for U. S. G. Bond Plaster.

#### GENERAL REQUIREMENTS

**Caution**—Use rough form boards. Avoid dressed or oiled boards. The concrete surface must be dry and free from dust, oils and efflorescence before base coat plaster is applied. If oil or grease is on the concrete surfaces, burn off with a torch. If there is any efflorescence, remove the frost with a wire brush, then wash with a diluted solution (1 to 5) of muriatic acid. Wash off acid with clean water.

**Mortar**—To be U. S. G. Bond Plaster, manufactured by the UNITED STATES GYPSUM Co., water only to be added, and to be mixed and applied according to directions of manufacturer.

**Grounds**—To be of sufficient thickness to bring to a true and even surface.

#### DIRECTIONS FOR MIXING AND APPLYING

Same as specified for unsanded wood fibre plaster.

### Standard Specifications for Sackett Built Walls.

These consist of Sackett Plaster board with  $\frac{1}{2}$  in. of any class of UNITED STATES GYPSUM Co.'s wall plaster.

(Specifications apply also to Adamant plaster board.)



## GENERAL REQUIREMENTS

**Lath**—Shall be  $\frac{1}{4}$ -in. Sackett Plaster Board made by the UNITED STATES GYPSUM Co., Chicago, Ill. Size of sheets, 32 by 36 ins.

**Grounds**—Shall be  $\frac{3}{4}$  in. ( $\frac{1}{4}$ -in. Sackett;  $\frac{1}{2}$ -in. plaster).

**Note to Architect**— $\frac{3}{8}$ -in. Sackett may be specified if preferred, and grounds should in that case be  $\frac{7}{8}$  in. Best results on ceilings requiring leveling are obtained by furring with  $\frac{7}{8}$ - by 2-in. furring strips set on 8- or 12-in. centers.

**Nails**—Sackett lathing shall be applied with Sackett nails,  $1\frac{1}{4}$  ins. long, No. 11 $\frac{1}{2}$ -gauge, 7/16-in. flat head (see illustration on page 163), obtainable from UNITED STATES GYPSUM Co. or supply dealers handling Sackett.

## DIRECTIONS FOR APPLICATION

Lay all Sackett sheets in parallel courses following the direction of studding, furring or joists. Start each alternate course with half sheet (32 by 18 ins.), so as to break joints at right angles to studding on walls (horizontally) and at right angles to joists or furring on ceilings. The last sheet of Sackett in each course shall be cut to exactly fit space. Cut boards with a common saw, or score with the point of a hatchet and break over a straightedge.

Break joints between walls and ceilings so that a vertical joint on the wall will not meet a ceiling joint. Perpendicular joints on opposite sides of partitions must not be on same stud, that is, the stud that comes at center of Sackett on one side of partition must be at edge of Sackett on opposite side.

Space Sackett sheets  $\frac{1}{4}$  in. apart at all horizontal or other joints which do not come on studs. Joints coming on studs or joists may be butted tight or come as will, but joints must not exceed  $\frac{1}{4}$  in.

Do not wet boards before plastering.

**PLASTERING**—See "Plaster Specifications," pages 166 and 167.

## Specifications for Jester-Sackett Solid Partitions.

All partitions shown on plans, except as otherwise noted, to be Jester-Sackett 2-in. solid partitions, constructed of Sackett Plaster Board clipped to  $\frac{3}{4}$ -in. Sharon or hot rolled channel iron studs. The flanges of the studs should not exceed  $\frac{3}{8}$  in. Channel studs to be spaced 24 $\frac{3}{4}$  ins. on centers and fastened in a suitable manner to floors and ceilings.

$\frac{1}{4}$ -in. Sackett Plaster Board, 24 by 36 ins. in size, to be placed between the channels and clipped to same with Jester clips, spaced 9 ins. on centers, starting 4 $\frac{1}{2}$  ins. from floor or ceiling.

Carpenter contractor to place  $\frac{5}{8}$ -in. grounds for plastering, picture mould, baseboard and chair rail where required, and set all bucks. Bucks to be made from 2 by 2-in. pine and properly braced and set.

**PLASTER AND FINISH**—To be UNITED STATES GYPSUM Co.'s Gypsum Wood Fibre, Cement or Prepared Plaster, and prepared trowel or sand float finish.

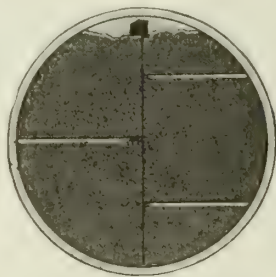
**PLASTERING**—Sackett Plaster Board must not be wet before applying plaster. Mix plaster same as specified for wood lath. First apply scratch coat on channel side of partition, taking care to fill in behind grounds, then apply brown coat on other side to grounds of thickness to receive finish coat. Plaster to grounds, making all angles and corners flush and straight, ready to receive trim. Allow plaster on one side of partition to set before plastering other side.

## Specifications for Jester-Sackett Hollow Partitions.

Jester-Sackett 2 $\frac{1}{2}$ -in. partitions are to be constructed with  $\frac{3}{4}$ -in. channels spaced 16 ins. on centers, fastened to floors and ceilings, the same as in metal lath partitions. On each side of the channels place Sackett Plaster Board 18 by 32 ins. in size and  $\frac{3}{8}$  in. thick, clipped to each channel with Jester No. 6 clips, breaking all perpendicular joints between floor and ceiling. Partition requires  $\frac{1}{2}$  in. of gypsum plaster on each side.

For size of channels and clips for thicker partitions, see table, page 164.

Carpenter contractor to furnish and set all bucks and grounds.



SHOWING METHOD OF SPACING AND BREAKING JOINTS

**PLASTERING**—See specifications for plastering Sackett applied to wood studs, pages 166 and 167.

## Specifications for Jester-Sackett Suspended Ceilings.

All ceilings where indicated to be suspended shall be formed of Sackett Plaster Board with Jester ceiling clips. Boards to be  $\frac{3}{8}$ -in. Sackett, 18 by 32 ins. in size, attached by means of Jester clips to  $\frac{3}{4}$ -in. standard or Sharon channels, spaced 16 ins. on centers. These  $\frac{3}{4}$ -in. channels to be attached by means of No. 16 tie wire to 1 $\frac{1}{2}$ -in. channels spaced 3 ft. apart, which latter are to be suspended from the construction above by 1 by  $\frac{1}{8}$ -in. flat iron straps or  $\frac{1}{4}$ -in. round rods or 2 No. 14 galvanized wires, not to exceed 4 ft. on centers, bent around them and wired securely.

Hangers are to be provided and set in place by contractor for concrete work.

**PLASTERING**—See specifications for plastering Sackett applied to wood studs, pages 166 and 167.

## Specifications for Sackett Soffit Ceilings.

**REINFORCED CONCRETE CONTRACTOR**—This contractor will install special combination reinforcing steel chairs and Sackett ceiling clips 9 ins. on centers in all joists; same to be furnished by plastering contractor.

**PLASTERING CONTRACTOR**—This contractor will supply required Sackett soffit ceiling clips to be installed 9 ins. on centers in concrete joists, and install Sackett Plaster Board on all ceilings unless otherwise specified, plastering same to a full  $\frac{1}{2}$  in. with U. S. G. Cement (or wood fibre) Plaster.

## Specifications for Pyrobar Gypsum Tile.

**PARTITIONS**—Unless otherwise specified or shown, all partitions shall be built of UNITED STATES GYPSUM Co.'s Pyrobar Gypsum Tile, of thickness indicated on plans. All partitions shall be started on the fireproof floor, and the tile shall be set plumb, straight and true and shall be wedged at ceiling and slushed in with mortar.

**FURRING**—All outside walls, where shown on plans or specified, shall be furred with Pyrobar Gypsum Tile, of thickness and type indicated on plans, laid up against the wall; and where hollow furring tile or 2-in. solid tile is used, the same shall be securely spiked to the wall every square yard with 10d steel cut nails.

**COLUMN PROTECTION**—All exposed interior columns shall be covered with Pyrobar Gypsum Tile, of thickness indicated on plans, and shall be securely bonded and wrapped as often as necessary with No. 12 galvanized wire.

**SHAFTS, OPENINGS AND DUCTS**—Construct all pipe chases, dumbwaiter shafts, heating and vent ducts, etc., where shown on plans, with 2-in. solid Pyrobar Gypsum Tile.

**MORTAR AND LAYING**—All Pyrobar Gypsum Tile shall be laid up in mortar composed of any brand of UNITED STATES GYPSUM Co.'s Cement Plaster—1 part of plaster to 3 parts of clean, sharp, dry sand, thoroughly mixed. No mortar shall be retempered. All tile shall be laid with full flush joints to a line, with horizontal beds uniformly level on each course. Fill all joints, chinks and crevices between the tile and other work, which shall be well slushed in.

**FRAMES**—The carpenter contractor shall set the rough bucks for openings ahead of the contractor for this work, so as to cause no delay. These bucks shall be left plumb and true by the carpenter, and shall be made of 2-in. lumber of the same width as the thickness of the partition tile. Anchor the partition at the wall and door bucks by driving spikes at the joints at the top of each course.

**ATTACHING TRIM, FIXTURES, ETC.**—For attaching heavy trim, baseboards and chair rails, nail to the end of each tile a 1 by 12-in. wood nailing block the width of the tile before laying up. For attaching heavy toilet fixtures, blackboards, etc., wood blocks may be nailed to the tile as they are laid in place. Plastering grounds, picture moulds and other light trim may be nailed directly to Pyrobar Tile by reverse, staggered, diagonal nailing.

**PLASTERING**—See plaster specifications, pages 166 and 167. Do not plaster Pyrobar with Portland cement or lime.

## Specifications for Pyrobar Gypsum Floor Tile.

All reinforced concrete floors are to be constructed with UNITED STATES GYPSUM Co.'s Pyrobar Gypsum Floor Tile voids, spaced 24 ins. on centers unless otherwise called for, and of thickness designated on drawings. Pyrobar spacers to be provided between the floor tile at all joists.

After floor tile are placed on forms, and immediately before concrete is poured, they are to be thoroughly wet with a hose.



# THE BISHOPRIC MANUFACTURING CO.

Manufacturers of Wall Boards and Sheathing

300 Este Avenue  
CINCINNATI, OHIO

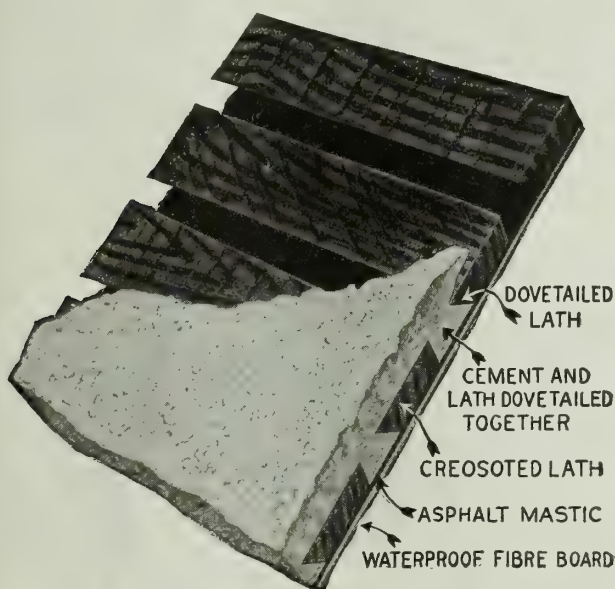
## Products.

BISHOPRIC STUCCO BOARD and  
BISHOPRIC SHEATHING.



## Bishopric Stucco Board.

This is a background for stucco, cement, or plaster finished buildings. It is made of creosoted, dovetailed lath on a background of heavy fiber board. There is not a piece of metal about it, to rust and break away from the fastenings. Every piece of material is time resisting and proof against water, weather and vermin. The finished construction is a rigid, permanent background, that holds the stucco cement or plaster in the dovetailed grip, *without cracking or peeling*, as long as the house lasts.



BISHOPRIC BOARD



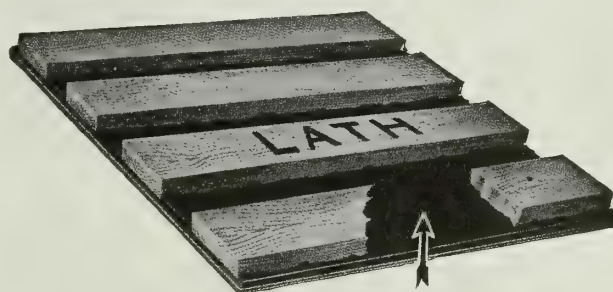
BISHOPRIC BOARD APPLIED TO BUILDING

SWEET'S CATALOGUE

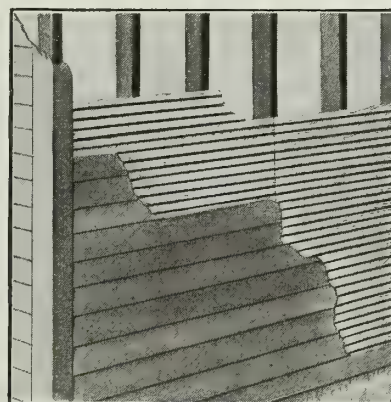
## Bishopric Sheathing.

The arrow (see illustration) points to the asphalt mastic in which the laths are embedded. Bishopric sheathing is nailed to the outside of studding, laths exposed as shown in the accompanying illustration. Over this weatherboards are nailed, or cement is applied. Bishopric sheathing is used as a foundation for ready roofing. It is applied to rafters, smooth side up.

When it is used under flooring, either side may be up, though it is preferable to have the lath side up, since it leaves dead air space between the laths and the flooring.



BISHOPRIC SHEATHING BOARD



BISHOPRIC SHEATHING UNDER WEATHERBOARD FINISH

## Further Information.

Samples, catalogues, etc., of Bishopric board and Bishopric sheathing are sent on request. The company's free book, "Built on the Wisdom of Ages," illustrates homes, apartments, factories and public buildings constructed with Bishopric board, and gives letters from architects, builders and users.

It also tells some interesting results of scientific tests.

# THE BEAVER BOARD COMPANIES

## Beaver Board, Beaver Board Tiled and Beaver Blackboard

CABLE ADDRESS:  
"BEAVER, BUFFALO"

ADMINISTRATION OFFICES  
BUFFALO, N. Y.

PLANTS  
BUFFALO, N. Y.  
THOROLD, ONT., CAN.  
OTTAWA, ONT., CAN.

BOSTON, 612 Oliver Building  
NEW YORK, 225 Fifth Avenue  
BALTIMORE, 1033 Calvert Building  
CLEVELAND, 611 Williamson Building

### UNITED STATES BRANCHES

DETROIT, 1014 Dime Bank Building  
CHICAGO, 1303 Lumber Exchange  
MINNEAPOLIS, 1135-1136 Plymouth Building  
KANSAS CITY, 207 R. A. Long Building

SAN FRANCISCO, 234 Rialto Building

### FOREIGN BRANCHES

CANADA: BEAVERDALE, OTTAWA

ENGLAND: 4 Southamton Row, LONDON, W. C.  
AUSTRALIA: Builders' Exchange, SYDNEY

### Products.

Sole manufacturers of BEAVER BOARD, BEAVER BOARD TILED and BEAVER BLACKBOARD. The largest manufacturers of wallboard in the world, and the only organization devoted exclusively to its manufacture and controlling every process from forest to finished board.

### Beaver Board.

Beaver Board has distinct superiorities in certain kinds of construction. Particularly recommended for cottages, bungalows, store ceilings, clubs and public buildings; for remodeling or repairing old walls; for building an extra room in an attic or other waste space; for single or double partitions, and in business buildings such as offices, factories, stores or restaurants.

WHAT IT IS—The careful selection of standing timber furnishes the first requisite—the long, tough fibre peculiar only to white spruce. Sawed logs of white spruce are shredded to fibrous form, and this pure wood fibre is compressed and built up into strong, light, resilient, 4-ply panels about  $\frac{3}{16}$  in. thick—dependably uniform.



REGISTERED TRADE-MARKS

SIZES—Beaver Board panels come in 32-in., and 48-in. widths, and in even foot lengths from 6 to 16 ft.

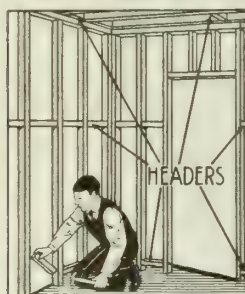
MOISTUREPROOF—Beaver Board is the only wallboard that is "Sealtite" sized—an exclusive Beaver Board treatment (protected by United States patent No. 1191099) which seals surface fibres on both front and back of the

board, preventing absorption of moisture. "Sealtite" sizing thoroughly protects it against climatic conditions or sudden change in temperature and humidity, eliminating any tendency to warp or bulge.

AGEPROOF—Beaver Board will not crack, chip, crumble or fall; neither does it deteriorate with age.

ELASTICITY—Shocks, strains, and vibrations do not affect Beaver Board. Its elasticity is sufficient to allow for the normal shrinking and swelling of timbers and the gradual settling of buildings.

HEAT, COLD, SOUND AND FIRE RETARDING—The wood fibres cross and recross in such a way that heat or sound waves meet with great resistance, making the



Placing "Headers" to Arrange Nailing Surface for All Panel Edges



Beaver Board is Nailed to Centers, Then to Panel Edges



Oil, Flat or Water Paints May Be Used to Paint Beaver Board



The Final Step, Applying Decorative Strips to Cover Joints Between Panels



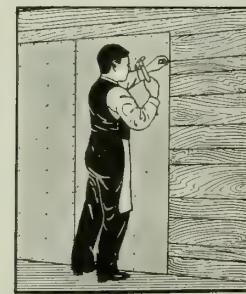
Preparing Old Plaster Wall for Remodeling with Beaver Board



Beaver Board Nailed Directly Over the Old Lath and Plaster



To Apply Beaver Board Over Concrete or Brickwork, Furring Strips Are Used



Nailing Beaver Board Over Old Wood Walls—No Preparation Necessary

ILLUSTRATING ADAPTABILITY AND APPLICATION OF BEAVER BOARD



Beaver Board room warmer in winter and cooler in summer.

**APPLICATION**—In new buildings, panels are nailed direct to joists, studding and headers; in remodeling, it is applied over old material. The surface is then painted (all first-class oil or cold water paints being used effectively on Beaver Board), and wood trim is applied over panel edges according to a preconceived panel design. Brick or cement walls are prepared to receive Beaver Board by the use of furring strips secured to walls by wood plugs. Under proper application, Beaver Board walls and ceilings can be relied on to remain permanently solid and even.

**IDENTIFICATION**—Beaver Board can always be positively identified by the Beaver Board registered trademark, which is printed every 36 ins. on the back of every panel. Complete instructions for applying are also printed on back of each panel.

### Beaver Board Tiled.

Beaver Board *Tiled* is Beaver Board blocked off by indentations to represent tile. When given two or more

ground coats, and finished with a good enamel, it presents the same glistening white surface as glazed tile. Wherever a sanitary appearance is desired, as in bathrooms, kitchens, lunchrooms or meat markets, it is advisable to have a wainscot of Beaver Board *Tiled*.

### Beaver Blackboard.

Beaver Blackboard and Beaver Greenboard make the satisfactory and economical blackboard for the schoolroom or wherever a bulletin board is desired. The greenboard is particularly advisable, because its soft, pleasing finish does away with the eyestrain caused by the usual blackboard. Built up on the solid foundation of Beaver Board and scientifically slated by a special process, Beaver Blackboard and Greenboard are backed by a broad guarantee as to durability and satisfaction.

### Specifications.

Specifications for Beaver Board are prepared in loose leaf form, 8½ by 11 ins., for handy filing by the architect. A set of these specifications will be gladly forwarded without charge.



RESIDENCE

Convenience, quick construction, durability and good taste urged the adoption of Beaver Board in this \$20,000.00 home. There is no delay in making the Beaver Board home ready for occupancy



SUMMER HOME

The cottage, summer home or bungalow is made more cheerful and comfortable if it has Beaver Board walls and ceilings. Beaver Board is always easy to use no matter where the summer home is located



ATTIC

An extra room, den, billiard room or bedroom is readily constructed in the attic by using Beaver Board, thereby solving the extra room problem which so often becomes a vital consideration



THEATER

With Beaver Board the theater receives a harmonious treatment, whether it is a new building or reconstructed. It permits mural decoration of the highest type without necessitating an undue investment



STORE

The Beaver Board ceiling will not rust like metal ceilings. Beaver Board is far easier to install and the finished appearance always is one that adds to the store's general attractiveness. Once up it stays there permanently; no cracking nor falling.



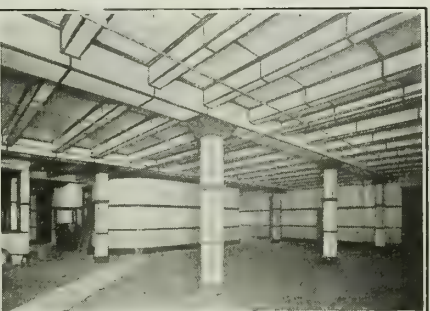
CLUB

The clubhouse with finished Beaver Board has that desirable atmosphere of good cheer and comfort. The walls and ceilings are permanent—the club's activities never will be hindered by repairs or repapering



PUBLIC BUILDING

In large dining rooms, churches, lodges, halls and other public buildings, it is much easier to obtain the desired decorative effect with Beaver Board than with other materials. Either heavy beaming or artistic paneling may be used



FACTORY

Factories, garages, machineshops and other buildings that are subject to constant jar and vibration that would bring down plaster can have lasting and durable walls and ceilings if Beaver Board is used



BEAVER BOARD TILED

Beaver Board *Tiled* is Beaver Board with the surface blocked off by indentations to represent tile. When finished with white enamel it is as washable, sanitary and permanent as tile



# THE PHILIP CAREY COMPANY

## Wall Board and Insulating Papers

### LOCKLAND, CINCINNATI, OHIO

FIFTY BRANCHES AND DISTRIBUTING POINTS IN NORTH AND SOUTH AMERICA AND EUROPE

#### Products.

CEIL-BOARD, a substitute for Lath and Plaster; BLACK JACK SIDING and ROOFING; FIBREWEAVE INSULATING PAPERS; PERCOPROOF DAMPPROOFING COMPOUND.

For Roofing, see page 398.

#### Ceil-Board.

**DESCRIPTION**—Ceil-Board is three layers of special chip-stock held in bond with waterproof cement. It is 3/16-in. thick and furnished in large panels. It is moisture-proofed, and will not absorb atmospheric moisture at any point, which means dry walls. It is an effective insulator against heat and cold, and is sound deadening.

**ADAPTABILITY**—Ceil-Board finds its largest use as a wall and ceiling covering; but is also largely used for insulating between inner and outer walls, for sound deadening between flooring, for lining varnish dry kilns, for display window back-grounds, as a core for wood veneers, etc.

**ADVANTAGES**—Ceil-Board can not crack or fall as plaster; will not absorb or hold moisture, and is applied without dirt or damage. It can be applied in freezing weather, and requires no special skill in its application. Rooms may be occupied immediately after Ceil-Board is up, and may be painted or papered at once. Ceil-Board is sanitary and safe.

**APPLICATION**—Ceil-Board is applied directly to studding and joists, over cracked plaster or to any flat surface. Joints are covered with wood strips for painting and with gummed paper or canvas strips for wall papering.

**FINISHES**—Plain gray, plain tan, golden quartered oak, mission quartered oak, circassian walnut and water-proof or Black Jack Siding. All finishes except Black

Jack Siding may be used wherever plaster or wood panels have heretofore been used. Black Jack Siding is used for siding, sheathing and roofing small buildings and for use in the interior where contact with water, steam or dense vapors may occur. This finish takes asphalt paints only.

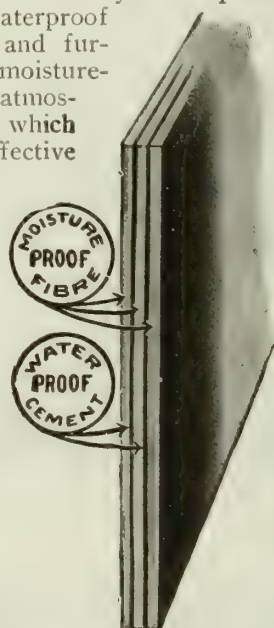
**SIZES**—Plain gray and plain tan in widths of 32 and 48 ins. Quartered oak and circassian walnut in 32-in. width only. Black Jack Siding in 48-in. width only. All styles in even foot lengths from 5 to 12 ft. Special sizes on factory orders.

**SAMPLES, ETC.**—Samples of all styles and descriptive booklets supplied on request.

#### Fibreweave Insulating Papers.

Carey Fibreweave papers are made from special jute stock base which is carefully and thoroughly treated with pure, high grade, odorless asphalts compounded in the company's refineries, resulting in a finished product possessing, as shown in comparative tests, unusual tensile strength—10 lbs. greater than any other similar paper on the market—as well as greater density, solid texture and higher degree of efficiency in resistance to air penetration. These papers are proof against moisture, wind, vermin, dust, acid and decay; also are temperature retarding and odorless.

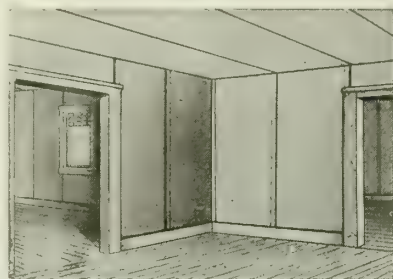
**ROLLS**—Furnished in rolls 36 ins. wide, containing 500 or 1000 sq. ft., and in various weights and finishes—see table below.



CEIL-BOARD  
Showing actual thickness



APPLYING CEIL-BOARD TO STUD-DING



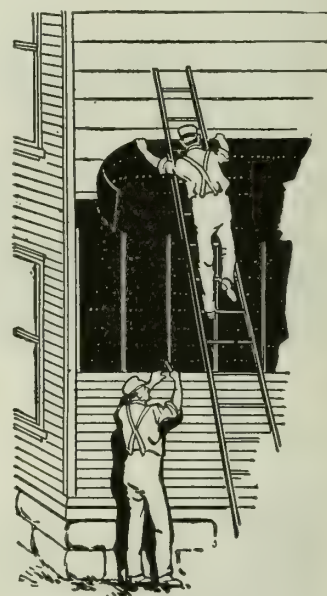
THE COMPLETED ROOM PANELED AND PAINTED



Roll

FIBREWEAVE

No. 1, saturated only, weight, 90 lbs. per 1000 sq. ft.  
No. 2, saturated only, weight, 60 lbs. per 1000 sq. ft.  
No. 3, saturated only, weight, 42 lbs. per 1000 sq. ft.



Application

#### Percoproof.

**SCOPE OF USE**—Used extensively, in superstructure work, for dampproofing (inside or outside) concrete, brick, stone, stucco, plaster or tile walls, interior of outside walls, under surfaces of concrete roofs; also, all interior or exterior of foundation walls, tunnels, areas, ways, etc.



# CORNELL WOOD PRODUCTS CO.

Manufacturers of Wall Board

175 West Jackson Boulevard

CHICAGO, ILL.

## Products.

CORNELL-WOOD-BOARD, a Pure Wood Fiber Wall Board for walls, ceilings, partitions, etc.

CORNELL WAINSCOTING; CORNELL TILE BOARD.

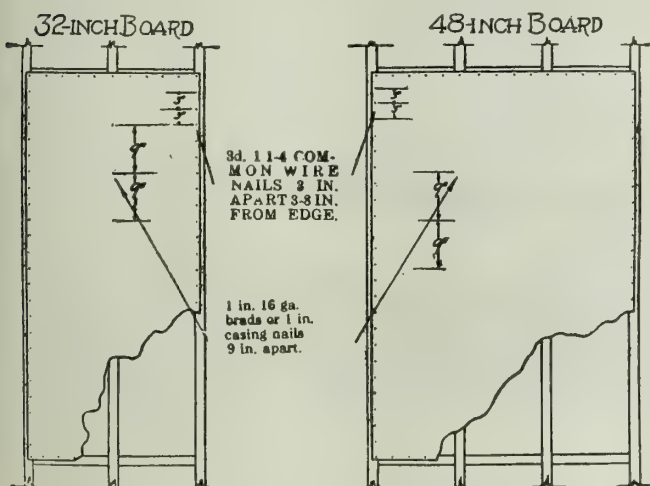
## Cornell-Wood-Board.

**GENERAL DESCRIPTION**—Cornell-Wood-Board is a built-up structure composed of 4 plies of pure wood fiber, bonded together with a moisture resisting cement. It is approximately  $\frac{5}{16}$  in. thick and of a light cream color. Contains no second hand or unsanitary material. Every fiber is thoroughly sized in the process of manufacture, and the finished board is surfaced with sizing which protects the board and reduces suction to a minimum.

**STOCK SIZES**—32 and 48 ins. wide, in even foot lengths from 6 to 12 ft. Lengths up to 16 ft. supplied on special order. Thickness, approximately  $\frac{3}{16}$  in. Capacity of plant, 450,000 sq. ft. daily.

**APPLICATION**—For new work, Cornell-Wood-Board is applied directly to the joists and studs. Headers are cut in wherever necessary to give a nailing surface for the edges and ends of panels. For repair work or remodeling, it may be nailed to frame through old plaster.

Decorate Cornell-Wood-Board with paint or cal-cimine, using panel strips to cover joints. *Do not use wall paper.* Surface of board is treated in such a way that sizing coat is not necessary.



APPLICATION OF CORNELL-WOOD-BOARD

## Wainscoting.

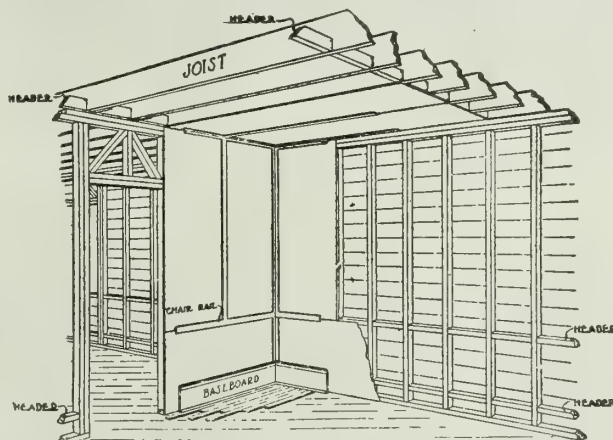
The same structure as Cornell-Wood-Board, but with the surface grained to represent natural oak. Two finishes—plain sawed and quarter sawed oak. Application, the same as Cornell-Wood-Board. Finish with stains or varnishes, the same as wood.

## Tile Board.

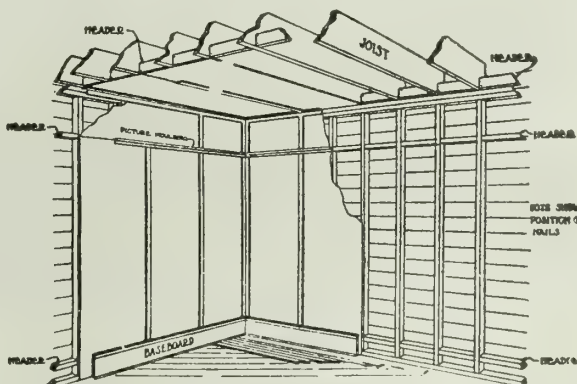
Made of pure wood fiber, four plies thick. Tile indentations,  $2\frac{1}{4}$  by 6 ins. Application, direct to the studs for bath and kitchen work. Decorate with enamel or flat paint.

## Guarantee.

Cornell products are guaranteed satisfactory when applied according to instructions furnished in each bundle.



FRAMING PLAN FOR CHAIR RAIL DESIGN



FRAMING PLAN FOR PICTURE Mould DESIGN

# INTERNATIONAL INSULATION COMPANY

GENERAL SALES OFFICES

ST. PAUL, MINN.

MILLS: INTERNATIONAL FALLS, MINN., FORT FRANCES, ONT.

AGENCIES IN THE PRINCIPAL CITIES OF THE UNITED STATES

## Products.

UNIVERSAL INSULITE BUILDING and COLD STORAGE INSULATION; PLASTER and STUCCO BASE; SHEATHING, SIDING and WALLBOARD; SOUND DEADENING, ACOUSTICAL TREATMENT and MURAL DECORATION MEDIUM.



TRADE-MARK

## Comparative Thermal Value.

All thermal insulating values and densities shown below are taken from the mimeograph sheet on this subject furnished by the U. S. Bureau of Standards:

## Description.

A clean, sanitary, odorless and verminproof insulation made from selected stock spruce wood fiber, automatically felted into light, strong, uniform sheets, containing by volume 90% minute air cells.

Because of its durability, strength, attractive texture, water repellant qualities, lightness, resilience, non-conductivity and sound absorbing qualities, it is admirably adapted to the following uses:

For Buildings, Sheathing, siding, wall board, plaster and stucco base, concrete roof slab lining, warehouses, ice houses, sound deadening, decorating medium and acoustical treatment.

*For Refrigeration of every description.*

Full information, samples and prices on request.

## Shipping Weights.

¼-in. Universal Insulite, per 1,000 sq. ft.; less than carloads, crated, 450 lbs.; carloads, uncrated, 350 lbs.

½-in. Universal Insulite, per 1,000 sq. ft.; less than carloads, crated, 650 lbs.; carloads, uncrated, 550 lbs.

## Standard Sizes of Insulite.

Stock thicknesses, ¼ and ½ in.

Stock widths, 4 ft., 32 and 14¼ ins.

Stock lengths, 8, 8½, 9, 9½ and 10 ft.

¾- or ½-in. strips, 2 ins. wide and 4 ft. long.

On special orders any size not exceeding 4 ft. wide and 10 ft. long.

Material	Conductivity B.t.u. 24-hrs., ft.-sq., 1" thick deg. Fahr.	Density	Nature of Material
Air.....	4.		Horizontal layer heated from above, radiation eliminated.
Colorax.....	5.3	.064	Fluffy finely div'd minute matter.
Hair Felt.....	5.9	.27	
Keystone Hair.....	6.5	.30	Hairfelt confined between layers building paper.
Insulite.....	7.1	.19	Pressed wood pulp. Rigid, fairly strong.
Linofelt.....	7.2	.18	Vegetable fiber confined between layers paper. Soft and flexible.
Corkboard (pure)....	7.4	.18	
Eelgrass.....	7.7	.25	Enclosed in burlap.
Flaxinum.....	7.9	.18	Vegetable fibers; firm and flexible.
Fibrofelt.....	7.9	.18	Vegetable fibers; firm and flexible.
Rock Cork.....	8.3	.33	Pressed rock wool with binder; rigid.
Balsa Wood.....	8.3	.12	Very light and soft.
Waterproof Lith.....	9.8	.27	Rock wool, vegetable fiber and binder, not flexible.
Pulp Board.....	10.4	...	Stiff pasteboard.
Air Cell ½ in.....	10.7	.14	Corrugated asbestos paper enclosing air spaces.
Air Cell 1 in.....	11.5	.14	Corrugated asbestos paper enclosing air spaces.
Asbestos Paper.....	11.8	.50	Fairly firm but easily broken.
Infusorial Earth.....	13.9	.69	(Block.)
Fire Felt (sheet)....	14.3	.42	Asbestos sheet coated with cement; rigid.
Fire Felt (roll)....	15.3	.68	Soft, flexible asbestos.
3-ply Regal Roofing.	16.7	.88	Flexible tar roofing.
Asbestos Mill Board.	20.2	.97	Pressed asbestos, fairly firm, easily broken.



U. S. ARMY HOSPITALS, FORT MCHENRY, BALTIMORE, MD., BUILT ENTIRELY OF UNIVERSAL INSULITE

Universal Insulite adopted and used by the War Department for inside and outside walls in hospital construction, after exhaustive tests extending over a long period. No paint or other protection was specified by the War Department because of the enduring character and water repellant qualities of Universal Insulite



# UNITED STATES GYPSUM CO.

## Wall Board

Williams Building, Monroe and Wells Streets  
CHICAGO, ILL.

### SALES OFFICES

NEW YORK, N. Y., 1170 Broadway  
CLEVELAND, OHIO, Schofield Building  
KANSAS CITY, MO., 513 Railway Exchange Building

CHICAGO, ILL., 205 West Monroe Street  
MINNEAPOLIS, MINN., Lumber Exchange Building  
SAN FRANCISCO, CAL.

Mills at All Principal Gypsum Producing Centers

### Products.

#### SHEETROCK WALL BOARD.

For all kinds of Gypsum Wall Plasters and Finishes, Hydrated Lime, Plaster Board, Jester-Sackett Partitions and Suspended Ceilings; Gypsum Floor Tile, Partition, Furring, Column Covering and Vent Tile, see pages 162-68; for Gypsum Roof Tile for Roof Decks, see pages 438-39.

#### Sheetrock, a Wall Board Made of Gypsum.

Sheetrock Wall Board is made of gypsum—a positively non-warping and non-inflammable material. The boards are very substantial and can be readily sawed or nailed. Sheetrock can be wall papered, painted or paneled, and, when not decorated, may be plastered.

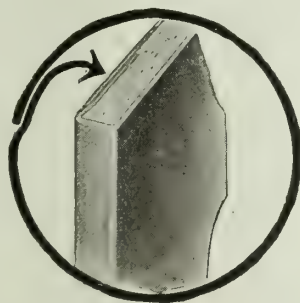
**DESCRIPTION**—Sheetrock wall board consists of a layer of gypsum between two sheets of heavy cardboard. The boards are  $\frac{5}{16}$  and  $\frac{3}{8}$  in. thick; are made in widths of 32 and 48 ins., and in lengths of 6, 7, 8, 9 and 10 ft. Sheetrock boards are uniform in size and shape; have smooth surfaces, and have a square paper fold over the edges.

**DURABILITY**—Sheetrock is not affected by climatic conditions. Even soaking it in water will not cause it to swell. Sheetrock will not, therefore, warp, shrink, nor bulge on the wall. The sheets are strong, firm and "tough," the gypsum being fibered so that it is slightly flexible. It can be sawed or nailed without splitting.

**FIRE PROTECTION**—The gypsum in Sheetrock retards fire. The paper covering of Sheetrock is impregnated with fireproof gypsum so that it will not support combustion.

**HEAT, COLD AND SOUND INSULATION**—Gypsum, of which 90% of Sheetrock is composed, is an excellent non-conductor of heat and cold. Tests show that less than  $\frac{1}{2}\%$  of sound can penetrate through Sheetrock.

**COST**—Sheetrock wall board with wood paneled joints will compete in cost with other wall boards. When the joints are covered with Sheetrock joint tape for



SHEETROCK FOLDED EDGE

Sheetrock has this folded, reinforced edge, a patented feature which gives a strong nailing edge and a permanently tight and uniform joint



ROOM IN SUMMER COTTAGE DESIGNED BY P. M. OLSON, DULUTH, MINN., SHOWING SHEETROCK WALL BOARD PANELED

smooth surface effect, the cost of the wood panel strips is saved.

### Construction Details.

**STUDDING AND JOISTS**—Set studding and joists straight and true 16 ins. from center to center and place headers between them to give cross nailing supports for the ends of Sheetrock.

**SETTING AND NAILING**—Set Sheetrock snug with trade-mark side against supports. Use 3d fine, flat head nails. Nail center of board first, then all four edges. When boards are to be taped or papered, space nails 9 ins. apart along center of board and 3 ins. apart along edges. When wood panel strips are to be used, space all nails 9 ins. apart.

**Note**—Cut Sheetrock to any desired length by placing trade-mark side down and cutting with a common saw; or score board on both sides with a knife and break over a straight-edge.

**FOR FLAT SURFACE EFFECT**—Apply Sheetrock Joint Tape over joints, to conceal the joints and nail heads, following printed direction on cover of tape box.

**DECORATING**—Apply 1 coat of any approved sizing over the entire surface. When this is dry, apply any desired paint or other finish.

**APPLICATION OF WALL PAPER**—Apply wall paper directly to Sheetrock. Joint Tape is recommended as an additional reinforcement; however, its use is optional.

**WHEN WOOD PANEL STRIPS ARE USED**—Boards are first decorated, and then the panel strips (usually  $\frac{3}{4}$  in. by 2 ins.), which have been previously stained or painted, are applied directly over the joints with brad head or concealed nailing.

**PLASTERING SHEETROCK**—When not decorated, Sheetrock affords a perfect "lath" for gypsum plaster. For specifications, see Specifications for Sackett Plaster Board, pages 167-68.

# THE BERGER MANUFACTURING CO.

Manufacturers of Metal Lumber and a General Line of Pressed Steel Building Materials

CANTON, OHIO

## BRANCHES

NEW YORK, N. Y., S. E. Corner 22nd Street and 11th Avenue  
PHILADELPHIA, PA., Corner 16th Street and Washington Avenue  
SOUTH BOSTON, MASS., 450-56 Broadway

CHICAGO, ILL., 20 North Market Street  
ST. LOUIS, MO., 16 South Tenth Street  
MINNEAPOLIS, MINN., 300-312 Tenth Avenue, South  
SAN FRANCISCO, CAL., 1120 Mission Street

AGENTS IN ALL PRINCIPAL CITIES

## Products.

BERGER'S METAL LUMBER, including JOISTS, STUDS, RAFTERS, CHANNELS, ANGLES and other PRESSED STEEL STRUCTURAL MEMBERS; all being of Pressed Steel Construction (officially tested fireproof).

For Concrete Reinforcement and Metal Lath see pages 202-05; for Steel Ceilings see page 417; for Metal Furniture see pages 1406-08.

## General Information Relating to Berger's Metal Lumber Pressed Steel Construction.

Berger's metal lumber pressed steel construction is protected by Letters Patent No. 682316, for building construction. It is a material brought to its present state of high efficiency through extensive use and our many years of experience in manufacturing.

**FACILITIES**—THE BERGER MANUFACTURING CO. controls the manufacture of the steel entering into its metal lumber pressed steel shapes, having its own blast furnaces, open hearth furnaces, rolling mills and factories. The facilities contrive to produce the quality of steel which is so highly essential in a material of this character.

**FIREPROOF FEATURE**—The fireproof qualities of Berger's metal lumber pressed steel construction have been established by extensive official fire, load and water tests, reports of which can be secured from this company on request.

**QUALITY OF STEEL**—The steel is a special analysis open hearth product, cross grained, double rolled and annealed, giving it an ultimate tensile strength of 64,000 to 70,000 lbs. per sq. in. of section, and so chemically proportioned as to give it full working values under high temperature.

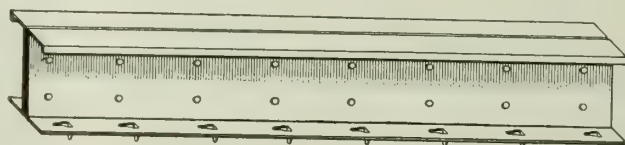
**DESIGN**—Over 30 years of experience in the manufacture and use of pressed steel, in all classes of building construction, has produced in Berger I-joists a section which is properly proportioned—a section which is not patterned after rolled steel shapes without regard to our knowledge of basic scientific principles. The proper relation of flanges to web, in order to realize the full working value of the steel within allowable and practicable limits, has been carefully worked out. Extensive physical, chemical and fire tests have been made to prove the accuracy of the design of section established as standard.

**USES**—The extensive use to which Berger's metal lumber pressed steel construction has been put, with unqualified success in every instance, has proved conclusively the merit which this construction possesses.

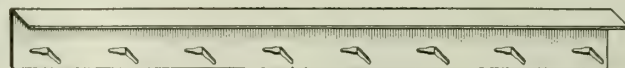
It has been used successfully and extensively in the construction of over 55 different classes of buildings, located in 40 different states and 8 foreign countries. It has been used by some of the largest industrial corporations of the country, as well as the Federal Government, in extensive building operations.

*Metal Lumber*  
TRADE-MARK

**ERECTION DIAGRAMS**—Erection diagrams are furnished in connection with the material, each member being marked and cut to size, thus making the matter of erection very simple.



I-JOISTS



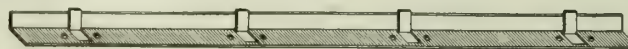
WALL RIBBON



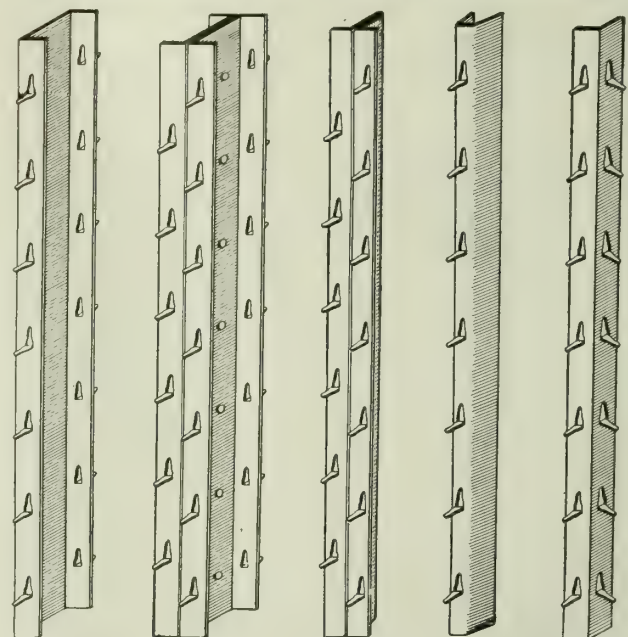
CHANNEL STUD TRACK



T-STUD SOCKET STRIP



U-STUD SOCKET STRIP



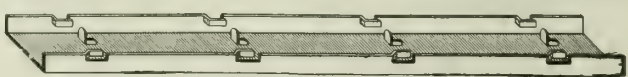
CHANNEL STUD

I-STUD

T-STUD

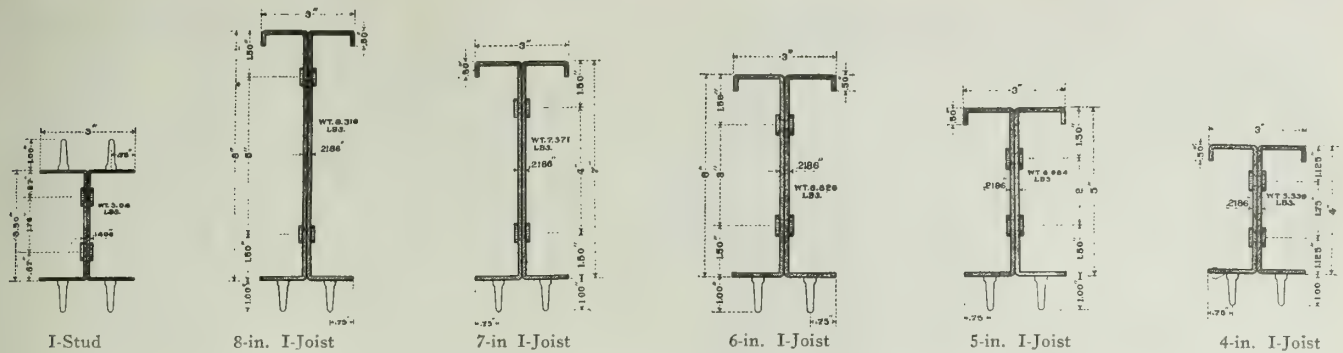
U-STUD

ANGLE STUD



CHANNEL STUD SOCKET STRIP





DIMENSIONS OF STANDARD I-JOIST AND I-STUD

TOTAL SAFE LOAD IN POUNDS UNIFORMLY DISTRIBUTED—BERGER'S METAL LUMBER I-JOISTS  
Safe Loads below are figured for Fiber Stress of 16,000 lbs. per sq. in. and include Weight of Joist

Depth, ins.	Gauge	4" Joist				5" Joist				6" Joist				7" Joist			
		16	15	14	12	16	15	14	12	16	15	14	12	16	15	14	12
Clear span in ft.	Wgt. per ft., lbs.	3.110	3.485	3.862	5.339	3.536	3.966	4.396	6.084	3.961	4.445	4.927	6.826	4.386	4.924	5.458	7.571
	4	2806	3133	3462	4719	3820	4273	4721	6460	4948	5538	6123	8400	6191	6931	7666	10537
	5	2245	2506	2769	3775	3056	3414	3777	5168	3959	4430	4891	6720	4953	5545	6133	8430
	6	1871	2088	2308	3146	2547	2846	3147	4307	3299	3692	4082	5600	4127	4621	5111	7025
	7	1603	1790	1978	2697	2183	2439	2698	3691	2828	3165	3499	4800	3538	3961	4381	6021
	8	1403	1566	1731	2360	1910	2134	2360	3230	2474	2769	3062	4200	3095	3466	3833	5269
	9	1247	1392	1538	2098	1698	1897	2098	2871	2199	2461	2721	3733	2751	3081	3407	4683
	10	1122	1253	1385	1888	1528	1707	1888	2584	1979	2215	2445	3360	2476	2773	3067	4215
	11	1020	1139	1259	1716	1389	1552	1717	2349	1799	2014	2227	3055	2251	2520	2788	3832
	12	935	1044	1154	1573	1274	1423	1574	2153	1649	1846	2041	2800	2064	2310	2555	3512
	13	863	964	1065	1452	1176	1313	1453	1988	1523	1704	1884	2585	1905	2133	2359	3242
Clear span in ft.	14	802	895	989	1348	1092	1220	1349	1846	1414	1582	1750	2400	1769	1980	2190	3011
	15	748	835	923	1259	1019	1138	1259	1723	1320	1477	1630	2240	1651	1848	2044	2810
	16	702	783	865	1180	955	1067	1180	1615	1237	1385	1531	2100	1548	1733	1917	2634
	17	660	737	814	1110	900	1004	1111	1520	1164	1303	1441	1977	1457	1631	1804	2479
	18	624	696	769	1049	849	949	1049	1436	1100	1231	1361	1867	1376	1540	1704	2342
	19	591	660	729	994	804	898	994	1360	1042	1166	1289	1768	1303	1459	1614	2218
	20	561	627	692	944	764	854	944	1292	990	1108	1223	1680	1238	1386	1533	2107
Clear span in ft.	Depth ins.	8" Joist				9" Joist				10" Joist				12" Joist			
	Gauge	16	15	14	12	16	15	14	12	16	15	14	12	16	15	14	12
	Wgt. per ft., lbs.	4.812	5.402	5.989	8.316	5.237	5.880	6.522	9.060	5.662	6.359	7.053	9.804	6.513	7.316	8.116	11.293
	4	7543	8451	9350	12871	9010	10097	11175	15403	10588	11868	13139	18129	14080	15789	17487	14174
	5	6035	6761	7480	10297	7208	8077	8940	12322	8471	9494	10512	14503	11264	12631	13990	19339
	6	5029	5634	6234	8581	6007	6731	7450	10269	7059	7912	8760	12086	9387	10526	11658	16116
	7	4311	4829	5243	7355	5149	5769	6385	8802	6050	6782	7508	10359	8046	9022	9993	13814
	8	3772	4225	4675	6436	4505	5048	5587	7701	5294	5934	6570	9064	7040	7894	8743	12087
	9	3353	3756	4156	5721	4004	4487	4966	6846	4706	5275	5840	8057	6258	7017	7772	10744
	10	3017	3380	3740	5149	3604	4039	4470	6161	4235	4747	5256	7251	5632	6315	6995	9669
	11	2743	3073	3400	4681	3276	3671	4064	5601	3850	4316	4778	6592	5120	5741	6359	8790
	12	2514	2817	3117	4290	3003	3366	3725	5134	3529	3956	4380	6043	4693	5263	5829	8058
Clear span in ft.	13	2321	2600	2877	3960	2772	3107	3438	4739	3258	3652	4043	5578	4332	4858	5381	7438
	14	2155	2415	2672	3678	2574	2885	3193	4401	3025	3391	3754	5180	4023	4511	4996	6907
	15	2012	2254	2493	3433	2403	2692	2980	4107	2824	3165	3504	4834	3755	4210	4663	6446
	16	1886	2113	2338	3218	2252	2524	2794	3851	2647	2967	3285	4532	3520	3947	4372	6043
	17	1775	1988	2200	3029	2120	2376	2629	3624	2491	2792	3092	4266	3313	3715	4145	5688
	18	1676	1878	2078	2860	2002	2244	2483	3423	2353	2637	2920	4029	3129	3509	3886	5372
	19	1588	1779	1969	2710	1897	2126	2353	3243	2229	2499	2766	3817	2964	3324	3682	5089
	20	1509	1690	1870	2575	1802	2019	2235	3081	2118	2374	2628	3626	2816	3158	3497	4835

NOTE—For loads below heavy horizontal line deflection will be greater than the allowable limit for plastered ceiling (i. e., 1/360 span)  
No. 15-gauge and No. 12-gauge joists are standard. Furnished from stock. Lengths over 16 ft. 8 ins. require splices.

SAFE LOAD IN POUNDS—BERGER'S METAL LUMBER I-STUDS  
Gordon's Formula  $P = \frac{50000}{1 + (12L)^2}$  Safety Factor 4  
36000r<sup>2</sup>

Depth, ins.	Gauge	Weight per ft., lbs.	Area of section, sq. in.	Length in ft.											
				3	4	5	6	7	8	9	10	11	12	13	14
2	16	2.073	.6094	7239	6966	6658	6303	5933	5557	5184	4823	4478	4153	3849	3567
	15	2.325	.6833	8115	7817	7458	7058	6642	6219	5800	5394	5006	4641	4300	3974
	14	2.575	.7568	8985	8647	8284	7807	7344	6873	6407	5957	5527	5122	4744	4394
	12	3.559	1.0459	12397	11918	11353	10731	10080	9419	8768	8140	7541	6980	6457	5974
2½	16	2.286	.6719	8117	7910	7660	7374	7063	6735	6399	6060	5726	5399	5083	4782
	15	2.570	.7536	9103	8870	8587	8266	7915	7546	7167	6787	6410	6043	5689	5350
	14	2.841	.8350	10082	9823	9509	9150	8761	8350	7929	7506	7088	6680	6300	5912
	12	3.931	1.1552	13939	13572	13127	12622	12073	11496	10906	10314	9730	9161	8612	8093
3	16	2.498	.7344	8954	8787	8581	8343	8078	7794	7491	7181	6868	6554	6244	5941
	15	2.837	.8240	10047	9859	9627	9356	9059	8737	8398	8050	7697	7344	6996	6654
	14	3.107	.9131	11132	10922	10689	10365	10032	9674	9298	8910	8518	8126	7739	7361
	12	4.303	1.2646	15410	15114	14750	14324	13860	13356	12828	12285	11735	11187	10647	10119
3½	16	2.711	.7969	9774	9634	9460	9256	9026	8751	8505	8222	7932	7636	7339	7043
	15	3.043	.8943	10969	10811	10615	10385	10125	9841	9538	9221	8894	8561	8227	7894
	14	3.373	.9912	12157	11982	11763	11507	11218	10902	10565	10212	9848	9479	9107	8737
	12	4.676	1.3740	16845	16596	16289	15927	15520	15075	14601	14105	13595	13076	12556	12039
4	16	2.924	.8594	10828	10641	10310	10131	9928	9704	9461	9204	8933	8659	8377	8093
	15	3.282	.9646	11878	11743	11573	11371	11142	10890	10616	10327	10025	9713	9401	9076
	14	3.639	1.0693	13167	13016	12827	12603	12348	12067	11764	11441	11106	10760	10407	10052
	12	5.048	1.4834	18261	18049	17782	17467	17109	16713	16286	15834	15363	14878	14385	13887

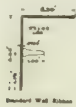


CHANNEL STUD A.

DATA, CHANNEL STUDS "B"  
FOR SOLID AND HOLLOW  
PARTITIONS

Size, ins.	Gauge	Weight per ft., lbs.	
		Black	Galvanized
1 1/2	20	.37	.41
2	20	.44	.48
2 1/2	20	.50	.55
3	20	.56	.62
3 1/2	20	.62	.69
4	20	.69	.76
1 1/2	18	.50	.54
2	18	.58	.63
2 1/2	18	.67	.72
3	18	.75	.81
3 1/2	18	.83	.90
4	18	.92	.99

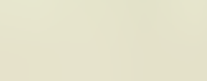
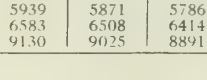
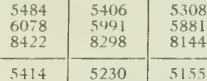
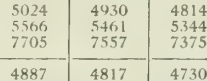
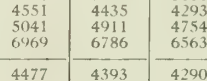
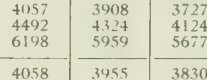
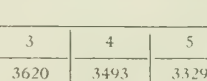
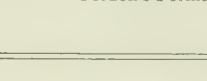
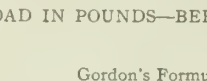
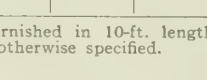
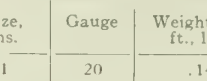
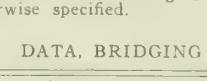
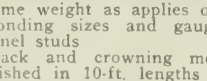
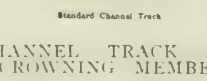
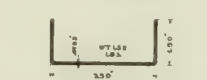
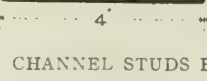
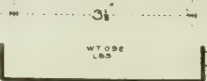
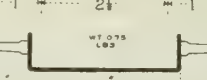
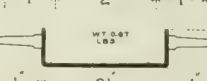
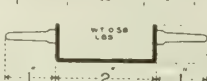
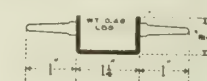
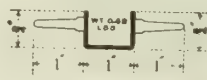
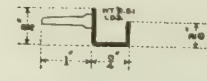
Lengths over 12 ft. require splices.



WALL RIBBON

Size, ins.	Gauge	Weight per ft., lbs.
3 1/2 x 2 1/2	15	1.42
3 1/2 x 2 1/2	14	1.57
3 1/2 x 2 1/2	12	2.20

Furnished in 10-ft. lengths unless otherwise specified.

STANDARD  
CHANNEL  
STUD

CHANNEL STUDS B.

CHANNEL TRACK AND  
CROWNING MEMBER

Same weight as applies on corresponding sizes and gauges of channel studs.  
Track and crowning members furnished in 10-ft. lengths unless otherwise specified.

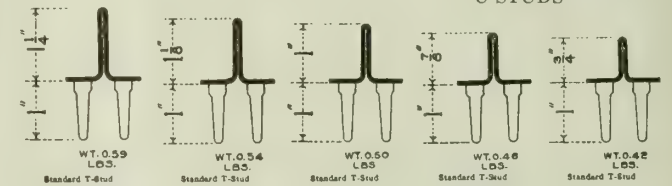
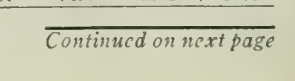
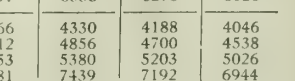
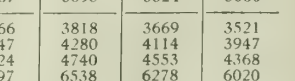
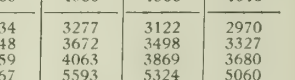
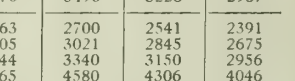
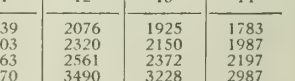
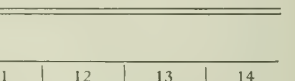
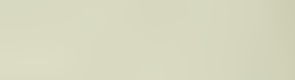
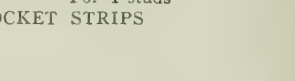
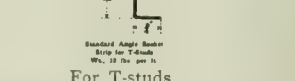
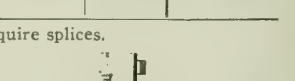
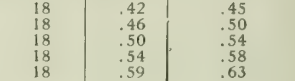
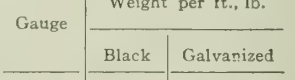
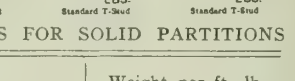
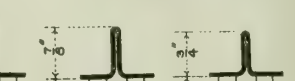
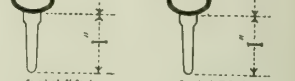
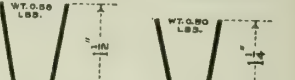
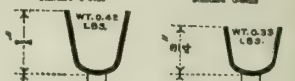
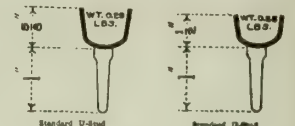
## DATA, BRIDGING

Size, ins.	Gauge	Weight per ft., lbs.
1	20	.14

Furnished in 10-ft. lengths unless otherwise specified.

## DATA, U-STUDS

Size, ins.	Gauge	Weight per ft., lbs.	
		Black	Galvanized
1 1/2	20	.19	.21
2	20	.22	.24
2 1/2	20	.25	.28
3	20	.31	.35
3 1/2	20	.38	.41
4	20	.44	.48
1 1/2	18	.24	.27
2	18	.29	.32
2 1/2	18	.33	.36
3	18	.42	.45
3 1/2	18	.50	.54
4	18	.59	.63
1 1/2	16	.31	.33
2	16	.37	.39
2 1/2	16	.42	.44
3	16	.52	.55
3 1/2	16	.63	.66
4	16	.73	.77
1 1/2	14	.83	.88
2	14	.94	1.00



STANDARD SECTIONS OF T-STUDS FOR SOLID PARTITIONS

Size, ins.	Gauge	Weight per ft., lb.		Gauge	Weight per ft., lb.	
		Black	Galvanized		Black	Galvanized
3/4	20	.31	.35	18	.42	.45
1 1/8	20	.34	.38	18	.46	.50
1 1/4	20	.38	.42	18	.50	.54
1 1/2	20	.41	.45	18	.54	.58
1 3/4	20	.44	.48	18	.59	.63

Lengths over 12 ft. require splices.

For U-studs  
STANDARD ANGLE SOCKET  
STRIPSFor T-studs  
STANDARD ANGLE SOCKET  
STRIPS

## SAFE LOAD IN POUNDS—BERGER'S METAL LUMBER CHANNEL STUDS

50000

Gordon's Formula  $P = \frac{1}{1+(12L)^2}$ 

Safety Factor 4

36000r<sup>2</sup>

Depth, ins.	Gauge	Weight per ft., lbs.	Area of section, sq. in.	Length in ft.											
				3	4	5	6	7	8	9	10	11	12	13	14
2	16	1.037	.3047	3620	3493	3329	3151	2966	2778	2592	2411	2239	2076	1925	1783
	15	1.163	.3416	4057	3908	3727	3529	3321	3110	2900	2697	2503	2320	2150	1987
	14	1.288	.3784	4492	4324	4124	3903	3672	3437	3203	2978	2763	2561	2372	2197
	12	1.779	.5229	6198	5959	5677	5365	5040	4710	4384	4070	3770	3490	3228	2987
2½	16	1.143	.3359	4058	3955	3830	3687	3531	3368	3200	3030	2863	2700	2541	2391
	15	1.285	.3768	4551	4435	4293	4133	3957	3773	3583	3393	3205	3021	2845	2675
	14	1.420	.4175	5041	4911	4754	4575	4380	4175	3964	3753	3544	3340	3150	2956
	12	1.966	.5776	6969	6786	6563	6311	6036	5748	5453	5157	4865	4580	4306	4046
3	16	1.249	.3672	4477	4393	4290	4171	4039	3897	3745	3590	3434	3277	3122	2970
	15	1.419	.4120	5024	4930	4814	4678	4530	4368	4199	4025	3848	3672	3498	3327
	14	1.554	.4565	5566	5461	5344	5182	5016	4837	4649	4455	4259	4063	3869	3680
	12	2.152	.6323	7705	7557	7375	7162	6930	6678	6414	6142	5867	5593	5324	5060
3½	16	1.356	.3984	4887	4817	4730	4628	4513	4375	4252	4111	3966	3818	3669	3521
	15	1.522	.4471	5484	5406	5308	5192	5062	4920	4769	4611	4447	4280	4114	3947
	14	1.686	.4956	6078	5991	5881	5753	5609	5451	5282	5106	4924	4740	4553	4368
	12	2.338	.6870	8422	8298	8144	7863	7760	7537	7300	7052	6797	6538	6278	6020
4	16	1.462	.4297	5414	5230	5155	5066	4964	4852	4730	4602	4466	4330	4188	4046
	15	1.641	.4823	5939	5871	5786	5685	5571	5445	5308	5163	5012	4856	4700	4538
	14	1.819	.5347	6583	6508	6414	6301	6174	6033	5882	5720	5553	5380	5203	5026
	12	2.524	.7417	9130	9025	8891	8733	8554	8356	8143	7917	7681	7439	7192	6944

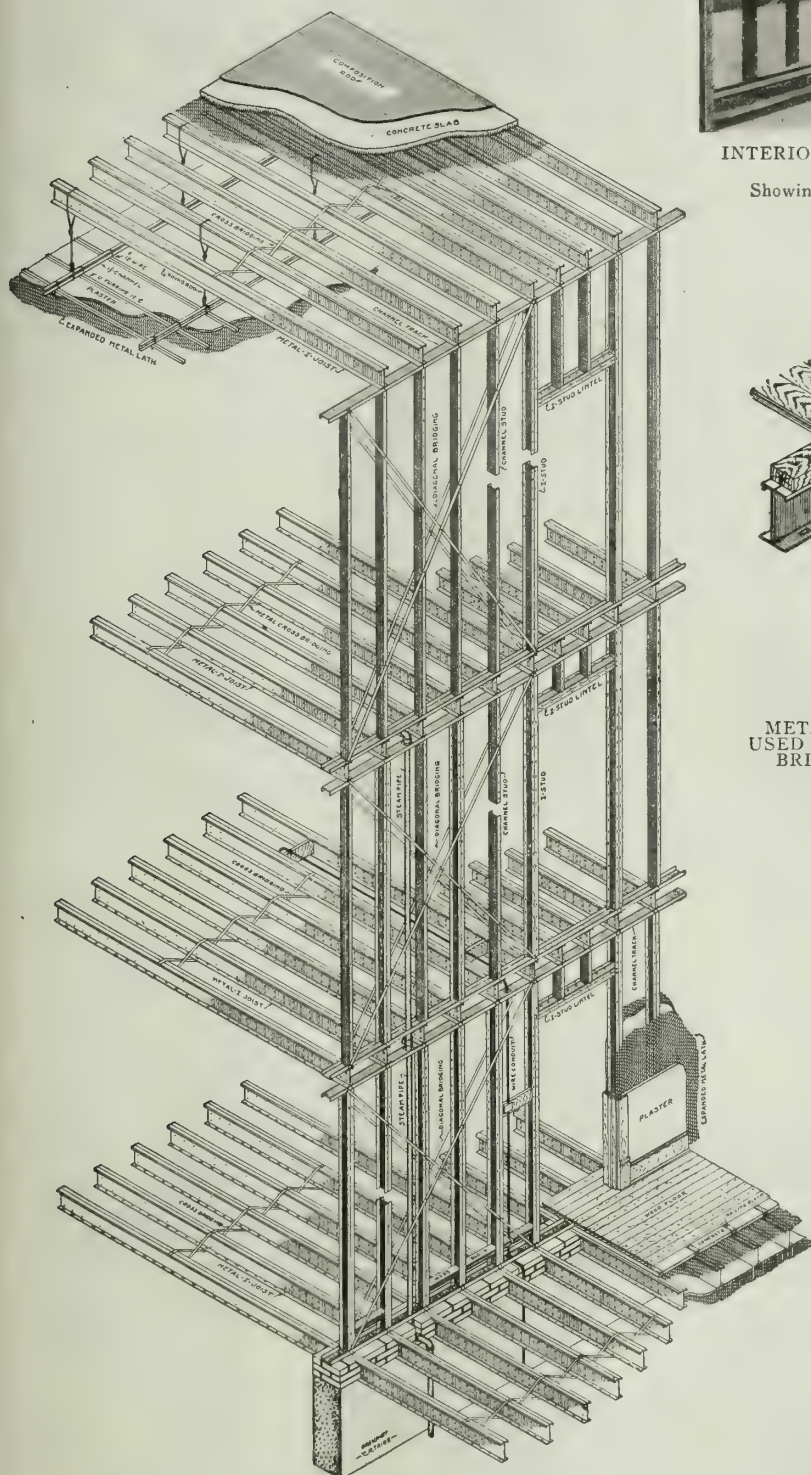


**Berger's Standard Metal Lumber Pressed Steel Construction (Patented).**

Total dead load per square foot, less than 40 lbs. I-joists spaced 16 ins. center to center with No. 25 gauge expanded metal lath on top and bottom flanges. Joists are diagonally bridged with 1-in. No. 20 galvanized steel bridging.

On top of joists 2 by 2-in. nailing blocks are placed and securely nailed into web. Space between nailing blocks filled with 1:3:6 concrete on top of lath without forms.

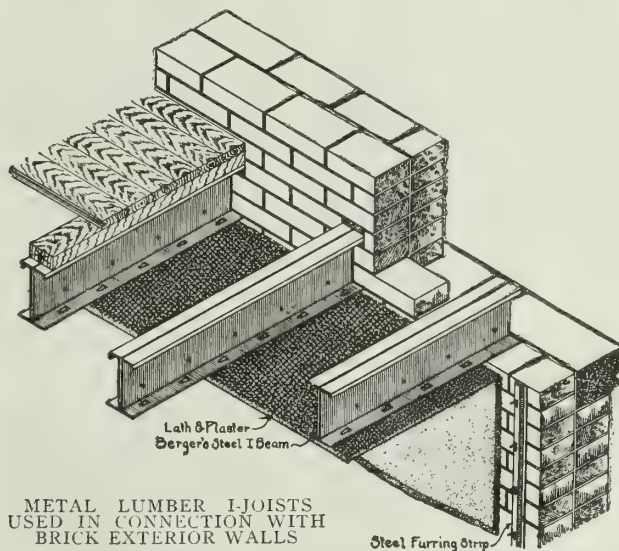
This is standard construction, and may be finished with wood, concrete, tile or any finish wearing surface desired.



TYPICAL CORRIDOR SUPPORTING PARTITION CONSTRUCTION

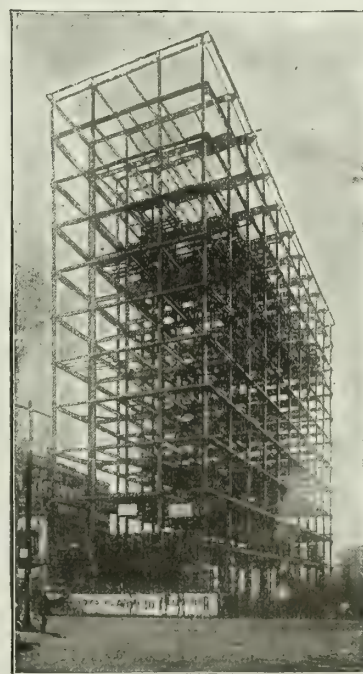


INTERIOR VIEW OF COURTLAND APARTMENT BUILDING, LOUISVILLE, KY.  
Showing metal lumber supporting partitions, I-joist and bridging



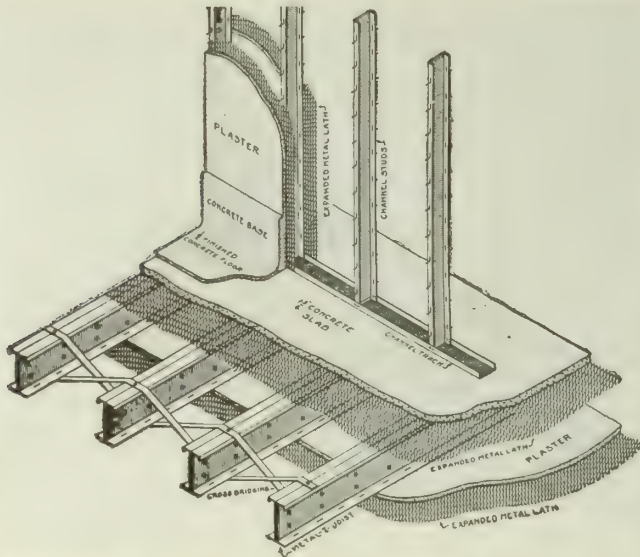
METAL LUMBER I-JOISTS  
USED IN CONNECTION WITH  
BRICK EXTERIOR WALLS

Steel Furring Strip

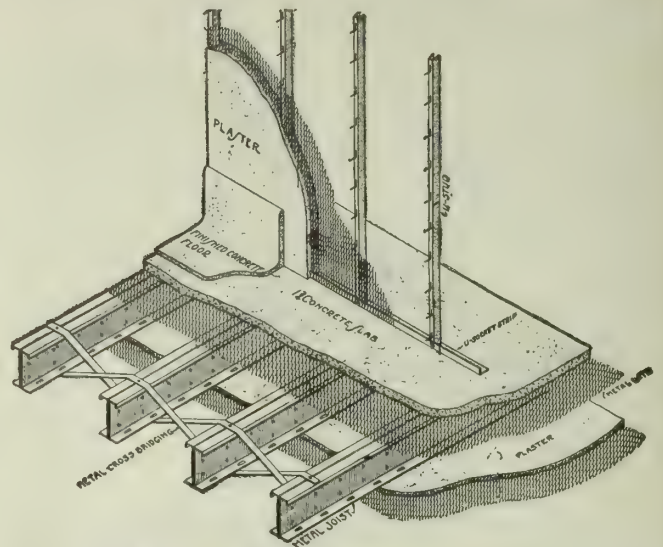


THE RENKERT BUILDING, CANTON, OHIO

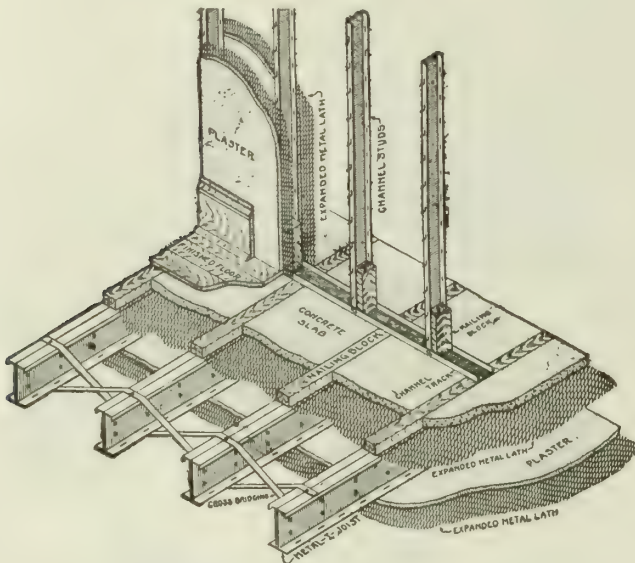




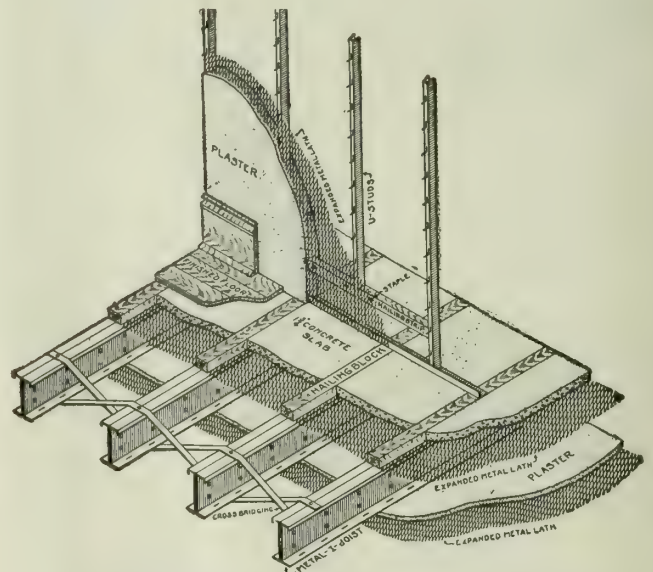
Non-supporting Channel Stud Partitions Resting on Rough Concrete Slab. Finished Floor and Base to be Concrete



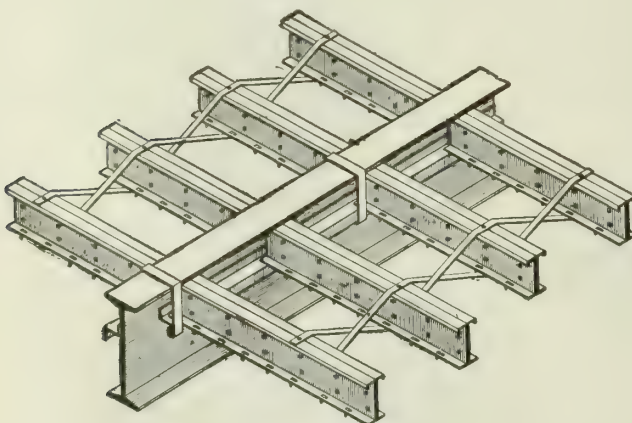
U-stud Solid Partitions in Connection with Concrete Base and Cement Finish Floor Surface



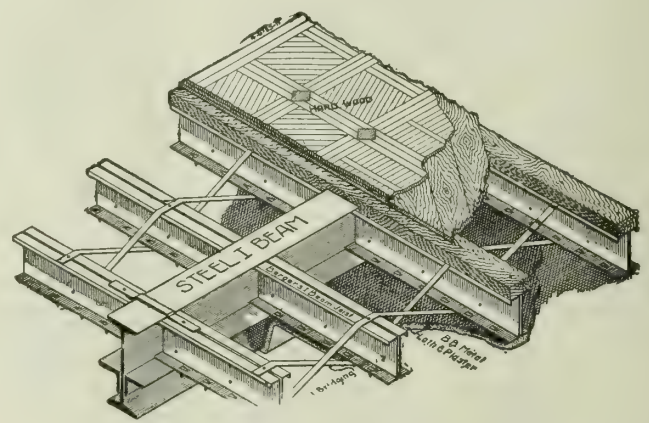
Non-supporting Channel Stud Partition Resting on Concrete Slab  
Note nailing strip applied directly to top of joists, and blocks inserted in partition by which to secure wood base



Non-supporting U-stud Partition Resting on Concrete Slab  
Note nailing strip applied directly to top of joists, and blocks inserted in partition by which to secure wood base



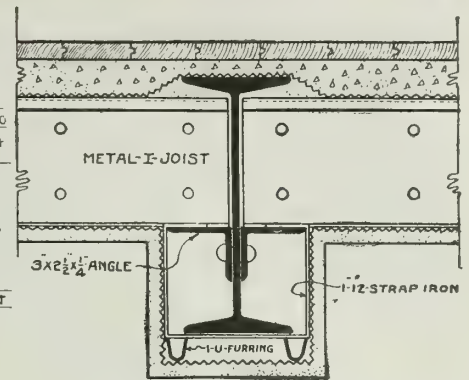
Steel Joists Supported by I-beams and Pressed Steel Z-bar Joist Hangers  
These hangers are very efficient and reduce the cost over shelf angles riveted directly to the beams



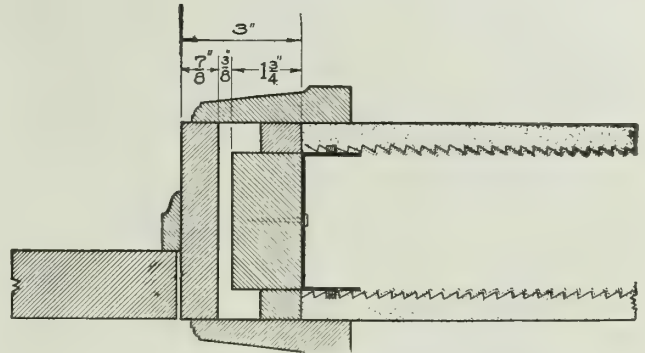
Without Concrete Base, the Wood Subfloor Secured to Joists by Means of Nailing Strips  
This construction costs less, but is less efficient from a fireproof and soundproof standpoint

DETAILS OF STANDARD METAL LUMBER FLOOR CONSTRUCTION

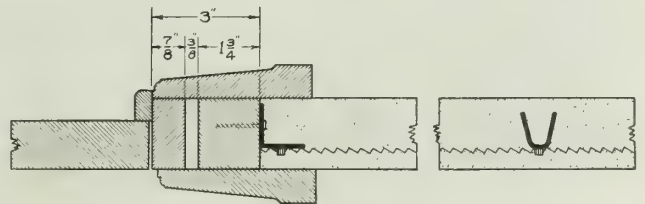




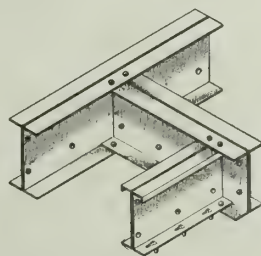
SECTION THROUGH BEAM



DETAIL SHOWING CONSTRUCTION OF DOOR JAMB FOR BERGER'S SUPPORTING PARTITION WHERE CHANNEL STUDS ARE USED AT JAMB

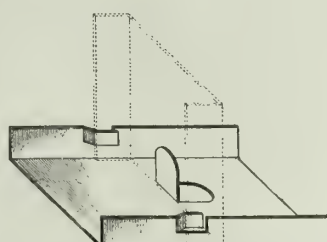


DETAIL SHOWING CONSTRUCTION OF DOOR JAMB FOR  
BERGER'S NON-SUPPORTING U-STUD PARTITIONS WITH  
ANGLE STUD USED AT JAMB



A technical drawing showing a cross-section of a mechanical assembly. It consists of a base plate with two circular holes. A vertical rectangular block is positioned on the left side of the base plate. A horizontal rectangular block is positioned on the right side of the base plate. Dashed lines indicate the alignment and dimensions of the blocks relative to the base plate.

### DETAIL OF SOCKET STRIP AND U-STUD CONNECTION



### DETAIL OF SOCKET STRIP AND T-STUD CONNECTION

## Metal Lumber Specifications.

**GENERAL**—Where pressed steel construction is called for on plans and specifications, it means material equal to that manufactured by THE BERGER MANUFACTURING Co. of Canton, Ohio.

Any system of pressed steel construction desired to be used as an equal to that specified above must be accompanied with official, authentic report of fire, load and water test—same having been made by competent, disinterested authorities—showing the construction capable of sustaining a live load of 150 lbs. per sq. ft., under a temperature of 1700° Fahr. for 4 hours, after which water is applied at a pressure of 60 lbs. per sq. in. at the nozzle, and the structure then loaded to 600 lbs. per sq. ft., with a deflection of not more than 2½ ins. on 12-ft. spans.

Steel used in the manufacture of joists and studs must not contain more than .04 of 1% of phosphorus and sulphur, and must show on chemical analysis .14 to .17 of 1% carbon. Steel must be rolled with a double grain, and annealed at not less than 1400° Fahr. before forming.

Gauges of steel used in joists and studs in supporting partitions shall in no case be less than No. 15 U. S. standard and the lath not less than No. 25 U. S. standard. All steel entering into the manufacture of joists must show an ultimate tensile strength of not less than 64,000 lbs. per sq. in. of section; a percentage of elongation equal to 1,400,000 divided by the ultimate strength and an elastic limit of not less than one-half the ultimate strength. In no case will the flanges of the pressed steel joist sections be permitted to contribute more than 60% of the resisting inches of the total section.

Full facilities must be provided for inspector to make, or have made, such physical or chemical tests as in his judgment are necessary to determine the quality of material used as specified above.

All pressed steel construction for floors and supporting partitions must be provided in connection with erection drawings showing the location, size and character of the members to be used, and submitted to the architect for approval before the material is installed.

All metal lumber pressed steel sections to be given 2 coats of hand dipped paint in graphite and linseed oil, consisting of from 5 to 8 lbs. of graphite to 1 gal. linseed oil. All expanded metal lath to be given 1 coat of hand dipped paint.

**FLOORS**—Floors to be constructed of size and gauge of pressed steel I-joists, as shown on drawings, spaced 16 ins. center to center, and bridged laterally every one-third length of span with 1-in. No. 20 gauge galvanized bridging. This bridging to be secured by 10d nails driven into webs of the joists.

On top of joists, after bridging has been applied, attach No. 25 gauge painted expanded metal lath, securing same by large head nails driven directly into web of joists. Ceiling lath to be applied to the bottom flange by means of prongs provided for the purpose. Directly on top of joists and parallel thereto apply 2 by 2-in. wood nailing strips, same being secured to joists by nailing directly thereto.

Top layer of lath to be covered with 2 ins. of concrete, consisting of 1 part cement, 2½ parts sand and 5 parts broken stone or clean gravel—the maximum size of which will pass through a ¾-in. ring. This concrete to be applied comparatively dry and directly on top of the lath without forms, same being floated to an even surface.

Where floors are used, requiring other than wood finished surface, eliminate the 2 by 2-in. nailing strips, and apply 2 ins. of concrete slab directly on top of the lath, consisting of 1 part cement, 2 parts sand and 4 parts gravel or broken stone. This slab to serve as a base for any finish floor which may be called for under other specifications.

**ROOF CONSTRUCTION**—The roof construction is the same as specified for the floors, using the 2-in. concrete slab on top of joists without nailing blocks. This slab to be left comparatively rough in order to thoroughly bond the waterproofing surface, which will be applied under another contract.

**SUSPENDED CEILING**—Suspended ceilings are to be constructed of 1-in. No. 20-gauge prong lock U-furring strips spaced 12 ins., center to center, and secured to 1½-in. pressed steel channel runners spaced 3 ft. 6 ins., center to center, which in turn are suspended from the roof construction by means of 3/16-in. round rods, galvanized, and securely fastened thereto

and spaced 3 ft. 6 ins., center to center, along channel runners. The furring is to be secured to channel runners by means of No. 12-gauge wire clips provided for this purpose. Apply No. 25-gauge painted expanded metal lath to the U-furring by means of prongs punched therefrom—these prongs being bent over in a manner that will hold the lath securely.

This ceiling construction is designed to support a safe live load of 25 lbs. per sq. ft.

**BEAM AND COLUMN FURRING**—Beam and column covering to consist of 1-in. No. 20-gauge U-furring strip, secured to the column by 1-in. No. 12-gauge strap iron, spaced 3 ft. 6 ins., center to center, and covered with No. 25-gauge painted expanded metal lath, secured to furring by means of prongs provided for the purpose. Care to be exercised in forming the column so that size and shape, when plastered, will conform to that shown in drawings.

**SUPPORTING PARTITIONS**—Where partitions are required to support floor loads, same are to consist of channel or I-stud sections of sufficient strength to carry, with a safety factor of 4, the load of the floor supported thereby. Studs are to be spaced not over 16 ins., center to center, and secured to channel track and crowning members at floor and ceiling line with ¼-in. diameter rivets. In no case will other devices be permitted to serve as connections for the pressed steel construction.

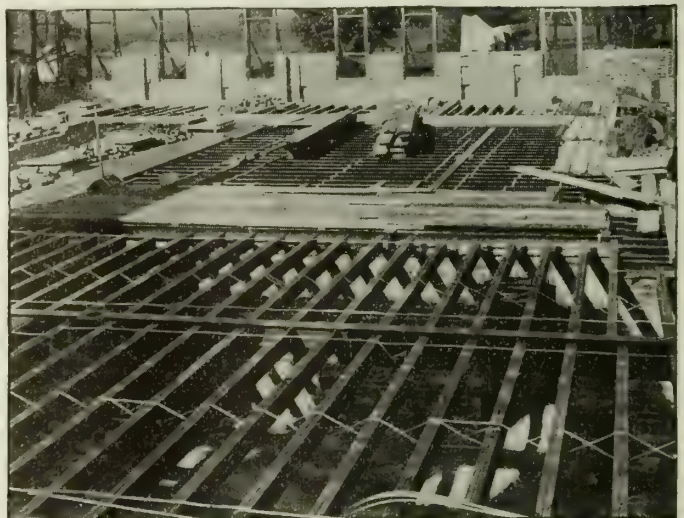
The lath will be applied to the flanges of channels by the prongs punched therefrom.

Where openings occur, such as doors and windows, same will be provided with special I-lintels of the proper size to carry superimposed loads which may come over these openings.

Partitions are to be erected in strict accordance with detailed erection drawings provided by the manufacturer and approved by the architect.

**NON-SUPPORTING, HOLLOW CHANNEL STUD PARTITIONS**—Where partitions are shown hollow, with metal lath both sides of studs, the depth of studs being 2 ins. or more, same are to consist of size of channels shown in plan, spaced 13½ ins., center to center, secured to both floor and ceiling by channel socket strips punched with sockets to receive them. No. 25-gauge painted expanded metal lath is secured to the studs by means of prongs punched out for that purpose, the prongs being clinched over the metal lath.

**NON-SUPPORTING PARTITIONS**—For 2-in. solid metal lath and plaster. The 2-in. partitions, where noted on drawings, are composed of 1-in. No. 18-gauge U-studs, spaced 13½ ins., center to center, secured to both floor and ceiling by means of angle socket strips punched with sockets to set studs in. No. 25-gauge painted expanded metal lath is secured to studs on one side only by means of prongs punched out for that purpose, prongs being clinched over the metal lath.



COTTAGE AT STATE HOSPITAL, TOLEDO, OHIO  
Showing metal lumber floor construction before lath and concrete are applied



SYMONS CLAMP CO.

Bar-ties and Column Clamps

2219-2239 South Halsted Street

CHICAGO, ILL.

Products.

SYMONS PLAIN BAR-TIES; SYMONS BAR-TIE SUPPORTS; SYMONS COLUMN CLAMPS.

Symons Bar-ties.

Made of high carbon spring wire. Locks the bars rigidly together. Provides a quick and economical way of tying reinforcement bars together.

The Symons ties are applied at one-fourth the labor cost of ordinary method of tying, and they are infinitely better. A green man, a day laborer, can tie together twenty intersecting bars per minute from the start.

The Symons ties are suitable for tying together intersecting bars, whether rounds, squares, square twisted or deformed, or any combination of one style with another. Only two sizes are required for fourteen different combinations in sizes of bars.

TYPES—(1) Symons Plain Bar-tie, used for tying intersecting reinforcing bars. (2) Symons Bar-tie Support, used for



APPLICATION OF PLAIN BAR-TIES

SIZES AND PRICES OF SYMONS PLAIN BAR-TIES

	List price per 1,000
SIZE NO. 1—For tying two intersecting bars, the combined diameter of which is not greater than 1 in., as follows: $\frac{3}{8}$ "x $\frac{1}{4}$ ", $\frac{3}{8}$ "x $\frac{3}{8}$ ", $\frac{1}{2}$ "x $\frac{1}{4}$ ", $\frac{1}{2}$ "x $\frac{3}{8}$ ", $\frac{1}{2}$ "x $\frac{1}{2}$ ".....	\$3.30
SIZE NO. 2—For tying two intersecting bars, the combined diameter of which is not less than 1 in. nor greater than 1 $\frac{3}{8}$ ins., as follows: $\frac{1}{2}$ "x $\frac{1}{2}$ ", $\frac{5}{8}$ "x $\frac{1}{4}$ ", $\frac{5}{8}$ "x $\frac{3}{8}$ ", $\frac{5}{8}$ "x $\frac{1}{2}$ ", $\frac{5}{8}$ "x $\frac{5}{8}$ ", $\frac{3}{4}$ "x $\frac{3}{8}$ ", $\frac{3}{4}$ "x $\frac{1}{2}$ ", $\frac{3}{4}$ "x $\frac{5}{8}$ ".	3.85
SIZE NO. 3—For tying any two intersecting bars, the combined diameter of which is not less than 1 $\frac{1}{4}$ ins. nor more than 1 $\frac{5}{8}$ ins., as follows: $\frac{3}{4}$ "x $\frac{1}{2}$ ", $\frac{3}{4}$ "x $\frac{3}{8}$ ", $\frac{3}{4}$ "x $\frac{1}{4}$ ", $\frac{7}{8}$ "x $\frac{3}{8}$ ", $\frac{7}{8}$ "x $\frac{1}{2}$ ", $\frac{7}{8}$ "x $\frac{5}{8}$ ", $\frac{7}{8}$ "x $\frac{3}{4}$ ", 1"x $\frac{3}{8}$ ", 1"x $\frac{1}{2}$ ", 1"x $\frac{3}{8}$ ".	4.50

SIZES AND PRICES OF SYMONS BAR-TIE SUPPORTS

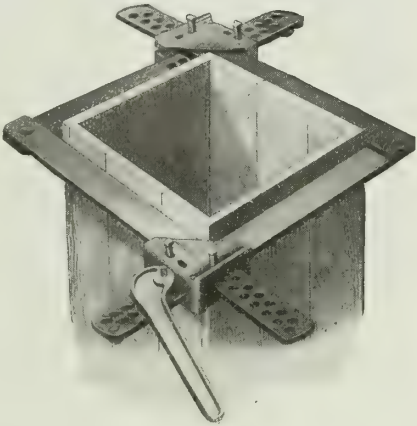
SIZE NO. 1—For tying and supporting any two intersecting bars, the combined diameter of which is not greater than 1 in., as follows: $\frac{1}{2}$ "x $\frac{1}{4}$ ", $\frac{1}{2}$ "x $\frac{3}{8}$ ", $\frac{1}{2}$ "x $\frac{1}{2}$ ", $\frac{5}{8}$ "x $\frac{1}{4}$ ", $\frac{5}{8}$ "x $\frac{3}{8}$ ", $\frac{3}{4}$ "x $\frac{1}{4}$ ".....	\$6.00
SIZE NO. 2—For tying and supporting two intersecting bars, the combined diameter of which is not less than 1 $\frac{1}{8}$ ins. nor more than 1 $\frac{3}{8}$ ins., as follows: $\frac{5}{8}$ "x $\frac{1}{2}$ ", $\frac{5}{8}$ "x $\frac{3}{8}$ ", $\frac{3}{4}$ "x $\frac{3}{8}$ ", $\frac{3}{4}$ "x $\frac{1}{2}$ ", $\frac{3}{4}$ "x $\frac{5}{8}$ ", $\frac{7}{8}$ "x $\frac{3}{4}$ ", $\frac{7}{8}$ "x $\frac{1}{2}$ ", 1"x $\frac{3}{8}$ ".	6.50

tying intersecting reinforcing bars and also to support the reinforcing bars at a uniform distance from the forms.

Symons Column Clamps.

Made in mild steel for both square and rectangular columns. The clamp squares the form. Does the work of two wooden clamps. No bolts, no nuts, no battered threads. One size clamp suitable for every column on the job. No detachable parts to become lost. Rivet head prevents malleable casting being lost. Adjustable to smallest fraction. The Symons clamps, being complete in themselves, may (at least one-half of them) be removed from a column form within a few hours after pouring and used to set up on the next floor. By the time the men are ready to pour the next floor the remainder of the clamps can be removed from the columns in floor below.

RENTAL PROPOSITION—Symons clamps can be rented as long as they are needed, with a ninety-day purchase option; in case purchase is made, all paid rentals apply on purchase price. Clamps may be returned if purchase is not desired. A sample clamp will be furnished on request.



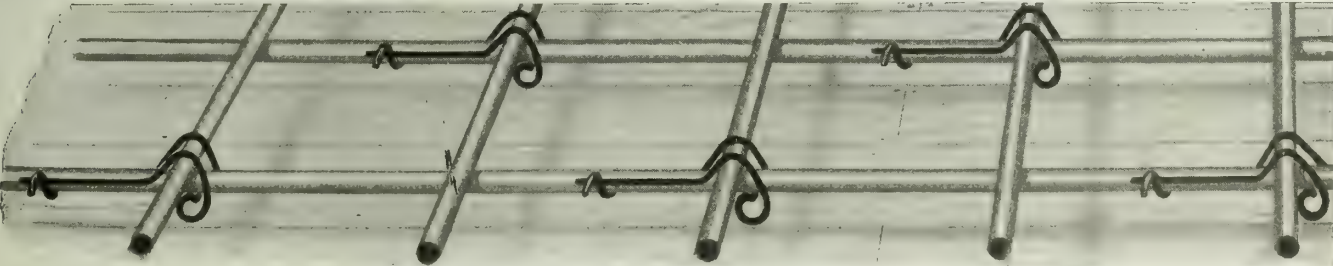
APPLICATION OF SYMONS COLUMN CLAMPS

SIZES AND SPECIFICATIONS OF SYMONS COLUMN CLAMPS

Size of clamp*	Arms (mild steel)	Adjustment	Size of columns (square or rectangular) for which clamps are suitable Size is net of concrete
30"x30"	2 "x $\frac{1}{8}$ "x30"	14"	20"x20" to 9"x9"
36"x36"	2 "x $\frac{1}{8}$ "x36"	17"	25"x25" to 12"x12"
44"x44"	2 $\frac{1}{2}$ "x $\frac{3}{8}$ "x44"	20"	32"x32" to 14"x14"
48"x48"	2 $\frac{1}{2}$ "x $\frac{3}{8}$ "x48"	22"	36"x36" to 17"x17"
60"x60"	3 "x $\frac{3}{8}$ "x60"	24"	48"x48" to 24"x24"

For further adjustment there are sleeves that fit over the clamp arms, making large clamps suitable for smallest columns, or for long, narrow, rectangular columns.

Above specifications are for column forms made of 2-in. boards. With 1-in. boards 30-in. size is suitable for columns 22 x 22 ins. down to 11 x 11 ins., etc.  
\* "Size of clamp" indicates length of clamp arm only. Does not mean size of column for which clamp is suitable.



APPLICATION OF SYMONS BAR-TIE SUPPORTS IN FLOOR CONSTRUCTION

FOUNDED 1880

# THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street  
 PITTSBURGH, PA., Oliver Building  
 CHICAGO, ILL., 208 South La Salle Street

SAN FRANCISCO, CAL., Monadnock Building  
 PORTLAND, ORE., THE COLBY ENGINEERING CO.  
 MONTREAL, CANADA, 145 St. James Street

## Products.

Manufacturers of "FERROINCLAVE,"  
 a Patent Sheet Steel Reinforcement for  
 concrete.

All kinds of Hoisting Machinery.



After cement on upper side has set,  
 under side should be coated with mortar  
 composed of 1 part Portland cement to 2

## Description.

"Ferroinclave" is a box annealed steel sheet with dovetail corrugations,  $\frac{1}{2}$  in. in depth or height, which are inversely tapered, permitting the large ends of corrugations of one sheet to fit or "shingle" over and into the small ends of corrugations of another sheet. This forms a tight joint and practically makes one continuous sheet.

Sheets for ridges or valleys of roofs are made with non-tapering corrugations.

## Advantages.

(1) Lightest reinforced concrete construction. (2) Strongest for a given thickness and span. (3) Erected without forms. (4) Sheets are waterproof and building can be used before concrete is applied. (5) Sheets are laid entirely from upper side. (6) Sheets easily handled. (7) Under side is smooth and white and serves as a ceiling.

## Details for Roofing.

"Ferroinclave" is laid in the same manner as ordinary corrugated iron roofing. The purlins, I-beams, channels or Z-bars may be spaced any distance up to 9 ft. 9 ins.

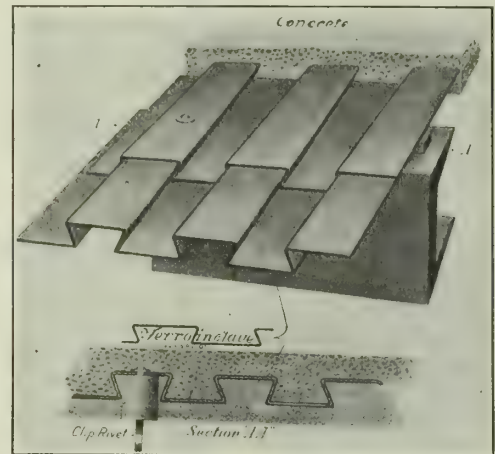
The standard size "Ferroinclave" sheets are 10 ft. long, and purlins must be so spaced that the lap (usually 3 ins. or more) of the sheets comes on one of them. A spacing of 4 ft.  $10\frac{1}{2}$  ins. is most economical, as it allows the use of sheets 10 ft. long and requires a minimum of concrete and erecting labor.

"Ferroinclave" sheets should be laid on hardwood strips,  $\frac{3}{8}$  in. square, placed along the tops of the purlins, thereby preventing corrosion. As the sheets are laid they should be secured to the purlin at intervals of 10 ins. with clips furnished with the sheets. The side laps are fastened with our special cross-ties, spaced about 2 ft. apart.

## Mortar Mixture.

When the "Ferroinclave" is secured in place, the upper side should be coated with a mixture of 1 part Portland cement to 2 to 3 parts of sand, or 1 part Portland cement, 2 parts sand and 4 parts of stone or gravel. The coating should be  $\frac{1}{2}$  in. in thickness above tops of corrugations when purlins spacing does not exceed 5 ft.

Tables of safe loads will be furnished on application.



"FERROINCLAVE" ROOF, FLAT FLOOR OR SIDING, ETC.

or 3 parts sand, with small amount of hair. Mortar to be  $\frac{3}{8}$  in. thick, applied in 3 consecutive coats—second and third applied before preceding one dries or sets. Waterproof covering should be used on top of roof.

## Weight and Cost.

Weight of complete roof (without waterproof covering),  $1\frac{3}{8}$  ins. thick, is about 16 lbs. per sq. ft. This kind of roof (with purlins not more than 5 ft. apart) will support a uniform load of 300 lbs. per sq. ft. after 10 days, and costs \$15.00 to \$17.00 per 100 sq. ft., including freight, labor and material.

## Sidings and Partitions.

Construction is practically the same as that for roofs.

## Stairways.

Sheets are bent so that tread and riser are formed by one sheet. Mounted on structural steel or reinforced concrete stringers. No forms necessary.

## Details for Flooring and Highway Bridges.

Same construction as roofing, or sheets may be curved between floor beams, making a segmental arch floor. Mortar of 1 part Portland cement to 2 or 3 parts sand should be spread over sheets to about  $\frac{1}{2}$  in. above corrugations. Then Portland cement concrete should be tamped on top to about 3 ins. above the crown of the



"Ferroinclave," thickness depending on span and load.

The under side, when coated as in roofing, presents a smooth white appearance and serves as a ceiling.

Water Tanks, Silos, Bins, Culverts.

Sheets are bent according to curvature required, and applied as roofing.

Details of all Sizes.

Sheets are made in any lengths up to 10 ft., and length is determined by spacing of the purlins. Width, 20½ ins. Center to center of side laps, 20 ins.

The following are kept in stock, for immediate shipments: No. 26 gage sheets in 10-ft. lengths, and No. 24 U. S. gage sheets in even and ½-ft. lengths, from 5 to 10 ft.

Other sizes and weights are formed to order and shipped promptly.

Service.

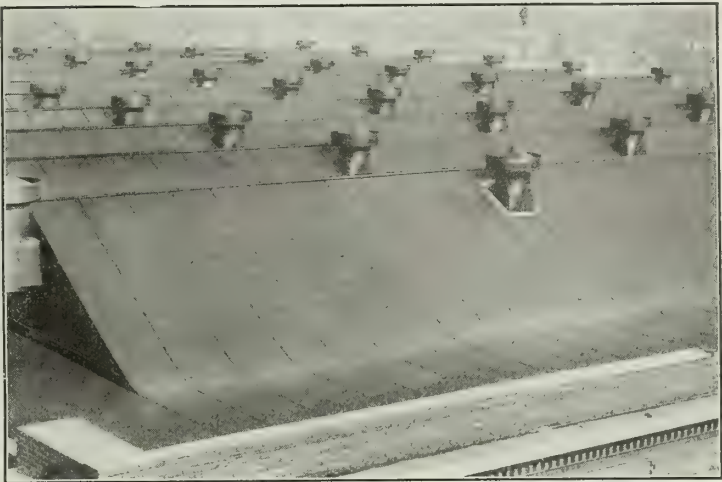
On request, and for large contracts, the company will execute the work complete and guarantee same. Catalogue H shows more fully how and where "Ferroinclave" is used.

WEIGHT OF "FERROINCLAVE" (NOT INCLUDING LAPS) AND CROSS-SECTIONAL AREAS

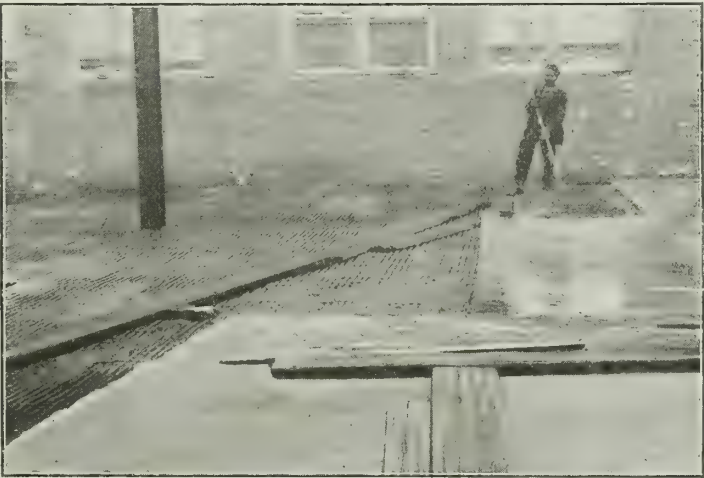
28-gage,	.94 lb. per sq. ft.,	.274 sq. in. per ft. of width
26-gage,	1.13 lbs. per sq. ft.,	.329 sq. in. per ft. of width
24-gage,	1.5 lbs. per sq. ft.,	.439 sq. in. per ft. of width
22-gage,	1.88 lbs. per sq. ft.,	.548 sq. in. per ft. of width

TABLE OF DEFLECTIONS  
SHEETS WITH CONCENTRATED LOADS AT MIDDLE AND WITHOUT CEMENT OR PLASTER COVERING—4-FT. SPAN

No. 26 gage		No. 24 gage		No. 22 gage	
Total load	Total deflection	Total load	Total deflection	Total load	Total deflection
30 lbs.	1⅛ in.	125 lbs.	1¼ in.	170 lbs.	1⅜ in.
80 lbs.	3⁄8 in.	150 lbs.	1¼ in.	270 lbs.	3⁄8 in.
130 lbs.	1½ in.	175 lbs.	7⁄16 in.	370 lbs.	13⁄16 in.
180 lbs.	5⁄8 in.	200 lbs.	1½ in.	518 lbs.	21⁄16 in.



"FERROINCLAVE" SAWTOOTH ROOF ON FACTORY OF JOSEPH AND FEISS CO., CLEVELAND, OHIO  
"Ferroinclave" is especially adapted for sawtooth roofs. Sheets can be bent to form gutter and siding, making a continuous monolithic slab



"FERROINCLAVE" FLAT FLOOR AT PLANT OF SUPERIOR FOUNDRY CO., CLEVELAND, OHIO  
"Ferroinclave" flat floor combines great strength with light weight. Can be erected easily and quickly; is attractive in appearance, fire-resistive and inexpensive. The concrete is applied without the use of any forms and without interfering with any work on the floor below



SUPERIOR FOUNDRY CO., CLEVELAND, OHIO, AFTER FIRE, SEPTEMBER, 1909  
Warehouse and paint shop near foundry were destroyed. Wooden window frames and sashes on exposed side of foundry were burned, but "Ferroinclave" roof and siding were uninjured and prevented spread of flames



UNDER SIDE OF "FERROINCLAVE" ROOF ON CAR BARN OF THE CONNECTICUT CO., NEW HAVEN, CONN.  
As "Ferroinclave" is applied to under side of "Ferroinclave" roof, it is given a smooth finish which makes a white ceiling, increasing the light of the building



# THE CONCRETE REINFORCING AND ENGINEERING CO.

## Reinforcing Steel and Engineering Service

1900 Euclid Building  
CLEVELAND, OHIO

STOCK AND FABRICATING PLANT, BUFFALO, N. Y.

### Products.

RIVET GRIP FABRICATED UNITS; RIVET GRIP BARS. Plain, Deformed, Square and Round Reinforcing Bars of standard sections; Spacing Devices and Bar Supports; Factory Built Spirals.

### Engineering Services.

THE CONCRETE REINFORCING AND ENGINEERING Co. furnish engineering services for reinforced concrete structures of all kinds. This service is co-operative. The cost of this service may be included in our estimate or may be paid for separately on the fee basis.

Co-operative service is offered architects in connection with any work of a preliminary nature. An efficient estimating and engineering department is maintained for service of this character. Suggestions are freely offered regarding type of construction which can be most economically used and estimates are furnished of comparative cost of various types suggested. Standardization of estimating and designing methods enables this company to offer a very efficient service.

### Rivet Grip Bars.

Rivet Grip bars are rolled in sections equivalent to standard square bars.

#### SIZES, AREAS, PERIMETERS AND WEIGHTS OF RIVET GRIP BARS

R. G. bars	Equivalent sq. bar	Area, sq. ins.	Perimeter, ins.	Weight per ft., lbs.
$\frac{3}{4}$ R. G.	$\frac{3}{4}$ "	.1406	1.63	.478
$\frac{5}{8}$ R. G.	$\frac{5}{8}$ "	.3906	4.00	1.328
$\frac{3}{4}$ R. G.	$\frac{3}{4}$ "	.5625	4.25	1.913
$\frac{7}{8}$ R. G.	$\frac{7}{8}$ "	.7656	4.75	2.603
1" R. G.	1"	1.0000	5.19	3.400
1 $\frac{1}{8}$ " R. G.	1 $\frac{1}{8}$ "	1.2656	5.75	4.303
1 $\frac{1}{4}$ " R. G.	1 $\frac{1}{4}$ "	1.5625	6.50	5.313

### Rivet Grip Fabricated Units.

A compact, rigid unit reinforcement, fabricated in shop strictly according to individual designs; tagged, bundled and shipped ready to place.

Rigidly attached shear members are generally recognized by competent authorities to have decided advantages.

Refer to joint committee final report for definite and authoritative statements.

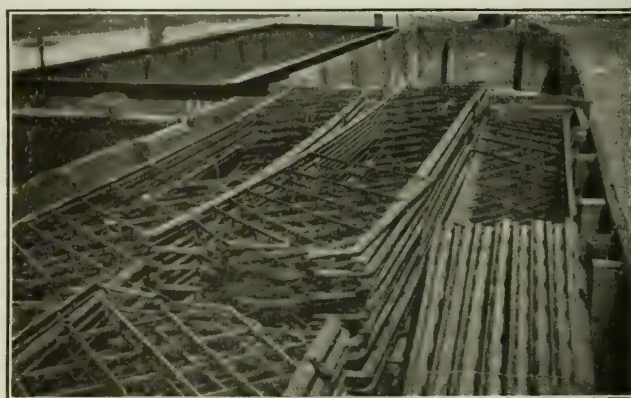


SHOWING METHOD OF ATTACHING SHEAR MEMBERS

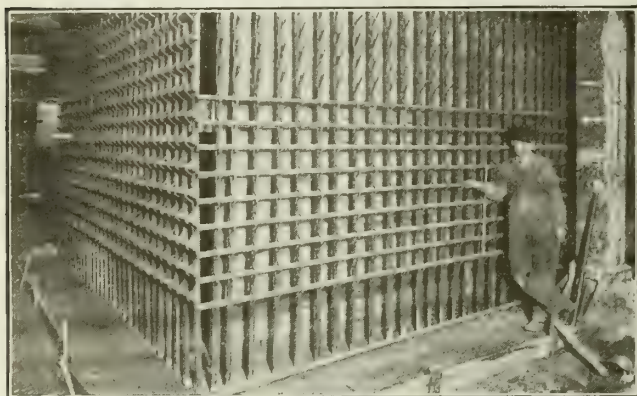
APPLICATIONS—Rivet Grip fabricated units are effectively and economically used as beam, girder or joist reinforcements in building and ship construction.

Rivet Grip reinforcement is ideally applicable for wall reinforcement of vaults, tanks, retaining walls, abutments, reservoirs, dry docks, dams, etc.

ADVANTAGES—By using Rivet Grip fabricated units, all errors of field fabrication and placing of reinforcements are eliminated. Field cost of handling is reduced to a minimum.



CARLOAD OF RIVET GRIP FABRICATED UNITS  
Excellent travellers



SHOWING APPLICATION OF RIVET GRIP BARS IN TANK, RESERVOIR OR OTHER WALL CONSTRUCTION



RIVET GRIP FABRICATED UNIT BEAM FRAMES  
Note simplicity in handling



**Types of Design.**

THE CONCRETE REINFORCING AND ENGINEERING Co. is thoroughly experienced and organized to design in detail, all types of reinforced concrete construction. This company is, therefore, able to offer, from an unbiased viewpoint, that particular type of construction which will most satisfactorily and economically meet individual conditions.

A brief outline of several types follows, which are clearly portrayed by the photographs.

**CLAY TILE AND CONCRETE JOISTS**—This system consists of concrete joists about 24 ins. on centers, either with or without a thin top slab of concrete placed over the tiles. The tiles are especially made for floor construction and are approximately 19 ins. in width.

This system results in a light load, and for plastered ceilings makes it unnecessary to use any form of suspended ceiling or metal lath.

**CONCRETE JOISTS AND STEEL FORMS**—This design consists of joists approximately 24 ins. on centers, with a thin top slab.

Steel forms, as indicated by photographs below, are used. These forms are removable.

The dead load of construction is very light, but for plastered ceiling it is necessary to use some form of metal lath or suspended ceilings.

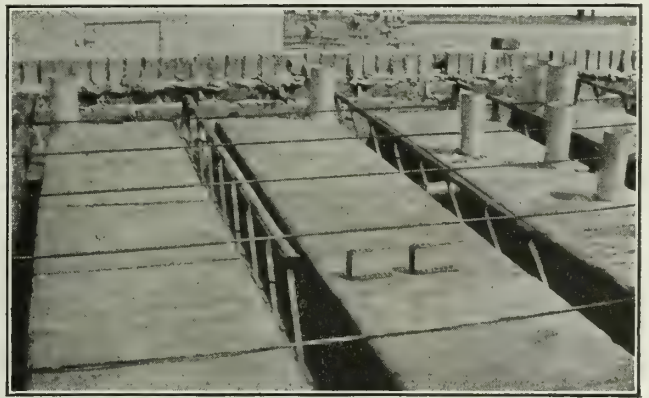
**"KRECT" SYSTEM OF FLAT SLAB CONSTRUCTION**—This design eliminates beams or girders in the ceilings, resulting in splendid economy for many classes of industrial buildings, especially those for heavy loads.

The advantages of the "Krect" system in securing correct position of reinforcement in a practical manner are clearly shown in photographs.

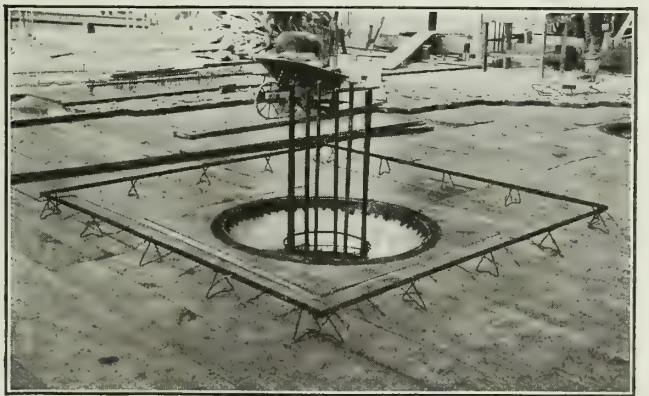
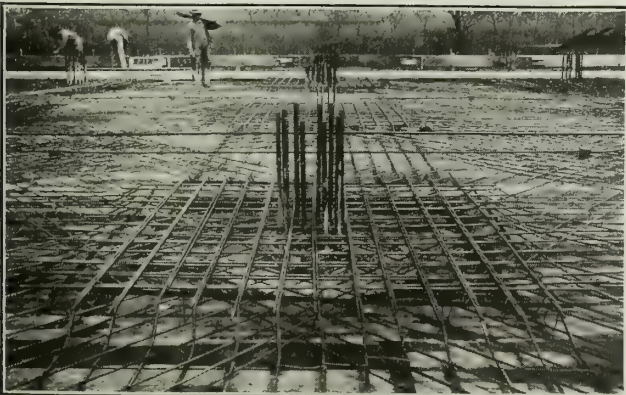
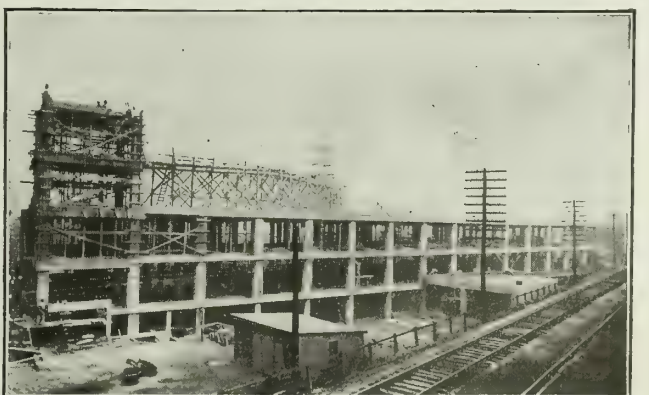
A variation of this design is being used and offered for many conditions in office, hotel or other buildings designed for light live loads.



CLAY TILE AND CONCRETE JOISTS



CONCRETE JOISTS AND STEEL FORMS

RESULTING INTERIOR FOR INDUSTRIAL BUILDING  
Flat slab typeDETAIL OF HEAD SUPPORTS SHOWING SUPPORTING AND  
SPACING MEANSREINFORCING IN PLACE SHOWING CORRECT POSITION  
OF BARS

THE STRUCTURAL FRAME IN COURSE OF ERECTION



# CONCRETE STEEL COMPANY

SOUTHERN OFFICE  
BIRMINGHAM, ALA., Brown-Marx Building

42 Broadway  
NEW YORK, N. Y.

WESTERN OFFICE  
CHICAGO, ILL., Monadnock Block

TELEPHONE, BROAD 6128, 6129, 6130

DISTRICT SALES OFFICES

SYRACUSE, N. Y., Union Building  
PHILADELPHIA, PA., Pennsylvania Building

BOSTON, MASS., 7 Water Street  
YOUNGSTOWN, OHIO, P. O. Box 24

WAREHOUSES AND FABRICATING WORKS

NEW YORK, N. Y.  
YOUNGSTOWN, OHIO

PHILADELPHIA, PA.  
BOSTON, MASS.

CHICAGO, ILL.  
BIRMINGHAM, ALA.

## Products.

HAVEMEYER DEFORMED BARS (Patented), for Reinforcing Concrete; FABRICATED UNIT FRAMES; TY-CHAIRS; BAR-TYS; EASEL CHAIRS; HY-CHAIRS; BAR-SPACERS; BEAM SADDLES and SEPARATORS; "SAINTREAD" SAFETY TREADS; CONCRETE INSERTS; CURB BARS; COLLAPSIBLE SPIRALS for Columns.

Stirrup Bending Machines and Bar Cutters.

## Description of Havemeyer Bars—Rounds, Squares, Flats.

Rolled deformed bars with the axes of the projections, forming the mechanical bond, parallel to the axis of the bar; designed to secure at all points constant uniform area of cross section equal to area of cross section of a plain bar of same size. Projections and depressions, being rolled longitudinally, allow all steel to be of value when bar is under tension. No sharp angles tending to start cracks when bar is bent. Full tensile strength of all metal is developed throughout length of bar, equalizing strength at all points. As Havemeyer bars are rolled to same weight and area as plain bars, a strong mechanical bond is obtained with same weight of metal used in rolling a plain bar.

The deformations furnish a mechanical bond more than sufficient to develop strength of bar, as proved by many testing laboratories.

**ADVANTAGES OF ROUNDS AND SQUARES**—Bending and handling costs are reduced to a minimum through the following important features: (1) Havemeyer bars bend easily, because metal in longitudinal projections follows bend as readily as metal in body of bar. (2) Less spring than in twisted bar; therefore easier to get required permanent set in bending. (3) Both ends of a "double bend" lie in same plane without extra work. (4) No abrupt changes in cross section to start cracks. (5) Bars easily wired at intersections, the projections and depressions preventing wire from slipping. (6) Bars easily selected on the work, because readily gaged.

**ADVANTAGES OF FLATS**—In such construction as sewers, grain elevators, coal pockets and silos, Havemeyer flats reduce the cost of the curved bends required. They can be run through a tire machine at high speed, much quicker and cheaper than rounds or squares. The edges of the flats prevent the lugs from being damaged and allow the bar to run smoothly with the minimum expenditure of power. Flats can be bent with less power than their equivalent squares, as may be gaged by the following approximate moments of resistance at the elastic limit:

1 3/4 in. by 7/16 in. .... 1670 in. lbs.  
7/8 in. square ..... 3360 in. lbs.

A greater effective depth makes possible economies in either steel or concrete.

Because the bonding area per pound of steel is greater than for rounds or squares, lengths of laps may

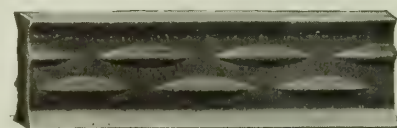
be reduced. A 7/8-in. square has a perimeter of 3.5 ins.; and a 1 3/4-in. by 7/16-in. flat, of equivalent sectional area, 4.375 ins., or a gain of 25%. There is a similar advantage in 1 1/2-in. by 3/8-in. and 1-in. by 1/4-in. over the equivalent squares.



SQUARE BAR



ROUND BAR



FLAT BAR

**SIZES**—Round, square and flat Havemeyer bars are regularly rolled at several mills in different parts of the country to sizes indicated in following table:

TABLES OF WEIGHTS AND AREAS, HAVEMEYER SQUARE, ROUND AND FLAT DEFORMED BARS

Size, ins.	SQUARE		ROUND	
	Area, ins.	Weight per ft., lbs.	Area, ins.	Weight per ft., lbs.
1/4	0.0625	0.212	0.0491	0.167
3/8	0.0977	0.332	0.0766	0.270
1/2	0.1406	0.478	0.1104	0.375
5/8	0.2500	0.850	0.1963	0.667
3/4	0.3906	1.328	0.3068	1.043
7/8	0.5625	1.913	0.4418	1.502
1	0.7656	2.603	0.6013	2.044
1 1/8	1.0000	3.400	0.7854	2.670
1 1/4	1.2656	4.303	0.9940	3.379
1 1/2	1.5625	5.312	1.2272	4.173

We can furnish 1 3/8" and 1 1/2" square Havemeyer bars from Pittsburgh Mills. Do not carry them in stock.

Size, ins.	FLAT	
	Area, ins.	Weight per ft., lbs.
1 x 1/4	0.2500	0.850
1 x 3/8	0.3750	1.280
1 1/4 x 3/8	0.4690	1.590
1 1/2 x 3/8	0.4688	1.590
1 1/2 x 1/2	0.5625	1.913
1 3/4 x 1/2	0.7500	2.550
1 3/4 x 3/4	0.6563	2.230
1 3/4 x 1	0.7656	2.600
1 3/4 x 1 1/4	0.8750	2.980

NOTE—A size extra of 10% applies against 1" x 1/4" and 1 1/2" x 3/8" flats; all other sizes tabulated take the base price.

**DELIVERIES**—Prompt shipments of bars cut to specified lengths can be made direct from nearest mill. Large stocks of round and square bars are always maintained at the warehouses in Youngstown, Philadelphia, Chicago, Birmingham, Boston and New York. Shipments can also be obtained from stocks carried by agents in larger cities.

## Specifications for Steel.

Havemeyer bars can be rolled to any standard specification. We recommend Manufacturers' Standard Specifications for concrete reinforcing bars, adopted 1910, because large tonnages are regularly going through mills on these specifications, and orders complying with them will be shipped in shortest possible time.

## Fabricating.

The fabricating works are equipped with the most modern machines for bending and fabricating. Very low prices can be made. Fabricated units for girders, beams, columns, etc., ready to drop into form boxes, can be shipped promptly.



**Havemeyer Ty-chairs.**

Made from high grade spring steel wire. Used for tying and supporting bars of any type or size. Standard distance from under side of bottom bar to forms is 1 in. Carried in stock.

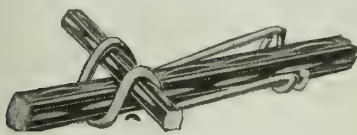


TY-CHAIR IN POSITION  
No tools required

**Havemeyer Bar-tys.**

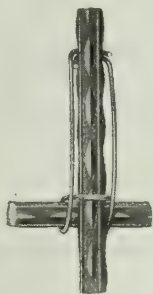
No. 1—Made from high grade spring steel wire. Used for tying bars both in slab and walls, principally in slab. Carried in stock.

No. 2—Made from high grade spring steel wire. Used for tying bars in walls, also for fabricating collapsible columns. Carried in stock.



No. 1

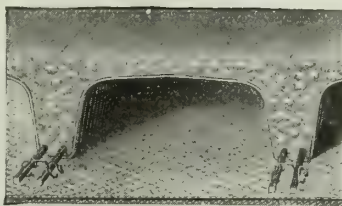
BAR-TYS IN POSITION  
No tools required



No. 2

**Havemeyer Easel Chairs.**

Made from high grade spring steel wire. Used in terra cotta or steel tile construction. Space tile as well as bars. Standard distance from under side of bar to forms is 1 in. Carried in stock.



EASEL CHAIRS IN POSITION  
Steel tile construction. No tools required

**Havemeyer Hy-chairs.**

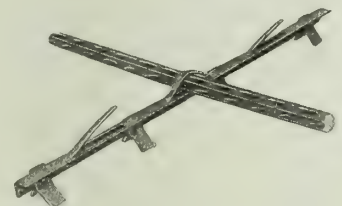
Made from pressed steel reinforced with ribs. Used in flat slab construction for supporting head rods over columns (4-way system) and for supporting single bars (2-way system) with top bent bars. Carried in stock in varying heights.



HY-CHAIR

**Havemeyer Bar-spacers.**

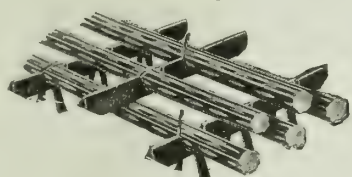
Made from 1/2-in. cold rolled angle. Used in continuous strips for supporting, accurately spacing, and locking bars in slab. Standard distance from under side of bar to forms is 1 in. Not carried in stock.



BAR-SPACER IN POSITION  
No tools required

**Havemeyer Beam Saddles and Separators.**

Made from sheet steel. Used in beams and girders, for supporting, accurately spacing, and locking the bars. Not carried in stock.

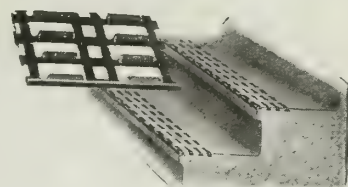


BEAM SADDLES AND SEPARATORS  
No tools required

**Havemeyer "Sanitread" Stair Treads.**

A combination of steel plates and lead slugs. Plate is buried in top surface of concrete, and the slugs,

being flush with the surface, offer a smooth tread, which allows stairs to be easily swept and washed, as there are no grooves to collect dirt or catch the mop. Carried in stock.



"SANITREAD" SET IN CON-  
CRETE STEPS

**Havemeyer Slotted Inserts.**

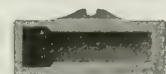
Made from highest grade open hearth steel pressed into shape. Have a broad bearing surface with 6 nailing holes and 4 "U" anchors. Sheet metal caps cover the ends. Carried in stock.



SLOTTED INSERT

**Havemeyer Adjustable Inserts.**

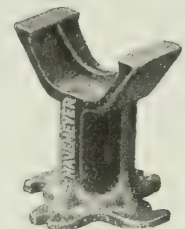
Made from highest grade malleable iron and are accurate and dependable. The diverging anchors not only form a strong grip, but do not interfere with the placing of reinforcing steel. Nailing slot being placed up from the bottom does not hamper nailing. In the 3/4-in. size, the nut, as well as the head of the bolt, will fit. Carried in stock.



ADJUSTABLE  
INSERT

**Havemeyer "Y" Socket Inserts.**

Made from highest grade malleable iron. The flared anchors form a firm grip, and broad base with 4 nailing holes prevents displacement. Over all height is 2 3/4 ins. Carried in stock.



"Y" SOCKET  
INSERT

**Havemeyer Round Nose Curb Bar.**

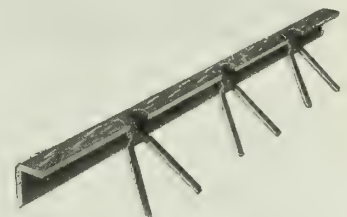
The flared anchors are staggered, occur every 6 ins. and extend into the concrete 2 3/4 ins. No web to split and weaken concrete, or to form a shelf for water to back up on and freeze, throwing the concrete. Carried in stock in lengths of 8, 10 and 12 ft.



ROUND NOSE CURB BAR

**Havemeyer Angle Curb Bar.**

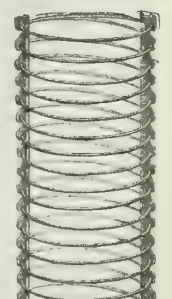
Not unlike the round nose bar in the method of anchorage. This bar has 3 rows of lugs staggered on top surface, and is used extensively as a stair nosing. Carried in stock in 10-ft. lengths.



ANGLE CURB BAR

**Havemeyer Collapsible Spirals.**

Made from highest grade rods or wire to size specified. Size of angle used as a spacing member varies with size of spiral. Rigidity, strength and uniformity of spiral is governed by size of spacing angle. Unless otherwise specified spirals are equipped with 2 spacing angles, and shipped collapsed.



COLLAPSIBLE  
SPIRAL

# CORRUGATED BAR COMPANY

## Concrete Reinforcement

Mutual Life Building  
BUFFALO, N. Y.

### DISTRICT OFFICES

NEW YORK, N. Y., Whitehall Building, 17 Battery Place  
CHICAGO, ILL., 20 West Jackson Boulevard  
ST. LOUIS, MO., Federal Reserve Bank Building  
ATLANTA, GA., 1017 Grant Building

BOSTON, MASS., 27 School Street  
ST. PAUL, MINN., Pioneer Building  
PHILADELPHIA, PA., Transportation Building  
SYRACUSE, N. Y., Union Building  
DETROIT, MICH., Penobscot Building

### Products.

CORRUGATED BARS, CORR-BAR UNITS and COLUMN SPIRALS.

CORR-MESH for Concrete Reinforcement.  
For Fireproof Floor Systems, see page 22.

### Corrugated Bars.

Corrugated Bars are made of medium, intermediate and hard grade steel, both square and round in cross section, and have ridges or corrugations which effect a positive mechanical bond with the concrete.

The value of a positive mechanical bond is now recognized by modern reinforced concrete engineers in all countries. Even in France, where they have so far confined themselves almost exclusively to plain round rods, the foremost government engineers admit that such reinforcement has been far from successful in actual service.

A fact not generally understood is that all bond is mechanical. Adhesion is mechanical bond to the extent that it exists at all. It is the entering of the cement into the microscopical pores in the surface of the steel. Small sized bars, cooling rapidly, are somewhat cold rolled. In these the pores are very small indeed, and the bond consequently less. Furthermore, when the working stress of 16,000 lbs. per sq. in. is developed in the steel, the diameter has been materially reduced. That is to say, the reduction is material when compared to the depth of the pores in the surface of the steel.



CORRUGATED SQUARES (PATENTED)

Standard sizes, ins. ....	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Net area in sq. in. ....	.06	.14	.25	.39	.56	.76	1.00	1.26	1.55
Weight per ft. in lbs. ....	.22	.49	.86	1.35	1.94	2.64	3.43	4.34	5.35



CORRUGATED ROUNDS (PATENTED)

Standard sizes, ins. ....	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Net area in sq. in. ....	.11	.19	.25	.30	.44	.60	.78	.99
Weight per ft. in lbs. ....	.38	.66	.86	1.05	1.52	2.06	2.69	3.41

Bond tests to show the real superiority of the Corrugated Bar should therefore be made on beams under stress.

Some such tests have been made at different places, and they show, as all kinds of bond tests have invariably shown, the Corrugated Bar to be superior in a marked degree to all other types of reinforcement.

### Corr-Bar Units.

Corr-Bar Units are shop fabricated and self-positioning reinforcement for concrete beams and girders. Each unit represents the entire reinforcement for the beam, anchored rigidly together, is made collapsible for shipment, and is opened on the job and set in the form wherein it positions itself.



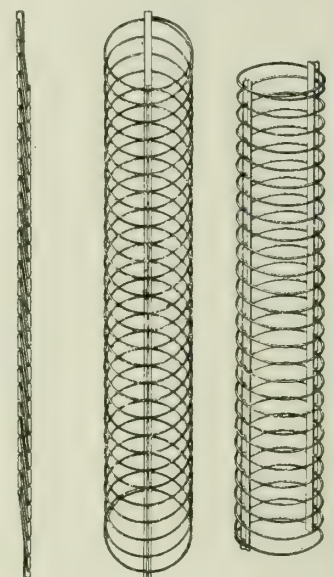
One form of unit is shown in the accompanying cut. Corr-Bar Units not only insure correct reinforcement in accordance with specifications, but save much labor cost in that only one piece has to be handled instead of fifteen or twenty. This and all other forms of fabricated reinforcement, including column spirals and hoops, beam stirrups, truss bars and other bending, are done with absolute accuracy, affording greatly increased speed of construction combined with absolute safety and an actual saving in cost.

### Column Spirals.

Spirals for columns are shop fabricated, made of cold drawn wire with T-section spacers and furnished in any length, in diameters of 10 to 36 ins., pitch 1 to 4 ins.

STOCK—A large stock is maintained at all times available for immediate shipment.

HOW TO SPECIFY—Reinforcement for slab and column construction shall be medium [hard grade] corrugated steel bars made in accordance with the Manufacturers' Standard Specifications, accurately spaced and rigidly held in position in the forms, and reinforcement for beams and girders shall be Corr-Bar Units as manufactured by the CORRUGATED BAR COMPANY, ..... City.





**Corr-Mesh.**

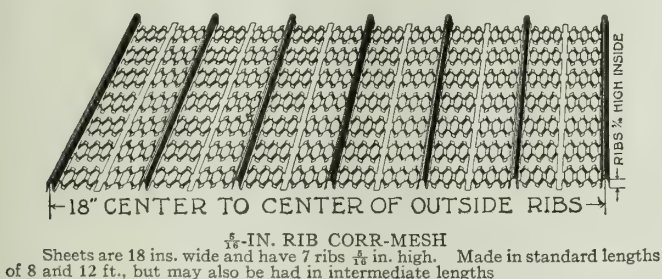
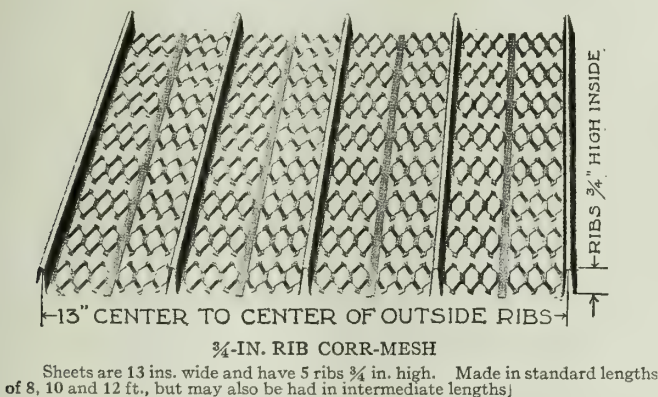
The material Corr-Mesh is an expanded metal with integral stiffening ribs. It is a one-piece product in which the ribs are connected by a diamond mesh. It is given a protective coating of paint applied after expansion.

**ADVANTAGES**—The material is so expanded that it produces no internal stress in the metal, and hence it is not essential to handle it carefully in order to avoid splitting, a condition peculiar to the overexpanded products.

The ribs obviate the necessity of studs for the partitions, practically eliminate centering for the floor and roof construction, and materially reduce the amount of light steel framing required for suspended ceilings.

**KINDS**—There are two kinds of Corr-Mesh; one with  $\frac{3}{4}$ -in. ribs and the other with  $\frac{5}{16}$ -in. ribs. The former is called " $\frac{3}{4}$ -in. Rib Corr-Mesh," the latter " $\frac{5}{16}$ -in. Rib Corr-Mesh."

**GAGES**—The standard sheets of both kinds are made in Nos. 24, 26, and 28 U. S. gages, painted. Other gages can be furnished if required.

**Corr-Mesh Partitions.**

Corr-Mesh partitions greatly reduce the amount of labor and time in the field, effect a considerable saving in floor space, are light in weight, and are fireproof and verminproof.

When used in fireproof buildings, the difference in the weight of Corr-Mesh and hollow tile partitions is enough to cause considerable saving in the cost of steel framing.

**SOLID PARTITIONS**—When used for solid partitions,  $\frac{3}{4}$ -in. Rib Corr-Mesh is steel studs and lath combined.

**How to Specify**—All partitions (3 ins. or less in thickness) shall be constructed of No. 28-gage,  $\frac{3}{4}$ -in. Rib Corr-Mesh with ribs spaced not more than  $3\frac{3}{4}$  ins. center to center (CORRUGATED BAR COMPANY, ..... City), erected with ribs vertical, outer

ribs interlocked and pinched together, set in sheet metal channel at ceiling and fastened by sheet metal angle at floor. Channel and angle shall be nailed to (wood plugs set in) floor and ceiling. At openings the Corr-Mesh shall be nailed to the wood bucks. Properly brace the Corr-Mesh until scratch coat on the lath side has set. (Partitions over 18 ft. high shall have framing of tee, angle or channel uprights, and sheets shall be set with ribs horizontal and wired to uprights.)

**Note**—In connection with the above, the usual plaster specification will apply.

**CORR-MESH SOLID PARTITIONS**

Height	Gage $\frac{3}{4}$ -in. Rib Corr-Mesh	Thickness of wall
Up to 8 ft.	28	1 $\frac{3}{4}$ ins.
8 to 12 ft.	28	2 ins.
12 to 13 ft.	26	2 ins.
13 to 14 ft.	26	2 $\frac{1}{4}$ ins.
14 to 15 ft.	26	2 $\frac{1}{2}$ ins.
15 to 16 ft.	24	2 $\frac{1}{2}$ ins.
16 to 17 ft.	24	2 $\frac{3}{4}$ ins.
17 to 18 ft.	24	3 ins.

If over 18 ft. in height, uprights of small angles, tees, or channels should be provided, and the Corr-Mesh sheets placed horizontally.

**DOUBLE PARTITIONS**—When used for double partitions, the stiffness and close spacings of the ribs  $\frac{5}{16}$ -in. Rib Corr-Mesh, permit the supports to be placed from 26 to 40 ins. center to center.

**How to Specify**—All double partitions shall be constructed of No. 28-gage,  $\frac{5}{16}$ -in. Rib Corr-Mesh, with ribs spaced not more than 3 ins. center to center (CORRUGATED BAR COMPANY, ..... City), erected with ribs next to the studs, ribs horizontal, outer ribs interlocked and wired together, each rib fastened to each stud.

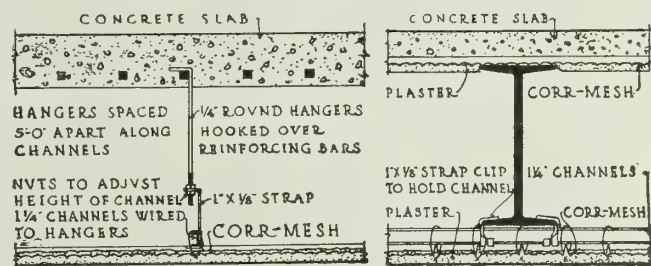
**Note**—In connection with the above, the usual plaster specification will apply.

**CORR-MESH DOUBLE PARTITIONS**

Span	Gage $\frac{5}{16}$ -in. Rib Corr-Mesh
26 ins.	28
32 ins.	26
40 ins.	24

**Corr-Mesh Ceilings.**

Corr-Mesh makes an economical suspended ceiling. Being a combined unit of steel lath and furring, it eliminates 50% to 80% of the light steel framing and time consumed wiring. The mesh affords a positive plaster key. As shown in the details, the material is placed with the lath side down, and cross supports for

**DESIGNING DETAILS OF CORR-MESH CEILINGS****DISTANCE BETWEEN SUPPORTS FOR CORR-MESH CEILINGS**

Kind of Corr-Mesh	Gage	Maximum distance between supports
$\frac{5}{16}$ in. Rib.	28	2 ft. 2 ins.
$\frac{5}{16}$ in. "	26	2 ft. 8 ins.
$\frac{5}{16}$ in. "	24	3 ft. 0 ins.
$\frac{3}{4}$ in. "	28	3 ft. 11 ins.
$\frac{3}{4}$ in. "	26	4 ft. 11 ins.
$\frac{3}{4}$ in. "	24	5 ft. 11 ins.

the ribs are placed as shown by the accompanying table. The hangers permit of adjustment to bring the ceiling to the true plane surface.

**HOW TO SPECIFY**—Under all floor and roof slabs, provide Corr-Mesh ceilings (CORRUGATED BAR COMPANY, ..... City),



consisting of No. 28-gage,  $\frac{3}{4}$ -in. Rib Corr-Mesh with ribs spaced not more than  $\frac{3}{4}$  ins. center to center with rib side upward,  $\frac{1}{4}$ -in. round rod adjustable hangers every 5 ft., and  $\frac{1}{4}$ -in. steel channel cross lines, 3 ft. 11 ins. apart, wired to the hangers and to the mesh at every rib. Outer ribs shall be interlocked and wired or pinched together at 24-in. intervals. End laps shall be at least 2 ins.

### Corr-Mesh Walls.

Corr-Mesh walls are especially adapted in connection with wood or steel framed stucco building.

**SOLID STUCCO (Steel Frame)**—When applied to a skeleton steel frame,  $\frac{3}{4}$ -in. Rib Corr-Mesh gives a wall especially suited for factories and such other buildings of an industrial character as are not required to be heated to the same degree as stores and office buildings. Such walls cost about half as much as bricks; are permanent, presentable, economical and fireproof.

**How to Specify**—All exterior walls shall be of  $\frac{3}{4}$ -in. Rib Corr-Mesh construction (CORRUGATED BAR COMPANY, ..... City), applied to the steel frame in accordance with manufacturer's printed directions, the ribs being placed outward and horizontally, and attached to the steel work by means of special wall clips or bolts spaced not more than  $\frac{3}{4}$  ins. apart on each furring strip or steel member.

To guard against cracking of stucco from temperature stresses, where the length of wall is more than 25 ft., end laps of sheets shall be not less than 6 ins., and pinched together by special punch, adjacent sheets breaking with respect to their end joints.

In cases where it is not practicable to run the Corr-Mesh sheets horizontally,  $\frac{1}{4}$ -in. round temperature rods shall be laid in horizontal lines 24 ins. apart.

**STUCCO VENEER (Wood Frame)**—When a stucco residence of excellent quality and moderate first cost is desired,  $\frac{5}{16}$ -in. Rib Corr-Mesh is fastened direct to the timber sheathing and plastered with cement mortar. This type of wall gives a very handsome finish, is economical, and affords an excellent insulation against heat in summer and cold in winter.

**How to Specify**—All exterior walls shall be of  $\frac{5}{16}$ -in. Rib Corr-Mesh construction (CORRUGATED BAR COMPANY, ..... City), applied to the timber sheathing in accordance with manufacturer's printed directions. Outside surface of wall shall be covered with No. 28-gage Corr-Mesh with ribs spaced not more than 3 ins. center to center, laid with ribs inward and horizontal, and fastened to the sheathing by staples in vertical rows 24 ins. apart, each rib being fastened every 24 ins. Outer ribs shall be interlocked. Sheets shall be end-lapped 6 ins.

**NOTE**—In connection with the above, the usual plaster on stucco specification will apply.

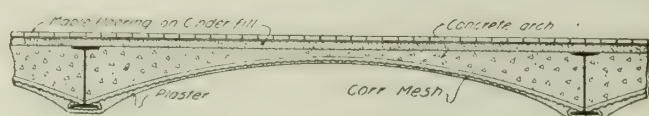
### Corr-Mesh Floors and Roofs.

**GENERAL**— $\frac{3}{4}$ -in. Rib Corr-Mesh forms a very efficient reinforcement for short span floor and roof construction between either steel or concrete beams. The accompanying cuts illustrate three types of floor construction.

The Corr-Mesh for types 1 and 3 is delivered bent to the required curvature. It is crated for shipment.

For warehouses and like buildings subject to heavy loads, Type 1 is recommended. For the lighter loads used in hotels, apartment houses, etc., Type 2 with a suspended ceiling is more desirable. Type 3 illustrates the arch panel between intermediate beams of reinforced concrete.

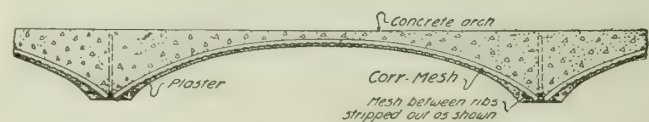
For carrying capacity of Type 2 slabs, see accompanying table. In view of the difficulty of formulating standard tables for arch construction, the carrying capacities of Types 1 and 3 are not given here. On receipt of full particulars, the company's nearest office will send full calculations for each particular condition.



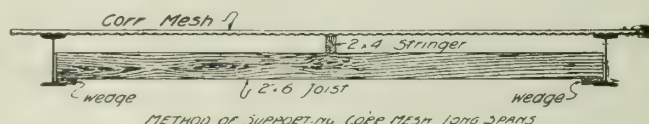
Type No. 1



Type No. 2



Type No. 3



METHOD OF SUPPORTING CORR-MESH LONG SPANS

TYPES OF CORR-MESH FLOOR AND ROOF CONSTRUCTION

TABLE OF CARRYING CAPACITIES OF TYPE 2 SLABS

t Sec	SPAN IN FEET	SPAN IN FEET																	
		2'-0"		3'-0"		4'-0"		5'-0"		6'-0"		7'-0"		8'-0"		9'-0"		10'-0"	
		Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load	Total Load	Live Load
1'	19'	26	261	242	115	96	64	45											
		26	307	288	135	116	75	56											
		24	335	316	147	128	82	63	52	33									
1'	22'	28	371	349	162	140	90	68	56	34									
		26	436	414	191	169	105	83	66	44									
		24	539	517	236	214	131	109	83	61	60	38							
		28	482	457	210	185	117	92	74	49									
1 1/2'	25'	26	565	540	247	222	136	111	87	62	61	38							
		24	744	719	325	300	181	156	115	90	79	54							
		28	597	569	260	232	144	116	92	64	53	35							
1 3/4'	28'	26	707	679	308	280	170	142	108	80	75	47							
		24	927	899	404	376	224	196	142	114	98	70	72	44					
		28	712	681	311	280	172	141	110	79	76	45							
2'	31'	26	850	819	370	339	205	174	130	99	90	59	66	35					
		24	1110	1079	483	452	267	236	170	139	117	86	86	55	65	34			
		28	838	804	364	330	201	167	128	94	89	55							
2 1/4'	34'	26	998	964	433	399	239	205	152	118	104	70	76	42					
		24	1305	1271	564	530	313	279	199	165	137	103	100	66	76	42			
		28	965	928	417	380	231	194	147	110	102	65	74	37					
2 1/2'	37'	26	1146	1109	496	459	274	237	174	137	119	82	87	50					
		24	1500	1463	646	609	359	322	228	191	157	120	114	77	87	50	69	32	
		28	1097	1057	470	430	260	220	165	125	114	74	83	43					
2 3/4'	40'	26	1308	1268	559	519	310	270	196	156	135	95	98	58	76	36			
		24	1700	1660	727	687	402	362	255	215	176	136	128	88	98	58	77	37	
		28	1230	1187	524	481	290	247	183	140	126	83	92	49					
3'	43'	26	1470	1427	623	580	345	303	219	176	151	108	110	67	84	41			
		24	1900	1857	808	765	446	403	282	239	195	152	142	99	109	66	85	42	
		28	1375	1329	586	540	324	278	204	158	140	94	102	56	78	32			
3 1/4'	46'	26	1621	1576	690	644	381	335	241	195	166	120	121	75	92	46			
		24	2117	2071	903	857	497	451	315	269	217	171	158	112	120	74	95	49	
		28	1520	1471	648	599	358	309	226	177	155	106	113	84	86	37			
3 1/2'	49'	26	1773	1724	758	709	416	367	264	215	181	132	132	83	100	51			
		24	2335	2286	999	950	549	500	349	300	240	191	174	125	132	83	105	56	34

The left hand column marked "total load," gives for each span the total safe load capacity in pounds per square foot. This load is the sum of the dead and live loads.

The "dead load" is the weight in pounds per square foot of floor of the materials shown in the sketch.

The right hand column marked "live load," gives for each span the safe load capacity in pounds per square foot in excess of the "dead load" as above defined.

MAXIMUM CLEAR SPANS ON WHICH  $\frac{3}{4}$ -IN. RIB CORR-MESH WILL CARRY VARYING THICKNESSES OF WET CONCRETE SLABS

GAUGE OF CORR-MESH U.S. STANDARD	THICKNESS OF SLAB = t															
	1'	1 1/4'	1 1/2'	1 3/4'	2'	2 1/4'	2 1/2'	2 3/4'	3'	3 1/4'	3 1/2'	3 3/4'	4'			
24	5'-7"	5'-1"	4'-8"	4'-4"	4'-0"	3'-10"	3'-8"	3'-6"	3'-4"	3'-2"	3'-1"	3'-0"	2'-11"			
26	4'-7"	4'-2"	3'-10"	3'-7"	3'-4"	3'-2"	3'-0"	2'-10"	2'-9"	2'-8"	2'-7"	2'-6"	2'-5"			
28	4'-0"	3'-7"	3'-3"	3'-1"	2'-10"	2'-8"	2'-7"	2'-6"	2'-5"	2'-4"	2'-3"	2'-2"	2'-1"			

For greater spans use temporary supports, as shown in detail on preceding page.

**HOW TO SPECIFY**—All floor and roof construction shall consist of concrete [slabs] [3 ins. thick], reinforced with No. 24-gage,  $\frac{3}{4}$ -in. Rib Corr-Mesh with ribs spaced not more than  $\frac{3}{4}$  ins. center to center (CORRUGATED BAR COMPANY, ..... City), laid with the rib side upward. Outer ribs shall be interlocked and pinched together and ends shall be lapped 2 ins. Ends of sheets in all cases shall bear on supporting beams. Attach alternate sheets to each supporting beam at the outer or lapped rib with Corr-clips. Provide  $\frac{1}{4}$ -in. round rods every 2 ft. at right angles to ribs and wired thereto.



# PAUL J. KALMAN COMPANY

## Concrete Reinforcement

Merchants National Bank Building

ST. PAUL, MINN.

DISTRICT SALES OFFICES

CHICAGO

MILWAUKEE

OMAHA

MINNEAPOLIS

WAREHOUSES AND SHOPS: CHICAGO, ST. PAUL, MINNEAPOLIS

### Products and Services.

DEFORMED or PLAIN REINFORCING BARS, in Structural, Intermediate or Hard Grade rolled from new billet stock; COLD TWISTED SQUARE REINFORCING BARS; MACHINEMADE COLUMN SPIRALS.

Woven Wire Concrete Reinforcement.

CONSULTING ENGINEERS on all matters relating to CONCRETE CONSTRUCTION. Efficient and experienced engineering departments are maintained in the various offices of this company so that when desired estimates, designs, plans, etc., can be furnished.

### Fabricating.

Modern machines afford the most complete facilities for bending and fabricating in the shops, and enable the company to do this work economically and without delay. Column spirals supplied completely fabricated with spacers.

### Quality of Materials.

All reinforcement is rolled from the best quality new billet steel; our years of experience having proved this the best quality for the purpose.

### Deliveries.

Large and complete stocks of reinforcing bars, in lengths up to and including 60 ft., are carried in the warehouses at Chicago and the Twin Cities, from which immediate delivery can be made. Where delivery is not so urgent, shipment is made promptly from our

mills. A wide reputation has been established for good service and for ability to ship as promised.

### Recent Installations.

The structures listed below were all built with reinforcing steel furnished by PAUL J. KALMAN COMPANY.

St. Paul Public Library, St. Paul, Minn.

Railroad Building, St. Paul, Minn.

Wyman-Partridge & Co., Warehouse, Minneapolis, Minn.

Morrison Hotel Addition, Chicago, Ill.

Jas. S. Kirk & Co., Soap Factory, Chicago, Ill.

Theater and Hotel Building for Miller Brewing Co., Milwaukee, Wis.

Foot, Schulze & Co., Shoe Factory, St. Paul, Minn.

Maxwell Motor Sales Corporation, Sales and Assembly Building, Minneapolis, Minn.

Plankinton Arcade Building, Milwaukee, Wis.

Ford Motor Co., Sales and Assembly Building, Minneapolis, Minn.

Junction Dam & Power Plant, Eastern Michigan Power Co., Wellston, Mich.

Reinforced Concrete Dam & Power Plant, Wisconsin-Minnesota

Light & Power Co., Wisconsin, Minn.

Pennsylvania Railroad Co.'s Northern Central Elevator, Baltimore, Md.

Corkran-Hill & Co., Packing Plant, Baltimore, Md.

Lutcher Hospital, Orange, Tex.

Court Avenue Bridge, Des Moines, Iowa

University Avenue Bridge, Des Moines, Iowa

City National Bank Building, Shreveport, La.

Buildings for Philadelphia Quartz Co., Berkeley, Cal.

Armour & Co., Ice Manufacturing Plant, Beef Cooler and Meat Loading Dock, South Omaha, Nebr.



SOAP FACTORY FOR JAS. S. KIRK & CO., CHICAGO, SHOWING COMPLETE CONCRETE SKELETON  
R. E. PINGREY, Architect. GEO. A. FULLER CO., Contractors. E. C. & R. M. SHANKLAND, Engineers

## EDWARD A. TUCKER COMPANY

Contracting Engineers for Fireproof Floor Systems and Concrete Reinforcement

683 Atlantic Avenue  
BOSTON, MASS.

### Products and Services.

#### MONOTYPE DEFORMED BARS.

Fabricated Stirrup Units; Fabricated Column Spirals; Clips; Spacers; Chairs; Removable Metal Forms.

FLOOR SYSTEMS: Metal Rib Long Span; Akme Flat Slab; Combination Tile.

The EDWARD A. TUCKER COMPANY are structural engineers, regularly retained by architects and contractors to make complete structural designs and plans. This service is also offered in connection with the sale of bars on floor systems, and, in such cases, careful and conservative designs of the features covered are guaranteed.

This company has various systems of floor construction, any one of which it will recommend to meet the conditions. An organization of men trained in the work of handling and placing reinforcement, and in erection of metal forms, is maintained. Reinforcement will be furnished to include this service, where architect or contractor desires to include reinforcement in one contract.

### Stock.

In the company's warehouse at East Cambridge, Mass., is carried a large stock covering, in general, all sizes of bars. Any point in New England can be supplied at a day's notice. Complete fabrication shop is equipped with power machines for all bending and assembling. It is the only plant in New England equipped to make a machine-made spiral.

### Monotype Deformed Bars.

Rolled by the Carnegie Steel Co. from new billet stock, to conform to the standard specifications of the Association of American Steel Manufacturers. Average elastic limit obtained is 40,000 to 45,000 lbs. per sq. in., with 25% to 30% elongation in 8 ins.

These bars are rolled to the same cross section for areas equivalent to round or square section.



MONOTYPE DEFORMED BAR

This feature should be especially noted, as it enables the designer to obtain exact area required without using both round and square bars in the same beam. All edges are rounded; there are no sharp edges to cause cracks and split the concrete; no edges to form pockets in the concrete.

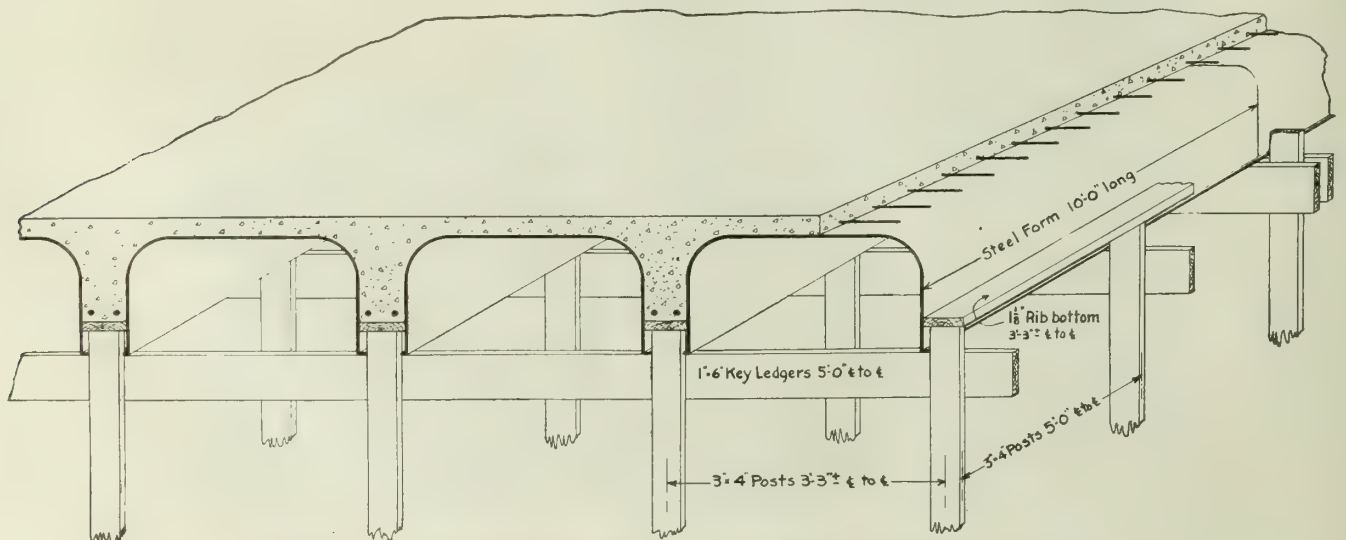
### Metal Rib Floors.

Consist of reinforced concrete joists and slab, formed by removable metal pans or domes. This system reduces the waste of form material to the lowest point, saves on the amount of concrete and reinforcement, and is adapted to all classes of work. For garages, manufacturing plants and unfinished buildings, open joist construction is used. For school houses, hospitals, etc., a metal lath ceiling is attached to the ribs, giving a level ceiling. Note this feature—lath is put up after all concrete work is done, thus avoiding the wavy ceiling effect, the rusting and breaking of lath through long exposure, and the uncertainty of the quality of concrete obtained.

Metal forms are of No. 10-gage; heavy enough to stand under severest working conditions. Specify metal rib forms Type A (without metal lath ceiling); metal rib forms Type B (with metal lath ceiling).

### Akme Flat Slab Floor System.

This is the girderless floor construction of Condon Co. The company will submit complete designs with its proposition for reinforcement. This system stands the highest tests. It is fully covered under Norcross and Sinks patents. This fee can be arranged separately, or will be carried by this company when furnishing the reinforcement.



METAL RIB FLOOR CONSTRUCTION SHOWING SLAB AND FORMS IN POSITION



# WITHEROW STEEL COMPANY

## Concrete Reinforcement

ROLLING MILLS AND OFFICES

PITTSBURGH, PA.

DISTRICT OFFICES

NEW YORK, N. Y., 120 Broadway  
WASHINGTON, D. C., 549 Munsey Building

BOSTON, MASS., 185 Devonshire Street  
CLEVELAND, OHIO, Park Building

### Products.

CONCRETE REINFORCING BARS: Witherow Deformed Bars (Patented); Plain Round, Plain Square, Square Twisted Bars.

COLLAPSIBLE SPIRALS.

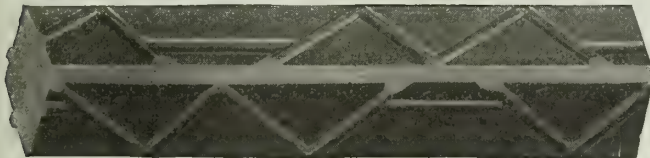
WISCOFORM CONCRETE FORMS.

SMALL STEEL FLATS, ANGLES and SMALL SPECIAL SHAPES.

Wisco Metal Lath.

### Witherow Deformed Bars.

Superior points are: (1) Round corners which prevent cracking of concrete. (2) Uniform cross section. (3) Maximum bond. (4) Tensile strength of more than 80,000 lbs.



WITHEROW DEFORMED BAR

### Plain Round, Square and Square Twisted Bars.

These bars are rolled in sizes from  $\frac{1}{4}$  to  $1\frac{1}{4}$  ins., according to standard specifications of the American Society for Testing Materials for concrete reinforcing bars.

AREAS AND WEIGHTS OF REINFORCEMENT BARS

Size, ins.	PLAIN SQUARE, SQUARE TWISTED AND WITHEROW DEFORMED		ROUND	
	Area, ins.	Weight per foot, lbs.	Area, ins.	Weight per foot, lbs.
$\frac{1}{4}$	.0625	.213	.0491	.167
$\frac{3}{16}$	.0977	.332	.0767	.261
$\frac{1}{2}$	.1406	.478	.1104	.376
$\frac{5}{8}$	.2500	.850	.1963	.668
$\frac{3}{4}$	.3906	1.328	.3068	1.043
$\frac{7}{8}$	.4727	1.607	.3712	1.262
$1\frac{1}{8}$	.5625	1.913	.4418	1.502
$1\frac{1}{4}$	.6602	2.245	.5185	1.763
$1\frac{3}{8}$	.7656	2.603	.6013	2.044
$1\frac{1}{2}$	.8789	2.989	.6903	2.347
$1\frac{3}{4}$	1.0000	3.400	.7854	2.670
$1\frac{7}{8}$	1.1289	3.838	.8866	3.014
$2$	1.2656	4.303	.9940	3.379
$2\frac{1}{8}$	1.4102	4.795	1.1075	3.766
$2\frac{1}{2}$	1.5625	5.312	1.2272	4.173

PHYSICAL PROPERTIES OF REINFORCEMENT BARS

Properties considered	PLAIN BARS	DEFORMED AND HOT-TWISTED BARS
Tensile strength, lbs. per sq. in....	80,000	80,000
Yield point, lbs. per sq. in.....	50,000	50,000
Elongation in 8 ins., per cent.....	1,200,000	1,000,000
	Tensile strength	Tensile strength

### Flats and Angles.

Hard steel flats and angles are extensively used by bedstead manufacturers. This product rolled to customers' specification, although some stock is always on hand.

Flats made in sizes from  $\frac{5}{8}$  by  $\frac{3}{16}$  in. to 3 by  $\frac{5}{16}$  in.

Angles made in sizes from  $\frac{3}{4}$  by  $\frac{3}{4}$  by  $\frac{1}{8}$  in. to  $2\frac{1}{2}$  by 3 by  $\frac{5}{16}$  in.

Other small shapes rolled on special order.

### Fabrication.

The WITHEROW STEEL COMPANY is equipped with the most modern labor and cost saving machinery for bending. Spirals are shipped fabricated and collapsed.

### Wiscoform Construction.

Wiscoform construction is economical because centering cost is reduced almost one-half. Excess dead weight is eliminated, thus a large saving in the required material for supporting beams and columns. It also saves a great amount of concrete. It makes use of all materials entering into the construction. No breakage can occur in Wiscoforms. Their light weight and extensive covering area make them easily and economically handled on the job. One carload of Wiscoforms will cover as much area as twenty carloads of hollow clay tile. Freight and handling costs are proportionately reduced.

Wiscoforms are removable and can be used again and again. The flat flanges insure accurate spacing and alignment, and positively prevent loss of any of the cement grout from the concrete.



ADDITION TO VICKERS BUILDING, CLEVELAND, OHIO

Showing Wiscoform construction

FERGUSON-FLANAGAN, Contractors, Cleveland, Ohio

### Quick Shipments.

Large stocks are constantly on hand ready to ship from warehouses in Pittsburgh, Cleveland and Boston. An efficient traffic department insures speediest possible delivery.

Inquiries are sought and promptly answered.

### Engineering Co-operation.

This company maintains a large engineering organization devoted entirely to furnishing assistance to architects, engineers and contractors.

Lump sum quotations are given, including reinforcing bars, Wiscoforms and ceiling materials, together with detailed working drawings, showing location of all Witherow materials in the structure.

# THE ASSOCIATED METAL LATH MANUFACTURERS

PUBLICITY BUREAU

901 Sweetland Building  
CLEVELAND, OHIO

## MEMBER COMPANIES

AMERICAN ROLLING MILL CO., Middletown, Ohio  
THE BERGER MANUFACTURING CO. (pages 176-82;  
202-05; 417), Canton, Ohio  
THE BOSTWICK STEEL LATH CO., Niles, Ohio  
CONSOLIDATED EXPANDED METAL COS. (pages  
206-08), Braddock, Pa.  
TRUSCON STEEL CO. (pages 217-19), Youngstown, Ohio  
THE SYKES METAL LATH AND ROOFING CO. (pages 220-21), Warren, Ohio and Niles, Ohio

THE GENERAL FIREPROOFING CO. (pages 210-13),  
Youngstown, Ohio  
THE MILWAUKEE CORRUGATING CO. (page 209), Mil-  
waukee, Wis.  
NORTH WESTERN EXPANDED METAL CO. (pages  
214-15), Chicago, Ill.  
PENN METAL CO. (page 216), Boston, Mass.

## Services.

(a) THE EXPLOITATION OF METAL LATH as a fire resistant building material of high efficiency.

(b) RESEARCH WORK, to develop Metal Lath for every desirable purpose and to determine the type best suited for different classes of construction, at the same time developing the material to perform in the most efficient manner the functions required of it.

(c) RESEARCH WORK, to determine the most perfect methods of application, and the formulation of these methods into practical specifications for the use of architects and the building trade generally.

(d) THE PUBLICATION OF A METAL LATH HANDBOOK to contain full information as to the use of Metal Lath. The current edition will be sent to any interested inquirer without charge, on application.

Engineering Departments are maintained, from which the user of Metal Lath may receive expert construction information without charge.

Experts in transportation are employed so that the products of the member companies may reach the ultimate consumer at the lowest delivered price.

## General Features of Metal Lath and Plaster.

Metal Lath is a non-combustible base and reinforcement for interior and exterior plaster construction; an economical and efficient fire resistant.

Scientific tests and actual service have proved that Metal Lath and plaster are effective fire resistants and any known method of reducing the tremendous waste, which in America approximates \$235,000,000 annually, is well worth the serious consideration of those whose interests are in structural subjects.

In 1912 exhaustive tests were made in Cleveland, Ohio, under the direction of Virgil D. Allen, City Inspector of Buildings. The following illustrations (Figs. 1 and 2) from a part of this test show clearly, as both were applied on wood studding and as the studding had been reduced to charcoal in both cases (the only support remaining being the friction at top, bottom and sides), that it is upon the rigidity of plaster reinforced by Metal Lath that dependence can be securely placed.

In Fig. 1 the panel of *Metal Lath and plaster* stood the test of exposure to furnace fire for two hours, the

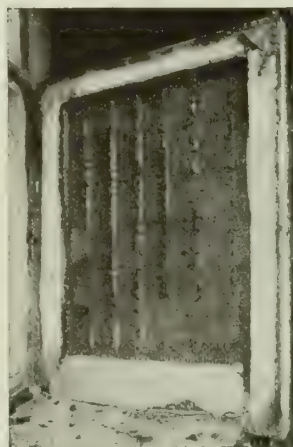


FIG. 1. METAL LATH AND PLASTER, WOOD STUDDING  
Condition at completion of test



FIG. 2. WOOD LATH AND PLASTER, WOOD STUDDING  
Failure at end of 75 minutes

maximum temperature being 1912° Fahr. The *Metal Lath* panel stood the further test of being subjected to a stream of water from a 1½-in. nozzle for 2½ minutes, 55 seconds after the furnace door was opened.

In Fig. 2 the *wood lath and plaster* show virtually a failure at the end of 75 minutes, with a maximum temperature of 1880° Fahr.

In 1914 a test was made in New York by Prof. Jas. S. McGregor, to determine the fire resisting value of the light, solid Metal Lath wall. Illustration (Fig. 3) shows the construction after exposure to fire for 2½ hours at an average temperature of 1746° Fahr. and to the application of water at 25 lbs. pressure from 1½-inch nozzle at a distance of from 2 to 6 ft. No fire, smoke or water penetrated through the partition; and after drying, it was firm and solid and rang true when struck with a hammer.

The entire wall was in the same condition as the small section shown here.

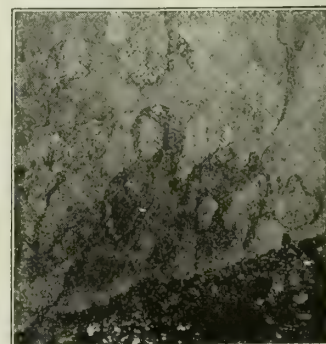


FIG. 3. LIGHT SOLID METAL LATH WALL  
After exposure to fire



The solid Metal Lath and plaster elevator shaft left standing after the fire at the Bacon Department Store, Boston, Mass., is a striking demonstration of the accuracy of these tests proved by actual service. See illustration, Fig. 4.

Chicago underwriters have announced that buildings of stucco (or plaster) exteriors are entitled to a 10% lower insurance rate than frame buildings.

### Partitions.

Whether solid of channel iron, Metal Lath and plaster, hollow walls of the same construction, or Metal Lath on wood studding, all have a distinct place in construction economy; apart from the saving of available space, they give fire resistive subdivisions, satisfactory alike from the viewpoint of first cost, low upkeep or remodeling expense, permanency and rigidity. For the convenience of owners, architects, superintendents and builders, reduced details are shown of various methods used for Metal Lath and plaster and the manner of application that has been proved most efficient as well as eminently satisfactory in actual service.

Complete specifications of the construction now shown are written in the Metal Lath Handbook, published by this Association, and will be forwarded on request.

For buildings where the maximum amount of usable space is desirable, or where space has an intrinsic value for rental purposes, the solid Metal Lath and plaster partition has an added value for increasing the available area, as is graphically shown by the following diagrams (Fig. 5).

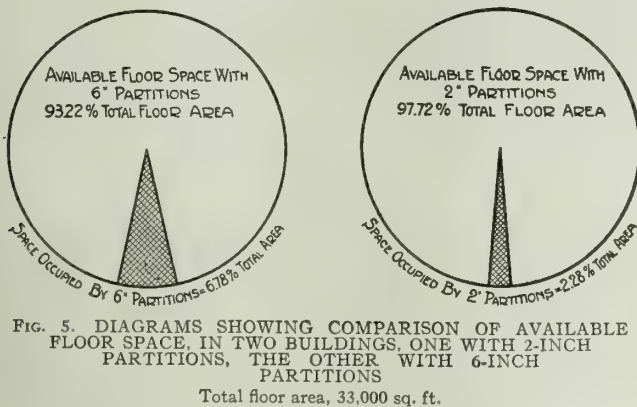


FIG. 5. DIAGRAMS SHOWING COMPARISON OF AVAILABLE FLOOR SPACE, IN TWO BUILDINGS, ONE WITH 2-INCH PARTITIONS, THE OTHER WITH 6-INCH PARTITIONS  
Total floor area, 33,000 sq. ft.

In addition to the detail views opposite, attention is directed to several diagrams on succeeding page which illustrate the construction of 2-in. and 2½-in. solid Metal Lath and plaster partitions in connection with wood door frames, anchorages, etc.; also the erection of the 4-in. hollow Metal Lath and plaster partition in relation to similar anchorages for elevator shafts and stair wells, door frames, etc.

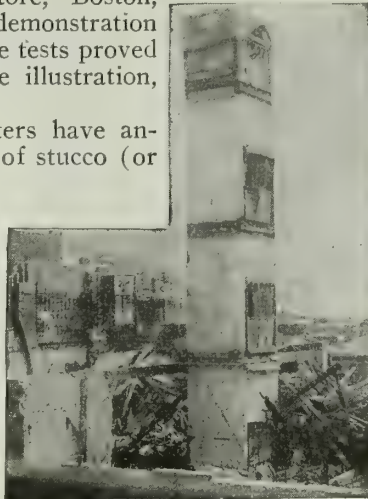


FIG. 4. SOLID METAL LATH AND PLASTER ELEVATOR SHAFT  
As it appeared after the fire

No partition efficient as a fire retardant can be constructed that will add so little to the dead load of a building as Metal Lath and plaster, either solid or hollow.

When special studding is not used, the practice is to use light channels, either ¾ in., 7⁄8 in. or 1 in., preferably the first and last mentioned.

Hollow walls 4 ins. over all (Fig. 14) have 2½-in. air space; two light channels are spaced for the desired thickness of wall and light pieces of band iron riveted or welded on (on 48-in. vertical centers) bind them together. The efficiency and stability of this wall is greatly increased by filling the space between the two surfaces of Metal Lath solid with a cinder concrete of 1 part Portland cement and 8 parts cinders.

The insulating properties of the 4-in. hollow wall are better, but the 2-in. solid wall is satisfactory for ordinary fireproof subdivisions.

Reference to the Cleveland tests, described in detail in the Metal Lath Handbook which will be sent to those interested on request, is convincing as to the efficiency of the 2-in. wall as a fire retardant.

The following diagrams describe these partitions and the various methods used.

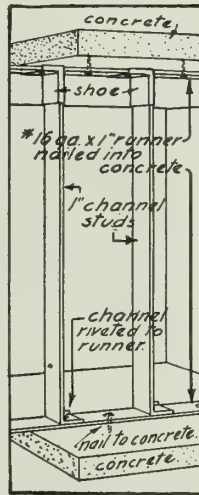


FIG. 6

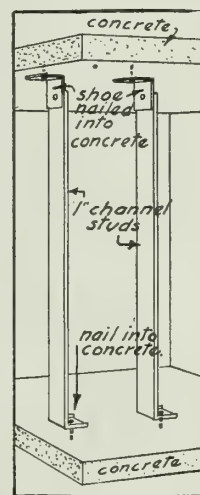


FIG. 7

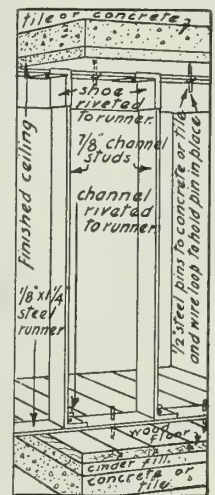


FIG. 8

SOLID PARTITIONS APPLIED TO CONCRETE



FIG. 9

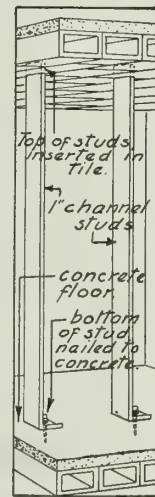


FIG. 10

SOLID PARTITIONS APPLIED TO TILE

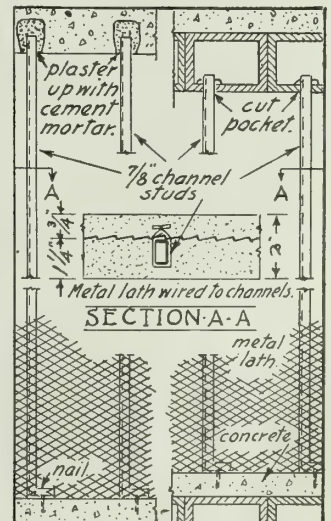


FIG. 11

2-INCH SOLID METAL LATH PARTITION



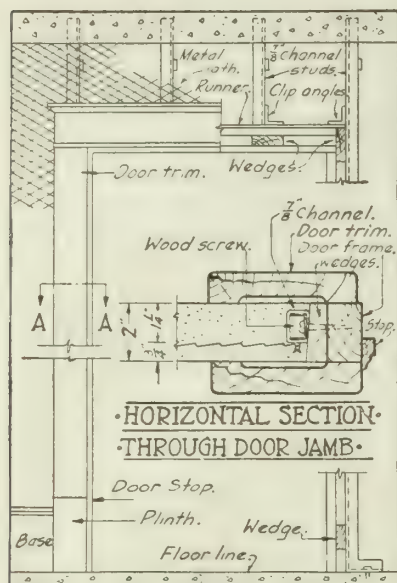


FIG. 12. 2-INCH SOLID METAL LATH AND PLASTER PARTITION AND WOOD DOOR FRAME

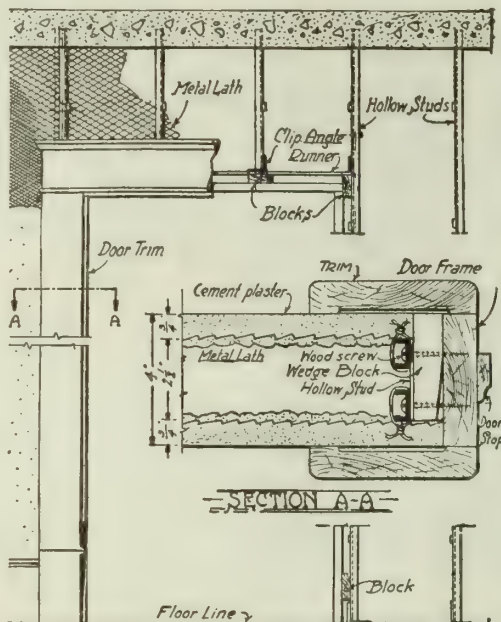


FIG. 14. 4-INCH HOLLOW PARTITION AND WOOD DOOR FRAME

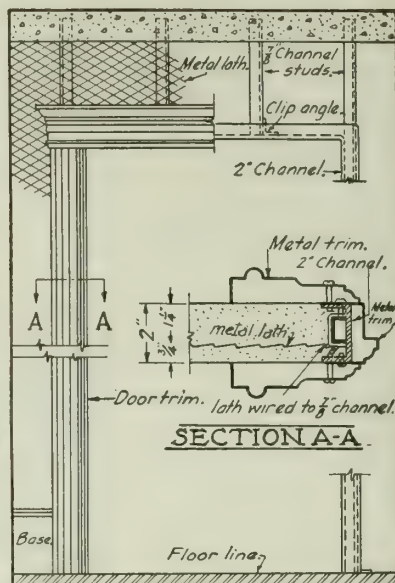


FIG. 13. 2-INCH SOLID METAL LATH AND PLASTER PARTITION AND WOOD DOOR FRAME

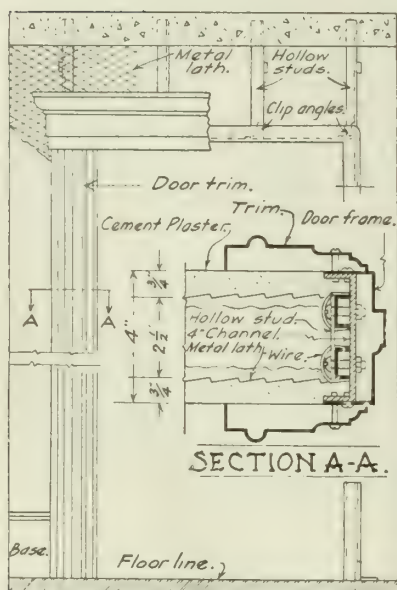


FIG. 15. 4-INCH HOLLOW METAL LATH AND PLASTER PARTITION AND METAL DOOR FRAME

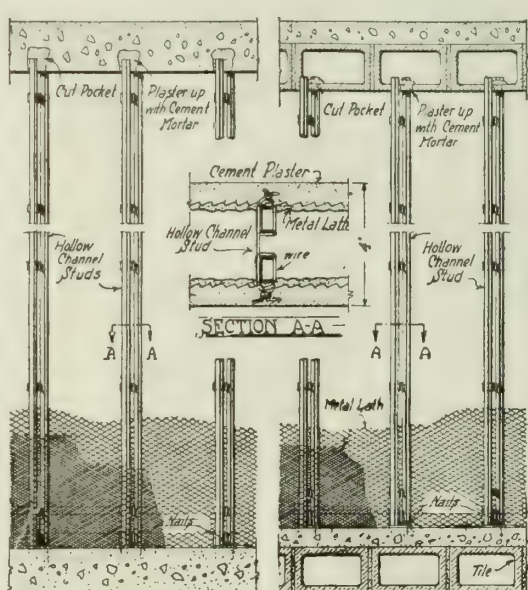


FIG. 16. 4-INCH HOLLOW METAL LATH PARTITION Showing anchorage at top and base

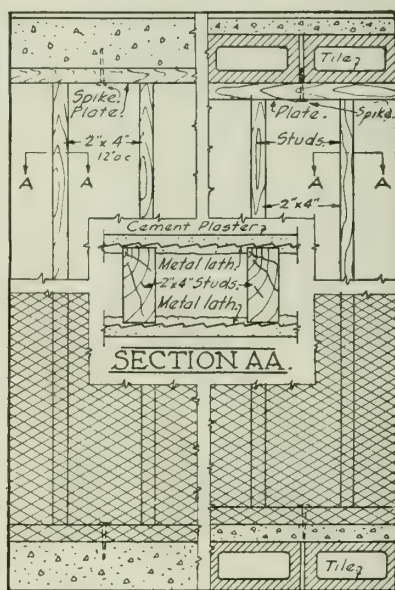


FIG. 17. HOLLOW WALL WITH METAL LATH ON WOOD STUDDING

## Elevator Enclosures

The New York building authorities class Metal Lath and plaster elevator enclosures as "Fireproof." See details of construction (Figs. 18 and 19).

The same methods are applicable for giving fire protection to vents and ducts and dumbwaiter shafts.

The importance of elevator enclosures warrants the best anchorage that can be devised. The forms shown typify the very best construction applied to hollow metal lath enclosures and to 2½-in. solid wall construction. Sliding shoes at top and bottom are advocated by some engineers, but observations suggest that the best protection is afforded by absolute bolted and riveted anchorage. The materials in this type of wall yield with expansion and contraction.

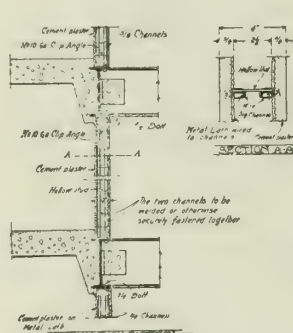


FIG. 18. DETAIL OF 4-INCH HOLLOW METAL LATH PARTITION

Showing anchorage for elevator shafts, stair wells, etc.

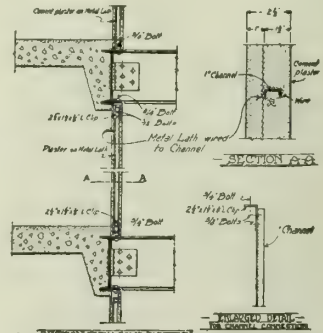
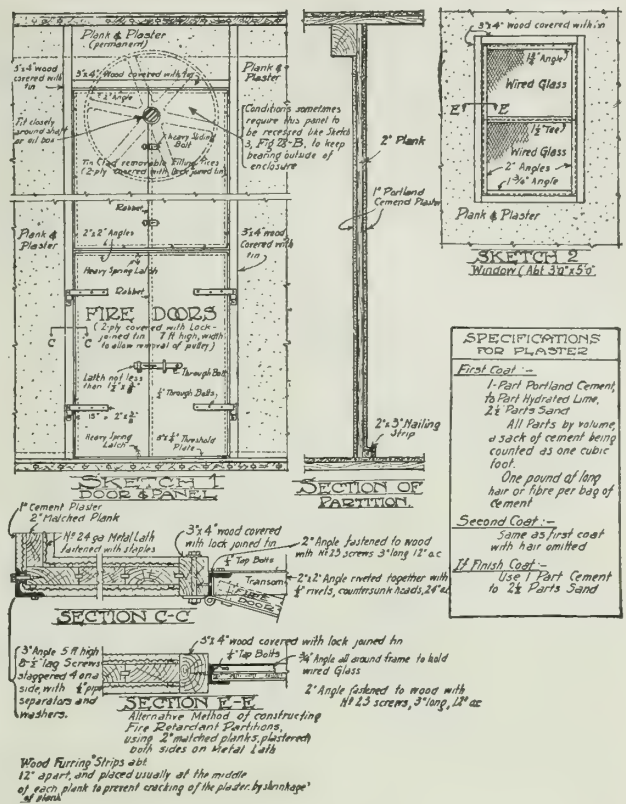


FIG. 19. DETAIL OF 2½-INCH SOLID METAL LATH PARTITION

Showing anchorage for enclosure for elevator shafts, stair wells, etc.



The construction shown herewith is recommended by the Engineering Department of the Associated Factory Mutual Insurance Companies of Boston, Mass., and the Inspection Department of the Factory Mutuals recommends the same construction for non-bearing stair



Plaster and Metal Lath on plank partition

### Fire Stops.

Fire resisting stops are equally necessary where masonry walls, hollow floors or wood construction are used; continuous spaces act as draught flues for the spread of fire vertically and as a passageway for rats and mice. Efficient fire stops are shown below.

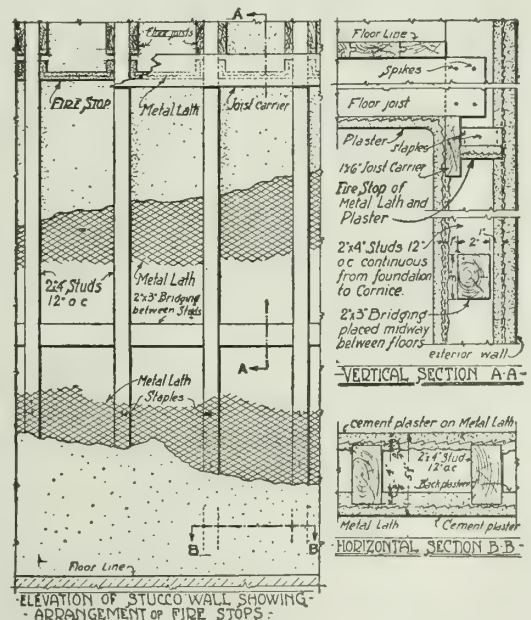


FIG. 20. STANDARD DETAILS FOR FIRE RETARDANT BELT ENCLOSURES

### ENCLOSURES

Plaster and Metal Lath on steel frame partition



## Suspended Ceilings.

The report of the Committee of Members of the American Society of Civil Engineers upon the San Francisco Fire reads: "It may be stated that one of the most obvious lessons taught by this fire is the protection to concrete floors and floor beams by the suspended ceiling of Lath and Plaster. In all cases where used it afforded complete protection. Where not used, concrete was destroyed and beams distorted." Upper section (Fig. 23).

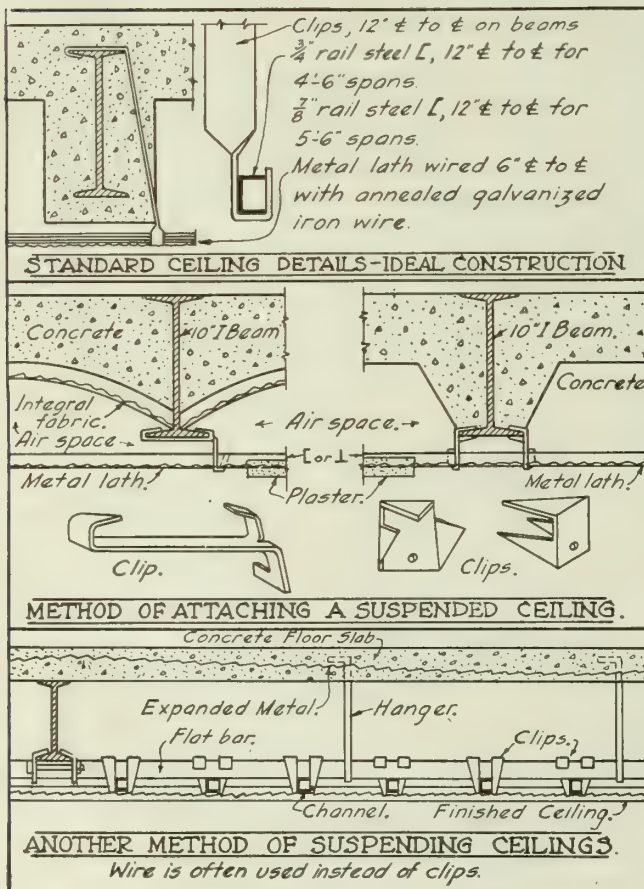
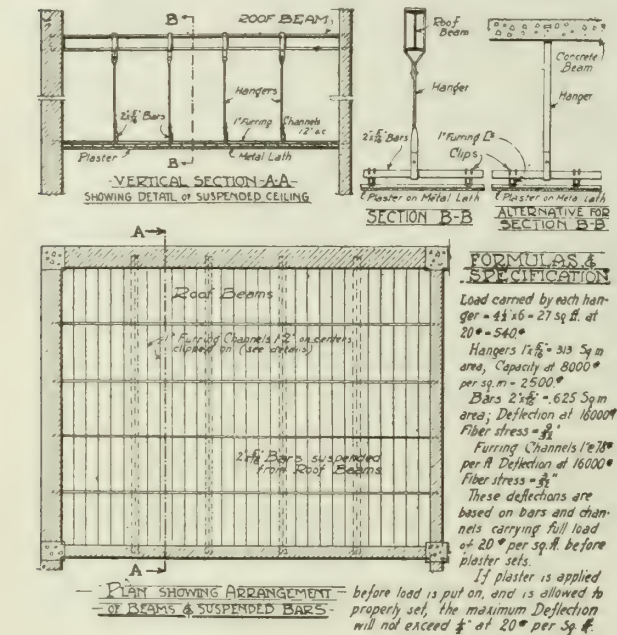


FIG. 23. SUSPENDED CEILING CONSTRUCTION

## Column Protection.

Columns are the most important load bearing members in modern buildings; they stand isolated, exposed on all sides. Steel columns commence to give at temperatures of 1000° to 1200° Fahr.; to protect them properly against fire is of the utmost importance. Just as it was proved by the San Francisco fire that concrete floors and floor beams were efficiently protected by suspended ceilings of Metal Lath and plaster, so will efficient protection be given to columns by using the construction illustrated in Figs. 24 and 25.

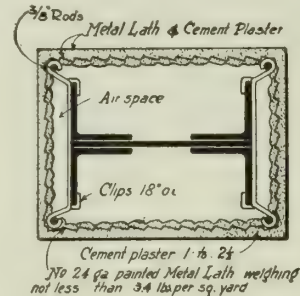


FIG. 24. COLUMN PROTECTION

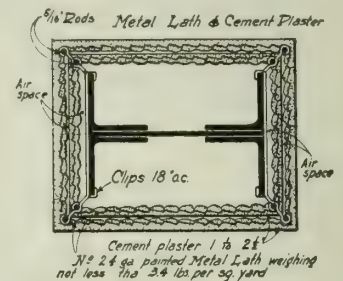


FIG. 25. DOUBLE WALL COLUMN PROTECTION

## Fire Protection for Mill Construction.

Buildings of this type where frame construction is used throughout, or in part, may be made fire resistive at low cost by protecting with metal lath and plaster as shown (Fig. 26).

**PROTECTION OF STEEL BEAMS**—In machineshops and other plants where exceptionally heavy floor construction is required above the ground level.

Steel girders are inexpensively protected against fire as shown by Fig. 29, and where unusual fire hazard exists by use of a double layer of metal lath and cement plaster providing an air space as in Fig. 28. Fig. 27 shows protection used in Class A buildings to stand the severest test of fire and water.

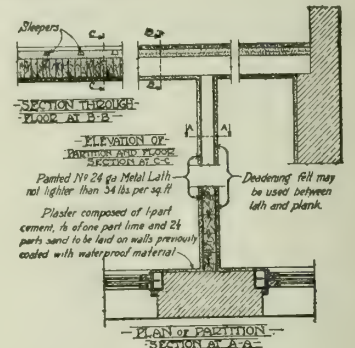


FIG. 26. TYPICAL DETAIL FOR MILL CONSTRUCTED BUILDINGS, IN WHICH WOOD IS PROTECTED BY METAL LATH AND PLASTER

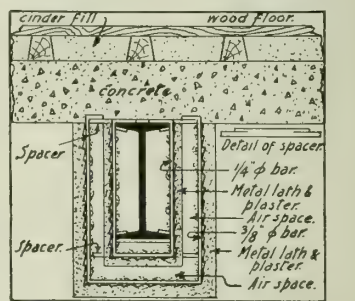


FIG. 27. DOUBLE WALL PROTECTION, CLASS A

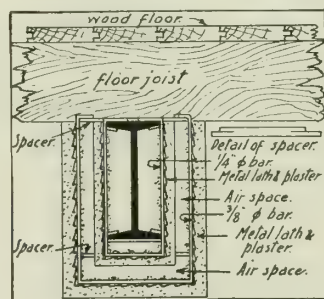


FIG. 28. DOUBLE WALL PROTECTION

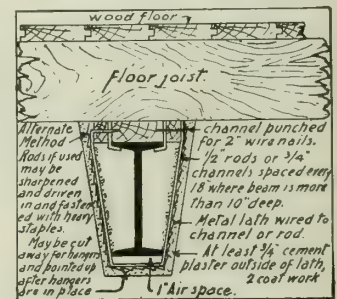


FIG. 29. BEAM PROTECTION





# THE BERGER MANUFACTURING CO.

Manufacturers of Concrete Reinforcement and Metal Lath

CANTON, OHIO

BRANCHES

NEW YORK, N. Y., S. E. Cor. 22nd Street and 11th Avenue  
PHILADELPHIA, PA., Corner 16th Street and Washington Avenue  
SOUTH BOSTON, MASS., 450-56 Broadway

CHICAGO, ILL., 20 North Market Street  
ST. LOUIS, MO., 16 South Tenth Street  
MINNEAPOLIS, MINN., 300-312 10th Avenue, South  
SAN FRANCISCO, CAL., 1120 Mission Street

## Products.

RIBPLEX, FERRO-LITHIC and MULTIPLEX REINFORCING PLATES; PRESSED STEEL CORES; EXPANDED METAL; EXPANDED METAL and LATTICE SHEET LATH; CORNER BEADS; BASE SCREEDS.

For Metal Lumber see pages 176-82; for Steel Ceilings see page 417; for Metal Furniture see pages 1406-08.

## Berger's Reinforcing Plates.

Berger's plates for concrete reinforcing, furring, partitions, side walls, suspended ceilings and stucco construction are made in three styles herein described, and of varying weights to meet any condition imposed in the most economical way.

## Berger's Ribplex Reinforcing Plates.

Ribplex is an expanded metal with ribs, a combined centering and reinforcement, for lightweight fireproof construction.

USES—Especially adapted for floors, roofs, side walls, partitions, suspended ceilings and stucco construction.

**RIBPLEX**  
TRADE-MARK

DESIGN—The design is a plexus or network of strands forming meshes between inverted V-shaped stiffening or supporting ribs.

These ribs have an inverted arch shaped formation at their base, from which the turned-on-edge mesh strands start.

This patented curve flange, which connects with the expanded metal, increases the stiffness of the ribs and provides additional strength.

RIBS—Cold formed, thereby increasing the elastic limit of metal. They act as beams in supporting the wet concrete or plaster, thus eliminating formwork on short spans in floor or roof construction—also studs and furring in plastering work. The ribs are  $\frac{3}{4}$  in. deep, spaced 4.8 ins. center to center.

MESH—The turned-on-edge mesh stiffens the expanded metal between the ribs and develops the full tensile strength of the metal. It also prevents the plates from becoming twisted or distorted in shipping or erecting.

The small meshes give a splendid bond, allowing but a small percentage of waste of concrete or plaster due to dripping.

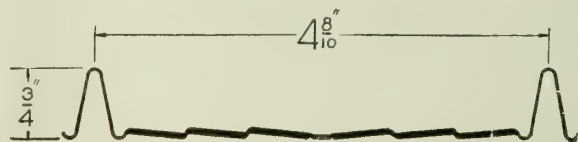
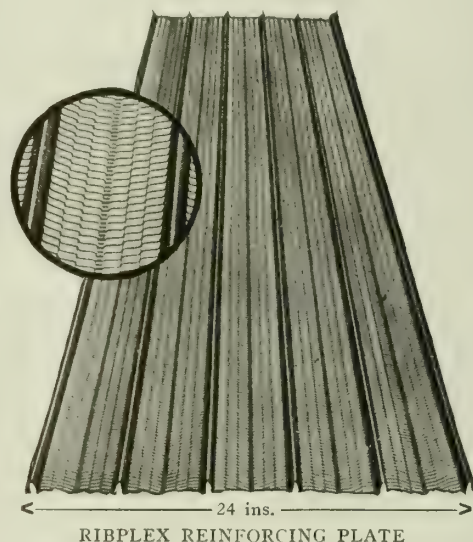
METHOD OF FASTENING—For floors and roofs, Ribplex is simply fastened to the framework by means of clips, and concrete placed. On ordinary spans, no support for plates while pouring concrete is necessary; and on longer spans, only temporary braces are required.

For suspended ceilings, Ribplex is simply clipped to the underside of the beams, and the plaster applied.

For partitions, Ribplex is usually supported at ceiling by channels and at floor by angles. No temporary center support is needed except in extra high partitions.

SIZES AND GAUGES—The plate is 24 ins. wide; stock lengths, 4, 5, 6, 7, 8, 9, 10, 11 and 12 ft.

Gauges Nos. 24, 26 and 28.



SHOWING CROSS SECTION BETWEEN RIBS OF RIBPLEX PLATE

SAFE TOTAL LOADS RIBPLEX PLATES IN POUNDS PER SQ. FT.

Thickness of concrete	Gauge	Resisting moment per ft. of width	Span in ft.							
			3	4	5	6	7	8	9	10
2 ins.	28	3140	291	164	104	73				
Wt., 24 lbs. per sq. ft.	26	3720	346	194	124	85	63			
	24	4370	405	228	146	101	74			
2 1/2 ins.	28	4070	376	211	135	94	69	53		
Wt., 30 lbs. per sq. ft.	26	4850	449	253	162	112	82	62		
	24	6360	588	331	211	147	108	81		
3 ins.	28	5030	465	261	168	116	85	65		
Wt., 36 lbs. per sq. ft.	26	5930	550	309	198	137	101	77	61	
	24	7820	722	406	260	180	133	101	84	
3 1/2 ins.	28	5950	550	310	198	137	101	77	64	
Wt., 42 lbs. per sq. ft.	26	7060	654	368	237	163	120	92	72	
	24	9300	861	484	310	214	158	121	96	
4 ins.	28	6910	640	360	230	160	117	90	71	
Wt., 48 lbs. per sq. ft.	26	8160	756	425	272	188	139	106	84	68
	24	10760	997	561	359	249	183	140	110	90

For safe live loads, deduct weight of slab.

Stress in steel not over 16,000 lbs. per sq. in.

Stress in concrete not over 650 lbs. per sq. in.

Ratio of moduli of elasticity, 15.

Distance of center of gravity above bottom of plate, .21 in.

Bending moment  $\frac{WL^2}{10}$ . For  $\frac{WL^2}{12}$  add 20%; for  $\frac{WL^2}{8}$  deduct 20% from above loads.

Sectional areas for calculation:

No. 28-gauge .124 sq. in. per ft. width.

No. 26-gauge .148 sq. in. per ft. width.

No. 24-gauge .198 sq. in. per ft. width.



**Berger's Ferro-Lithic Reinforcing Plates.**

Ferro-Lithic steel plates are composed of a series of cross ribbed, dovetailed formations which give a remarkable stiffness and rigidity to the plate.

USES—Especially suitable for buildings exposed to smoke, acid fumes, gases, condensation or moisture such as found in various manufacturing plants, chemical works, collieries, rolling mills, galvanizing plants, plating works, foundries, powerhouses, train sheds, breweries, roundhouses, etc.

CENTERING—By reason of the continued row of dovetails in cross section, the plate serves both as centering and reinforcing, as the bare plate itself is sufficiently rigid to support the concrete and the dovetails on the top hold the concrete in place while the dovetails on the underside of the plate hold the plaster in place. No centering other than the plate itself is necessary; but it is well to brace the plate, usually at the center of the span, while the concrete is being installed and until same is thoroughly set.

STANDARD SIZES AND GAUGES—Made of gauges Nos. 22, 24 and 26, and depth of  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$  in. The standard plate is the No. 24-gauge, plain, unpainted, with dovetails  $\frac{1}{2}$  in. deep. The effective covering width of the  $\frac{1}{2}$ -in. depth plate is 20 ins.; of the  $\frac{5}{8}$ -in. depth, 18 ins.; and of the  $\frac{3}{4}$ -in. depth, 16 $\frac{1}{2}$  ins.

All depths and gauges can be furnished in any length up to and including 10 ft., and can be furnished cut to size or formed into special shape, such as may be required for cornice work. They can be curved for segmental arch construction in No. 24-gauge and depths of  $\frac{1}{2}$  and  $\frac{5}{8}$  in., and no other size or gauge can be curved.

ROOF CONSTRUCTION—On account of the location of roof trusses, often high above the ground, it is an exceedingly difficult matter to erect centering for a concrete slab to be reinforced with rods, expanded metal, etc. In contrast, the application of Ferro-Lithic plate is made directly on the roof framing with purlins spaced at proper intervals.

**Purlin Spacing**—The most desirable spacing of purlins is at centers of 4 ft. 10 $\frac{1}{2}$  ins. so as to provide for the use of a 10-ft. sheet and a lap of 3 ins. at the end of the plate. The plates are placed in position and securely anchored to the framing; and if weather is unsuitable for concreting, the plates may be applied and the concreting and plastering completed at a later, more convenient date.

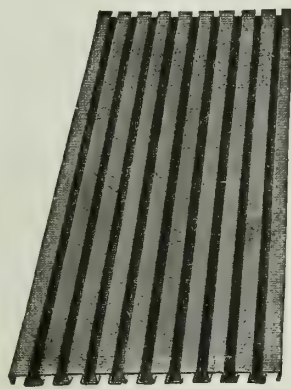
**Weight**—The Standard Ferro-Lithic roof slab weighs approximately 16 lbs. per sq. ft., plastered and waterproofed.

**SIDING CONSTRUCTION**—For sidings, the plates can be placed with the dovetails running either vertically or horizontally, or on the incline. The application of

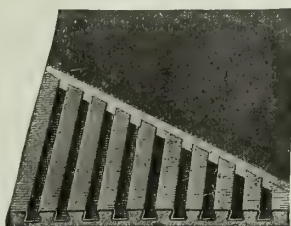
Ferro-Lithic plates for sidings of buildings is made directly on the framing.

**FLOOR CONSTRUCTION**—The accompanying illustrations and tables explain the adaptability of Ferro-Lithic plates to fireproof floor construction. Floor construction using Ferro-Lithic plates can proceed on all floors of buildings at the same time, thus expediting the work.

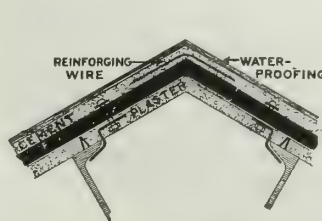
*Ferro-Lithic*  
TRADE-MARK



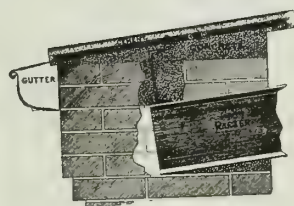
FERRO-LITHIC PLATE  
READY TO LAY



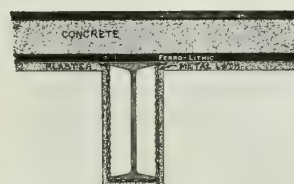
FERRO-LITHIC PLATE CON-  
CRETED ON TOP, PLAS-  
TERED UNDERNEATH



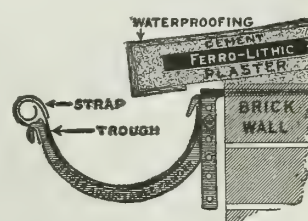
Construction at Ridge



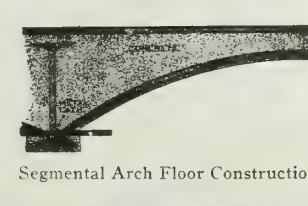
Permanent Gutter Construction



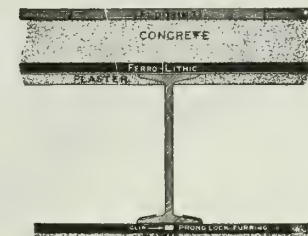
Suspended Ceiling



Adjustable Gutter Construction



Segmental Arch Floor Construction



Flat Furred Ceiling

DETAILS SHOWING APPLICATION OF FERRO-LITHIC PLATE

SAFE LIVE LOADS, FLAT FERRO-LITHIC REINFORCED SLABS  
IN POUNDS PER SQUARE FOOT  
Safety Factor of Four

Clear span ft. ins.	Depth of concrete over top of plates, ins.								
	0	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
2 0	159	415	718	1025	1325	1665	1955	2270	2620
2 6	100	265	460	655	848	1065	1250	1455	1680
3 0	70	184	319	455	588	738	869	1010	1165
3 6	53	138	238	335	438	539	638	741	855
4 0	40	105	181	256	335	413	489	568	655
4 6	31	84	144	208	269	330	394	458	519
5 0	25	68	116	168	218	268	319	370	420
5 6	21	54	95	138	179	221	253	305	346
6 0	18	45	80	115	150	186	221	256	291
6 6	15	38	69	99	129	159	189	219	248
7 0	13	33	59	85	111	136	163	189	214
7 6	11	29	51	74	95	119	141	164	185
8 0	10	25	45	65	84	104	124	144	163
8 6	9		40	59	76	93	111	124	144
9 0	8			52	68	83	99	113	129
9 6	7				60	75	88	101	115
10 0	6					68	79	91	104

NOTE—Loads for  $\frac{1}{2}$ -in. depth and No. 24-gauge only. Loads per sq. ft. uniformly distributed. Loads below heavy lines show excessive deflection. Data of safe loads for other depths and gauges furnished on application.

**Berger's Multiplex Reinforcing Plates.**

Multiplex steel plates consist of steel sheet formed into a series of continuous corrugations, ending at the top and bottom in three half-circle arches separating the sides of these corrugations from each other. The depth of corrugations and gauge of material is varied according to the span and the load to be carried.

*Multiplex  
Steel Plate*  
TRADE-MARK

USES—Especially adapted for floor, roof and sidewalk construction.



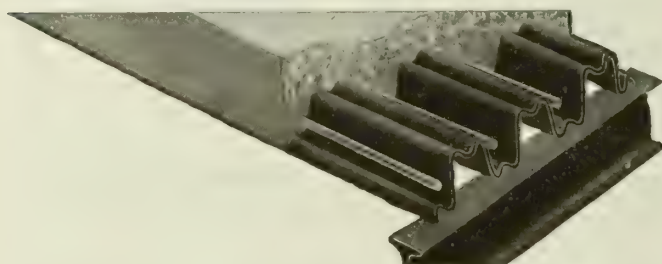
**LAYING AND CONCRETING**—In installing the plates they are placed on the bearings and the upper portion of manifold is filled with concrete, which can be put on immediately and should be lightly tamped. While filling the plate the concrete is incidentally moulded into a series of concrete beams which reduce the dead load of concrete about 30%.



FLOOR CONSTRUCTION USING MULTIPLEX PLATES

**PLATE DETAILS**—Multiplex steel plates are made of Nos. 16 to 24 gauge sheet steel, either painted or galvanized, and formed into corrugations with depths as listed below.

**ROD REINFORCEMENT**—Multiplex steel plates, to be used to the best advantage, should include small rein-



MULTIPLEX PLATES WITH ROD REINFORCEMENT

SAFE LOADS, MULTIPLEX STEEL PLATE IN POUNDS PER SQUARE FOOT\*

†Filled with Concrete 1 In. Above Plate

Metal gauge number	Depth of plate, ins.	Distance between supports in ft.							
		3	4	5	6	7	8	9	10
16	4	4230	2370	1510	1040	760	575	450	360
18	4	3180	1780	1130	780	570	430	335	270
20	4	2260	1265	800	550	400	300	235	185
22	4	1810	1010	640	435	320	240	185	145
24	4	1408	792	507	352	258	198	156	127
16	3 1/2	3755	2100	1340	915	672	510	400	320
18	3 1/2	2815	1575	1000	790	510	380	295	235
20	3 1/2	1990	1115	705	485	350	265	205	165
22	3 1/2	1500	840	530	360	265	201	150	120
24	3 1/2	1280	720	461	320	235	180	142	115
16	3	2820	1610	1025	705	515	390	305	240
18	3	2165	1210	760	530	385	290	235	180
20	3	1730	970	615	420	305	230	180	145
22	3	1230	685	435	295	215	160	125	100
24	3	978	550	352	244	169	137	109	88
16	2 1/2	2260	1265	905	555	405	305	240	190
18	2 1/2	1700	950	605	415	305	230	180	140
20	2 1/2	1210	675	430	295	215	160	125	100
22	2 1/2	970	540	340	235	175	130	100	80
24	2 1/2	770	433	277	192	143	108	86	69
16	2	1330	745	475	325	235	180	140	110
18	2	1005	560	355	245	180	135	120	85
20	2	810	450	285	200	145	110	85	65
22	2	640	350	230	155	115	85	65	50
24	2	454	255	163	117	87	65	25	41

\*Load is total safe load less weight of concrete filling and weight of plate itself.

†Concrete filling consists of 1 part best cement, 3 parts clean, sharp, angular sand, mixed with 5 parts of pure crushed furnace slag.

Estimated weight of concrete per cubic foot, 90 lbs.

NOTE.—These tables represent safe loads with factor of safety of 4 and show the strengths of new work. For absolute permanence, and as additional factor of safety, it is recommended that rods be added according to specific requirements. Expanded metal may also be used.

Table prepared from actual tests under the direction of Hallstead & McNaugher, successors to G. W. G. Ferris & Co., civil engineers.

forcing rods in each manifold, or every other manifold, as the conditions may require. In installing the rods, they are laid in place on a small bed of concrete spread over the lower part of the arch manifold.

### Berger's Pressed Steel Cores.

Berger's pressed steel cores are corrugated steel forms used in the construction of lightweight fireproof floors.

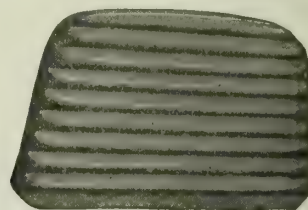
The resulting construction is that of a series of parallel T-beams, spaced about 2 or 2½ ft. apart.

This type of T-beam floor is strong, rigid and economical—its economy being particularly great where the distance between supporting beams is from 15 to 35 ft. and the live loads to be carried are less than 200 lbs. per sq. ft.

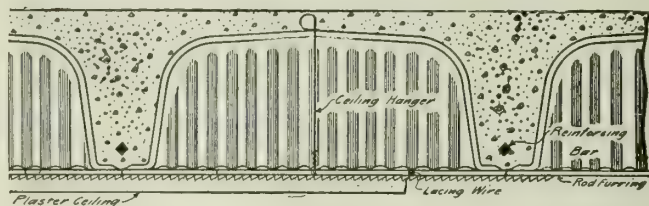
The cost of centering and formwork is cut to a minimum, as only skeleton forms are required. No loss in breakage can occur, and no concrete is wasted.

Concrete floors built by use of Berger's pressed steel cores are soundproof to a remarkable degree, on account of dead air space between the floor and plastered ceiling.

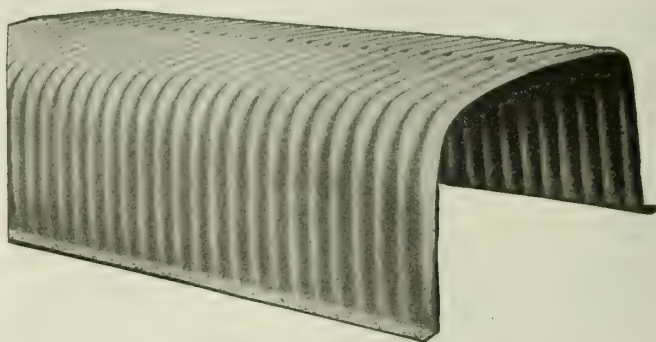
Berger's pressed steel cores find ideal application in schools, hotels, apartment houses, office buildings and warehouses.



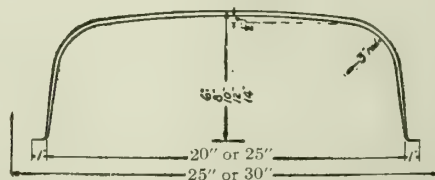
SPECIAL END CAP  
Corrugated end caps supplied for closing ends of the cores



SECTION THROUGH FINISHED FLOOR AND CEILING  
Showing simple method of ceiling construction



PRESSED STEEL FLOOR-CORE  
(Patented)

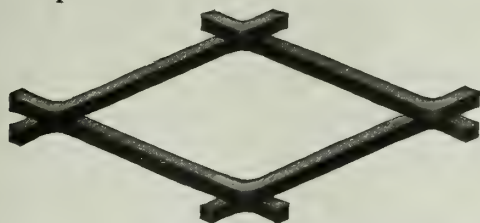


ELEMENTS OF STANDARD PRESSED STEEL CORES  
Gauges: Nos. 22, 24, 26, 27 and 28

FURTHER INFORMATION—Designing data and complete information sent on application.

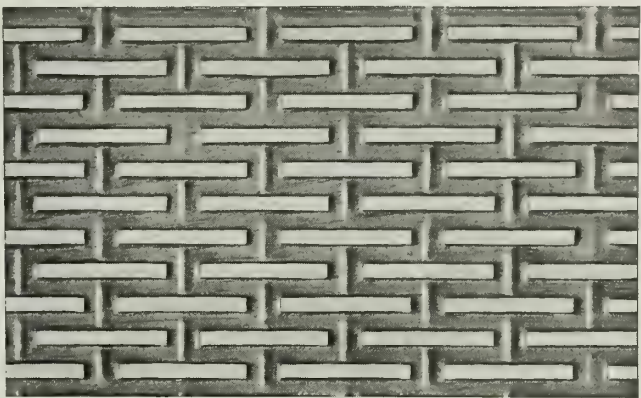


Berger's Expanded Metal.



EXPANDED METAL

Style	Mesh, ins.	Gauge	Weight per sq. ft., lbs.	Standard size of sheets	
				Widths	Lengths, ft.
049-5 1/4	5 1/4	12	.16	6'	12
06-5 1/4	5 1/4	12	.20	6'	12
073-5 1/4	5 1/4	12	.25	6'	12
088-5 1/4	5 1/4	10	.30	6'	12
06-3	3	16	.20	3', 4', 5' and 6'	6, 8 and 12
08-3	3	16	.27	3', 4', 5' and 6'	6, 8 and 12
10-3	3	16	.34	3', 4' and 6'	6, 8 and 12
125-3	3	12	.42	3', 4' and 6'	6, 8 and 12
15-3	3	10	.51	3', 4' and 6'	6, 8, 10 and 12
16-3	3	10	.55	3', 4' and 6'	6, 8, 10 and 12
176-3	3	10	.60	3', 4' and 6'	6, 8, 10 and 12
20-3	3	10	.68	3', 4' and 6'	6, 8, 10 and 12
25-3	3	10	.85	3', 4' and 6'	6, 8, 10 and 12
265-3	3	10	.90	3', 4' and 6'	6, 8, 10 and 12
30-3	3	10	1.02	3', 4' and 6'	6, 8, 10 and 12
324-3	3	10	1.10	3', 4' and 6'	6, 8 and 12
35-3	3	10	1.19	3', 4' and 6'	6, 8, 10 and 12
40-3	3	7	1.36	3' 6' and 7'	6, 8 and 12
10-2 3/4	2 3/4	16	.34	3', 4', 5' and 6'	6, 8 and 12
135-2 3/4	2 3/4	12	.46	3', 4' and 6'	6, 8 and 12
15-2 3/4	2 3/4	12	.51	3', 4' and 6'	6, 8 and 12
16-2 3/4	2 3/4	12	.55	3', 4' and 6'	6, 8 and 12
10-1 1/2	1 1/2	16	.34	3', 4' and 6'	6, 8 and 12
15-1 1/2	1 1/2	14	.51	3' and 6'	6, 8 and 12
20-1 1/2	1 1/2	12	.68	3', 4' and 6'	6, 8 and 12
15-3/4	3/4	16	.51	3' 6' and 7'	6, 8 and 12
25-3/4	3/4	12	.85	3', 4' and 6'	6, 8 and 12
20-1/2	1/2	18	.68	3' 6' and 7'	8 only



LATTICE SHEET LATH

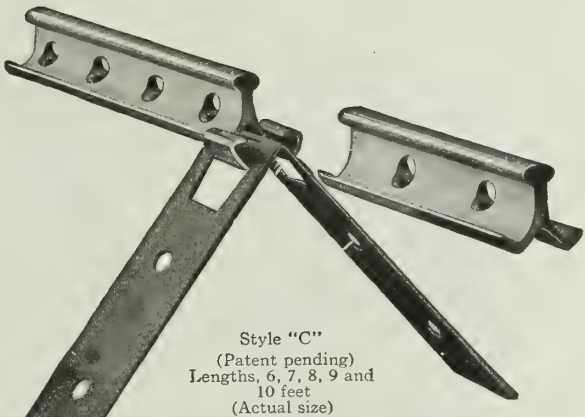
Berger's Corner Beads.

For protecting exposed corners of plastered walls; applied directly to metal lath, wood or any other ground, and plastered over, leaving only the face of the nose exposed. The wings are perforated to allow the plaster to bond through the bead.

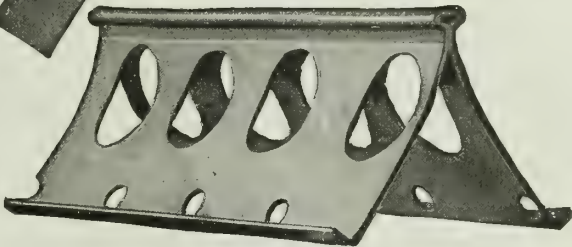
TYPES—Made in 2 types: large or wing, and small or rail; the latter with clips, and the former with or without. For hollow blocks or bricks or any rough corners, use corner beads with clips.

MATERIAL—Always galvanized.

STANDARD LENGTHS—6, 7, 8, 9 and 10 ft.



Style "C"  
(Patent pending)  
Lengths, 6, 7, 8, 9 and 10 feet  
(Actual size)

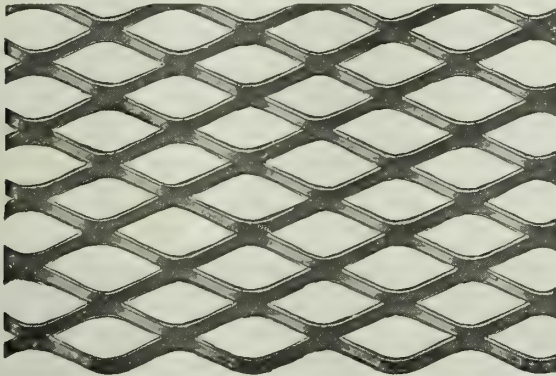


Style "D" (Ribbed Point)  
CORNER BEADS

Berger's B. B. Expanded Metal Lath.

Used on stucco walls, partitions, ceilings, and all kinds of work where plaster is required. The diamond shaped meshes are small and expanded in such a manner as to permit of a perfect clinch and covering of the lath. Prevents cracking of the walls.

Made of open hearth steel or Toncan metal; painted or galvanized. Standard sheets are 18 ins. wide by 96 ins. long. Made in gauges 27, 26, 25, 24 and 22.



EXPANDED METAL LATH

Berger's Lattice Sheet Lath.

A perforated sheet lath; not expanded. It is very rigid and stiff and is preferred by many as against expanded metal lath where extra strength is desired. It is especially adapted for mantel and tile setting.

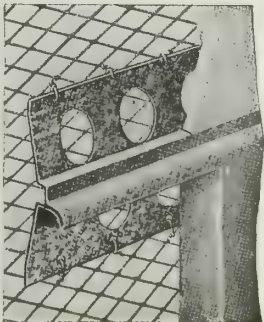
In use for ceilings, the special shape forms a partial vacuum or suction and thus prevents the mortar dropping off when wet. Each keyway has 4 retaining ledges, 2 in front and 2 in rear, making practically one solid continuous clinch 1/2 in. apart.

Size of sheets, 18 ins. wide by 96 ins. long. Weight, approximately 4 1/2 lbs. to the sq. yd. It is painted or galvanized.

Berger's Base Screed.

A metal screed that is nailed in place, affording a permanent ground for the plaster above and the cement base below. It protects both plaster and cement at all times, thus eliminating patching. Made in 10-ft. lengths only.

Screed applied over metal lath. Plaster above and cement base below.



APPLICATION OF BASE  
SCREED



# THE CONSOLIDATED EXPANDED METAL COMPANIES

GENERAL OFFICES AND WORKS

BRADDOCK, PA.

(In the Pittsburgh District)

SALES OFFICES

CHICAGO, ILL.

PHILADELPHIA, PA.

PITTSBURGH, PA.

EXCLUSIVE REPRESENTATIVES

NEW YORK, N. Y., EXPANDED METAL ENGINEERING CO.  
BOSTON, MASS., PENN METAL CO.SAN FRANCISCO, CAL., HOLLOWAY EXPANDED METAL CO.  
DALLAS, TEX., BUILDERS' METAL PRODUCTS CO.

TORONTO, CAN., BAINES &amp; PECKOVER

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

## Products.

"STEELCRETE" EXPANDED METAL for reinforcing concrete; "STEELCRETE" FLOOR BINDER; "STEELCRETE" EXPANDED METAL LATH; "STEELCRETE" CORNER BEAD.

Beam Wrapping, Channel Furring, and Special Meshes for lockers, machine guards, etc.

## "Steelcrete" Expanded Metal for Concrete Reinforcement.

**SECTIONAL AREA**—A 16-ft. long sheet of expanded metal, for reinforcing concrete, can now be obtained with sectional area of 1.00 sq. in. Heretofore this long length and heavy section has been unobtainable. It will reduce cost of placing reinforcing in concrete. Reinforcing ranges from sectional area of 1.00 sq. in. down to a light section to be used for temperature stresses.

**SCOPE OF USE**—"Steelcrete" expanded metal, the oldest and most widely used of concrete reinforcement, is used and indorsed by contractors and engineers all over the world for reinforced concrete work such as floor and roof slabs, sewers, conduits, tanks, highway bridges, culverts, retaining walls, etc.

**DESCRIPTION**—"Steelcrete" is a concrete reinforcing expanded metal mesh that possesses great unit strength and a high elastic limit. It is cold drawn to its mesh shape under enormous speed, being previously covered with oil. Owing to the proper cold drawing process employed in its manufacture, and the use of soft low carbon steel, "Steelcrete" retains the two important features of uniformity of quality and stiffness, which render it valuable as a reinforcing medium.

The open hearth steel used in the manufacture of "Steelcrete" has a tensile strength of from 55,000 to 60,000 lbs.; elastic limit not less than  $\frac{1}{2}$  its ultimate strength; elongation of about 25% in 8 ins., and a cold bending test of 180°. In the finished product, because of the process used, the ultimate strength is raised to a value of 70,000 to 80,000 lbs. and the elastic limit increased by 100%.



The diamonds or quadrilaterals of the sheet under severe loading tend to close. The effect of this contraction in the meshes is to give the "Steelcrete" a ductility unencountered in any other reinforcement of high elastic limit, and to introduce counteracting compression in the concrete, which, at the points where the reinforcing is placed, is in tension, thus reinforcing the construction against sudden rupture.

**DISTINCTIVE FEATURES**—Three distinctive features make for its superiority. They are entirely unique with the material and are not encountered in any other type of concrete reinforcing steel: (1) The cold working of the steel in the process of manufacture. (2) The diamonds, or quadrilaterals, of the sheet under severe loading tend to close, giving "Steelcrete" an unusual ductility. (3) The closing of the diamonds, in addition to giving ductility, introduces a compression into the concrete which at this point is in tension. This is highly beneficial to the slab and greatly adds to its strength.

To these are added many other features which are readily recognized by experienced users.

**SPECIFICATIONS**—Only by specifying "Steelcrete" expanded metal can proper results be obtained. Simply saying "Expanded Metal" may result in a cheap substitution.

The following should be embodied in specifications:

The slabs shall be reinforced with "Steelcrete" expanded metal system, size .... [or, The Slabs shall be reinforced with "Steelcrete" expanded metal, of such a thickness of slab and size of metal as shall carry a superimposed load of .... lbs. per sq. ft. with a factor of safety of 4].

The expanded metal shall be laid on the forms with long way of diamond meshes extending transversely to supporting beams. Adjoining sheets shall be lapped 8 ins. on the end and 3 ins. on the side.



Flat Sheets Being Handled by Cheap Labor



Showing How Sheets Lie in Place

"STEELCRETE" EXPANDED METAL SHEETS



TABLE OF SAFE LIVE LOADS IN POUNDS PER SQUARE FOOT FOR SLABS WITH "STEELCRETE" REINFORCEMENT

$$M = \frac{WL^2}{12}$$

Weight of Slab Deducted  
 M—Maximum bending moment  
 W—Total load per sq. ft.  
 L—Center to center span

Name of mesh	Clear Span															Over all thickness of slab, ins.
	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'6"	8'0"	9'0"	10'0"	11'0"	12'0"	13'0"	14'0"	
3-13-075	119	86	63	45	32	22										3
3-13-075	178	130	96	71	51	36	25									4
3-13-125	218	164	126	98	76	60	46	36	27							3
3-13-125	323	245	189	147	116	91	72	56	43	24						4
3-9-15	395	302	235	185	148	119	95	77	61	38	21					4
3-9-20	536	413	325	260	211	172	142	117	97	66	44	28				4
3-9-30	744	578	458	370	303	251	210	176	149	107	77	55	38	25		4
3-6-40	1049	818	652	529	436	363	305	258	220	162	121	90	67	49	34	4½
3-6-40	1797	1404	1124	915	757	634	536	457	393	295	225	173	133	102	78	6

1 in. of concrete 1 ft. square costs more than 2¢. It is usually economical to use heavy mesh and a thin slab.

NOTE—3-in. No. 10 light—3-9-15. 3-in. No. 10 heavy—3-9-25.

Mesh should not be ordered as 3-in. No. 10, as 3-13-075 and 3-16-06 are both frequently termed 3-in. style No. 10.

USUAL LOADS—Roofs.....	30 to 40 lbs. per sq. ft.
Porch floors.....	60 lbs. per sq. ft.
Garage floors.....	125 lbs. per sq. ft.
Sidewalks.....	200 lbs. per sq. ft.

TABLE OF PROPORTIONS FOR MIXING CONCRETE

1:2:4 Mix.	Cement, bags	Sand, cu. ft.	Stone, cu. ft.
Stone 1 in. and under, dust screened out.....	4	7.9	18.4
Stone 2½ ins. and under, dust screened out.....	4	8.0	18.4
Stone ¾ in. and under (gravel).....	4	8.1	17.6

"STEELCRETE" SPECIAL MESHES

Designation of mesh	Size of Mesh		Weight per sq. ft. in lbs.	Size of standard sheets
	Width of diamond	Length of diamond		
½" No. 18	.43"	1.2"	.74	3'0" x 8'0"
¾-13-25	.95"	2"	.80	6'0" x 8'0"
1½-13-20	1.36"	3"	.60	6'0" x 8'0"
2-13-15	1.82"	4"	.50	4'0" x 8'0"
¾" No. 9	.95"	2"	1.80	5'0" x 8'0"
1½" No. 9	1.36"	3"	1.28	4'0" x 8'0"
2" No. 9	1.82"	4"	.90	5'0" x 8'0"
Floor binder	1.82"	4"	.20	4'0" x 8'0"
Beam wrapper	3"	8"	.20	5'0" x 8'0"
				0'6" x 8'0"

Note that in the decimal standard for "Steelcrete" expanded metal, the width is designated as the short way of the diamond and the length is designated as the long way of the diamond.

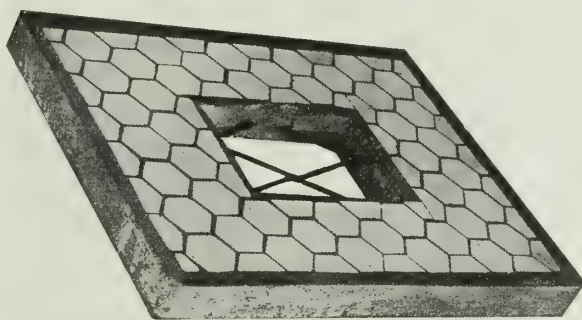
DECIMAL STANDARDS FOR "STEELCRETE" EXPANDED METAL

Designation of mesh	Size of Mesh		Sect. in sq. in. per ft. of width	Wt. per sq. ft., lbs.	Size of standard sheets
	Width of diamond	Length of diamond			
3-13-075	3"	8"	.075	.27	6'0" x 8'0"
3-13-10	3"	8"	.10	.37	6'0" x 12'0"
3-13-125	3"	8"	.125	.46	6'0" x 16'0"
3-9-15	3"	8"	.15	.55	6'0" x 8'0"
3-9-175	3"	8"	.175	.64	6'0" x 12'0"
3-9-20	3"	8"	.20	.73	6'0" x 16'0"
3-9-25	3"	8"	.25	.92	5'3" x 8'0"
3-9-30	3"	8"	.30	1.10	5'3" x 12'0"
3-9-35	3"	8"	.35	1.28	5'3" x 16'0"
3-6-40	3"	8"	.40	1.46	7'0" x 8'0"
3-6-45	3"	8"	.45	1.65	7'0" x 12'0"
3-6-50	3"	8"	.50	1.83	7'0" x 16'0"
3-6-55	3"	8"	.55	2.01	6'0" x 8'0"
3-6-60	3"	8"	.60	2.19	6'0" x 12'0"
3-1-75	3"	8"	.75	2.74	6'0" x 16'0"
3-1-100	3"	8"	1.00	3.65	7'0" x 8'0"
					7'0" x 12'0"
					7'0" x 16'0"
					6'0" x 8'0"
					6'0" x 12'0"
					6'0" x 16'0"
					7'0" x 8'0"
					7'0" x 12'0"
					7'0" x 16'0"
					6'3" x 8'0"
					6'3" x 12'0"
					6'3" x 16'0"
					5'9" x 8'0"
					5'9" x 12'0"
					5'9" x 16'0"
					5'3" x 8'0"
					5'3" x 12'0"
					5'3" x 16'0"
					4'9" x 8'0"
					4'9" x 12'0"
					4'9" x 16'0"
					5'9" x 8'0"
					5'9" x 12'0"
					5'9" x 16'0"
					4'3" x 8'0"
					4'3" x 12'0"
					4'3" x 16'0"

**"Steelcrete" Floor Binder.**

This material is a light sectional area of expanded metal designed to reinforce concrete against temperature stresses. It is especially fitted for use in mosaic work, terrazzo, tile or cement flooring. Such surfaces are designed to have a sanitary smooth finish, and if cracks occur, their whole purpose would be ruined. They must be guaranteed against cracks, and it is necessary that they be reinforced against temperature stresses.

The illustration shows a section with the "Steelcrete" floor binder in place.

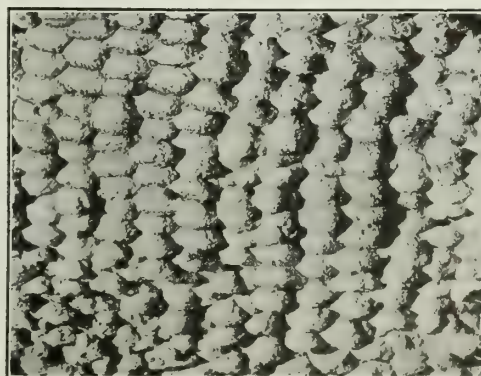
**"STEELCRETE" FLOOR BINDER**

Note the mesh shape which rigidly binds the whole floor together. Details of floor binder are noted in table of "Steelcrete" Special Meshes

**Expanded Metal Plastering Lath.**

The functions of the lath are to provide a stiff base upon which to apply the plaster and to hold and clinch the mortar of the plastered wall. "Steelcrete" lath has all the properties to insure these necessities in any plaster construction.

"Steelcrete" lath is manufactured into stiff sheets 24 or 28 ins. wide, and 97 ins. long. The process of

**EXPANDED METAL LATH**

Showing thorough bond with plaster. Note the clinch mortar

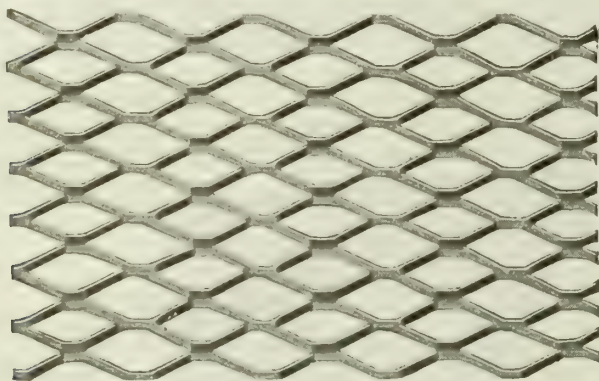
manufacturing makes the finished sheets stiffer than the sheet steel.

The lath will be in a true plane against the studding and insures the mortar being evenly distributed over the entire surface of the wall. The back of the plastered wall in any "Steelcrete" lath construction is fully covered with clinch mortar embedding the lath entirely, insuring permanence.

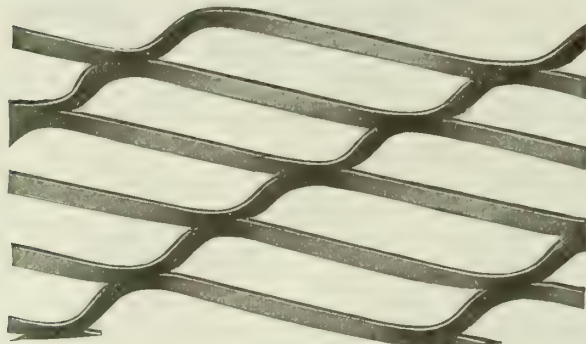
"Steelcrete" lath is made in different grades to meet all possible conditions. The diamond type of lath is the lath which is recommended for general construction. The sheets are stiff and the openings are of the proper size to allow just the right amount of mortar to be forced through. The mortar clinches on the back and thoroughly embeds the lath.

For exterior stucco work, it is desirable to have the very best lath obtainable, and for this the diamond lath cut from galvanized sheets is recommended. The presence of zinc in the galvanized coating protects the lath against corrosion.

The 22-A type is acceptable to the United States Government for post office work as it has a 3/32-in. strand, and is made from No. 22-gage United States standard steel; the finished lath weighs 4.37 lbs., and it has an oblong opening.



"STEELCRETE" DIAMOND LATH



"A" AND "B" LATH

"STEELCRETE" EXPANDED METAL LATH

Designation and gage	Painted weight per sq. yd., lbs.	Size of sheets, ins.	Number of sheets in bundle	Number of sq. yds. in bundle	Weight per bundle, lbs.
*22-A	4.37	18 x 96	15	20.00	87.40
24-F	3.50	24 x 96	15	26.66	93.34
25-F	3.10	24 x 96	15	26.66	82.68
26-F	2.68	24 x 96	15	26.66	71.48
27-F	2.48	24 x 96	15	26.66	66.14
24-H	3.00	28 x 96	14	29.00	87.00
26-H	2.30	28 x 96	14	29.00	66.70

\*Special post office lath 3/32-in. strand, oblong opening.

Unless otherwise specified, the above laths will be furnished painted black; same can be furnished made from a copper bearing steel or galvanized sheet.

The illustrations show the two types of lath, and the back of plastered sections. The illustration was taken from plaster torn from a building which had been erected for quite a few years. It illustrates the actual conditions of that part of the plastered wall placed on "Steelcrete" lath. The back of a plastered wall can not be inspected after the wall is completed and for that reason it is necessary to have a lath which insures the clinching of the mortar.

The lath is not the greatest cost item of the plastered wall, but it is one of the most important ones and the best lath should be selected.

**ORDERS AND SPECIFICATIONS**—When ordering or specifying lath, always give the full designation by name, gage, weight per square yard, and whether painted, galvanized, or made from copper bearing steel. Specify as follows:

"The metal lath shall be 'Steelcrete Diamond' 'F' or 'H' No. 24-gage, painted [galvanized or 'Cop-al' painted red], weighing .... lbs. per sq. yd."

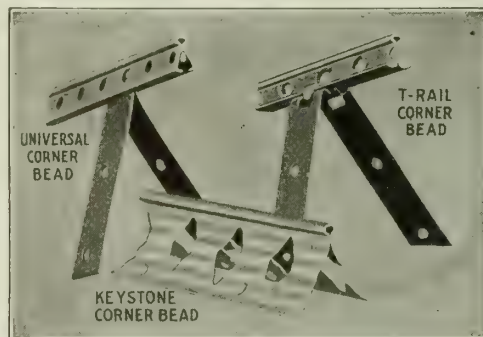
The accompanying table gives all necessary particulars. Lath should be wired to metal furring with No. 18-gage annealed steel wire. For fastening to wood studs or sheathing, use staples long enough to enter at least 3/4 in.

#### "Steelcrete" Corner Bead.

The standard wing type, rail type and bullnose corner beads in the standard gages, hot galvanized after forming. The same may be obtained cut from galvanized sheet.

The beads are strong and straight, and prevent cracking of the plaster after erection.

Write for catalogues.



"STEELCRETE" CORNER BEADS

#### Literature.

The Companies issue free, the "Steelcrete" handbook, containing useful tables and designing data.

The Universal Slab Computer will be sent on receipt of 25c., which covers mailing charges.

This slab computer enables one to obtain the correct thickness of the slab, and the steel reinforcing required for any given load and span, with two settings of the rule.

The general catalogue lists and describes all products. If interested, send for it. Every architect, engineer and contractor should be interested in the bulletins issued from time to time by the Companies. On request, names will be placed on the mailing list.



MILWAUKEE CORRUGATING CO.

Metal Lath and Corner Bead

MILWAUKEE, WIS.

BRANCH AT KANSAS CITY, MO.

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

Products.

Manufacturers of "NETMESH" EXPANDED DIAMOND METAL LATH; "SUPERIOR" METAL CORNER BEAD.

"Copperoid" Metal Sheets; "Crimpedge" Gutter; "Interlock" Conductor Pipe; "Milwaukee" One-piece Elbows and Shoes; One-piece Miter, Ends and Drops; Kuehn's Korrekt Kutoffs; Steel and Wire Hangers; Steel Roofing and Siding, and Metal Building Corners.

For Metal Ceilings, Shingles and Tile, see page 421; for Ventilators, see page 471.

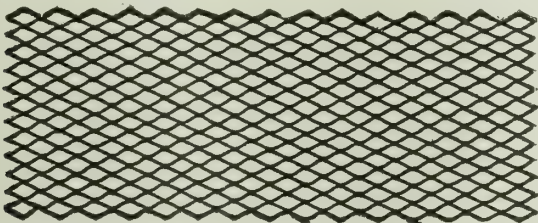
"Netmesh" Expanded Diamond Metal Lath.

PURPOSE—Unexcelled for exterior stucco or interior plaster construction. It acts as a fire retardant; is stainproof and verminproof. It holds the plaster in a firm grip, affording a perfect key. It reinforces the plaster or stucco and minimizes cracking. It makes for economy, because it requires a minimum amount of plaster and reduces the labor cost of applying plaster or stucco. The shape of the mesh affords a perfect key. Every strand is thoroughly embedded in the mortar.

SPECIFICATIONS— "Netmesh" lath is furnished painted or galvanized in bundles of 9 sheets each, sheets 24 by 96 ins.



No. 3 3/8-IN. DIAMOND MESH—Where salt air or industrial gases are present, "Netmesh" lath made from "copperoid" metal, a rust resistant, is recommended.



"NETMESH" EXPANDED DIAMOND METAL LATH

Gage	Weight per sq. yd., lbs.		Sq. yds per bundle
	Painted	Galvanized	
27	2.3	2.88	16
26	2.5	3.09	16
25	3.	3.5	16
24	3.4	3.95	16
22	4.3	4.8	16

"Superior" Inside and Outside Metal Corner Bead.

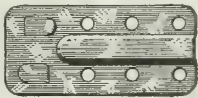
PURPOSE—The inside bead insures correct lines in

plastered surfaces where wall meets wall or ceiling. Supplies mechanic with a ground to work to, thereby avoiding "skinning" of the mortar coat from jambs back to the inner angles of the walls. It prevents unsightly fissures by taking up the strain of building settlement and the warping and shrinking of timbers. Solves the problem of joining wood lath, metal lath or plaster block partitions on brick or tile walls. The outside beads prevent clipped and bruised outside corners by distributing shock from damaging blocks.



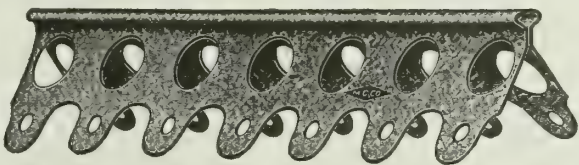
"SUPERIOR" INSIDE CORNER BEAD  
(Patented June 18, 1912)

SPECIFICATIONS—"Superior" inside and outside corner beads are made from open hearth galvanized sheets, Nos. 26 and 28 gage in 5, 6, 7, 8, 9, 10 and 12 ft. lengths. This company does not furnish the painted and sheradized, and recommends a bead made only from galvanized sheets.



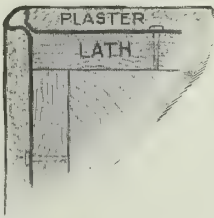
CLIP

CLIPS—At small extra cost clips are furnished. By their use either wing of the metal inside corner bead



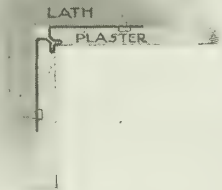
"SUPERIOR" OUTSIDE CORNER BEAD  
(Patented June 18, 1912)

may be extended 1 1/2 ins., thus affording ample nailing room and doing away with chipping or splintering on brick or tile partitions.



"SUPERIOR" OUTSIDE CORNER BEAD

Showing application Note how nose of corner bead affords a protection to the plastered corner



"SUPERIOR" INSIDE CORNER BEAD

Note the plasterer has "something to work up to." This eliminates "skinning" of mortar coat and insures correct lines on inside corners

# THE GENERAL FIREPROOFING COMPANY

Expanded Metal Lath, Expanded Metal Reinforcement and  
Steel Tile for Floor Construction

YOUNGSTOWN, OHIO

## BRANCH OFFICES

CHICAGO, ILL., 325 West Madison Street  
BUFFALO, N. Y., 696 Ellicott Square Building  
WASHINGTON, D. C., 711 Woodward Building

ATLANTA, GA., Third National Bank Building  
PHILADELPHIA, PA., 1119 Pennsylvania Building  
KANSAS CITY, MO., 1009 Waldheim Building

EXPORT DEPARTMENT: NEW YORK, 395 Broadway

For methods of construction with Metal Lath and Plaster see pages 196-201 of the Associated Metal Lath Manufacturers.

## Products.

"HERRINGBONE" RIGID METAL LATH, Painted, Galvanized or made from "Armco" Iron; "KEY" LATH; in fact, METAL LATH for every purpose.

COLD-ROLLED CHANNELS, used as Stud-  
ding for Metal Lath Partitions and as Furring for Sus-  
pended Ceilings, Cornices, False Beams and Ornamental  
Plaster Work; CORNER BEAD, carrying a heavy plaster  
coat for exposed corners.

"SELF-SENTERING," an Expanded Metal Rein-  
forcement for Concrete, acting as both Form and Rein-  
forcement or as Lath and Stud; EXPANDED METAL  
ANGLES; "TRUSSIT," a patented Reinforcement for  
Curtain Walls and Partitions without studding; EX-  
PANDED METAL, the general purpose Reinforcement for  
Concrete Work.

STEEL-TILE and END-TILE—Steel Forms for T-  
beam Concrete Floors.

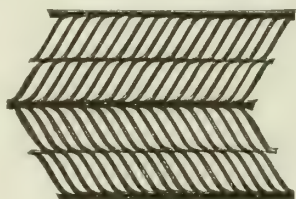
For Waterproofings, Dampproofings and Technical  
Paints, see page 42; for Metal Furniture, see page 1414.

## "Herringbone" Expanded Metal Lath.

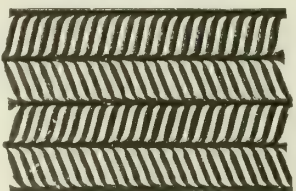
"Herringbone," universally used because of its  
stiffness, is, on account of its heavy, longitudinal ribs,  
the stiffest metal lath made. It permits wider stud  
spacing. The "Herringbone" standard is 16 ins. on  
centers.

"Herringbone" offers  
a firm, flat surface, over  
which it is easy to lay a level  
coating of plaster. It will  
not buckle or sag between  
supports, which means a  
saving on plaster and labor.  
Selvage edges interlock,  
eliminating waste from lap-  
ping and materially reducing  
the cost of lacing the sheets  
together.

The flat cross-stands  
spread the mortar, which  
completely envelops them  
and curls around the ribs,



"HERRINGBONE" EXPANDED  
METAL LATH  
STYLE BB



"HERRINGBONE" EXPANDED  
METAL LATH  
STYLE A

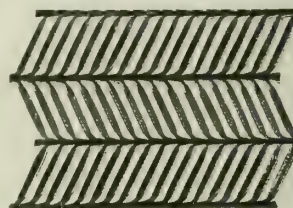


TRADE-MARK  
Reg. U. S. Pat. Office

forming a perfect key. A coat of protective  
paint is as much a part of "Herringbone"  
as the metal it is made of. When not  
ordered galvanized, it is furnished painted.  
Suitable for all interior plastering, as well  
as for exterior

stucco work.

As a special precaution  
against corrosion, where salt  
air or industrial gases are  
present, "Herringbone" can  
be furnished galvanized or  
made from "Armco"  
(American Ingot) iron.



"HERRINGBONE" EXPANDED  
METAL LATH  
STYLE AAA

## "HERRINGBONE" EXPANDED METAL LATH STYLE BB, STANDARD LATH FOR CEMENT SIDING CONSTRUCTION AND FIREPROOF PARTITIONS

Sheets 20 1/4 x 96 ins. .... 1 1/2 sq. yds.  
Size of mesh. .... 1/2 x 1 1/4 ins.  
Packed 15 sheets (22 1/2 sq. yds.) to the bundle.

Approximate weight per sq. yd.:

Gage	Painted	Galvanized
No. 27 U. S. Standard.....	2.25 lbs.	2.82 lbs.
No. 26 U. S. Standard.....	2.50 lbs.	Not made
No. 24 U. S. Standard.....	3.37 lbs.	3.91 lbs.
No. 22 U. S. Standard.....	4.21 lbs.	Not made

Furnished painted, galvanized, or made from rust resisting "Armco" Iron.

## STYLE A, STANDARD LATH

Sheets 13 1/2 x 96 ins. .... 1 sq. yd.  
Size of mesh. .... 1/2 x 1 in.

Packed 20 sheets (20 sq. yds.) to the bundle.

Approximate weight per sq. yd.:

Gage	Painted	Galvanized
No. 28 U. S. Standard.....	3.00 lbs.	3.75 lbs.

Furnished painted, galvanized or made from rust resisting Armco Iron.

## STYLE AAA, THE "GENERAL PURPOSE" LATH

Sheets 18 x 96 ins. .... 1 1/4 sq. yds.  
Size of mesh. .... 3/4 x 1 1/4 ins.

Packed 15 sheets (20 sq. yds.) to the bundle.

Approximate weight per sq. yd.:

Gage	Painted	Galvanized
No. 27 U. S. Standard.....	2.53 lbs.	3.17 lbs.
No. 26 U. S. Standard.....	2.81 lbs.	Not made
No. 24 U. S. Standard.....	3.79 lbs.	4.39 lbs.
No. 22 U. S. Standard.....	4.74 lbs.	Not made

Furnished painted, galvanized, or made from rust resisting "Armco" iron.

"Herringbone" catalogue, containing standard lathing and plastering  
specifications, mailed on request. Refer also to the standard specifications in  
the "Metal Lath Handbook" of the Associated Metal Lath Manufacturers

## GF Cold Rolled Channel Studding and Furring.

Rolled from No. 16-gage steel, with square corners  
and true right angle sides. GF channels are light, stiff  
and straight; therefore, easily erected. Lath goes on  
quickly, because the channels do not twist and turn, but  
stand up squarely in place.

Used for studding in solid or hollow partitions, for  
furring on flat or suspended ceilings, false beams,  
columns, cornice work and on masonry.



Plain channels furnished in widths of  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$  and 2 ins., and lengths of 12, 14, 16, 18 and 20 ft.

Perforated channels (punched for easy erection of metal lath) furnished in widths of  $1\frac{1}{2}$  and 2 ins., same lengths as plain channels. Both styles stocked in large quantities.

### GF Corner Bead.

A heavy galvanized bead with enough backbone to make erection easy, and so designed that the plaster coat is carried tight up to the nose and held firmly in place. GF corner bead with "Herringbone" lath insures a job that will not crack.

Made with or without clip. No. 26 gage. Stock lengths, 6, 7, 8, 9 and 10 ft.

### Specifications for Studding and Furring.

**HOLLOW PARTITIONS**—Hollow partitions to be made as follows:

Studding to be of  $1\frac{1}{2}$ - or 2-in. GF cold rolled steel channels spaced not exceeding 16 ins. on centers. To be rigidly attached by means of "shoes" bent over and spiked or bolted to structural portion of the building, or, where concrete floors are used, to be secured by anchor bolts embedded in the concrete. This may be varied by fastening steel runner plates to structural members or to concrete slabs, and bolting studs to these by the use of sheet iron "knees." Partitions to be lathed on both sides with No. 27-gage BB "Herringbone" expanded metal lath, securely wired to the studding with No. 18-gage annealed wire.

**SOLID PARTITIONS**—2-in. solid partitions to be made as follows:

Studding to be  $\frac{3}{4}$ -in. GF cold rolled steel channels where height is 10 ft. or less and 1-in. GF cold rolled steel channels where height is more than 10 ft., spaced not to exceed 16 ins. on centers. Studding to be rigidly anchored to structural frame of the building at ceiling and floor (in same manner as for hollow partitions). No. 27-gage BB "Herringbone" expanded metal lath to be securely tied to one side of the studding with No. 18-gage annealed wire.

**FLAT CEILINGS**—Flat ceilings to be constructed as follows:

Furring strips, consisting of 1-in. GF cold rolled steel channels spaced not more than 16 ins. on centers, shall be clamped directly to the soffits of the steel beams or securely anchored to the bottom of concrete beams. To these furring strips, "Herringbone" style AAA No. 27-gage, 2.53-lb. ceiling lath shall be rigidly attached with No. 18-gage annealed wire.

**SUSPENDED CEILINGS**—Suspended ceilings to be hung from roof beams or slabs with hangers not less than  $\frac{1}{4}$ -in. round spaced on 4-ft. centers. The lower end of these hangers to be bent in the form of a hook to receive runner bars which shall be  $1\frac{1}{2}$ -in. GF cold rolled channels. To these runner bars shall be wired  $\frac{3}{4}$ -in. GF cold rolled steel channels spaced not more than 24 ins. on centers. "Herringbone" Style AAA No. 24 gage, 3.79-lb. ceiling lath, to be securely tied to these channels with No. 16-gage annealed wire.

Detail drawings of standard partition construction are given by the Associated Metal Lath Manufacturers. See their name in General Index.

### Specifications for Stucco (Cement Siding).

**FRAMING**—Studs spaced at 16-in. centers, wherever possible, shall be run continuously from foundation to rafters.

**BRACING**—The frame of the building shall be rigidly braced—(a) at least one point between each 2 floors, using 2- by 4-in. bridging; (b) when sheathing is used, bracing may be omitted, as the sheathing boards act as bracing.

**SHEATHING**—(a) The lath to be fastened direct to studding

and back plastered, and no sheathing boards are to be used; (b) sheathing boards shall be not less than 6 ins. nor more than 8 ins. wide and  $\frac{7}{8}$ -in. thick, and shall be laid diagonally or horizontally across the wall studs.

**FURRING**—On account of the self-furring qualities of "Herringbone" lath, furring strips may be omitted.

**LATH**—The lath shall be BB No. 24-gage "Herringbone" expanded metal lath, weighing 3.4 lbs. to the sq. yd.

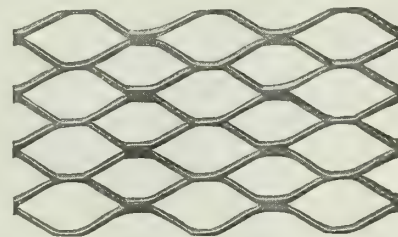
**APPLICATION OF LATH**—Place "Herringbone" lath horizontally (a) over the studs, (b) over the furring strips, and staple every 8 ins. with  $1\frac{1}{4}$ -in. by No. 14-gage galvanized staples. Lap the sheets 1 in. directly over the stud. Interlock selvage edges top and bottom.

**CORNERS**—(1) There shall be a 6-in. strip of metal lath bent round all angles or stapled or wired to the lath, or (2) the sheets shall be folded around the corners for at least 3 ins. and stapled or wired.

### "Key" Expanded Metal Lath.

"Key" expanded metal lath is adapted for all kinds of work; but is especially suitable for curved surfaces because of its uniform pliability.

"Key" lath is easy to handle and erect. A small mesh insures its complete envelopment in plaster, with the use of a minimum amount of material. The large sheets reduce the number of laps and save both labor and material.



"KEY" EXPANDED METAL LATH

#### "KEY" EXPANDED METAL LATH

Sheets 24 by 96 ins., packed 15 sheets to a bundle,  $26\frac{2}{3}$  sq. yds.  
Approximate weight per sq. yd.:

Gage	Painted	Galvanized
No. 27 U. S. Standard.....	2.30 lbs.....	2.73 lbs.
No. 26 U. S. Standard.....	2.50 lbs.....	2.94 lbs.
No. 25 U. S. Standard.....	3.05 lbs.....	3.32 lbs.
No. 24 U. S. Standard.....	3.40 lbs.....	3.74 lbs.
No. 22 U. S. Standard.....	4.00 lbs.....	Not made

Can also be furnished of rust resisting "Armco" iron.

For lathing and plastering specifications see the standard specifications in the "Metal Lath Handbook" of the Associated Metal Lath Manufacturers.

### "Self-Sentering."

"Self-Sentering" is a combined reinforcement and centering used extensively for floor and roof construction. It is also adaptable for solid and hollow walls, light partitions, etc., making possible a light weight, thin slab, built without expensive formwork, and equal to heavy reinforced concrete in fire protection.

Roofs of any design and pitch can be built with "Self-Sentering," requiring little more than the permanent purlins and trusses for centering, and no solid forms.

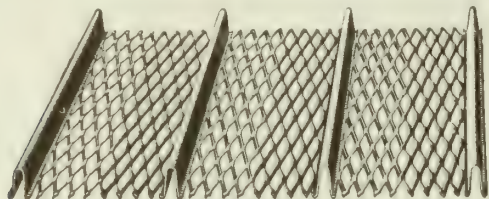
"Self-Sentering" is an expanded metal sheet, stiffened by heavy ribs  $1\frac{1}{16}$  in. high, and spaced  $3\frac{3}{8}$  ins. apart. The ribs carry the weight of the concrete until set; the diamond mesh forms a perfect bond for the concrete and carries the tension in the slab.

"Self-Sentering" is always furnished with a coating of baked-on paint to protect it from corrosion until it is placed on the job. The mechanical bond of

"Self-Sentering" is so great that this coating need cause no apprehension.

**"SELF-SENTERING" PUNCH**—This punch is used to eliminate a large portion of wiring at the laps of "Self-Sentering" sheets. By its use, the interlocking ribs are securely clinched, making further tying unnecessary. Such work is very rapid and leaves absolutely no play in the joints and no opportunity for sheets to sag or bulge.

**SIZES**—Sheets are 29 ins. wide and are furnished in lengths from 4 to 12 ft., in variation of 1 ft. Long sheets permit rapid erection and minimum laps. The side ribs rest snugly.



"SELF-SENTERING"

Patented March 3, 1914

"SELF-SENTERING" SHEETS  
Stock Gages and Weights per Sq. Ft.

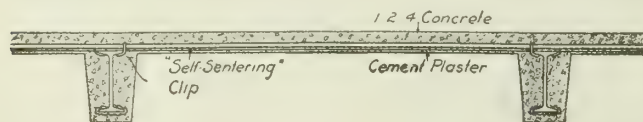
Gage	Painted weight	Galvanized weight	Sec. area per ft. of width
28	.58 lb.	.72 lb.	.173 sq. in.
26	.70 lb.	.90 lb.	.208 sq. in.
24	.93 lb.	Not made	.277 sq. in.

Other gages furnished on special order.  
Galvanized "Self-Sentering" furnished on special orders only

### "Self-Sentering" Floor Designs.

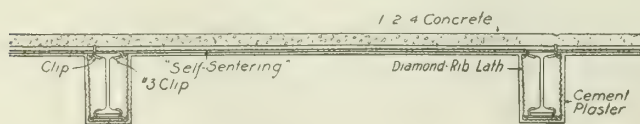
"Self-Sentering" makes an economical type of fireproof floor, very similar to "Self-Sentering" roofs, except that the construction must be heavier, to conform to the loads carried. The types of floors shown have each their individual merits, but are uniform in the economy of erection—due to the absence of formwork.

**"SELF-SENTERING" FLOOR, TYPE NO. 1**—"Self-Sentering" is attached direct to steel beams by clips; concrete applied to the desired thickness and the underside plastered with cement mortar. Sides of beam boxes are wired together, to save bracing across the span. To permit pouring the beam covering at the same time, punch out the mesh between the "Self-Sentering" ribs where they come over the beam.



"SELF-SENTERING" FLOOR, TYPE NO. 1

**"SELF-SENTERING" FLOOR, TYPE NO. 2**—This type of floor is the same as No. 1, except that beams are fireproofed with metal lath and plastered. This can be done at the same time the underside of the slab is plastered.



"SELF-SENTERING" FLOOR, TYPE NO. 2

### SAFE UNIFORMLY DISTRIBUTED LIVE LOADS PER SQUARE FOOT ON "SELF-SENTERING" SLABS

Assumptions:

Stress in steel, 16,000 lbs. per sq. in.  
Ratio between the moduli of elasticity, 15.  
Center of gravity, .19 in. above bottom slab.  
R. M. = resisting moments per ft. width in in. lbs.; f c = maximum extreme fiber stress in concrete.

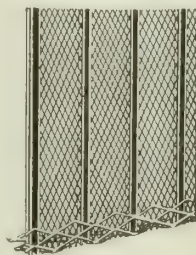
$$\text{Bending moment} = \frac{WL}{10}$$

Gage "Self-Sentering"	Thickness of slab above mesh	R. M.	f c	Span					
				3-ft.	4-ft.	5-ft.	6-ft.	7-ft.	8-ft.
28	2"	4,360	660	310	164	98	61	...	...
26	2"	5,190	760	359	192	128	92	49	...
24	2"	6,210	800	476	258	166	110	64	30
28	2½"	5,625	560	419	233	150	93	57	...
26	2½"	6,710	650	484	279	186	118	76	50
24	2½"	8,720	680	...	377	254	165	111	76
28	3"	6,920	500	561	311	184	114	73	45
26	3"	8,240	560	...	386	231	147	97	64
24	3"	10,820	660	...	512	322	210	143	100
28	3½"	8,250	460	...	368	218	135	80	50
26	3½"	9,800	500	...	455	274	174	115	76
24	3½"	12,750	610	...	...	375	245	166	116
28	4"	9,500	425	...	439	261	164	105	68
26	4"	11,300	460	...	533	320	206	136	91
24	4"	14,800	560	...	...	436	286	196	137

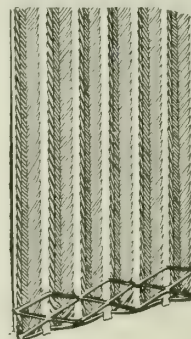
Tables for other spans, also tables and complete data for all types of "Self-Sentering" floors and roofs, are given in the "Fireproofing Handbook." A copy of the latest edition available on request.

### Expanded Metal Angles.

For attaching "Trussit" or "Self-Sentering" to floor and ceiling in studless partition and curtain wall construction. Made of No. 13-gage steel; furnished in lengths up to 8 ft. Should be stapled every 3 ft.



EXPANDED METAL ANGLES

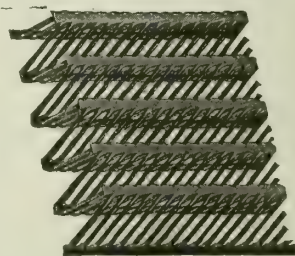


### "Trussit."

"Trussit" is an expanded steel reinforcement which is particularly adaptable to the construction of light fireproof walls and partitions of 1½ ins. thick and over; also, of solid and hollow walls, curtain walls, elevator enclosures, small individual structures, or offices in a larger building—wherever a fireproof, soundproof partition is required.

"Trussit" eliminates the usual studding, a few temporary braces being required only till the plaster coat on one side is set. Sheets are attached to floor and ceiling with expanded metal angles or by other methods that assure a firm support.

"Trussit" is uniformly expanded in both directions. This makes it possible to plaster upon each side exactly alike, and, when the wall is finished, steel and concrete are so uniformly distributed that expansion or contraction in any direction is prevented by the "Trussit" reinforcement.



"TRUSSIT"  
Patented



Stocked in sheets 8, 10 and 12 ft. long; sheets uniformly 19 ins. in width. Furnished painted, galvanized or made from "Armco" (American Ingot) iron.

"TRUSSIT" STEEL REINFORCEMENT			
Approximate Weight per Sq. Ft.			
Gage	Painted	Galvanized	
No. 27 U. S. Standard.....	.57 lb.	.68 lb.	
No. 26 U. S. Standard.....	.62 lb.	Not made	
No. 24 U. S. Standard.....	.83 lb.	.88 lb.	

"Armco" and galvanized "Trussit" on special order only.  
Construction details are given fully in the "Fireproofing Handbook"

Expanded Metal Reinforcement.

Expanded metal, made by expanding sheets of steel into elongated diamond shape mesh, has greater reinforcing strength, pound for pound, than any other material. It can be cut and expanded to a greater variety of sizes adapted for particular classes or sizes of work.

The larger mesh is used for concrete reinforcement in construction of floors, roofs, sidewalks over basements, bridge decks, retaining walls, sewers, conduits, tanks, reservoirs, etc. Smaller mesh widely used in lighter cement work and for railings, window guards, machinery guards, elevator and tool room enclosures.

Style 3-10-176  
(3-in. mesh, No. 10-gage, .176 sq. in. sectional area, illustrated) is a type very commonly used for general work.



EXPANDED METAL

DATA ON EXPANDED METAL

Style	Size mesh, short way of diamond	Nominal gage metal	Net section area per foot width—in sq. ins.	Approx. weight per sq. ft., lbs.	Standard Size Sheets	
					Lengths	Widths
					Long way of diamond	Short way of diamond
1½-12-194	1½"	12	.194	.66	6', 8'	3', 4', 6'
½-18-220	½"	18	.220	.75	6', 8'	4'
3-10-353	3"	10	.353	1.20	6', 8', 9' and 10'8"	3', 4', 6'
3-10-265	3"	10	.265	.90	6', 8', 9' and 10'8"	4', 5', 5'4"
3-10-176	3"	10	.176	.60	6', 8', 9' and 10'8"	3', 4', 5', 6'
3-12-150	3"	12	.150	.51	6', 8', 9' and 10'8"	3', 4', 6'
3-12-082	3"	16	.082	.278	6', 8', and 10'8"	3', 4', 5', 6'
¾-12-246	¾"	12	.246	.84	6', 8'	3', 4', 6'

A full line of expanded metal carried in stock at all times

Steel-Tile and End-Tile.

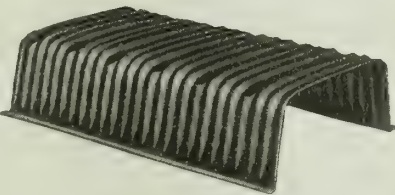
GF Steel-Tile are simply light weight steel forms for concrete floors, designed on the well known T-beam principle—deep reinforced joists and thin connecting slabs of concrete.

One of the advantages of Steel-Tile construction lies in its substantial reduction in weight. Lazy concrete is reduced to the minimum, saving a good percentage of the load upon girders, columns, foundations and footings, and permitting a lighter construction throughout, without sacrificing strength.

GF Steel-Tile make the old, expensive solid form work unnecessary. Centering along the line of joists, which are 25 ins. apart, is sufficient.

Flange is flat and fits snugly against forms, preventing any leakage of concrete.

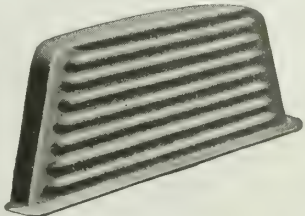
Cost of transporting and handling Steel-Tile is



GF STEEL-TILE

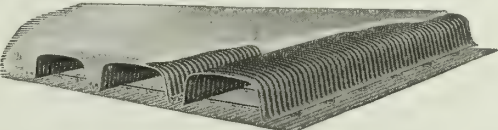
much less than terra cotta tile, which involves the same principle of construction, and loss through breakage is eliminated. Steel-Tile are adaptable in schools, hotels, office buildings, department stores, apartments, warehouses, lofts, etc. Wherever long spans are required GF Steel-Tile construction will be found most economical.

Flat ceilings are easily constructed under Steel-Tile floors. Two methods are illustrated. One is to suspend wires from the reinforcing bars or through holes in the Steel-Tile and erect GF cold rolled channels and "Herringbone" lath after pouring the floor. Another is to lay "Herringbone" lath directly on forms before setting Steel-Tile and pouring concrete. Suspended ceilings are built upon hangers suspended through joists before pouring concrete.

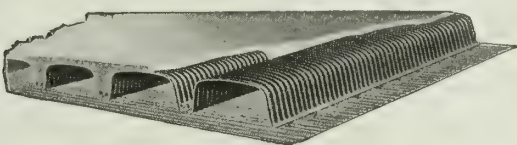


GF END-TILE

GF Steel-Tile with End-Tile to match are made of corrugated steel in sizes of 4, 6, 8, 10, 12 and 14 ins., also of 10, 12 and 14 ins. in tapered tile and tapered ends. Steel-Tile are furnished in lengths of 30 and 35 ins. Width at bottom, 20 ins., exclusive of flange. Shipped nested.



TYPE No. 1. CEILING CONSTRUCTION UNDER GF STEEL-TILE, GF COLD ROLLED CHANNELS AND "HERRINGBONE" LATH Erected after pouring the floor



TYPE No. 2. CEILING CONSTRUCTION UNDER GF STEEL-TILE, "HERRINGBONE" LATH LAID ON FORMS Before pouring the concrete

PROPERTIES OF STEEL-TILE FLOORS

Width of joists	Center to center of joists	2" of Concrete Above					
		Size Steel-Tile....	6"	8"	10"	12"	14"
4"	24"	Average weight per sq. ft., lbs..	40.1	46.0	53.5	61.0	72.6
		Cu. ft. of concrete per sq. ft. of floor	.278	.319	.371	.423	.505
		Core area, per cent of section.....	58.3	61.7	63.0	63.8	62.2
5"	25"	Average weight per sq. ft., lbs..	42.3	49.4	57.1	65.3	78.4
		Cu. ft. of concrete per sq. ft. of floor	.293	.342	.396	.452	.537
		Core area, per cent of section.....	55.9	59.2	60.3	61.2	59.7

Send for GF Steel-Tile Handbook.

Handbooks.

GF publications cover construction data completely, and include standard specifications. The "Herringbone" Catalogue contains full information on "Herringbone" lath. The Fireproofing Handbook treats fully the uses of "Self-Sentering," "Trussit" and expanded metal. The Steel-Tile Handbook includes drawings, formulas, tables and computations for the concrete designer.

ESTABLISHED 1884

## NORTH WESTERN EXPANDED METAL CO.

407 South Dearborn Street  
CHICAGO, ILL.FACTORIES  
CHICAGO, ILL.  
JEANNETTE, PA.

BRANCH OFFICE: CAMBRIDGE, MASS., 280 Sidney Street

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

## Products.

EXPANDED METAL LATH, which includes "Kno-Burn," "Eureka," "P. O. Special," "XX Century," "Pure Iron," "Diamond Mesh," "Kno-Fur," Corrugated and "T-Rib Chancelath"; "Econo" Expanded Metal for Reinforcing, Machine Guards, Elevator Enclosures and Tool Room Partitions; "Kno-Equal" Corner Beads, Metal Lath Accessories; "Nemco" Expanded Metal Waste Baskets, "Nemco" Door Mats and Expanded Metal Specialties.

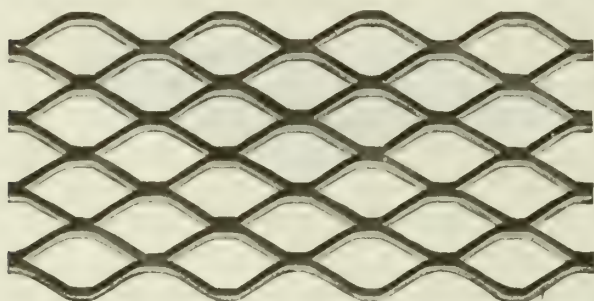
**Nemco Products**  
TRADE-MARK

## "Kno-Burn" Expanded Metal Plastering Lath.

"Kno-Burn" lath has a small mesh, as shown in the illustration. This insures the use of a minimum of plaster. The shape of the mesh provides a perfect "key," and every strand completely embeds itself in the plaster. Suitable for either exterior or interior work or ornamental plastering work. Furnished either painted or galvanized.

Reg. U. S. Pat. Off.

**KNO-BURN**  
TRADE-MARK



ACTUAL SIZE OF MESH OF "KNO-BURN" LATH; ALSO OF "XX CENTURY" LATH

STOCK SIZES AND WEIGHTS OF "KNO-BURN" LATH

Number	Sheets per bundle	Yards per bundle	Weight per yard, lbs.	Weight per bundle, lbs.
27-gage	9	12	2 1/4	28
26-gage	9	12	2 1/2	30
25-gage	9	12	3.0	36
24-gage	9	12	3.4	40.8

Regular size of sheets, 18 x 96 ins.

Special size, 24 x 96 ins., 16 yds. per bundle, can be furnished.

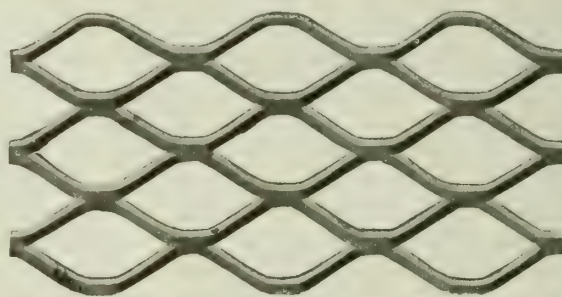
All gages furnished painted; Nos. 24 and 26 gages can be furnished galvanized in 18-in. widths only.

## "Eureka" Expanded Metal Plastering Lath.

"Eureka" lath has a slightly larger mesh than "Kno-Burn," but with strands of the same width. It is specially adapted for use in the construction of solid plaster partitions, and in any other work where a light weight strong lath is required. Furnished painted or galvanized.

Reg. U. S. Pat. Off.

**EUREKA**  
TRADE-MARK



ACTUAL SIZE OF MESH OF "EUREKA" LATH

STOCK SIZES AND WEIGHTS OF "EUREKA" LATH

Number	Sheets per bundle	Size of sheets, ins.	Yards per bundle	Weight per yard, lbs.	Weight per bundle, lbs.
26-gage	9	21x96	14	2.2	30.8
24-gage	9	22x96	15	2.8	42.0
22-gage	9	22x96	15	3.5	52.5

Furnished either painted or galvanized.

## "XX Century" Expanded Metal Plastering Lath.

"XX Century" lath is manufactured from a special acid and corrosion resisting metal. It is designed for use on both interior and exterior work. The size of the mesh is the same as that of "Kno-Burn."

Reg. U. S. Pat. Off.

**XX CENTURY**  
TRADE-MARK

STOCK SIZES AND WEIGHTS OF "XX CENTURY" LATH

Number	Sheets per bundle	Size of sheets, ins.	Yards per bundle	Weight per yard, lbs.	Weight per bundle, lbs.
27-gage	9	18x96	12	2.3	38.0
26-gage	9	18x96	12	2.5	30.0
25-gage	9	18x96	12	3.0	36.0
24-gage	9	18x96	12	3.4	40.8

## "Pure Iron" Expanded Metal Plastering Lath.

This company is able to furnish an expanded metal lath, in the same sizes and weights as "XX Century," manufactured from "Pure Iron." This lath is furnished painted only.

## Corrugated Expanded Metal Lath.

"Kno-Burn," "Eureka" and "XX Century" laths, when used as a base for stucco over sheathing or when used in conjunction with wood studding, require furring so that the plaster can flow through the meshes and "key."

Wood furring strips swell and shrink with changes in the weather and cause cracks. Metal furring strips increase the time and labor required in erecting the lath.

Several methods have been devised to do away with these troubles, but the most satisfactory one is that of forming ribs or corrugations in the lath itself.

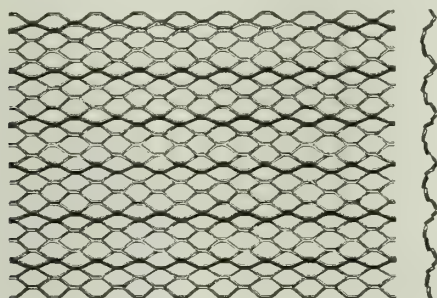


These corrugations are  $\frac{1}{4}$  in. deep and are spaced 1 in. apart, running lengthwise of the sheets. The corrugations being open meshes completely embedded in the plaster and insure a perfect "key" over the entire plastering surface.

Additional rigidity and reinforcing value are secured through this corrugation as the plaster, or stucco wall, becomes a series of small reinforced concrete beams, joined by reinforced concrete slabs.

**VALUE IN STUCCO CONSTRUCTION**—A large proportion of stucco work is applied over sheathing. Perfect stucco is possible only when the stucco "keys" to every part of the lath surface and completely embeds the lath and furring. The  $\frac{1}{4}$ -in. deep ribs permit the stucco to be forced through the meshes, completely filling the space between the lath and the sheathing. The lath is close to the middle of the plaster, where its value is greatest as a reinforcement to prevent cracking.

Sizes for "Kno-Burn," "Eureka" and "XX Century" types same as given in tables on preceding page.



CORRUGATED EXPANDED METAL LATH

### "T-Rib Chanelath."

"T-Rib Chanelath" is a new expanded metal product, combining in one material a form and reinforcement for concrete slabs. It also provides in one material the lath and the necessary furring and studding for plastering work.

It is designed for reinforcing concrete roofs and floors, and as a base for plastering solid partitions, ceilings, curtain walls, etc.

"T-Rib Chanelath" is composed of a series of heavy, cold formed steel T-ribs connected together by the ideal mesh known as "Kno-Burn" metal lath.

The T-ribs are  $\frac{7}{8}$  in. high and spaced 4 ins. center to center. The flange of the T is  $\frac{1}{2}$  in. wide.

"T-Rib Chanelath" entirely eliminates the use of expensive wooden forms and requires only supports of such a temporary character that they are usually removed as soon as the concrete has set sufficiently hard to carry its own weight. The ribs are so rigid that they easily support the weight of the wet concrete without undue deflection. The sheets of "T-Rib Chanelath" are placed in position and the concrete is poured directly upon it—the mesh is so small that it does not allow the concrete to pass through.

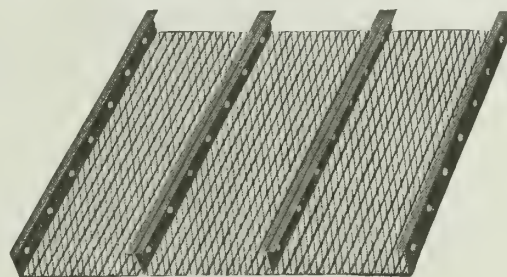
Ample protection to the metal in the rib is assured, because it is completely embedded in the concrete even if the plaster coat on the lath should be omitted.

"T-Rib Chanelath" can be erected quicker than any metal lath, because the sheets are larger than those of any other product used for this purpose. The largest sheets of "T-Rib Chanelath" are 4 ft. wide by 12 ft. long.

The mesh of "T-Rib Chanelath," being small and diamond shaped, insures a perfect "key" when the ma-

terial is used as a base for plastering work. It is so shaped that the wet plaster flows through the meshes and spreads out on the reverse side in little knobs like rivets. When "T-Rib Chanelath" is used for solid partitions, the "keys" furnish a perfect clinching surface for the plaster to be applied on the reverse side of the lath. This makes it absolutely certain that there are no voids or pockets in the wall.

The solid ribs of "T-Rib Chanelath" make the plastering surface continuous, thus insuring the rapid and easy application of the plaster, as there is nothing to catch the trowel, and the 4-in. spacing of the ribs stiffens the lath surface to such an extent that no auxiliary furring or studding is required when the "T-Rib Chanelath" is used.



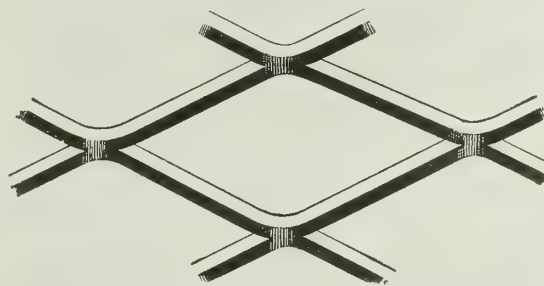
"T-RIB CHANELATH"

STOCK SIZES AND WEIGHTS OF "CHANELATH"

Number	Weight per sq. ft., lbs.	Area per 12 ins. of width	Width of sheets, ins.	Length of sheets, ft.
28-gage	56	.152 sq. ins.	4, 8, 12, 16, 20,	3, 4, 5, 6, 7,
26-gage	67	.195 sq. ins.	24, 28, 32, 36,	8, 9, 10, 11,
24-gage	89	.244 sq. ins.	40, 44 and 48	and 12

### "Econo" Expanded Metal Concrete Reinforcing.

"Econo" is an expanded metal fabric having meshes 3 by 8 ins. and  $2\frac{1}{4}$  by 6 ins. It is designed for use in all forms of reinforced concrete construction.



TYPICAL MESH OF "ECONO" FABRIC  
Actual dimensions 3 x 8 ins. and  $2\frac{1}{4}$  x 6 ins.

STOCK SIZES AND WEIGHTS OF "ECONO" FABRIC

Number	Area per 12 ins. of width	Weight per sq. ft., lbs.	Mesh and gage	Widths, ft.	Lengths, ft.
06-3	.06 sq. in.	.20	3"-16 ga.	3, 4, 6	8 and 12
10-3	.10 " "	.34	3"-12 " "	3, 4, 6	8 and 10
15-3	.15 " "	.51	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
16-3	.16 " "	.55	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
20-3	.20 " "	.68	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
25-3	.25 " "	.85	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
30-3	.30 " "	1.02	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
35-3	.35 " "	1.19	3"-10 " "	3, 4, 6	8, 10 $\frac{1}{2}$ , 12
40-3	.40 " "	1.36	3"-7 " "	3 $\frac{1}{2}$ , 7	8 and 12
10-2 $\frac{1}{4}$	.10 sq. in.	.34	2 $\frac{1}{4}$ "-16 ga.	3, 4, 6	8 and 12
15-2 $\frac{1}{4}$	.15 " "	.51	2 $\frac{1}{4}$ "-12 " "	3, 4, 6	8 and 12
20-2 $\frac{1}{4}$	.20 " "	.68	2 $\frac{1}{4}$ "-10 " "	3, 4, 6	8 and 12
40-2 $\frac{1}{4}$	.40 " "	1.36	2 $\frac{1}{4}$ "-7 " "	3 $\frac{1}{2}$ , 7	8 and 12

A full line of smaller meshes for machine guards, elevator enclosures, tool room partitions, etc., is also carried.

# PENN METAL COMPANY

## Manufacturers of Fireproofing Specialties

201 Devonshire Street  
BOSTON, MASS.

### SALES OFFICES

NEW YORK, N. Y., 559 West 36th Street

WASHINGTON, D. C., 327 Colorado Building

PORTLAND, MAINE, 95 Exchange Street

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

### Products.

PENCO EXPANDED METAL LATH; METAL STUDS; METAL CORNER BEAD; METAL GROUND OR BASE BEAD; PENCO RAIL BEAD.

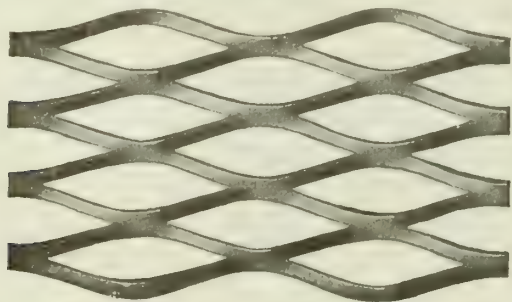
Sheet Lath; Stair Risers; Metal Boxes; Metal Ceilings; Metal Shingles and Roofing; Metal Culverts and Flumes.

For Hollow Metal Windows and Doors, Shelving and Lockers, see page 734.

### Penco Expanded Metal Lath.

A perfect metal lath should (1) be rigid; (2) have gauge consistent with span of supports or condition of work required; (3) be sufficiently expanded to allow lath to become thoroughly embedded in plaster; (4) have wide strand to hold plaster with a proper slant to avoid cutting key (see U. S. Government Specifications for Post Offices); (5) be of a width conveniently handled without extra labor; (6) and in sheets uniform and squared.

All of these essentials are embodied in Penco expanded metal lath, backed by over 20 years' actual service in outside and inside construction.



FULL SIZE SECTION OF PENCO EXPANDED METAL LATH

Furnished painted or galvanized, Nos. 22, 24, 25, 26 and 27 gauges. Also made from No. 24 gauge Hampton rust resisting metal in sheets 24 x 96 ins. Packed in convenient bundles of 9 sheets, or 16 sq. yds. Wide slanting strand does not cut key of plaster; it allows plaster to be spread on strand and through meshes, making Penco lath a reinforcement, and not a background for plaster.

### Penco Metal Stud.

Low in first cost. Easily and quickly erected.

Penco U-studs for furring, suspended ceiling and solid partitions. Made in lengths of 10 and 12 ft.

### Fireproof Partition Construction.

Penco metal lath and stud-ding or channels plastered and back plastered give a fireproof and soundproof partition at less cost than brick, tile, block or concrete.

Air "insulation" in hollow partitions does not retard sound, but transmits it; greater sound resistance does not necessarily follow an increase in thickness of partition. See Kidder's Handbook, "Fireproof Partitions," in



PENCO U-STUD OR WALL FURRING  
PENCO CHANNEL OR HOLLOW PARTITION STUD



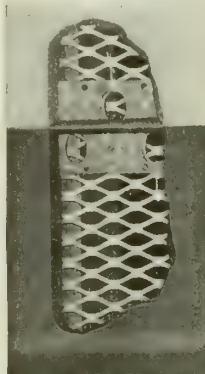
TRADE-MARK

which an account is given of a test in Chicago; when a 2-in. solid plaster partition (metal lath and angles) was found to rank higher than double studding (hollow partitions), or a 4-in. porous partition of hollow block 5 1/4 ins. thick over all.

In the great Baltimore fire metal lath and plaster partitions, though somewhat distorted and buckled, still remained to hold back the spread of the fire, while partitions of other types failed by crushing from their own expansion.

### Penco Metal Beads.

Penco bead is formed over a micrometered die that makes a positive straight edge.



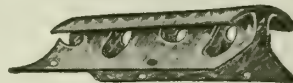
SHOWING APPLICATION OF PENCO NO. 3 METAL GROUND BEAD



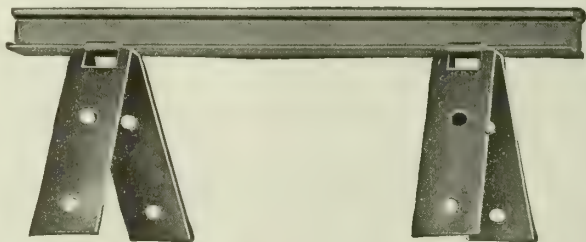
PENCO PRONG STUD AND PENCO METAL LATH, SINGLE PARTITION



PENCO NO. 2 METAL CORNER BEAD



PENCO NO. 4 BULL NOSE CORNER BEAD



PENCO NO. 6 RAIL BEAD

No. 2 METAL CORNER BEAD—Lengths of 6, 7, 8, 8 1/2, 9, 10 and 12 ft., galvanized. Weight (bundled), 235 lbs. 1000 ft.

No. 3 METAL GROUND OR BASE BEAD—Gives a wall joint between plaster and cement or tile; non-shrinking and solid. Made in a number of sizes in 10-ft. lengths, to suit all plaster thicknesses. Weight, 247 lbs. 1000 ft.

PENCO No. 4 BULL NOSE CORNER BEAD—For hospitals and public buildings; makes a large rounded corner at less cost than an all plaster corner. Weight, 368 lbs. 1000 ft.

RAIL BEAD No. 6—Adjustable for any depth of grounds; lengths of 6, 7, 8, 9, 10 and 12 ft.; 1 clip furnished with each foot of rail. Clips may be firmly locked onto the rail and fastened into mortar between bricks or tile. Packed 25 pieces to a bundle. Weight, including clips, 225 lbs. 1000 ft. Clips in cartons of 100 and 500



# TRUSCON STEEL COMPANY

(TRUSSED CONCRETE STEEL COMPANY)

Manufacturers of Reinforcing Steel, Metal Lath, and Specialties

YOUNGSTOWN, OHIO

REPRESENTATIVES IN THE FOLLOWING CITIES

ATLANTA, GA.	COLUMBUS, OHIO	KANSAS CITY, MO.	OKLAHOMA CITY, OKLA.	SALT LAKE CITY, UTAH
BALTIMORE, MD.	DALLAS, TEX.	LOS ANGELES, CAL.	PHILADELPHIA, PA.	SAN ANTONIO, TEX.
BOSTON, MASS.	DENVER, COLO.	LOUISVILLE, KY.	PITTSBURGH, PA.	SEATTLE, WASH.
BUFFALO, N. Y.	DES MOINES, IOWA	MILWAUKEE, WIS.	PORTLAND, ORE.	SPOKANE, WASH.
CHICAGO, ILL.	DETROIT, MICH.	MINNEAPOLIS, MINN.	ROSWELL, N. M.	SYRACUSE, N. Y.
CINCINNATI, OHIO	EL PASO, TEX.	NEW YORK, N. Y.	ST. LOUIS, MO.	TOLEDO, OHIO
CLEVELAND, OHIO	INDIANAPOLIS, IND.	NORFOLK, VA.	ST. PAUL, MINN.	WASHINGTON, D. C.

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

## Products.

REINFORCING STEEL; KAHN TRUSSED BARS; RIB BARS; RIB METAL; COLUMN HOOPING; STEEL FLORETYLES and FLOREDOMES; Hy-Rib; METAL LATH; PRESSED STEEL JOISTS and STUDS; CORNER BEADS; INSERTS; STEEL BUILDINGS.

Hollow Tile, Stair Treads, etc.

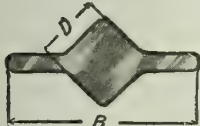
For Steel Windows, see pages 702-03.

## Kahn Trussed Bars.

Kahn trussed bars are specially adapted for concrete beams, girders, floors and arches. Diagonals are formed from flanges of main bar, producing a unit bar. The rigid connection of shear members makes beams 12% to 30% stronger than where loose stirrups are used. Kahn bars save steel in designing and labor in installation, and insure accuracy, safety, strength, and fireproofness.

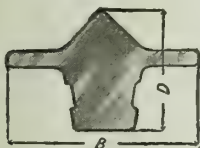


KAHN TRUSSED BAR



SECTION KAHN TRUSSED BAR

D & B	Weight, ins.	Area, per lin. ft.	sq. in.
$\frac{1}{2} \times 1\frac{1}{2}$	1.4 lbs.	0.41	
$\frac{3}{4} \times 2\frac{1}{2}$	2.7 lbs.	0.79	



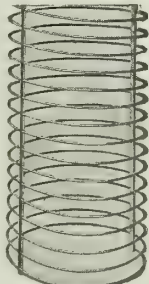
SECTION KAHN TRUSSED BAR

D & B	Weight, ins.	Area, per lin. ft.	sq. in.
$1\frac{1}{2} \times 2\frac{1}{4}$	4.8 lbs.	1.41	
$1\frac{3}{4} \times 2\frac{3}{4}$	6.8 lbs.	2.00	
$2 \times 3\frac{1}{2}$	10.2 lbs.	3.00	

\*NOTE—The special lengths enclosed in parentheses are ordinarily available only for items of 5 tons or more.

## Collapsible Column Hooping.

Collapsible column hooping specially designed for reinforcing concrete columns. Vertically reinforced with rib bars. Shipped assembled ready for erection in field, in flat circular coils of exact diameter, which spring automatically into hooped columns. Accurately constructed, easily handled, and saves labor and time in construction.



COLUMN HOOPING  
Diameters from 9 to 30 ins.; pitch from  $1\frac{1}{2}$  to 12 ins.



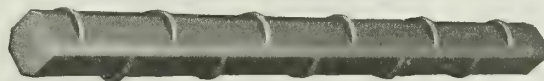
TRADE-MARK

## Rib Bars.

Designed to give maximum grip on concrete. Used principally in connection with Kahn trussed bars, rib metal, and Hy-Rib; also extensively in all classes of construction requiring reinforcement.

### PROPERTIES OF RIB BARS

Size, ins.	SQUARE BARS		ROUND BARS	
	Area, sq. in.	Wt. per ft., lbs.	Area, sq. in.	Wt. per ft., lbs.
$\frac{3}{8}$	.1406	.48	.1104	.379
$\frac{1}{2}$	.2500	.86	.1963	.674
$\frac{5}{8}$	.3906	1.35	.3068	1.054
$\frac{3}{4}$	.5625	1.95	.4418	1.517
$\frac{7}{8}$	.7656	2.65	.6013	2.065
1	1.0000	3.46	.7854	2.697
$1\frac{1}{8}$	1.2656	4.38	.9940	3.414

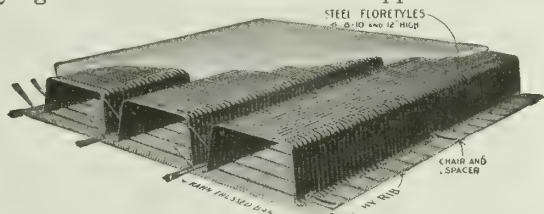


RIB BARS

## Floretyles and Floredomes.

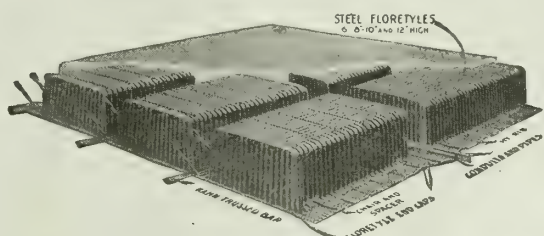
FLORETYLES—Rectangular corrugated steel tiles, used extensively in constructing fireproof floors. Reinforcement between Floretyles carries load to supports. Effect great saving in concrete, steel, centering and weight. Produce flat ceilings of long span.

FLOREDOMES—Similar to Floretyles, except closed on four sides. Reinforcement extends on all four sides, carrying load in two directions to support.



STEEL FLORETYLES

Approximate width at base,  $20\frac{1}{2}$  ins.; standard lengths. 3 and 4 ft.; standard heights, 6, 8, 10 and 12 ins.



FLORETYLE END CAPS

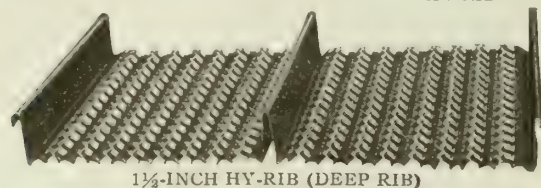
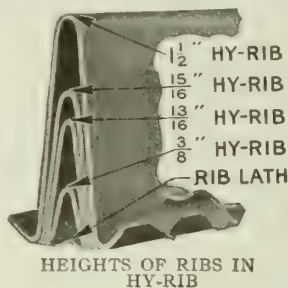


CANTILEVER FLORETYLE CONSTRUCTION

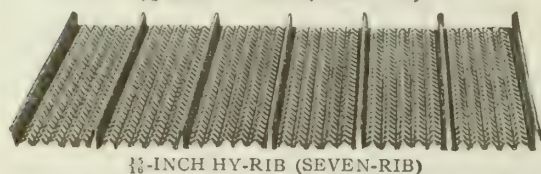


## Hy-Rib.

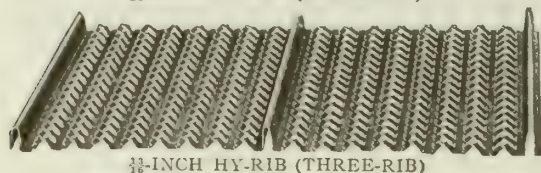
Hy-Rib is a reinforcement obtained by shearing and pressing sheet steel, making a unit of lath and stud. Ribs thus formed take place of centering and studs in concrete and plaster work, reducing cost and simplifying construction, saving labor, time and expense. Used in construction of floors, roofs, walls, sidings, partitions, ceilings, furring, tanks, sewers, culverts, conduits, etc.



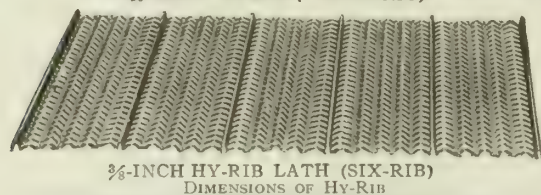
1 1/2-INCH HY-RIB (DEEP RIB)



1 5/8-INCH HY-RIB (SEVEN-RIB)



1 3/4-INCH HY-RIB (THREE-RIB)

3/8-INCH HY-RIB LATH (SIX-RIB)  
DIMENSIONS OF HY-RIB

Type of Hy-Rib	Formerly called	Height of ribs	Spacing of ribs	Width of sheets	Gauge Nos. U. S. Standard
1 1/2"	Deep-Rib	1 1/2"	7	14	22, 24, 26
1 5/8"	7-Rib	1 5/8"	4	24	22, 24, 26, 28
1 3/4"	3-Rib	1 3/4"	8	16	24, 26, 28
3/8"	6-Rib	3/8"	4	20	24, 26, 28

Standard lengths, 6, 8, 10 and 12 ft. Other lengths cut without charge except for waste.

SAFE LOADS IN POUNDS PER SQUARE FOOT FOR SLABS REINFORCED WITH 1 1/2" HY-RIB

Thickness of slabs above base of sheathing	Gauge No.	M. R. per ft. of width	Span in Feet										
			3	4	5	6	7	8	9	10	11	12	13
2 1/2" slab	26	4870	451	254	162	113	83	63					
Wt. 30 lbs. per sq. ft.	24	6500	601	338	216	150	110	85					
3" slab	26	6090	563	317	203	141	104	63					
Wt. 36 lbs. per sq. ft.	24	8120	751	423	270	188	138	84					
3 1/2" slab	22	10150	940	529	338	234	172	104					
4" slab	26	7310	676	380	243	169	124	95	75				
Wt. 42 lbs. per sq. ft.	24	9740	901	508	324	225	165	127	100	81			
4 1/2" slab	22	12180	1126	663	406	282	207	158	125	102			
5" slab	26	8530	789	443	284	197	145	111	88	71			
Wt. 48 lbs. per sq. ft.	24	11370	1052	592	379	263	194	148	117	95	78		
5 1/2" slab	22	14210	1318	740	473	329	242	185	146	118	98		
6" slab	26	9740	901	508	324	225	165	127	100	81			
Wt. 54 lbs. per sq. ft.	24	12990	1202	678	433	301	221	170	134	108	89	75	
6 1/2" slab	22	16240	1505	847	541	376	276	211	167	135	112	94	
7" slab	26	10960	1013	570	365	254	186	142	113	91			
Wt. 60 lbs. per sq. ft.	24	14620	1352	761	487	338	248	190	152	122	100	84	
7 1/2" slab	22	18270	1688	950	609	422	310	237	187	152	126	106	90
8" slab	26	12180	1123	632	406	281	207	158	125	102			
Wt. 66 lbs. per sq. ft.	24	16240	1500	845	541	376	276	211	167	135	112	94	
8 1/2" slab	22	20300	1880	1058	676	470	345	264	209	169	140	118	100

## Rib Lath.

Rib lath for plastering and stucco is a stiffened steel lath permitting wide spacing of studs. Furnished in three types and various gauges; also in open hearth or copper bearing steel—all painted.

STANDARD RIB LATH

Size of sheets—21 by 96 ins.			
Grade	Wt. per sq. yd. in lbs.	Max. stud spac. for walls c. to c.	Max. joist spac. for ceilings c. to c.
No. 1	2.74	14"	12"
No. 2	3.42	16"	14"
No. 4	4.10	18"	16"

No. 1-A HY-RIB LATH

Size of sheets—15 1/2 by 96 ins.			
Grade	Wt. per sq. yd. in lbs.	Max. stud spac. for walls c. to c.	Max. joist spac. for ceilings c. to c.
No. 1A	3.66	18"	16"

3/8" HY-RIB LATH WITH CHANNELS OR STUDS FOR PARTITIONS AND CEILINGS

Gauge	Max. stud spac. for walls and partitions	Max. spac. of supports for ceilings
24	36"	33"
26	32"	30"
28	24"	22"

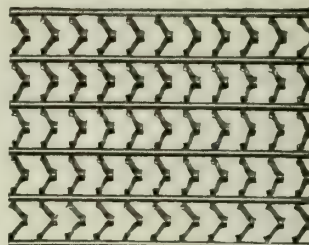
Note wide spacing of studs.

DETROIT DIAMOND LATH

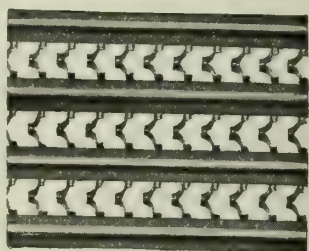
Size of Sheets—24 by 96 ins.				
Gauge	Sheets per bundle	Yds. per bundle	Wt. per sq. yd. in lbs., Painted	Wt. per sq. yd. in lbs., Galvanized
No. 27	15	26 2/3	2.48	2.88
No. 26	15	26 2/3	2.68	3.08
No. 25	15	26 2/3	3.10	3.50
No. 24	15	26 2/3	3.50	3.90

UNIVERSAL DIAMOND LATH

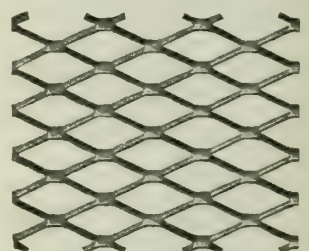
Size of Sheets—28 by 96 ins.				
Gauge	Sheets per bundle	Yds. per bundle	Wt. per sq. yd. in lbs., Painted	Wt. per sq. yd. in lbs., Galvanized
No. 26	14	29	2.30	2.70
No. 24	14	29	3.00	3.40



STANDARD RIB LATH



1-A HY-RIB LATH



DETROIT AND UNIVERSAL DIAMOND LATH

HY-RIB SIDE WALLS

Span	Thickness	No. Reinforcement
2'	1 3/4"	28, 3/8" Hy-Rib Lath
2'-8"	1 3/4"	26, 3/8" Hy-Rib Lath
	1 3/4"	28, 1/2" Hy-Rib, or 24, 3/8" Hy-Rib.
6'	1 3/4"	26, 1/2" Hy-Rib, or 28, 1/2" Hy-Rib.
8'	2"	24, 1/2" Hy-Rib, or 26, 1/2" Hy-Rib.
10'	2"	26, 1/2" Hy-Rib.
12'	2 1/2"	24, 1/2" Hy-Rib.

Temporary bracing should be used horizontally every 5 ft. for 1 3/8" Hy-Rib and 6 ft. for 1 1/8" Hy-Rib.

HY-RIB PARTITIONS

Hgt.	Thickness	No. Reinforcement
up to 10'	1 3/4"	28, 1/2" Hy-Rib.
10'-12'	2"	26, 1/2" Hy-Rib, or 28, 1/2" Hy-Rib.
14'	2 1/4"	24, 1/2" Hy-Rib, or 26, 1/2" Hy-Rib.
16'	2 1/2"	26, 1/2" Hy-Rib.
18'	2 3/4"	24, 1/2" Hy-Rib.
20'	3"	22, 1/2" Hy-Rib.

HY-RIB CEILINGS

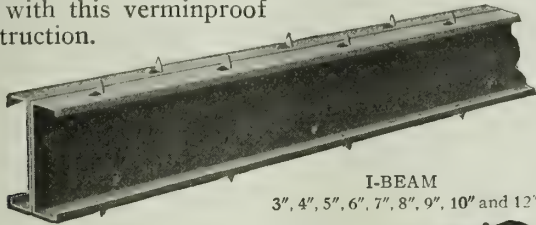
Spacing of supports	No. Reinforcement
1'-10"	28, 3/8" Hy-Rib Lath.
2'-6"	26, 3/8" Hy-Rib Lath.
2'-9"	24, 3/8" Hy-Rib Lath.
2'-11"	28, 1/2" Hy-Rib.
3'-11"	26, 1/2" Hy-Rib, or 28, 1/2" Hy-Rib.
4'-11"	24, 1/2" Hy-Rib, or 26, 1/2" Hy-Rib.
5'-11"	24, 1/2" Hy-Rib.

For B. M. =  $\frac{1}{2}$  w 12, add 20% to above.  
B. M. =  $\frac{1}{6}$  w 12, loads.  
For B. M. =  $\frac{1}{8}$  w 12, deduct 20% from above loads.

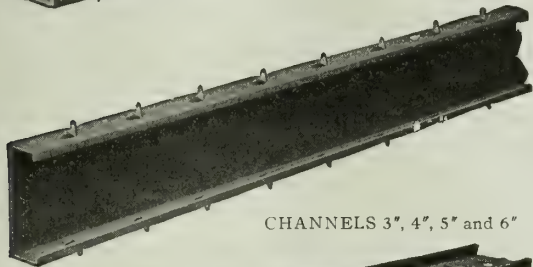


### Truscon Pressed Steel.

Truscon pressed steel products include I-beams, channel beams, studs and channels, cap and sill plates, etc. These products insure strength and rigidity together with lightness, economy in use of steel, labor saving in erection, and simplicity and speed in construction. When used in conjunction with Hy-Rib metal lath, simply concrete the top, and plaster the bottom, and a soundproof, fire-resisting, lightweight floor of great strength is created. Eliminate expensive maintenance cost with this verminproof construction.



I-BEAM  
3", 4", 5", 6", 7", 8", 9", 10" and 12"



CHANNELS 3", 4", 5" and 6"



CAPS AND SILL PLATES  
For 2", 3", 4", 5", and 6" studs



H STUD  
3", 4", 5" and 6"



CHANNEL STUD  
2", 3", 4", 5" and 6"



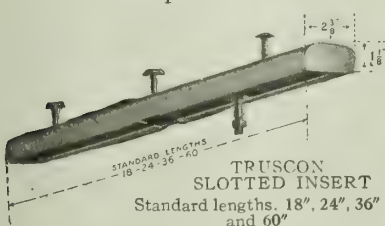
HOLLOW STUD  
2", 3" and 4"



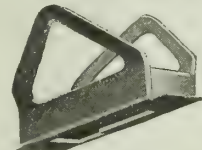
CHANNELS  
 $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ " and 2"

### Truscon Inserts.

Used in concrete slabs, beams or columns for attaching shaft hangers, fixtures, sprinkler systems, etc. Obviate expensive drilling into concrete in finished building. Built into concrete during process of construction by merely fastening them to wood centering. The concrete thoroughly embeds insert and holds it rigidly in place. Only narrow slot flush with concrete is seen in completed work.



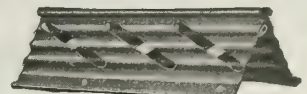
TRUSCON  
SLOTTED INSERT  
Standard lengths. 18", 24", 36"  
and 60"



TRUSCON  
ADJUSTABLE  
INSERT  
 $\frac{1}{2}$ ",  $\frac{3}{8}$ " and  $\frac{3}{4}$ "

### Corner Beads.

Furnished in three different styles for the protection of plastered corners. Equipped with adjustable clips ready for attaching.



CORNER BEAD

### Metal Base Screeds.

Supplied in three types for all purposes.



METAL BASE SCREED

### Kahn Armor Plate.

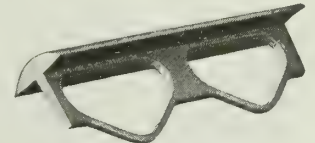
Protects expansion joints in concrete pavements. These plates have sheared lugs for anchoring in concrete. The beveled edge prevents concrete from chipping at the plates. Supplied curved to fit crown of pavement. Improved installing device assures accuracy of placing.



CROSS SECTION OF JOINT  
MADE BY KAHN ARMOR  
PLATE

### Kahn Curb Bars and Edge Protectors.

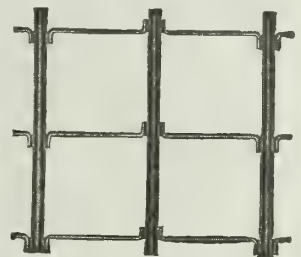
Protect corners of concrete construction such as curbs, bridges, sidewalks, columns, platforms, etc. Unit of substantial protecting plate and rigid positive anchorage. Furnished in two sizes, either straight or curved.



KAHN CURB BAR

### Rib Metal.

Rib Metal is a unit reinforcement for floors, roofs, walls, vaults, arches, conduits, sewers, reservoirs, tanks, etc., equivalent to a large number of separate bars. Provides perfect cross reinforcement against temperature and shrinkage strains.



RIB METAL

### Kahn Mesh.

Kahn mesh is an expanded steel reinforcement. Furnished in sheets and provides absolute grip for concrete. Used in all classes of reinforced concrete construction, pavements, floors, roofs, walls, sewers, conduits, tanks, culverts, bridges, retaining walls, abutments, etc. Easily handled and placed; saves labor and time.

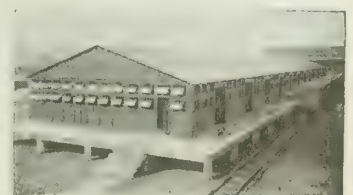


CONSTRUCTION OF KAHN  
MESH

### Truscon Steel Building.

The ideal construction to care for auxiliary additions to industrial plants. Built of solid interchangeable steel panels firmly fastened together with bolt and wedge device. Equipped with solid steel doors, steel roofing plates, steel trusses and Truscon steel windows. Permanent, fireproof and weatherproof, yet portable.

Full particulars and literature on request.



TRUSCON STEEL BUILDING

# THE SYKES METAL LATH AND ROOFING CO.

NILES, OHIO

For methods of construction with Metal Lath and Plaster, see pages 196-201 of the Associated Metal Lath Manufacturers

## Products.

Manufacturers of SYKES EXPANDED CUP LATH, SYKES TROUGH SHEET LATH.

Sykes Diamond Mesh Metal Lath, Economy Metal Lath, Sykes Wall Ties, and Metal Corner Bead.

## Sykes Expanded Cup Lath.

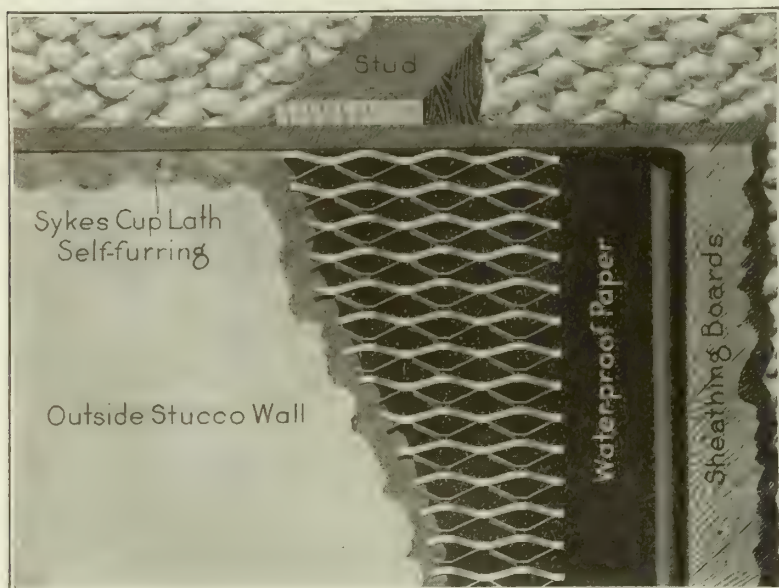
Stucco houses are becoming more popular each year, and their construction is now so well understood that they can be successfully built in any climate. There is no better material, or a more economical one for this purpose, than Sykes expanded cup lath "Self-Furring."

QUALITY—Because we are determined that our products shall be of the best quality regardless of ex-

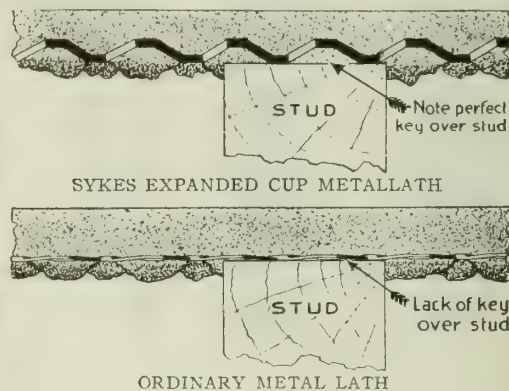
The key or bond of this lath is perfect. Mortar does not hang on a sharp cutting edge that would cut the clinch on either side walls of ceiling, but rests on a beveled edge in each case. The lath becomes thoroughly embedded in the mortar, bracing it from all directions. It is not merely a background for the plaster, but makes a thorough reinforcement.

SUPERIORITY, BEING BEST FOR INTERIOR AS WELL AS FOR EXTERIOR WORK—Sykes expanded cup metal lath gives greater durability by giving more weight. By its peculiar formation it reinforces the wall to a greater extent than any other expanded metal lath. Note these illustrations:

Observe that one great superiority of Sykes expanded metal lath, over the common expanded metal lath, is that Sykes lath extends *into the wall*  $\frac{1}{4}$  in. and is therefore embedded in the mortar. Sykes lath is a backbone to the wall; common lath is *on the back of the wall*—only a background for the plaster. The corrugation in the Sykes lath makes a perfect reinforcement of the wall. The wall will be much stronger, much more rigid, if Sykes lath is used.



SYKES EXPANDED CUP LATH  
Showing how it is used without furring strips



pense, deoxidized or pickled sheets are not used, which would save the cutting edges on knives, but would make the lath more susceptible to rust. In the process of manufacture, the metal is not stretched, thus avoiding damage to the fiber. We give clear evidence of this statement by cutting galvanized sheets without even breaking the coating of spelter. Any operation that stretches the metal in the process of expanding it while cold, destroys its durability to a certain extent.

ADVANTAGES—This material is "self-furring"; mortar gets a perfect clinch when lath is applied direct to sheathing boards or where passing over wood studs or other obstructions, without the use of furring strips.

MORE WEIGHT; LESS MORTAR; MORE DURABILITY—All grounds being measured from face of stud, not from face of lath, it is easily demonstrated that Sykes lath requires *less mortar* than any other expanded lath:

First, because there will be less mortar back of the face of the stud, the key upon Sykes lath being to a great extent *in the wall itself*.

Second, because the key on Sykes lath is formed in a natural cup, therefore no mortar will be cut off and allowed to fall down back of the wall.

Sykes expanded cup lath is heavier than others cut from the same gauge of metal, because of its wider strands. It is nearly one and one-half times as heavy as



some metal laths of the same gauge now on the market. *Judge by weight and gauge, not by gauge alone.*

Sykes expanded cup metal lath saves money and adds to the wall's life. It keys perfectly; can not be applied wrong.

**HOW APPLIED**—The illustration shows the manner of applying Sykes expanded cup lath direct to sheathing boards for stucco work without the use of furring strips, although this lath is equally good for interior use.



SYKES LATH HEAVIER THAN OTHERS CUT FROM SAME GAUGE OF METAL

**SIZE AND WEIGHT**—Sykes cup lath is manufactured in sheets measuring 18 by 96 ins.; packed in bundles of 15 sheets each, containing 20 sq. yds.

Approximate weight per square yard in painted: No. 27-gauge,  $2\frac{7}{10}$  lbs.; No. 26-gauge,  $2\frac{9}{10}$  lbs.; No. 24-gauge,  $3\frac{6}{10}$  lbs.

Approximate weight per square yard in galvanized: No. 27-gauge, 3 lbs.; No. 26-gauge,  $3\frac{1}{8}$  lbs.; No. 24-gauge, 4 lbs.

**SPECIFICATIONS**—Specify Sykes expanded cup lath No. 27- or No. 26-gauge for either interior or exterior work, where centering is 12 ins. or less. Where centering is over 12 ins., specify Sykes expanded cup lath No. 24-gauge or Sykes trough sheet lath. Use 1-in. galvanized staples driven every 4 ins., lapping the sheets and arranging them to be bent around curves and angles, to prevent cracks in the plastering.

On iron framework use No. 18-gauge wire for lacing.

No furring strips required with Sykes expanded cup lath when used for exterior work.

**SAMPLES, ETC.**—On request, architects will be gladly furnished with booklet entitled "Complete Specifications for Stucco on Metal Lath"; also any special data desired, together with samples. Write us.



SPECIFICATION BOOKLET

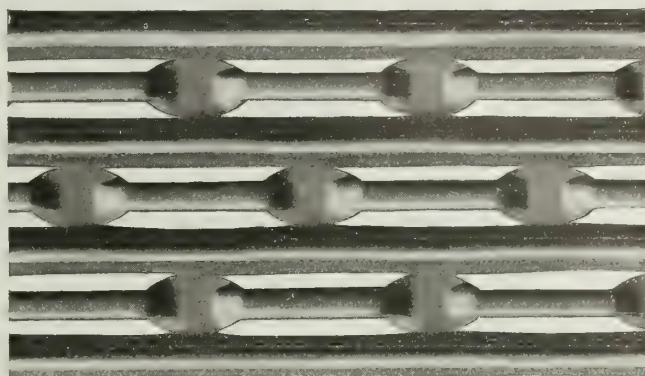
### Sykes Trough Sheet Lath.

Sykes trough lath is a sheet lath (not expanded), and by many is preferred because of its rigidity or stiffness. It can be applied on 16-in. centering with absolutely no uncertainty.

Sykes trough sheet lath is especially desirable for either exterior or interior purposes, and when used

for ceilings the trough forms a partial vacuum or suction, and thus prevents the mortar from falling off when wet.

Furnished with a good coat of durable black paint.



SYKES TROUGH SHEET LATH

**ADVANTAGES**—The novel design and shape of the trough in Sykes sheet lath, in connection with the corrugations that run the entire length of the sheet, make it beyond question the strongest and most rigid lath on the market.

It is economical in the amount of plaster used, and on account of its rigid character is an ideal lath for mantel and tile setting.

The merit of Sykes trough sheet lath, when once used, is recognized by architects, builders and contractors.

**SIZES**—Manufactured in the following sizes:

13½ by 96 ins.—10 sheets per bundle, containing 10 sq. yds.

18½ by 96 ins.—9 sheets per bundle, containing 12 ⅓ sq. yds.

23½ by 96 ins.—9 sheets per bundle, containing 15¾ sq. yds.

Approximate weight, 5 lbs. to the sq. yd.

### SPECIFICATION

*For Interior Walls and Ceilings where Centering is 16 ins. or less*—Use Sykes trough sheet lath, manufactured by THE SYKES METAL LATH AND ROOFING Co., Niles, Ohio. Use 3d wire nails driven every 4 ins., lapping the sheets and arranging them to be bent around corners and angles to prevent cracks in the plastering.

On iron construction use No. 18-gauge wire for lacing.

*For Exterior Concrete or Stucco*—Apply Sykes trough sheet lath, using 3d wire nails or staples. Use regular ⅜-in. furring set up to 16 ins. on centers.

For panel work of medium size, ⅜-in. wood lath may be used for furring, set up to 16 ins. on centers.

# UNION METAL CORNER COMPANY

18 Heath Street  
BOSTON, MASS.

FACTORY  
EAST DEDHAM, MASS.

## Products.

METAL CORNER BEADS.  
"OUTERSITE" METAL PICTURE MOULDING.  
METAL BASE GROUNDS.

## Union and Hannon Metal Corner Beads.

Because of their excellence, Union and Hannon beads are specified everywhere for buildings of the highest class. Moreover, their reasonable cost permits their use for inexpensive buildings; in fact, these beads are used today to protect the plastered corners in all kinds of fireproof and non-fireproof construction.

The fact that for one-fifth of a century the UNION METAL CORNER COMPANY has manufactured metal beads exclusively, bespeaks the high standard that the company maintains.

Monuments of architectural efficiency, like the new Custom House, Boston, the new Technology Buildings, Cambridge, and buildings of like magnitude, prove conclusively the high opinion in which these beads are held by architects and experts in building construction.

Every plaster or cement corner, either inside or outside of buildings, should be protected and made damageproof by using one of our metal corners. Broken, rough looking corners are unsightly.

**ADVANTAGES**—These metal corner beads are superior for the following reasons:

Perfectly true and straight, because a folded edge is naturally straight.

Straddle the corner, giving it a double continuous bearing. This makes the corner strong and rigid, and prevents cracking of plaster when struck a hard blow.

Unusually strong plaster key that locks the plaster firmly, making a solid corner of steel and plaster.

**SIZES**—The Hannon Bead is made in the following face widths:

No. 1 bead $\frac{1}{4}$ -in. face	No. 6 bead $1\frac{1}{2}$ -in. face
No. 2 bead $\frac{1}{2}$ -in. face	No. 7 bead $1\frac{3}{4}$ -in. face
No. 4 bead 1-in. face	No. 8 bead 2-in. face
No. 5 bead $1\frac{1}{4}$ -in. face	

Please specify by name and number.

**REFERENCES**—Some of the buildings in which Union or Hannon Beads were used, and architects by whom they were specified:

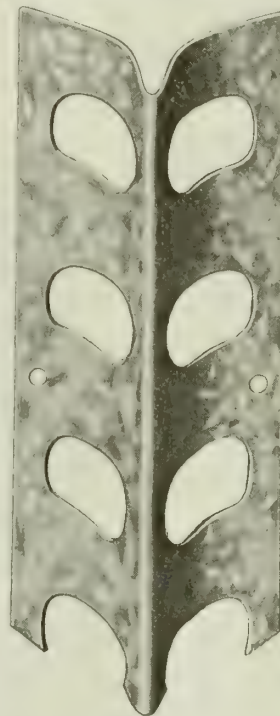
Multnomah County Court House, Portland, Ore., Whidden & Lewis  
Board of Trade, San Francisco, Cal., D. C. Lewis  
Alexandria Hotel, Los Angeles, Cal., Parkinson & Bergstrom  
Van Nuys Building, Los Angeles, Cal., Morgan, Walls & Morgan  
L. C. Smith Building (42 stories) Seattle, Wash., Gaggin & Gaggin, Syracuse, N. Y.  
Residence, G. A. French, Duluth, Minn., F. W. Perkins  
Eiger Building (22 stories), Chicago, Ill., A. L. Alschuler

Woolworth Building, New York, N. Y., Cass Gilbert  
Altman Building, New York, N. Y., Trowbridge & Livingston  
Peoples' Bank Building, Chester, S. C., J. S. Starr  
Cumberland Lodge, Nashville, Tenn., A. Norton  
Macon Savings Bank, Macon, Ga., P. E. Dennis  
New Haven County Court House, New Haven, Conn., Allen & Williams

Post Office Buildings in the following cities: Winchester, Tenn.; Pulaski, Tenn.; Granada, Miss.; Canton, Miss.; Bryan, Texas; Miami, Fla.; Gary, Ind.

Buildings in which Hannon Number 4 Metal Beads were used:

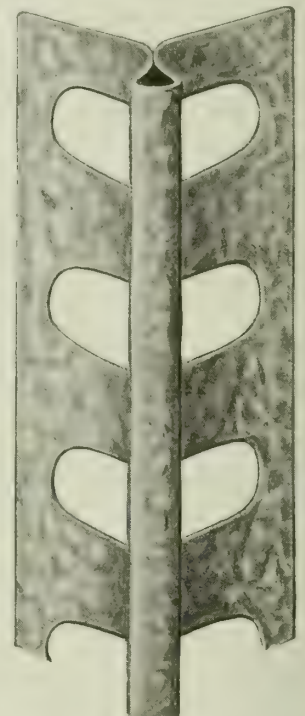
Epileptic Colony Buildings, Dixon, Ill., James B. Dibelka  
Mission Hospital, Asheville, N. C., W. H. Lord  
Psychopathic Hospital, Boston, Mass., Kendall, Taylor & Co.



UNION METAL CORNER BEAD

Made in lengths of 6, 7, 8,  $8\frac{1}{2}$ , 9,  $9\frac{1}{2}$  and 10 ft.

Use  $\frac{3}{4}$  in. on wood stud;  $\frac{3}{8}$  in. over wood lath;  $\frac{1}{2}$  in. on fireproof construction, such as brick, wire, terra cotta, iron, expanded metal, etc. Ideal for arch work.

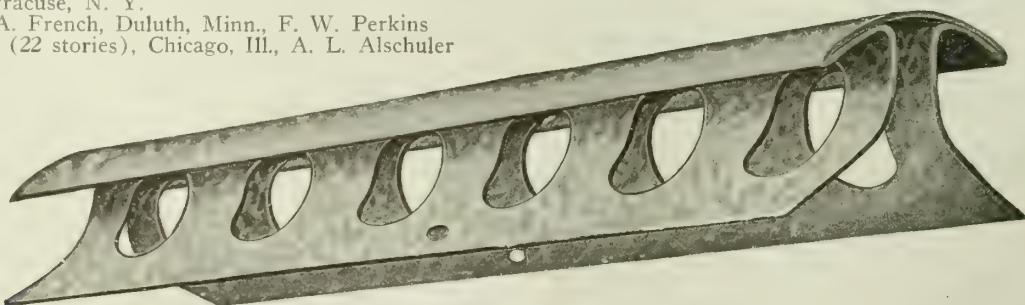


HANNON NUMBER 1 METAL CORNER BEAD

Made in lengths of 6, 7, 8,  $8\frac{1}{2}$ , 9,  $9\frac{1}{2}$  and 10 ft. Supplied in one size plaster ground only,  $\frac{3}{8}$  in.

Not intended for wood stud, but for use over wood lath, or where a  $\frac{3}{8}$ -in. plaster ground is wanted.

**CLIPS FOR BEADS**—If desired, flat, annealed iron clips,  $3\frac{1}{2}$  by  $1\frac{1}{4}$  ins. will be supplied for use on beads. Useful for badly broken terra cotta construction; allow plaster grounds of any size. Suitable for any of our metal corners.



HANNON NO. 4 METAL CORNER BEAD

1-in. face width

In building where inadvisable to use a sharp corner—hospitals, nurseries, homes for aged, etc.—Hannon Number 4 Bead is recommended.



### Hannon "Outersite" Metal Picture Moulding.

The Hannon "Outersite" metal picture moulding is formed from one piece of heavy metal, so folded as to make two parallel edges  $\frac{1}{8}$  in. apart; and perforated to form a perfect key for the plaster and to permit its being fastened to any form of construction.

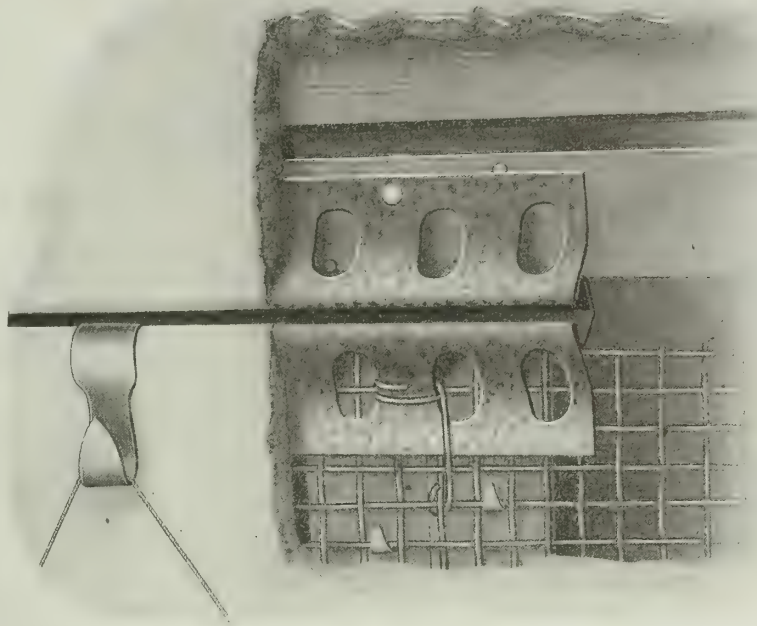
When plastered to the edges, as shown in illustration, the moulding is out of sight ("outersite"), making a strong, lasting and thoroughly sanitary picture moulding. It also forms the top plaster ground, thereby serving two useful purposes.

"Outersite" should be specified for all schools, public buildings, private and public art galleries—in fact wherever large pictures are to be hung.

Will support a weight of 1000 lbs. to the foot.

Made in one length only, 10 ft.; width,  $2\frac{1}{2}$  ins.

Shipped in wooden crates, the capacity of each crate being 50 pieces (500 ft.) of moulding.

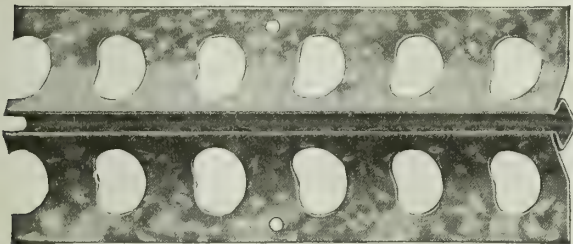


"OUTERSITE" PLASTERED  
Showing hook inserted.  
Hooks can be placed  
wherever desired

#### HANNON "OUTERSITE" METAL PICTURE MOULDING

An Invisible Moulding

Above section shows "Outersite" applied to wood lath (upper half) and to wire (lower half). Can be used on any kind of fireproof construction



"OUTERSITE" METAL PICTURE MOULDING

REFERENCES—"Outersite" was specified for following buildings and used in their construction:

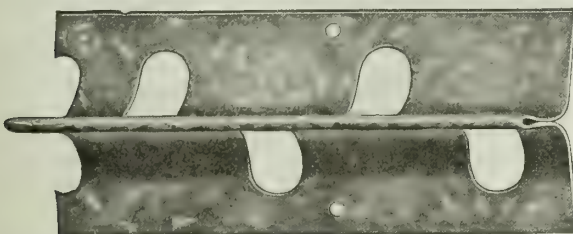
Jefferson School Building, Tampa, Fla., F. J. Kennard  
Rock Springs High School, Rock Springs, Wyo., D. D. Spani

Kenyon College, Gambier, Ohio, C. F. Schweinfurth  
Willoughby High School, Willoughby, Ohio, Franz Warner

Charles Vernon Gridley School, Erie, Pa., Wm. B. Ittner  
High School, Girard, Kan., J. H. Felt & Co.  
Bruce Dodson Building, Kansas City, Mo., J. H. Martling

### Hannon Metal Base Grounds (or Separations).

Hannon Metal Base Grounds do not permit the plaster to run to a V-point, so easily liable to crack or chip.

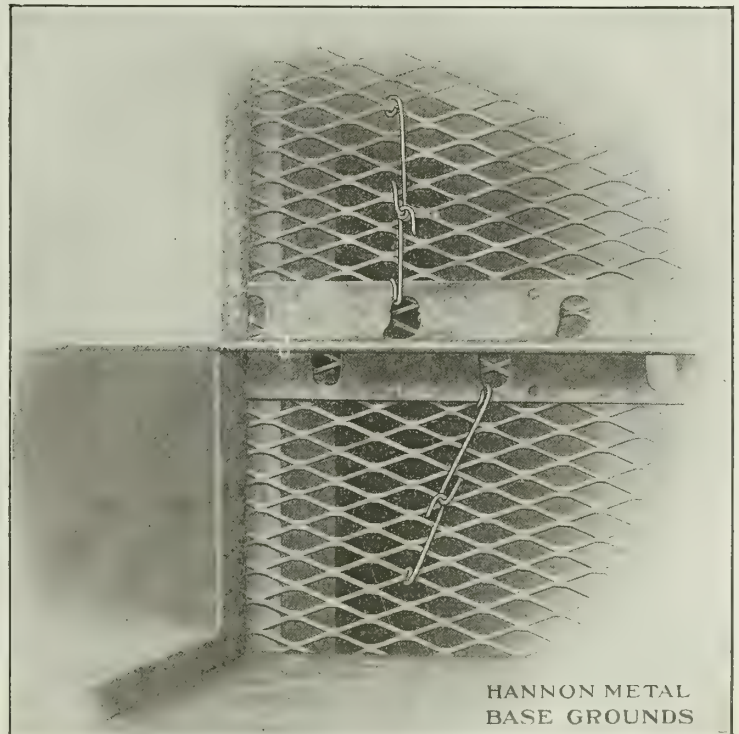


Length, 10 ft. only; width,  $2\frac{1}{4}$  ins. Sizes:  $\frac{3}{8}$ -in. and  $\frac{5}{8}$ -in. grounds  
Shipped in crates, capacity 500 ft.

#### HANNON METAL BASE GROUNDS (OR SEPARATIONS)

Sanitary and necessary in modern fireproof construction.

Otis & Clark specified Hannon metal base grounds for the Municipal Tuberculosis Sanitarium, Chicago, Ill.



HANNON METAL  
BASE GROUNDS

Separates plastered wall from mastic base

# THE YOUNGSTOWN PRESSED STEEL CO.

Manufacturers of Metal Lath

YOUNGSTOWN, OHIO

## Products.

EXPANDED METAL LATH; EXPANDED METAL REINFORCING; COLD FORMED CHANNELS; CORNER BEAD; PRONG LOCK STUDDING; CRIMPED FURRING; CORRUGATED SHEETS.

Pressed Metal Stampings.

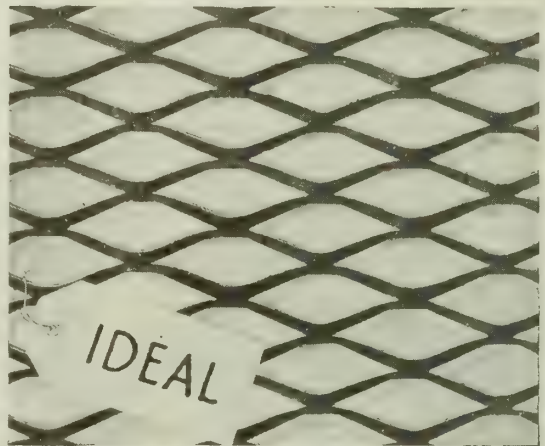
## Ideal Expanded Metal Lath.

The highest grade metal lath manufactured. Exceedingly rigid, has a wide strand, meets United States Government specifications and affords a firm and solid base for plastering.

Owing to the peculiar formation of the mesh, it does not shear the plaster and is therefore an economical lath to use.

Furnished painted or galvanized after expansion in the following weights and gages:

Gage	Size of sheet	Weight per sq. yd.	Sheets per bundle	Yards per bundle
No. 18	21" x 97"	8.00 lbs.	14	21
No. 20	21" x 97"	6.00 lbs.	14	21
No. 22	21" x 97"	5.00 lbs.	14	21
No. 24	21" x 97"	4.00 lbs.	14	21
No. 25	21" x 97"	3.50 lbs.	14	21
No. 26	21" x 97"	3.00 lbs.	14	21



IDEAL EXPANDED METAL LATH

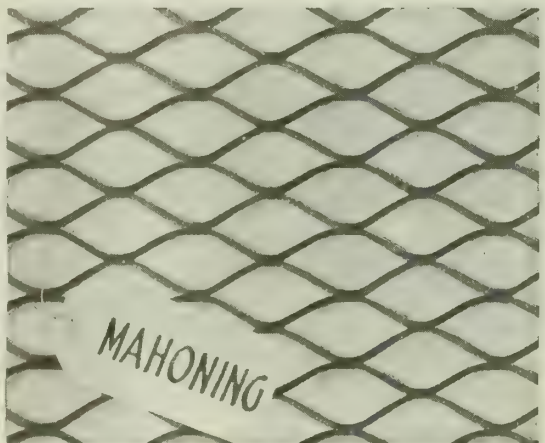
## Mahoning Expanded Metal Lath.

Mahoning lath as shown in the illustration has a small mesh. This insures the use of a minimum of plaster.

The formation of the mesh is perfect and provides an excellent key, every strand becoming thoroughly embedded in the plaster.

Furnished in the following weights and gages:

Gage	Size of sheet	Weight per sq. yd.	Sheets per bundle	Yards per bundle
No. 18	21" x 97"	5.50 lbs.	14	21
No. 20	21" x 97"	4.15 lbs.	14	21
No. 22	21" x 97"	3.40 lbs.	14	21
No. 22½	21" x 97"	3.33 lbs.	14	21
No. 23	21" x 97"	3.10 lbs.	14	21
No. 24	21" x 97"	2.75 lbs.	14	21
No. 25	21" x 97"	2.40 lbs.	14	21
No. 26	21" x 97"	2.10 lbs.	14	21



MAHONING EXPANDED METAL LATH

## Youngstown Expanded Metal Lath.

Particularly recommended for exterior stucco work.

A corrugated lath manufactured from the best grade of open hearth sheets.

The transverse corrugation, together with the extra wide strand, makes this material exceedingly rigid.

Approved and used extensively by the United States Government.

Furnished in the following weights and gages:

Gage	Size of sheet	Weight per sq. yd.	Sheets per bundle	Yards per bundle
No. 24	21" x 97"	4.00 lbs.	14	21
No. 26	21" x 97"	3.00 lbs.	14	21
No. 27	21" x 97"	2.80 lbs.	14	21

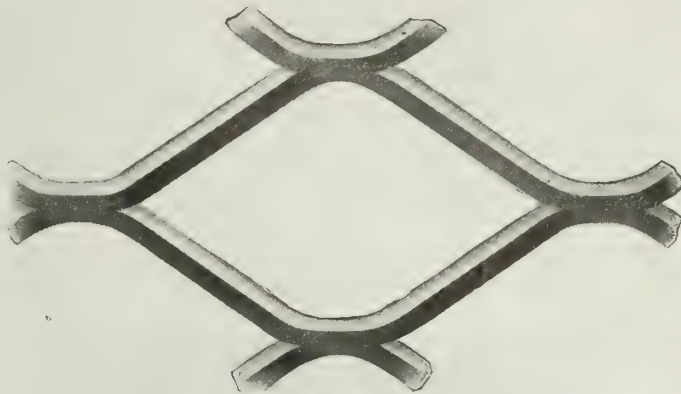


YOUNGSTOWN EXPANDED METAL LATH



Youngstown and Mahoning Expanded Metal.

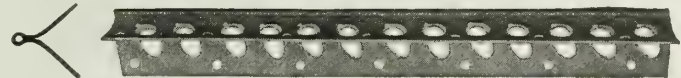
A reinforcement of the highest grade.  
This material is formed cold at a single operation without waste. The size of meshes and also widths of strands can be varied to fit the purpose for which metal is intended.  
Detailed information regarding this material will be cheerfully furnished at any time.



YOUNGSTOWN AND MAHONING EXPANDED METAL

American Steel Corner Bead.

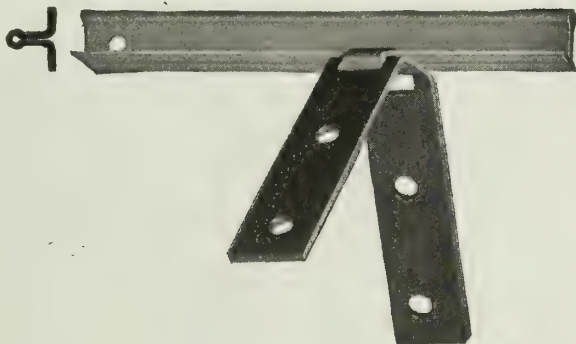
A reinforcement for plastered corners.  
Where construction is such that good grounds for fastening can be easily secured, this bead is erected without clips.  
This company manufactures a clip for use in connection with this bead, where good grounds for fastening can not readily be secured.  
Galvanized after forming, so as to guard against rust.  
Stock lengths, 6, 7, 8, 9, 10 and 12 ft.  
Intermediate lengths between 6 and 12 ft. can be furnished promptly.



AMERICAN STEEL CORNER BEAD

Parker Steel Corner Bead.

Especially adapted for use in fireproof construction, as the long clips enable the erector to find good grounds for fastening on brick, terra cotta, concrete or metal lath.  
Stock lengths, 6, 7, 8, 9, 10 and 12 ft.  
Intermediate lengths between 6 and 12 ft. can be furnished promptly.  
One clip furnished for each foot of bead.



PARKER STEEL CORNER BEAD

Youngstown Prong Lock Studs.

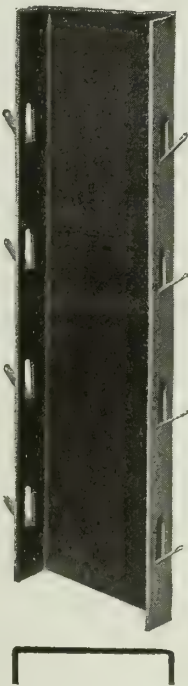
Prong lock studs in connection with metal lath are used for partitions, ceilings and roofs; also for many light structures where the floor loads are not heavy.  
Individual sockets, or socket strips, hold the stud in position at top and bottom.  
Lath is quickly and easily applied by firmly clinching the prongs with a hammer. This eliminates all wiring on of lath and is more economical.  
Furnished in the following weights and gages:

Gage	Size	Weight per 1000 lin. ft.
No. 20	3/4" T-stud	290 lbs.
No. 20	2" double stud	415 lbs.
No. 20	3" double stud	535 lbs.
No. 20	4" double stud	650 lbs.
No. 20	5" double stud	785 lbs.
No. 20	Furring stud	325 lbs.
No. 18	3/4" T-stud	400 lbs.
No. 18	2" double stud	550 lbs.
No. 18	3" double stud	700 lbs.
No. 18	4" double stud	880 lbs.
No. 18	Furring stud	435 lbs.

Sharon Cold Formed Channel.

For wall and column furrings, thin partitions carrying bars and furring strips for suspended ceiling.  
Manufactured in the following sizes:

Gage	Size	Weight per 1000 lin. ft.	Size of flange
16	3/4"	276 lbs.	
16	7/8"	304 lbs.	
16	1"	331.50 lbs.	
16	1 1/4"	386.80 lbs.	
16	1 1/2"	456 lbs.	
16	1 3/4"	539 lbs.	1/2"
16	2"	580 lbs.	3/8"
16	2 1/2"	635.40 lbs.	1/2"
18	1 7/8"	458.20 lbs.	1/2"



DOUBLE STUD



FURRING STUD



T STUD

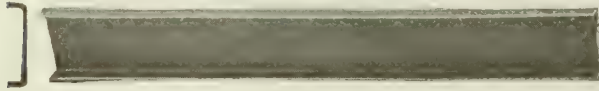
Formed cold of best quality open hearth steel, pro-

ducing an exceptionally straight and very rigid channel. Can be bent into the most difficult shapes for furring without the steel fracturing.

Sharon channels have been accepted by the best architects.

Copy will be furnished of Robert W. Hunt & Company's test on  $\frac{3}{4}$ -in. channel for furring and 1-in. channel for carrying bars in suspended ceiling construction.

Stock lengths, 12, 14, 16, 18 and 20 ft.; 22-ft. lengths can be furnished on special orders.



SHARON COLD FORMED CHANNEL

### Sharon Perforated Cold Formed Channels.

Manufactured in the following sizes:

Gage	Size	Weight per 1000 lin. ft.	Size of flange
16	1 1/2"	455.80 lbs.	3/4"
18	1 7/8"	458.20 lbs.	1"
18	2"	479 lbs.	1 1/2"
18	2 1/4"	520.60 lbs.	1 1/2"
18	2 1/2"	562.30 lbs.	1 1/2"
18	3"	645.60 lbs.	1 1/2"
18	3 1/2"	728.90 lbs.	1 1/2"

**PERFORATIONS 4-IN. ON CENTERS**—A very substantial, as well as economical, hollow metal lath partition can be erected with Sharon perforated channels. Much lower in price than a double row of  $\frac{3}{4}$ -in. channels, and can be erected for half the cost.

Perforations permit the erector to tie metal lath on either side with ease.

Shipped in bundles of convenient size.

Stock lengths, 12, 14, 16, 18 and 20 ft.; 22-ft. lengths can be furnished on special orders.



SHARON PERFORATED COLD FORMED CHANNELS

### Corrugated Sheets.

Corrugated sheets are formed by machinery of most recent design, making each corrugation true and perfect, so that all sheets will lap and fit perfectly.

Can be had in various gages, corrugations and size of sheets.

Detailed information cheerfully furnished on request.



CORRUGATED SHEETS

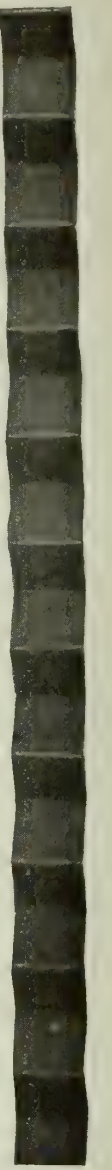
### Crimped Furring.

For use when metal lath is applied in old buildings or without use of steel studding.

May be placed against any solid surface and it will allow an abundance of room for the plaster to key.

Can be had in widths of  $\frac{1}{2}$ ,  $\frac{3}{4}$  or 1 in.; comes in lengths desired from 9 to 14 ft., packed 25 pieces per bundle; made from special analysis open hearth steel.

CRIMPED FURRING





# CLINTON WIRE CLOTH COMPANY

Manufacturers of Electrically Welded Wire Fabrics

Sears Building  
BOSTON, MASS.

FACTORY, CLINTON, MASS.

## BRANCH OFFICES

CHICAGO, Conway Building, Washington and Clark Streets

NEW YORK, 949 Broadway

## DISTRIBUTERS OF CLINTON ELECTRICALLY WELDED WIRE

BOSTON, DILLABY FIREPROOFING Co.  
NEW YORK, ALBERT OLIVER & SON, INC.  
SAN FRANCISCO, L. A. NORRIS Co.

ATLANTA, SOUTHERN G. F. Co.  
SAN ANTONIO, W. C. MOODY

SEATTLE, L. A. NORRIS Co.  
LOS ANGELES, L. A. NORRIS Co.  
PORTLAND, ORE., L. A. NORRIS Co.

And Building and Masonry Supply Concerns in Principal Cities

MONTREAL, OSHAWA, TORONTO, WINNIPEG, CAN., PEDLAR PEOPLE, LTD.  
VANCOUVER, B. C., L. A. NORRIS Co.

## Products.

"CLINTON" ELECTRICALLY WELDED WIRE FABRICS for Reinforcing Concrete; "CLINTON" WOVEN WIRE LATH, and "CLINTON" WELDED SHEATHING for Interior Plastering and Stucco Work.

Wire Cloth and Netting; "Hunt" Metal Corner Bead.

For Perforated Metals of every description and Grilles, see pages 990-91.

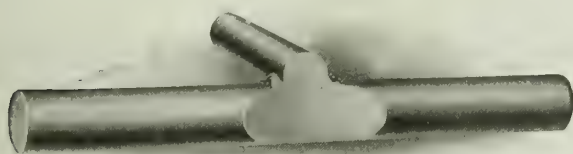
## Electrically Welded Wire Fabric.

**DESCRIPTION**—Clinton electrically welded wire fabric is a wire mesh made up of a series of parallel longitudinal wires, spaced certain distances apart and held at intervals by means of transverse wires arranged at right angles to the longitudinal ones, and cross-welded to them by means of a patented electrical process.

**THE WIRE**—The material is fabricated from a special grade of good quality steel wire possessing such strength, elasticity and ductility as to render it especially adapted for reinforcing concrete. The wire will develop an average ultimate strength of 70,000 to 80,000 lbs., with a maximum in some cases of 85,000 lbs. per sq. in. Innumerable tests and investigations have conclusively proved that the process of welding does not in any way lessen the tensile strength of the longitudinal wires.

**THE ELECTRIC WELD**—The mesh is not formed by loops, twists or clips, but the intersecting wires are cross-welded, and actually fused together by electricity, producing thereby an immovable connection between the wires, which at all times assures a rigid mesh, regardless of the size and shape in which the fabric may be used.

**THE RECTANGULAR MESH**—The mesh is rectangu-



THE CLINTON ELECTRIC WELD

In this view the two wires have been cut through at their point of union, revealing a perfectly smooth surface. It is a perfect weld; the wires are actually fused together

lar, with no zigzag, crisscross woven members to ravel out when the fabric is being handled. The wires intersect at right angles with a clean cut intersection, without any knobs or lumps to obstruct the free passage of the concrete, which feature assures always a dense concrete, free from voids, covering all parts of the reinforcement. Clinton electrically welded wire fabric, affording an efficient transverse as well as longitudinal reinforcement, prevents cracking due to changes in temperature, and provides a perfect network of steel which knits and binds the concrete together, reinforcing it securely in all directions. In floor slabs, designed and estimated on the basis of distributed loads, this is a most important factor in enabling a slab to receive a very heavy load upon a small area of floor.

**THE PERFECT BOND**—There is perfect adhesion of the concrete to Clinton fabric. The transverse strands, which may be of much heavier gage than can be used in any type of woven or twisted fabric, are securely welded at right angles to the longitudinal strands, and thus provide absolute anchorage against movement of the fabric in the concrete.

**UNBROKEN CONTINUITY**—As used in floor and roof slabs, the fabric comes to the work in rolls of any desired length, and may be laid in continuous unbroken sheets over all spans from one side of the building to the other, obtaining thereby a perfect unbroken sheet of reinforcement extending through every span, with no laps, no splices, and no danger of misplaced steel.

**EASE AND ACCURACY OF INSTALLATION**—Through the absolute welded union of transverse and longitudinal wires, the reinforcing strands of Clinton electrically welded wire fabric are spaced on exact centers. The spacing is established by machinery at the factory, and it is impossible for the relative position of the various members to become changed in the slightest degree. This renders the material foolproof, and enables great quantities of it to be installed in a very short time by the most unskilled labor.

**GALVANIZING**—Clinton electrically welded wire fabric is thoroughly galvanized before being welded, and is thereby thoroughly protected against rust or corrosion. If galvanizing is not required, these fabrics can be furnished made from plain steel longitudinal and galvanized steel transverse wires.

**USES**—Combining as it does the distinctive properties of a low carbon steel wire of the best grade with the advantages of an accurate and rigidly fabricated mesh, Clinton electrically welded wire fabric is a reinforcement especially adapted for floors, roofs, walls, roads, sidewalks, sewers, reservoirs, levees, and in fact every kind of slab construction. The material is used to special advantage in work involving the fireproofing or protection of steel with concrete, as in buildings, bridges, subways and tunnels.

**SIZE OF WIRE**—The longitudinal or transverse strands may consist of Nos. 0 to 12, inclusive, Washburn & Moen gage galvanized steel wire. When the same size of wire is not required in both members of the fabric, the heavier size can be placed longitudinally or transversely, as may be specified; but there should not be a difference exceeding 6 numbers in heavy grades, or 5 numbers in light grades, between the longitudinal and transverse strands.

**SPACING OF WIRES**—The longitudinal wires may be spaced on centers of 2 or more ins. in steps of  $\frac{1}{2}$  in. The distance between centers of outside longitudinal wires can not exceed 100 ins. The transverse wires can be spaced on centers of 1 to 10 ins., inclusive, in steps of 1 in.; and on centers of 10 to 18 ins., inclusive, in steps of 2 ins. They must project at least  $\frac{1}{2}$  in. beyond the outside longitudinals, and may, if required, be extended to a maximum length of 102 ins.

**ROLLS AND SHEETS**—Special lengths of rolls or sheets, as may be required, can be made to order. Rolls may be of any desired length not exceeding 400 ft. in the light grades, depending upon the weight and convenience in handling. Sheets should not exceed 20 by  $7\frac{1}{2}$  ft., if shipped in box cars; or 32 by 8 ft., if shipped on flat cars.

**HOW TO SPECIFY**—In ordering or specifying Clinton welded wire fabric, it is necessary to name merely the mesh and the wires. The longitudinal wires are considered as those running lengthwise of the sheet or roll, and their spacing and size are mentioned first. Thus, to indicate a fabric in which the longitudinal wires are No. 6 Washburn & Moen gage spaced 3 ins. on centers, with No. 10 Washburn & Moen gage transverse wires spaced 16 ins. on centers and welded at right angles to the longitudinal wires, it is sufficient to state:

3 x 16 in. mesh, No. 6 and No. 16 Clinton welded wire.

DESCRIPTION OF STOCK GRADES

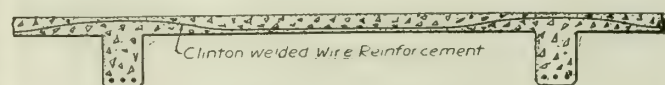
Longitudinal wires		Transverse wires		Sectional area 1-ft. fabric width, based on longitudinal wires, sq. in.	Weight per sq. ft. lbs.	Description of rolls			Specifications for ordering	
Spacing, ins.	Size No.	Spacing, ins.	Size No.			Length, ft.	Width, ins.	Weight, lbs.	Mesh, ins.	Gage of wire
*2	3	16	8	.2798	1.002	150	62	776	2 x 16	Nos. 3 and 8
*2½	3	16	8	.2238	.816	150	77	785	2½ x 16	Nos. 3 and 8
*3	3	16	8	.1865	.693	150	86	744	3 x 16	Nos. 3 and 8
*3	4	16	9	.1594	.592	150	86	636	3 x 16	Nos. 4 and 9
*4	3	16	8	.1399	.539	150	86	579	4 x 16	Nos. 3 and 8
*3	5	16	9	.1346	.506	150	86	543	3 x 16	Nos. 5 and 9
*3	6	16	10	.1158	.434	200	86	621	3 x 16	Nos. 6 and 10
*3	7	16	10	.0984	.374	200	86	535	3 x 16	Nos. 7 and 10
*4	6	16	10	.0868	.338	200	86	484	4 x 16	Nos. 6 and 10
3	8	12	10	.0824	.332	200	86	475	3 x 12	Nos. 8 and 10
3	8	8	10	.0824	.356	200	86	510	3 x 8	Nos. 8 and 10
*4	7	16	10	.0738	.293	200	86	419	4 x 16	Nos. 7 and 10
3	9	12	11	.0691	.276	200	86	395	3 x 12	Nos. 9 and 11
4	8	12	10	.0618	.263	200	86	376	4 x 12	Nos. 8 and 10
4	9	12	11	.0518	.219	200	86	313	4 x 12	Nos. 9 and 11
6	10	6	10	.0286	.198	400	98	646	6 x 6	Nos. 10 and 10
4	12	12	12	.0262	.120	400	102	408	4 x 12	Nos. 12 and 12
5	12	9	12	.0209	.113	400	102	384	5 x 9	Nos. 12 and 12

All of the foregoing items are made from steel wire, galvanized before welded. Those marked with \* are also made with plain wire in the longitudinal and galvanized wire in the transverse strands, and are less expensive than when galvanized wire is used throughout. In ordering, specify whether plain or galvanized wire is required.

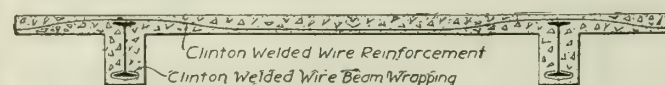
**INFORMATION**—For complete information concerning Clinton electrically welded wire fabric, write for special publications: "Concrete Floors," containing tables and other data relating to fireproof floor construction; and "Miscellaneous Construction," illustrating the varied uses of Clinton fabric.

### Concrete Floor Slabs in New York City.

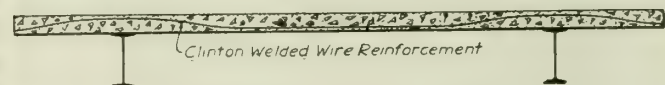
Because of the unaccountable strength of short span slabs, as shown by actual tests, the city of New York, after long consideration of the subject, has adopted a special empirical formula to be used in designing slabs of 8-ft. span and less, when confined between steel beams. For these conditions, a minimum thickness of 4 ins. is required; while the actual capacity is determined by the thickness of slab, the conditions of continuity, and the amount and kind of reinforcement used. The new law in New York City fixes this special formula as applicable only to spans of 8 ft. or less, and also prohibits the use of cinder concrete for spans exceeding 8 ft.



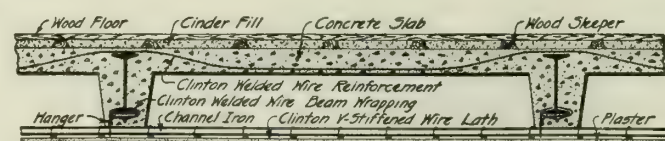
Slab Supported on Concrete Beams



Steel Beams with Complete Concrete Fireproofing



Slab Supported on Top of Steel Beams



Clinton Welded Wire and Clinton Wire Lath in Typical Fireproof Floor and Ceiling Construction

SHOWING USE OF CLINTON WELDED WIRE IN REINFORCING CONCRETE



The following table has been computed by this special formula for the conditions of continuous wire mesh reinforcement, and the designs shown are, therefore, in accord with the new regulations now in force in New York City.

Write for special booklet "Concrete Floors," or see SWEET'S ENGINEERING CATALOGUE (1917 Edition) for other and more complete tables for designing floor slabs.

SLAB TABLES BASED ON NEW YORK CITY REQUIREMENTS

Span	Thickness " of slab, ins.	Applied load, lbs. per sq. ft.	STONE CONCRETE SLABS			CINDER CONCRETE SLABS		
			Total load, lbs. per sq. ft.	Required steel, sq. ins. per ft. width	Required Clinton fabric	Total load, lbs. per sq. ft.	Required steel, sq. ins. per ft. width	Required Clinton fabric
4 ft.	4	50	100	.0432	4 x 12 ins. Nos. 9 and 11	86	.0432	4 x 12 ins. Nos. 9 and 11
	4	75	125	.0432	4 x 12 " " 9 and 11	111	.0432	4 x 12 " " 9 and 11
	4	100	150	.0432	4 x 12 " " 9 and 11	136	.0432	4 x 12 " " 9 and 11
	4	125	175	.0432	4 x 12 " " 9 and 11	161	.0432	4 x 12 " " 9 and 11
	4	150	200	.0432	4 x 12 " " 9 and 11	186	.0432	4 x 12 " " 9 and 11
	4	175	225	.0432	4 x 12 " " 9 and 11	211	.0432	4 x 12 " " 9 and 11
	4	200	250	.0445	4 x 12 " " 9 and 11	236	.0484	4 x 12 " " 9 and 11
	4	225	275	.0489	4 x 12 " " 9 and 11	261	.0535	4 x 12 " " 9 and 11
	4	250	300	.0534	4 x 12 " " 8 and 10	286	.0587	4 x 12 " " 8 and 10
	4	275	325	.0578	4 x 12 " " 8 and 10	311	.0638	4 x 12 " " 8 and 10
	4	300	350	.0622	4 x 12 " " 8 and 10	336	.0689	4 x 16 " " 7 and 10
5 ft.	4	50	100	.0432	4 x 12 ins. Nos. 9 and 11	86	.0432	4 x 12 ins. Nos. 9 and 11
	4	75	125	.0432	4 x 12 " " 9 and 11	111	.0432	4 x 12 " " 9 and 11
	4	100	150	.0432	4 x 12 " " 9 and 11	136	.0436	4 x 12 " " 9 and 11
	4	125	175	.0486	4 x 12 " " 9 and 11	161	.0516	4 x 12 " " 9 and 11
	4	150	200	.0556	4 x 12 " " 8 and 10	186	.0597	4 x 12 " " 8 and 10
	4	175	225	.0625	4 x 12 " " 8 and 10	211	.0677	4 x 16 " " 7 and 10
	4	200	250	.0695	4 x 16 " " 7 and 10	236	.0757	3 x 12 " " 8 and 10
	4	225	275	.0764	4 x 16 " " 7 and 10	261	.0837	3 x 12 " " 8 and 10
	4	250	300	.0834	4 x 16 " " 6 and 10	286	.0917	3 x 16 " " 7 and 10
	4	275	325	.0903	4 x 16 " " 6 and 10	311	.0998	3 x 16 " " 7 and 10
	4	300	350	.0972	3 x 16 " " 7 and 10	336	.1078	3 x 16 " " 6 and 10
6 ft.	4	50	100	.0432	4 x 12 ins. Nos. 9 and 11	86	.0432	4 x 12 ins. Nos. 9 and 11
	4	75	125	.0500	4 x 12 " " 9 and 11	111	.0513	4 x 12 " " 9 and 11
	4	100	150	.0600	4 x 12 " " 8 and 10	136	.0628	4 x 12 " " 8 and 10
	4	125	175	.0700	4 x 16 " " 7 and 10	161	.0744	4 x 16 " " 7 and 10
	4	150	200	.0800	4 x 16 " " 6 and 10	186	.0859	4 x 16 " " 6 and 10
	4	175	225	.0900	4 x 16 " " 6 and 10	211	.0974	3 x 16 " " 7 and 10
	4	200	250	.1000	3 x 16 " " 7 and 10	236	.1089	3 x 16 " " 6 and 10
	4	225	275	.1100	3 x 16 " " 6 and 10	261	.1205	3 x 16 " " 7 and 10
	4	250	300	.1200	3 x 16 " " 6 and 10	286	.1320	3 x 16 " " 5 and 9
	4	275	325	.1300	3 x 16 " " 5 and 9	311	.1436	2 x 16 " " 7 and 10
	4	300	350	.1400	4 x 16 " " 3 and 8	336	.1551	3 x 16 " " 4 and 9
7 ft.	4	50	100	.0545	4 x 12 ins. Nos. 8 and 10	86	.0540	4 x 12 ins. Nos. 8 and 10
	4	75	125	.0681	4 x 16 " " 7 and 10	111	.0697	4 x 16 " " 7 and 10
	4	100	150	.0817	4 x 16 " " 6 and 10	136	.0855	4 x 16 " " 6 and 10
	4	125	175	.0953	3 x 16 " " 7 and 10	161	.1011	3 x 16 " " 7 and 10
	4	150	200	.1089	3 x 16 " " 6 and 10	186	.1168	3 x 16 " " 6 and 10
	4	175	225	.1225	3 x 16 " " 6 and 10	211	.1325	3 x 16 " " 5 and 9
	4	200	250	.1361	3 x 16 " " 5 and 9	236	.1481	2 x 16 " " 7 and 10
	4	225	275	.1497	2 x 16 " " 7 and 10	261	.1639	2 x 16 " " 6 and 10
	4	250	300	.1633	2 x 16 " " 6 and 10	286	.1796	3 x 16 " " 3 and 8
	4	275	325	.1770	2 x 16 " " 6 and 10	311	.1953	2 x 16 " " 5 and 9
	4	300	350	.1906	2 x 16 " " 5 and 9	336	.2110	2 x 16 " " 4 and 9
8 ft.	4	50	100	.0711	4 x 16 ins. Nos. 7 and 10	86	.0706	4 x 16 ins. Nos. 7 and 10
	4	75	125	.0889	4 x 16 " " 6 and 10	111	.0911	3 x 16 " " 7 and 10
	4	100	150	.1067	3 x 16 " " 7 and 10	136	.1116	3 x 16 " " 6 and 10
	4	125	175	.1244	3 x 16 " " 6 and 10	161	.1321	3 x 16 " " 5 and 9
	4	150	200	.1422	4 x 16 " " 3 and 8	186	.1526	3 x 16 " " 4 and 9
	4	175	225	.1600	3 x 16 " " 4 and 9	211	.1732	2 x 16 " " 6 and 10
	4	200	250	.1778	2 x 16 " " 6 and 10	236	.1936	2 x 16 " " 5 and 9
	4	225	275	.1956	2 x 16 " " 5 and 9	261	.2142	2 x 16 " " 4 and 9
	4	250	300	.2133	2 x 16 " " 4 and 9	286	.2346	2 x 16 " " 4 and 9
	4	275	325	.2311	2 x 16 " " 4 and 9	311	.2553	2 x 16 " " 3 and 8
	4	300	350	.2489	2 x 16 " " 3 and 8	336	.2758	2 x 16 " " 3 and 8

**Woven Wire Lath.**

The CLINTON WIRE CLOTH COMPANY is the original inventor of wire lath. For over half a century no effort has been spared to maintain the very highest standard of quality, with the result that Clinton wire lath has long been the recognized standard wherever first class construction is known.

**STRUCTURAL ADVANTAGES**—A good quality wire lath is recognized as the ideal lathing material. A drawn steel wire, in the matter of strength and quality of material, can not be compared with sheet metal which has suffered cold cutting and expansion. In wire lath the woven wire mesh enables the plaster to form a key, which can not be obtained with any kind of expanded or perforated metals. In any lath, it is the key or the back plaster which holds the plastered surface in place and which determines the degree of protection afforded the lath against deterioration. By the efficient back plaster obtained with Clinton wire lath, the wires are completely covered, and the metal is thoroughly protected against corrosion and deterioration. This absolute embedment of wire lath in the body of the plaster is also a most important element in the strength and durability of the plastered surface. Plaster on Clinton wire lath is thus practically reinforced, much as a concrete floor is reinforced, and for this reason will not check or crack.

**STOCK GRADES**—All standard stock grades of Clinton wire lath have  $2\frac{1}{2}$  meshes per lin. in. in warp and

filling, and are made from No. 18 to No. 22 Washburn & Moen gage steel wire.

Special grades having 2 meshes per lin. in. in warp and filling, and made from Nos. 18 and 19 Washburn & Moen gage steel wire, galvanized after woven, are also carried in stock.

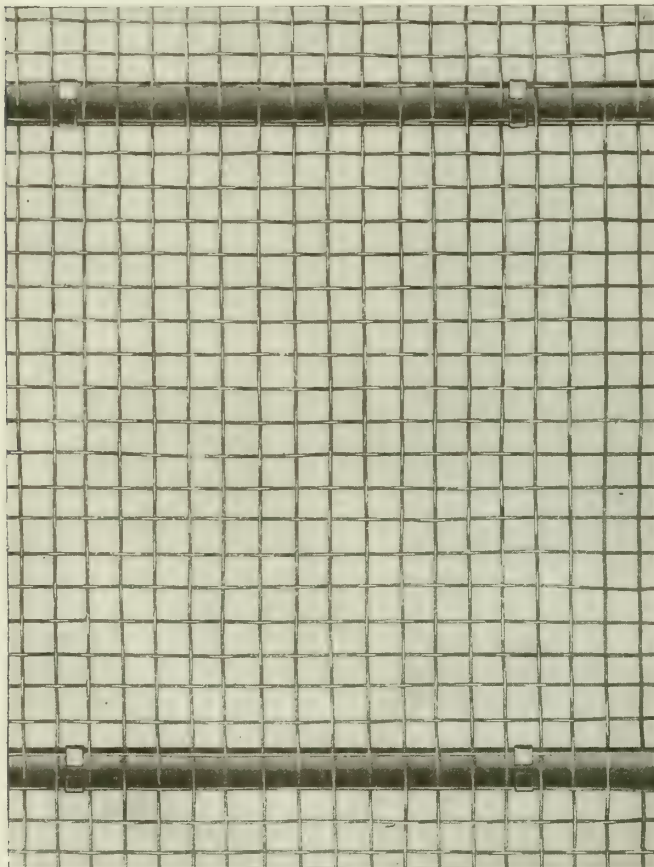
Clinton wire lath may be obtained either plain or V-stiffened; and either may be painted, galvanized after woven, or may be used without any protective coating at all.

The painting, while cheaper than galvanizing, affords for most interior construction a very satisfactory and efficient protective covering. The galvanized *after-woven* process serves a double purpose. Through this process the mesh is made rigid by the soldering together of the wires where they cross each other. The galvanizing also forms the most efficient and lasting protection to the metal that can be obtained.

The stock grades of stiffened lath have V-shaped ribs of sheet metal attached transversely of the fabric and spaced 8 ins. apart. These stiffening ribs, in addition to increasing the rigidity of the lath, also afford an offset of about  $\frac{3}{8}$  of an in. from the supporting frame, or surface of the building, and permit the plaster to be crowded through the meshes and establish a thorough key on the rear side of the lath.

**SIZES OF ROLLS**—All plain Clinton lath is put up in rolls of about 150 lin. ft., while stiffened lath is shipped in rolls of about 100 lin. ft. The stock width of Clinton wire lath is  $36\frac{5}{8}$  ins., sold commercially as 36 ins.

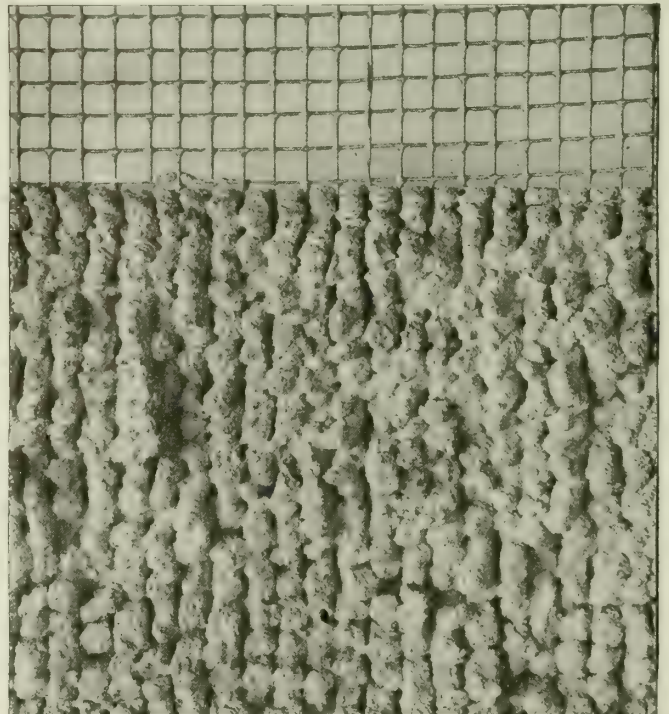
**INFORMATION**—Write for "Lath and Plaster Handbook," describing Clinton wire lath and containing drawings, tables, and specifications covering the entire subjects of furring, lathing and plastering; also for "Successful Stucco Houses," a booklet dealing with the construction, economy and utility of stucco houses.



CLINTON V-STIFFENED WIRE LATH

View showing photographic reduction of Clinton wire lath fitted with V-stiffeners. Note stiffeners are rigidly connected to lath by metal clips, which hold them securely in place and prevent stiffeners from turning or dropping out when lath is being handled.

This important feature is lacking in other brands of stiffened lath, wherein the stiffeners are merely laid in while the fabric is being woven.



THE KEY OF CLINTON WIRE LATH

Photographic reduction of the rear side of section of wall plastered on Clinton wire lath, showing perfect key obtained and thorough manner in which lath is embedded in body of plaster. Upper unplastered portion of view shows Clinton wire lath galvanized after woven. Note particles of galvanizing where wires cross, showing how process of galvanizing after weaving solders wires together where they cross. This maintains integrity of the meshes and adds greatly to rigidity of the lath.



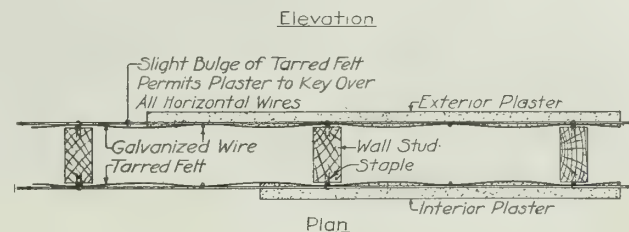
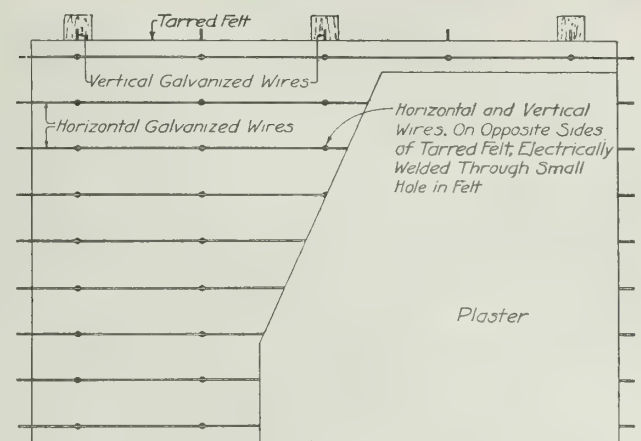
### Welded Sheathing.

**DESCRIPTION**—Clinton welded sheathing, which consists of a light grade of electrically welded wire fabric provided with a tarred felt backing, is a most economical and efficient lathing for stucco or interior plastering. This material is manufactured by arranging longitudinal and transverse wires on opposite sides of a sheet of tarred felt, and electrically welding them together through very small holes previously punched in the felt at each point where a longitudinal crosses a transverse wire. In this way the tarred felt becomes an integral part of the wire mesh, being securely locked and held between the two groups of wires, but at the same time having no physical connection to any of the wires.

Thus the longitudinal or so-called "carrying" wires, all of which are arranged on the side of the felt to which the plaster or cement mortar is applied, are entirely unobstructed, and thereby become thoroughly embedded in the body of the plaster, since the felt bulges slightly away from the wires under the pressure of the plasterer's trowel.

**USES**—Welded sheathing is especially adapted as an inexpensive lathing material for stucco and all kinds of interior plastering; also as a reinforcement for short span concrete slabs, as in roofs, or in floors carrying comparatively light loads.

**ADVANTAGES**—As applied to exterior wall construction, welded sheathing may be used without wood sheathing, as the wire fabric with its tarred felt backing may be stapled directly to the studs. The lath is placed so that the longitudinal or "carrying" wires, which are 3 ins. apart, extend horizontally across the studs; the transverse or "stay" wires, which are 8



DETAILS OF WALL ON CLINTON WELDED SHEATHING

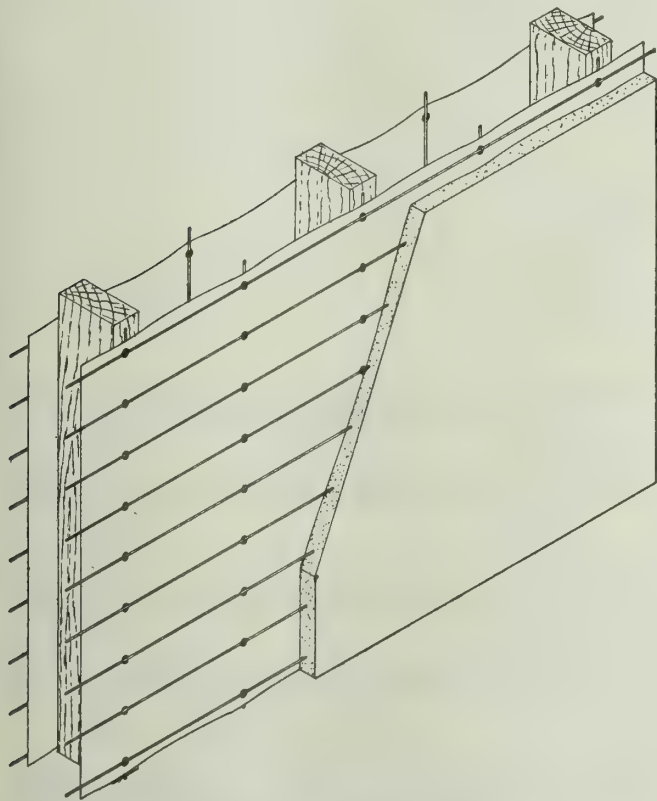
ins. apart, run vertically with the studs. As the cement mortar is applied, it is pushed back, and keys thoroughly around all the carrying wires; while the tarred felt serves as a backing to prevent waste, and as a stop to retain the mortar while in its plastic state.

Exterior walls constructed in this manner are continuous slabs of cement, spanning from stud to stud, reinforced with galvanized steel wire, and covered with an impervious moistureproof backing. The strength of this construction is apparent, as the reinforcing wires are of much heavier gage than can be conveniently used in any type of woven or expanded metal lath; while its great economy is shown by the fact that the cost of any acceptable type of metal lath is more than double that of welded sheathing. Here is the ideal material for stucco work—galvanized wire lathing and moistureproof felt, combined in one material at about half the cost of ordinary metal lath.

Welded sheathing, as applied to cement roof and floor construction, requires no forms, as the material may be stapled directly to the joists and merely screeded over with 1 to 1½ ins. of concrete or cement mortar. For light loads and short spans, welded sheathing provides both forms and galvanized wire reinforcement combined in one material, at about half the cost of wood forms in place.

**STOCK SIZES**—Stock grades of welded sheathing consists of galvanized longitudinal wires of No. 13 Washburn & Moen gage, spaced 3 ins. apart and cross-welded to No. 13 galvanized transverse wires spaced 8 ins. apart. Inserted in the wire mesh is a well saturated grade of tarred felt. The material is cut into flat sheets 32 ins. wide and 8 ft. long, packed in bundles of convenient size and crated for shipment. Heavier wires and sheets of special size may be obtained upon special order.

**INFORMATION**—Booklet describing uses and construction details will be sent on request.



ISOMETRIC VIEW OF WALL ON CLINTON WELDED SHEATHING

# AMERICAN STEEL & WIRE COMPANY

## Manufacturers of Triangle Mesh Concrete Reinforcement

### SALES OFFICES

NEW YORK, 30 Church Street  
 WORCESTER, 94 Grove Street  
 BOSTON, 120 Franklin Street  
 PHILADELPHIA, Widener Building  
 PITTSBURGH, Frick Building  
 BUFFALO, 337 Washington Street  
 DETROIT, Foot of First Street  
 CINCINNATI, Union Trust Building  
 CLEVELAND, Western Reserve Building

CHICAGO, 208 South La Salle Street  
 BALTIMORE, 32 South Charles Street  
 WILKES-BARRE, PA., Miners Bank Building  
 ST. LOUIS, Third National Bank Building  
 ST. PAUL-MINNEAPOLIS, Pioneer Building, St. Paul  
 OKLAHOMA CITY, State National Bank Building  
 BIRMINGHAM, ALA., Brown-Marx Building  
 DENVER, First National Bank Building  
 SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, UNITED STATES STEEL PRODUCTS CO., 30 Church Street, New York

PACIFIC COAST REPRESENTATIVES, UNITED STATES STEEL PRODUCTS CO., San Francisco, Los Angeles, Portland, Seattle

### Product.

TRIANGLE MESH CONCRETE REINFORCEMENT.

For Wire Rope, see pages 30-33; for Electric Wires and Cables, see pages 1182-87.

### Uses.

Triangle mesh reinforcement is used for floor and roof slabs, arch construction, beams, columns, dams and retaining walls, water and culvert pipe, pavements and roadways, river revetment, silos, fireproofing steel framing, bridge floors and reservoirs.

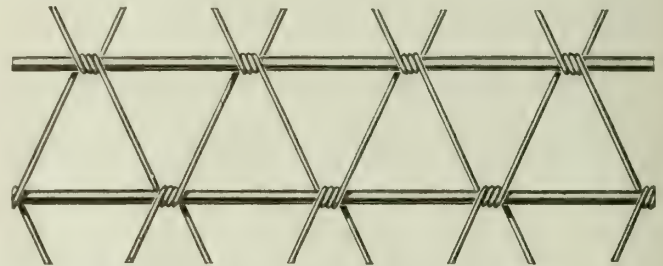
### Description.

Triangle mesh woven wire reinforcement for concrete is made with either solid or stranded longitudinal members, properly spaced by means of diagonal cross wires, so arranged as to form a series of triangles between the longitudinal or tension members; the longitudinal members being spaced 4 ins., the cross wires either 4 or 8 ins. as desired, providing either a 4-in. or 8-in. mesh.

The sizes of both longitudinals and cross wires are varied in order to provide the cross-sectional areas of steel required to meet the conditions.

### Advantages.

- (1) Provides even distribution of steel.
- (2) Reinforces in every direction.
- (3) Tension or carrying members accurately spaced.
- (4) Low cost of inspection.
- (5) Properly distributes over a large area stresses due to concentrated load.
- (6) Due to cold drawing, higher elastic limits and ultimate strengths with same quality of steel.
- (7) Continuous action from one end of the structure to the other.
- (8) Impossible to leave out or otherwise reduce the necessary steel, if specific style number of fabric or area of steel is specified.
- (9) Perfect mechanical bond.
- (10) Easily handled and stored on the work.
- (11) Minimum cost of installation.
- (12) It is the only design of woven wire fabric in which the cross wires assist the longitudinal or tension members in carrying the load.
- (13) By using stranded longitudinals in the heavy fabrics the necessary strength is furnished, and the finished material is more flexible and therefore more easily handled from the rolls.



TRIANGLE MESH CONCRETE REINFORCEMENT  
Solid longitudinals

### Grade of Steel.

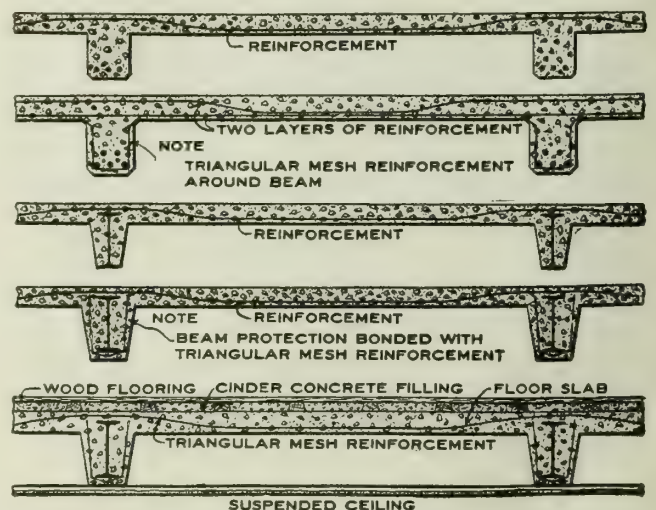
High carbon, high tensile strength steel has its advantages over the low carbon low tensile strength steel mainly because of the higher allowable working stresses; therefore, a smaller sectional area of steel is required, or, with the same sectional area of steel, an added factor of safety is secured.

The main disadvantage to a high carbon product is the stiff, brittle nature of the material.

By cold drawing a mild steel, the advantages of the high carbon steel are secured with an elimination of the disadvantages.

Triangle mesh reinforcement is manufactured from a cold drawn mild steel having an ultimate tensile strength of from 70,000 to 85,000 lbs. per sq. in.

Higher or lower strengths can be furnished if desired.



TYPES OF FLOOR CONSTRUCTION

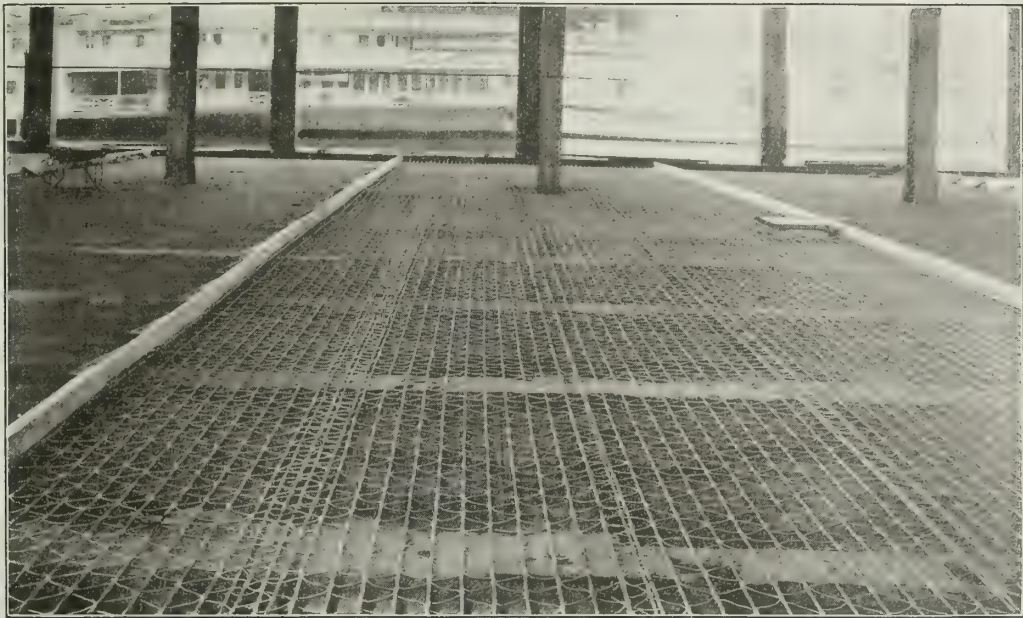


Galvanizing.

While triangular mesh reinforcement can be furnished either galvanized or plain, the latter is strongly recommended, due to the fact that a much better adhesive bond is provided, and also greater strength.

Except for special cases, such as when used in cinder or slag concrete, the plain material is preferable, as the adhesion of the concrete is then directly to the steel and not to a coating.

Galvanized material must of necessity cost more; and since nothing is added to the strength of the finished construction, this increased cost is not justified.



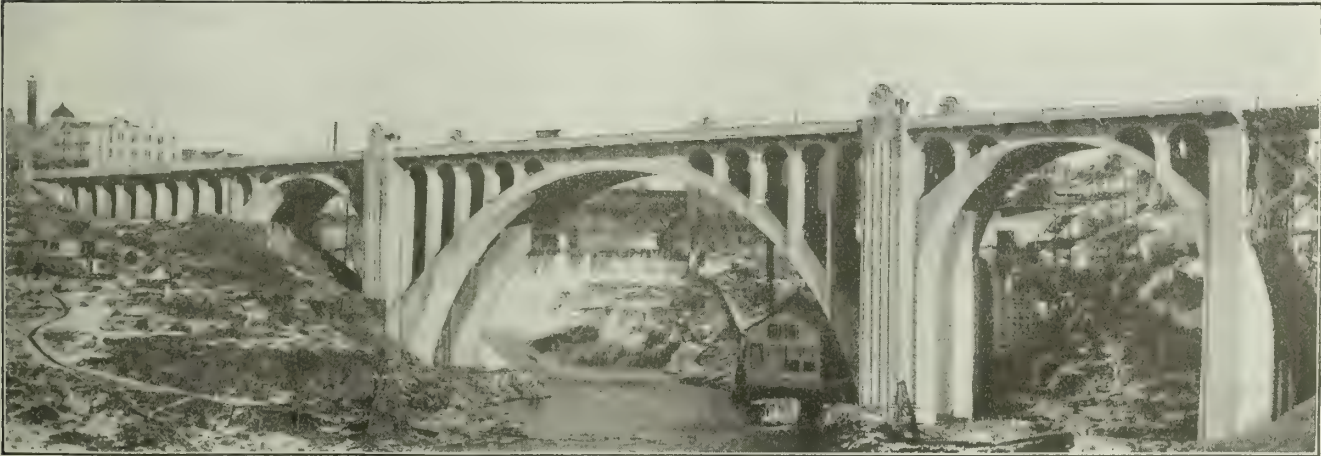
PIER 42, NORTH RIVER, 56,000 SQUARE FEET, STYLE 40, TRIANGLE MESH REINFORCEMENT USED  
Note large area of reinforcement with its heavy stranded longitudinals. Excellent results obtained with minimum installation cost

DATA, VARIOUS STYLES TRIANGLE MESH REINFORCEMENT  
NUMBER AND GAGE OF WIRES, AREAS PER FOOT, WIDTH AND WEIGHTS PER 100 SQ. FT.

Longitudinals spaced 4 ins., Cross wires No. 14 gage spaced 4 ins.						Longitudinals spaced 4 ins.					
Style No.	No. of wires, each longitudinal	Gage of wire, each longitudinal	Sectional area of longitudinal, sq. ins. per ft. width	Total effective longitudinal sectional area, sq. ins. per ft. width	Approximate weight, lbs. per 100 sq. ft.	Style No.	No. of wires, each longitudinal	Gage of wire, each longitudinal	Cross-sectional area, sq. ins. per ft. width	Sectional area of longitudinal, sq. ins. per ft. width	Approximate weight, lbs. per 100 sq. ft.
032	1	12	.026	.032	23	CROSS WIRES NO. 14 GAGE, SPACED 8 INS.					
040	1	11	.034	.040	29	036P	1	12	.009	.036	17
049	1	10	.043	.049	35	044P	1	11	.009	.044	20
058	1	9	.052	.058	41	053P	1	10	.009	.053	24
068	1	8	.062	.068	47	052P	1	9	.009	.062	27
080	1	7	.074	.080	54	072P	1	8	.009	.072	31
093	1	6	.087	.093	61	033P	1	7	.009	.084	35
107	1	5	.101	.107	70	077P	1	6	.009	.097	40
126	1	4	.120	.126	81	CROSS WIRES NO. 12½ GAGE, SPACED 8 INS.					
146	1	3	.140	.146	94	041R	1	12	.014	.041	21
153	1	¼-in.	.147	.153	63	049R	1	11	.014	.049	24
168	1	2	.162	.168	74	058R	1	10	.014	.058	28
180	2	6	.174	.180	78	067R	1	9	.014	.067	31
208	2	5	.202	.208	89	077R	1	8	.014	.077	35
245	2	4	.239	.245	103	089R	1	7	.014	.089	40
267	3	6	.261	.267	111	102R	1	6	.014	.102	44
287	3	5½	.281	.287	119	Length of rolls: 150, 200 and 300 ft. Rolls of any of these lengths may be used for the lighter styles. Material of medium weight is recommended to be used in 150-ft. or 200-ft. lengths, while with heaviest styles it is more conveniently handled in rolls of 150-ft. lengths.					
309	3	5	.303	.309	128						
336	3	4½	.330	.336	138						
365	3	4	.359	.365	149						
395	3	3½	.389	.395	160						

Widths: 16, 20, 24, 28, 32, 36, 40, 44, 48, 52 and 56 ins.

NOTE.—Material may be furnished either plain or galvanized. Unless otherwise specified, shipments will be made of material not galvanized.



MONROE STREET BRIDGE, SPOKANE, WASH.

Double tracked highway bridge requiring 25,000 yds. concrete. Cost, \$500,000. 100,000 lbs. of AMERICAN STEEL & WIRE COMPANY'S triangular mesh reinforcement used in the floor construction of this bridge



# WRIGHT WIRE COMPANY

## Wire Lath and Ornamental Metal Work

### WORCESTER, MASS.

BOSTON, 256 Franklin Street  
CHICAGO, 33 West Austin Avenue

#### BRANCH OFFICES

NEW YORK, 256 Broadway  
PHILADELPHIA, 410 Commerce Street  
SAN FRANCISCO, 111 Townsend Street

#### Products.

##### EXCELSIOR WIRE LATH.

ARCHITECTURAL and ORNAMENTAL METAL WORK of IRON, BRASS or BRONZE: Grilles, Gratings, Bank and Office Railings, Elevator Cabs and Enclosures, Window Guards, Gates, Fire Escapes, Iron Stairs.

EXCELSIOR RUSTPROOF FENCING; WIRE PARTITIONS; TOOL ROOM ENCLOSURES; MACHINERY GUARDS.

Wire Rope, Wire Cloth, Poultry Netting, Screen Cloth, Stable Fittings, Clothes Lines, Picture Cord, Coal and Sand Screens, Foundry Riddles.

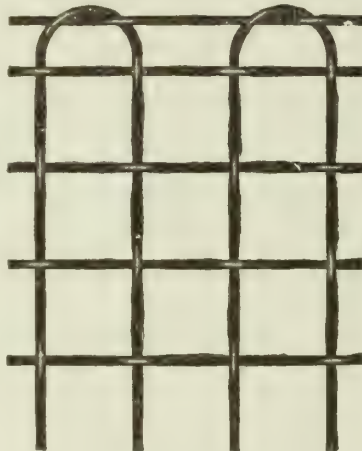
##### Excelsior Wire Lath.

**ADVANTAGES**—The superiority of Excelsior wire lath to lath of wood or of expanded, sheared or punched metal is due, first, to the superior strength of the drawn steel wires, and, second, to the wide and even mesh in which they are woven. The individual wires woven into Excelsior wire lath possess relatively high strength for their diameters, and on account of their smooth and hard finish are better protected against corrosion. They are accurately woven into a fabric, the meshes of which are such that the area of the metal is a relatively small percentage of the total area of the fabric. This is important, because it gives the plaster greater opportunity to pass through the openings between the wires and form a perfect key on the back, which prevents it from being shaken loose. A coating of plaster properly applied on Excelsior wire lath will completely cover all wires, thereby keeping them from corroding and protecting them absolutely against fire. Excelsior wire lath, moreover, being less susceptible to expansion and contraction than other types of metal lath, is more certain to keep the plaster smooth and free from cracks.

Owing to its comparative lightness and ease of handling, Excelsior wire lath affords architects the easiest and most satisfactory medium for obtaining effects in plaster, such as ornamental cornices and mouldings, columns and similar shapes.

It is capable of being stretched substantially upon comparatively simple framework and assures a smooth and durable finish to the plaster, thereby enhancing the decorative effect.

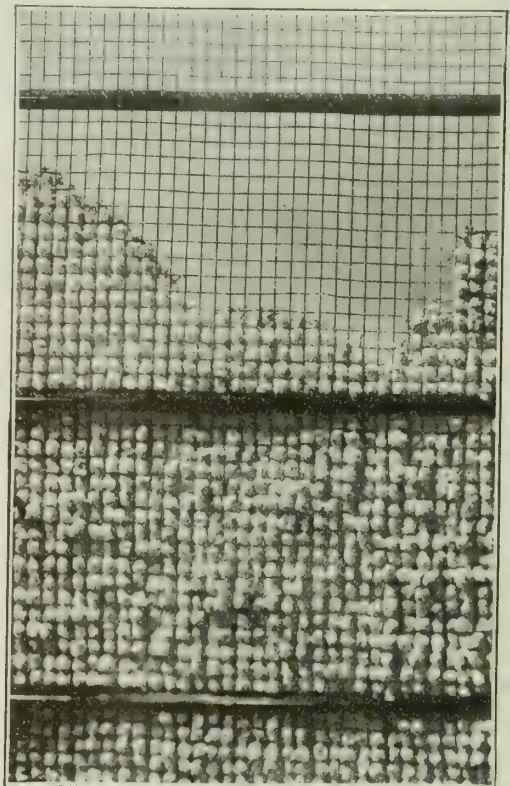
**STYLES**—Excelsior wire lath is supplied in rolls 50 yds. long and 1 yd. wide, with fabric plain or stiffened. There are 3 finishes: plain, japanned and galvanized.



EXCELSIOR WIRE LATH  
2 by 2 mesh, No. 19

#### Excelsior Stiffened Lathing.

Excelsior stiffened lath is reinforced by V-ribs of sheet steel placed across the web, 8 ins. apart, and securely attached by steel clips. These ribs prevent the lath from bagging between supports and serve to hold the web away from flat surfaces so the plaster may form a perfect key.



BACK VIEW OF EXCELSIOR STIFFENED WIRE LATH  
WITH PLAIN FINISH

Shows perfect key secured by plaster, which was put on thin to reveal the outline of the lath. In actual practice, the plaster would have come through and completely covered all the wires. Illustration shows what a splendid protection wire lath makes against fire. Standard V-rib stiffeners are ½-in. high, but are furnished ¾- or 1-in. high when desired.

#### DATA

Mesh, per inch	Size of mesh	Number of wire	Decimal size of wire	Decimal opening
2 x 2	1 ½-in.	18	.047	.453
2 x 2	1 ½-in.	19	.041	.459
2 x 2	1 ½-in.	20	.035	.465
2 ½ x 2 ½	3 8-in.	18	.047	.353
2 ½ x 2 ½	3 8-in.	19	.041	.359
2 ½ x 2 ½	3 8-in.	20	.035	.365
2 ½ x 2 ½	3 8-in.	21	.032	.368

Prices quoted on application.

**DIRECTIONS FOR USE**—In attaching lath of No. 20 wire and lighter, studs or furring strips should be not over 9 ins. apart; and for No. 18 or No. 19 wire not over 12 ins. apart. Supply 1 lb. of ¾-in. or ⅞-in. lath staples to fasten 12 ½ yds. of lath.



**Excelsior Wire Lath Installations.**

The strength and durability of Excelsior wire lath and its value as a fire preventive has led to its extensive use in the construction of the most modern fireproof buildings.

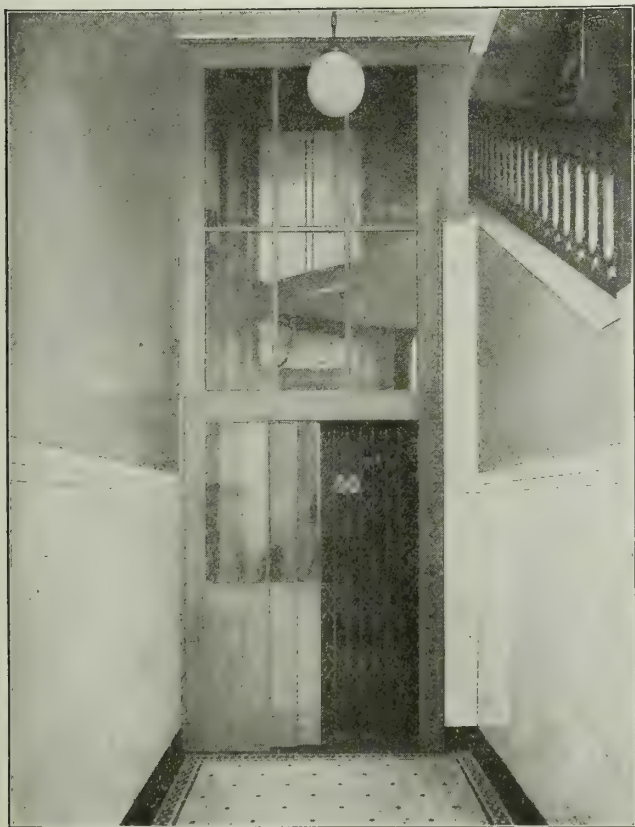
The following is a list of a few of the modern buildings in which Excelsior lath has been used:

James Deering Residence, Miami, Fla.  
 Aeolian Hall, New York, N. Y.  
 Municipal Office Building, New York, N. Y.  
 Grand Central Terminal, New York, N. Y.  
 Western Union Building, New York, N. Y.  
 Flower Hospital, New York, N. Y.  
 German Hospital, New York, N. Y.  
 Staff House of Kings County Hospital, Brooklyn, N. Y.  
 Journalism Building of Columbia College, New York, N. Y.  
 Telephone Building, New York, N. Y.  
 Telephone Building, Brooklyn, N. Y.  
 Consolidated Gas Co.'s Building, New York, N. Y.  
 Strand Theater, New York, N. Y.  
 Astor Apartments, New York, N. Y.  
 Pier of the Central R.R. of New Jersey, 11 North River, New York, N. Y.  
 Bird House at Franklin Park Zoo, Boston, Mass.  
 Saco Petti Machines, Newton Lower Falls, Mass.  
 Dormitory for Mill Hands, Newton Lower Falls, Mass.  
 Travelers Insurance Co. Building, Hartford, Conn.  
 New City Hall, San Francisco, Cal.  
 St. Francis Hotel, San Francisco, Cal.  
 Children's Hospital, San Francisco, Cal.  
 Mendocino State Hospital, Ukiah, Cal.  
 Preston School of Industry, Ione, Cal.  
 Ebbets' Field Grand Stand, Brooklyn, N. Y.

The dome in the rotunda of the Ebbets' Ball Field building is 84 ft. in diameter, and is the largest dome ever erected entirely of iron furring and wire lath. Excelsior galvanized wire lath was used throughout this dome.

**Fireproof Enclosures.**

Modern fireproof enclosures furnished in several standard types. Special designs executed for architects.



FIREPROOF ENCLOSURE

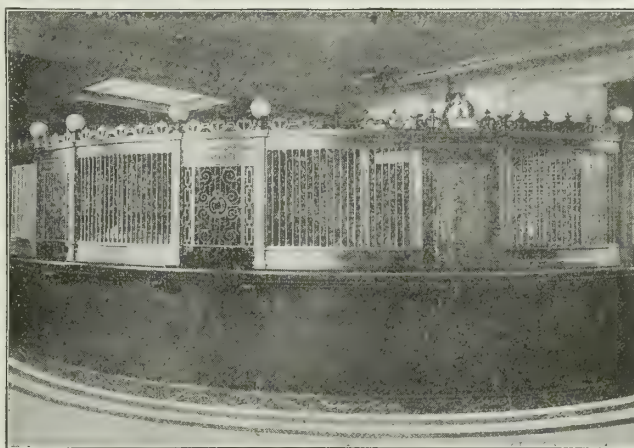
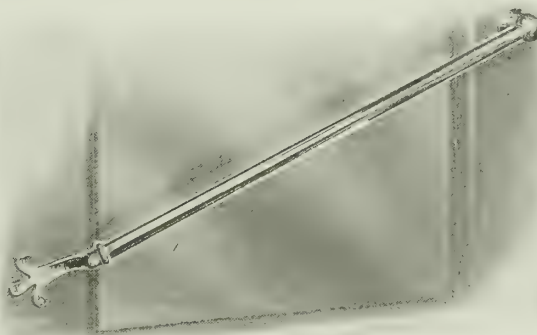
**Ornamental Metal Work.**

This company manufactures a large variety of grille work: bank and office railings, elevator cabs and enclosures, window guards, tool room enclosures and partitions, and protection guards for gears and machinery.

Also ornamental grilles of wrought or cast iron, or steel painted, or in steel electroplated; and in brass or bronze metal with natural or antique finish. Brass or bronze rails for protecting show windows; door rails, foot rails, and kick plates.

Also Excelsior rustproof fencing, folding gates, fire escapes, iron stairs, and light ornamental iron work of all kinds.

Will furnish designs or figure architects' specifications and plans.

BANK AND OFFICE RAILINGS  
Made of iron, brass or bronze

GUARD FOR GLASS PANEL DOOR



ORNAMENTAL WROUGHT IRON GATE



# THE COMPOSITE METAL LATH COMPANY

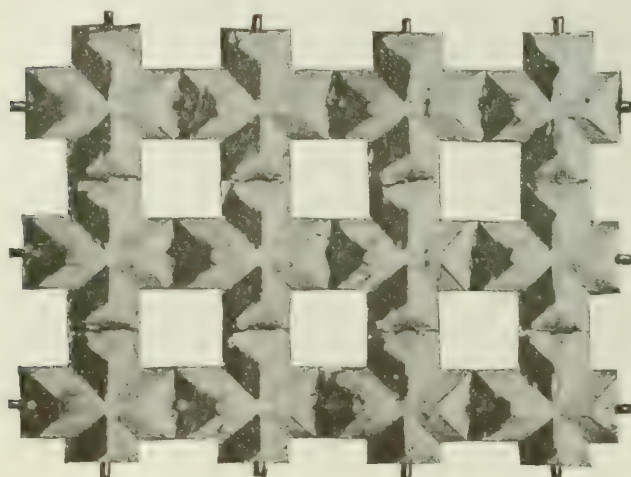
128 Broadway  
NEW YORK, N. Y.

## Product.

COMPOSITE METAL LATH: "Brick lath" or "Terra Cotta Lath."

## Description.

Composite Metal Lath (or, as it is popularly known, "Brick Lath" or "Terra Cotta Lath") is a mesh of annealed steel wire No. 19 gage, upon which brick clay has been placed under high pressure and baked so as to



A FULL SIZE SECTION FROM A SHEET OF COMPOSITE METAL LATH

practically enclose the wire. This makes the best possible plastering base, while an excellent key is assured through the openings without loss of material by pushing through. Standard sheets are 16 ft. 4 ins. long and 40 ins. wide, and are shipped in rolls containing 6 sq. yds., weighing 55 lbs. Special lengths are furnished on order.

## Purpose.

To produce a fireproof lath that has an absolute affinity for and a positive bond with plaster or cement mortar, and that will not depend solely on the key or clinch for its holding powers; one that is easy to apply, inexpensive in cost and economical of material.

## Uses.

For every purpose where metal lath may be used: for thin wall construction; as a plastering surface for concrete; for fireproofing steel columns, wooden beams and similar construction; for stucco and all positions where moisture may be encountered and danger from rust is present; as a base for cement fire protection for high tension electric, lead covered cables.

## Advantages.

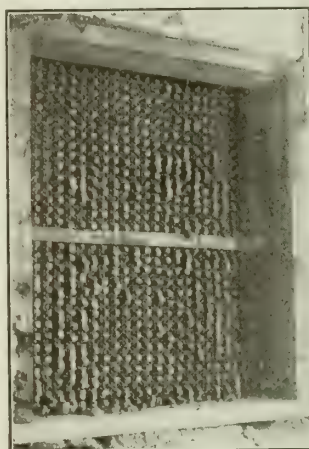
There is a natural affinity between brick or terra cotta and plaster or cement mortar which results in an absolute bond. "Brick Lath" is attached to its support, not around the metal but around the little brick buttons which, becoming bonded to and embedded in the cement mass, hold the sheet firmly in position.

Failure due to rust is impossible.

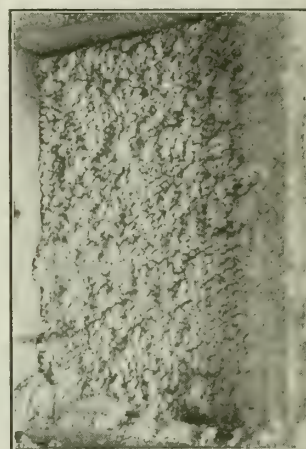
By its use in thin partition construction practically all standing members are eliminated, so the full 2 ins. of plaster are secured at all points, resulting in a wall of great strength and rigidity.

As plastering surface for concrete it is far more efficient than scratching or roughing, and at far lower cost.

The brick or terra cotta is in fact a scratch coat permanently baked on the wire mesh and, owing to the suction, plastering upon it is rapid and easy.



KEY ON ORDINARY METAL LATH



KEY ON COMPOSITE METAL LATH

Note the quantity of material wasted on ordinary forms of metal lath

It is low in first cost and economical in use. Its unique material and design make it available for many purposes that are impracticable or expensive with other materials.

INDUSTRIAL HOUSING—Owing to its low cost, economy of time and material and the great durability of the finished construction, Composite Metal Lath may be used to great advantage in all forms of community housing. Erected on a frame of wood studding, the lath is plastered on both sides to form exterior walls of great strength and very low cost, while interior partitions, ceilings, etc., of this construction make the buildings practically fireproof and very easy to keep clean.

## Monolithic 2-in. Partitions.

A rigid and economical partition in which there is no necessity for angles, channels or studs; and in which the plaster is not weakened at regular intervals by these ordinarily necessary members. Supporting angles, etc., are bound to be elements of weakness in thin, monolithic walls. They have no bond with the plaster, and materially reduce its thickness at these points. They are of necessity light and the structure is flimsy before it is plastered. Settlement cracks, if any, invariably occur along such supporting members and it is very difficult to keep the plastering base erected on such studding within the grounds. A monolithic 2-in. partition on a base of



Composite Metal Lath is rigid, strong and true. The lath is drawn drumtight from ceiling to floor along the center line of the partition. When plastered to the required thickness such a wall becomes a solid slab, the cement bonding with the terra cotta to form a homogeneous mass. Such walls are even more sound resisting than the ordinary forms of construction. This form of construction is approved by the New York City Building Department for use in fireproof buildings.

### Other Interior Construction.

Great economy in plaster as well as in time makes the use of Composite Metal Lath for hollow partitions on steel or wooden studs, or for ceilings, extremely economical. Its flexibility makes it very useful for cornices, groined ceilings, false work and all intricate details.

### Stucco.

"Brick Lath" is self-furring and may be applied directly to the sheathing, some waterproofing material being interposed.

Ordinary forms of metal lath must of necessity be attached to their support around the metal, which rusting away at such points leaves the stucco slab unsecured and results very soon in cracks and falling stucco. "Brick Lath" on the contrary is attached around the little bricklets which serve as permanent anchors in the cement mass, and hold the stucco sheet in place even if the wire should in time disintegrate. This is of great importance particularly near the seashore.

### General.

Composite Metal Lath may be applied in general in much the same way as any ordinary metal lath. A few suggestions which, however, are given below apply to certain special uses for which it has been found superior to other laths.

### Specifications.

**MONOLITHIC 2-IN. PARTITIONS—Fireproof Construction—**Special conditions must, of course, govern the best method of erection in buildings where anchorage must be found in concrete, over steel beams, etc. In new work, expansion bolts or concrete inserts may generally be placed in floor and ceiling during construction, lined for the partitions required and properly spaced for securing steel rods or other forms to which to anchor the lath.

In new cinder concrete work straps of iron may be nailed to the concrete with 2-in. concrete nails and the lath firmly wired to them. The lath for this work is furnished in sheets 6 ins. longer than the height of ceilings. 3 ins. on each end of the sheet are folded over a  $\frac{3}{8}$ -in. iron rod, the lap being wired to the main sheet to hold the rod in place. The lath is wired to its anchorage over this rod.

Various methods of drawing the lath taut are used, perhaps the simplest being to draw the lath as tight as possible to the floor by loops of wire, which, by inserting an iron rod may then be twisted in such a way as to bring the lath down to position. Any of the ordinary forms of clips may be used for securing the lath to steel girders, etc.

**Non-fireproof Construction—**Sheets may be prepared by folding the ends over iron rods as above, and then hung on hooks driven along the center line of the wall in the floor beams to allow a lap of about 1½ ins. When the wall is hung, the hooks to be driven home and additional staples driven over the iron rod to hold the upper end of the lath firmly in position. The lower ends of the sheets then to be drawn down to a 2- by 3-in. sleeper spiked to the floor or embedded in concrete.

A simple method of bottom anchorage is to toe-nail 20d wire spikes through the sheets just above the bottom rod with about 1 in. exposed through the lath. By the use of a short iron pipe which will just fit over the head of the nail, the head may be bent over and the rod in the lath forced down in the

same operation. A few blows from a hammer will hold the rod firmly in position. When the sheets are stretched as above, wire the laps together with ordinary galvanized tie wire.

**PLASTERING—**When the lath has been stretched and before any plastering is commenced, it may be stiffened by wiring a wooden strip, 1 by 2 ins. across the length of the wall about half way from floor to ceiling. After the first scratch coat has been applied and allowed to set, this stiffening rod to be taken down and the wall plastered out on both sides to the desired thickness without any further bracing. Any of the usual hard wall gypsum plasters will make a satisfactory wall of this construction. When set, picture mouldings, etc., may be nailed directly to the gypsum wall with  $\frac{1}{2}$ -in. cut nails. Grounds should be secured to lath and plastered flush.

**HOLLOW PARTITIONS—**Set steel or frame structural members in any standard manner and apply Composite Metal Lath in the same manner as ordinary metal lath. Studding to be placed on 13-in. centers in order to bring the lap over the stud.

**PLASTERING CEILINGS OR HOLLOW WALLS—**Scratch with very thin 2½ to 1 mixture and plaster rapidly. This sets quickly and may then be browned out as usual. This method prevents sagging and consequent hollows to be filled in and will assure greatest economy of plaster and labor.

**FIRE AND RAT STOPS—**In frame construction cut in between studs around the outside walls at each floor level. Cut strips of Composite Metal Lath the full size of the open space, turn up the edges and nail securely to the surrounding timbers. Plaster both sides with Portland cement mortar, making a solid sheet about 1 in. thick. Place small stops in interior partitions to break continuous chambers from floor to floor. Place similarly plastered stops vertically between the floor beams where long runs of continuous channels are found.

**PLASTER BOND FOR CONCRETE—Ceiling Plastered Directly on Concrete Slabs—**Lay the lath over the center forms as a carpet and pour the concrete directly upon it. Upon removal of forms a terra cotta surface will be presented offering the best possible surface for plaster. Where plaster surface on concrete is desired for perpendicular walls, etc., for tiles, mosaic or other finish, the inside surface of the forms to be covered with lath, lightly nailed in position and the concrete poured as usual.

**EXTERIOR WORK—Stucco on Frame Buildings—**Frame the job and apply sheathing and waterproof paper in the usual manner. Apply Composite Metal Lath by nailing it directly over the sheathing and paper, using staples placed diagonally over the bricklets. Care should be taken to drive staples snug over the bricklets but not to crush the terra cotta. This may easily be done with a little practice by lightening up on the last blow of the hammer. Use lathers' hammer with corrugated head. Apply cement and finish in the ordinary manner. An ideal method for exterior cement walls is to frame in the ordinary way and put in 2 by 4-in. catting for stiffeners. Do not sheath the outside walls, but apply Composite Metal Lath to the outside of the frame using galvanized washers of  $\frac{3}{4}$ -in pipe 1 in. long to hold the lath 1 in. away from the frame. Plaster directly to the lath on the outside and back plaster the entire lath surface, thus producing a monolithic outside cement wall 2 ins. in thickness. Shrinkage in the frame will be taken up by movement of the nail in the washer, and cracking due to that cause will be eliminated.

**PIPE AND ELECTRIC CABLE CONDUIT FIREPROOFING—**Cut the lath in strips of convenient width and wrap spirally about the pipe or cable, wiring securely. Plaster with 2-to-1 Portland cement  $\frac{5}{8}$  in. thick.

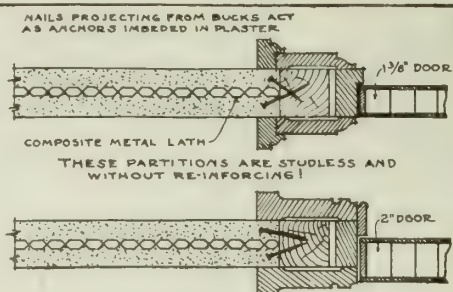
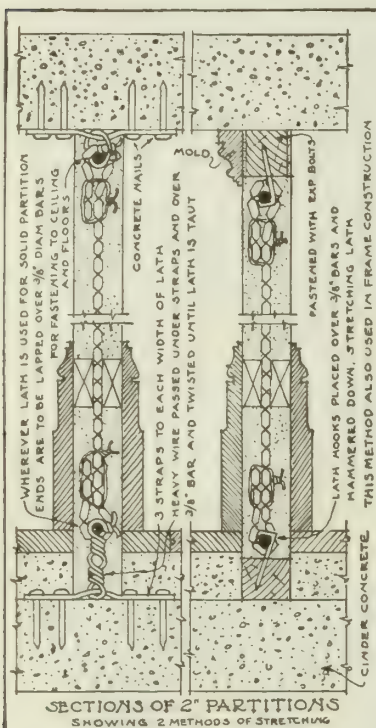
**FIREPROOFING MILL CONSTRUCTION, FLOORS, COLUMNS, GIRDERS, ETC.—**Secure the lath directly to the wood, cement, plaster or the exposed surface, or fur as with ordinary metal lath, and finish with cement.

**GENERAL—**Use Composite Metal Lath for any purpose in the same manner as ordinary metal lath, excepting where furrings are ordinarily applied for the purpose of allowing for the clinch of plastic materials these may be omitted, as Composite Metal Lath is self-furring, in addition to which the bond makes the clinch or key of little or no importance.

### Details.

There are so many unique constructional possibilities through the use of Composite Metal Lath and plaster, that but a few standard suggestions can be presented in this catalogue. Other details and suggestions will be furnished on application.

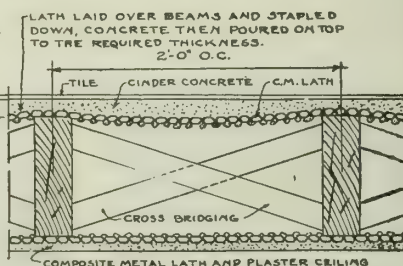
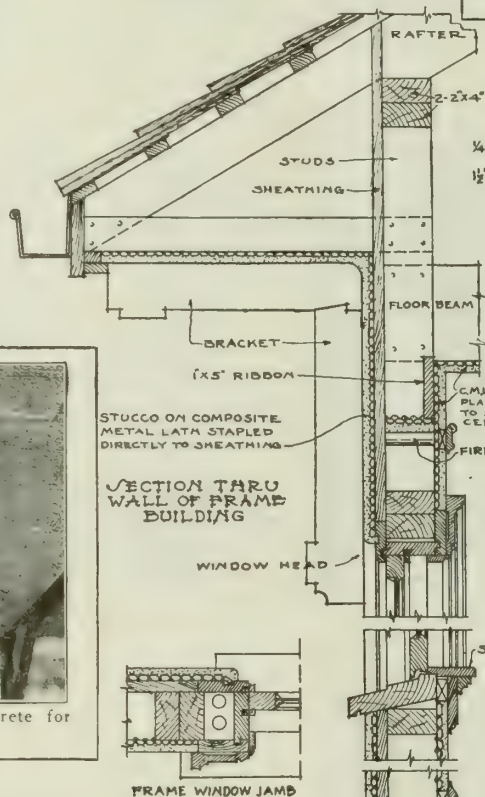




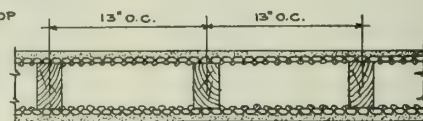
2-2 INCH SOLID PARTITIONS  
WITH SUGGESTION FOR TRIM FOR  
LIGHT AND HEAVY DOORS



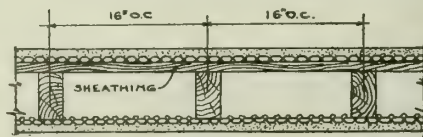
Method of Temporary Bracing for 2-in.  
Solid Partition



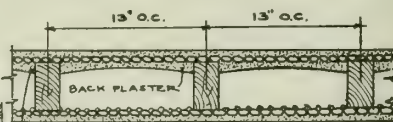
TILE FLOOR ON CINDER  
CONCRETE ON C.M. LATH



ORDINARY INTERIOR PARTITION



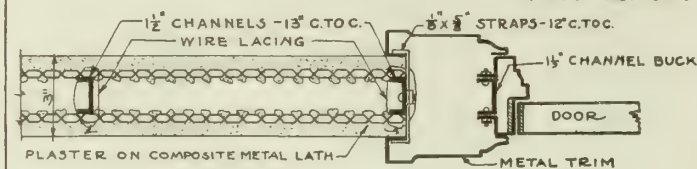
STUCCO EXTERIOR WALL WITH SHEATHING



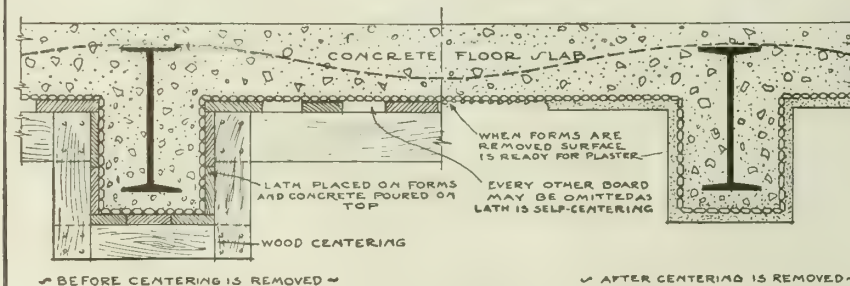
STUCCO EXTERIOR WALL WITHOUT  
SHEATHING



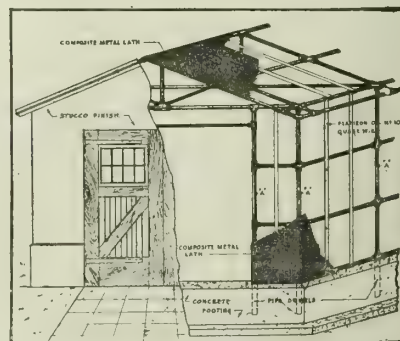
Composite Metal Lath for Surfacing Concrete for  
Plastering New York Subways



HOLLOW PARTITION ON STEEL STUDS



METHOD OF PREPARING CONCRETE  
WITH CLAY SURFACE FOR PLASTERING



Garage, with Composite Metal Lath Over  
Pipe Construction

TYPICAL APPLICATIONS OF COMPOSITE METAL LATH



ESTABLISHED 1865

# FORD MANUFACTURING COMPANY

## Manufacturers of Gal-va-nite Lath

ST. LOUIS, MO.

MILLS AND FACTORIES: VANDALIA, ILL., CLINTON, IOWA

SALES OFFICES AND WAREHOUSES

ST. LOUIS, MO.

CHICAGO, ILL.

KANSAS CITY, MO.

BUFFALO, N. Y.

ATLANTA, GA.

### Products.

#### GAL-VA-NITE LATH.

Gal-va-nite Roofing; all grades of Prepared Roofing, Pyramid Tarred Felts, Asphalt Saturated Felts, Pitch, Roofing and Paving Asphalt, Refined Coal Tar, Red and Green Slate-Kote Roofing and Shingles (Individual and Strip), Pyramid Red Rosin Sheathing Paper, Pyramid Deadening Felt, Plaster Board, Wall Board, Asphalt Paints and Coatings, Waterproofing Compounds, Shingle Stains, Pyramid Wood Preservative.

#### Gal-va-nite Lath.

On account of the thousands of cells (864 to the sq. ft.), Gal-va-nite lath forms the firmest key known for interior plastering and exterior stucco work.

It is free from expansion and contraction due to variation in temperature or dampness from any source, therefore eliminates the cause of stained, cracked, crumbling and falling walls and ceilings.

Because of its freedom from cracking, falling and staining, this lath is especially valuable for walls and ceilings in theaters, churches, public halls, etc., where re-decorating and repairing are difficult.

Gal-va-nite lath is composed of fiber board and selected wood veneer, thoroughly saturated and coated with waterproofing compound (the result of years of experience with roofing and building requirements) and is waterproof. When covered with plaster, it is also practically fireproof, and may be specified in all "non-combustible" and slow burning construction.

A Gal-va-nite lath ceiling will not loosen or sag even when 2 ins. of water is permitted to stand thereon for more than 24 hours.

In outside stucco work, Gal-va-nite lath can not rust like metal, thus it forms a permanent wall, proof against rust stains, as well as cracking and crumbling.

Gal-va-nite lath is flexible, thus it may be used around pillars, bay windows and arches, yet is extremely rigid when applied. Easily cut to fit odd spaces. Quickly applied, because of the large units handled. The perfect key permits a thinner coating of material.

*Gal-va-nite*  
CRUMBBAUGH  
PATENT  
*Lath*



The cellular formation prevents damage from unusual vibration and shock, such as bumping or hammering (except at point of contact). Under bending strain, the plaster will spring back to original position without showing crack or break.

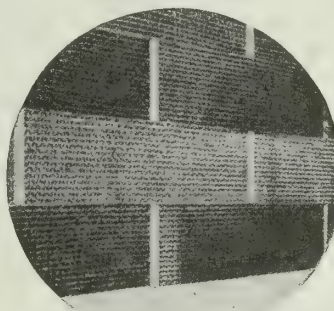
Gal-va-nite lath, like metal lath, is for use with hard plaster only. The use of lime plaster is not advisable and is not recommended.

The cost is less than galvanized metal lath. Gal-va-nite lath is far more rigid when applied, and requires no tie wires at the joints. The saving in time, labor and material also reduces the cost of the finished job, as compared to other foundations for plaster and stucco. As the construction is permanent, and subsequent repairs are eliminated, the comparison is still more favorable to Gal-va-nite on the cost-per-year basis.

SUMMARIZING—Gal-va-nite lath affords an ideal foundation for plaster and stucco, which saves time, labor and material, eliminates the necessity for periodic repairs and re-decorating, and costs no more (often less) than other types of lath and foundation material.

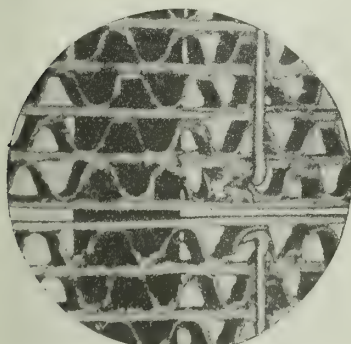
#### Co-operative Service.

Samples and further information will be furnished promptly on request.

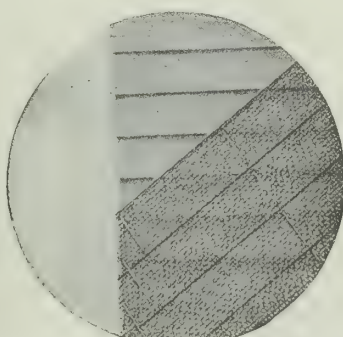


RIGID 2-IN. PARTITION WALL MADE OF GAL-VA-NITE LATH UNITS WOVEN BETWEEN CHANNEL IRON FOR STUDDING

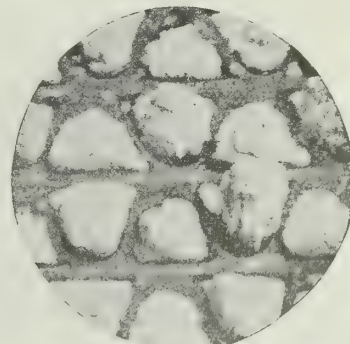
No nails or wires required. This partition equals the 6-in. ordinary construction and is a valuable advantage in apartments and office buildings where space is at a premium. This arch construction is only possible with Gal-va-nite lath



GAL-VA-NITE LATH PUT ON WITH SPECIAL LONG WIRE STAPLES FURNISHED WITH EACH BUNDLE  
Illustration is about one-half diameter



GAL-VA-NITE LATH INSTALLED OVER OLD SIDING WHEN REMODELING WITH NEW STUCCO WALLS



BACK VIEW OF PLASTERED GAL-VA-NITE LATH, SHOWING THE PERFECT KEY

## F. D. KEES MFG. CO.

## Metal Building Corners and Siding Clips

BEATRICE, NEBR.

## Products.

"KEES" METAL BUILDING CORNERS and SIDING CLIPS for Lap Siding and Shingles, and for No. 106 Drop Siding.

For Screen and Sash Hangers and Fasteners, see page 799.

## Metal Building Corners for Beveled Lap Siding.

"Kees" metal building corners are used in place of corner boards to finish the corners of lap siding and form a finish similar to mitered siding.

These corner pieces are made of galvanized iron, shaped to fit the beveled corner formed by the siding, pierced with nailholes and treated so that they will take and hold stain or paint the same as wood. After the building is painted the metal corners can scarcely be noticed. If the building is painted when it needs it, the metal corners will always be protected, and will last as long as the building itself.



TRADE-MARK

11 years ago show the metal corners in as good condition as when they were put on.

## Styles and Sizes.

FOR LAP SIDING LAID  $3\frac{1}{2}$  INS. OR LESS TO THE WEATHER—No. 4-O for outside square corners. No. 4-A for inside angles. No. 4-B for bay window corners, octagons, etc.

FOR LAP SIDING LAID 5 INS. OR LESS TO THE WEATHER—No. 6-O for outside square corners and bay windows. No. 6-A for inside angles.

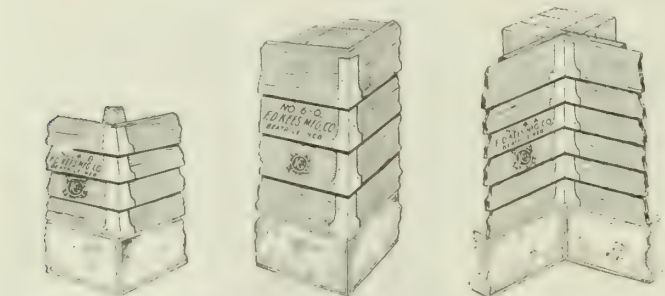
FOR WIDE BUNGALOW SIDING AND SHINGLES—Corners and angles furnished to order for any exposure to the weather up to 12 ins. and for siding of any specified thickness at the lower edge.

FOR DROP SIDING—Pattern No. 106—No. 106-O for square outside corners. No. 106-A for square angles.

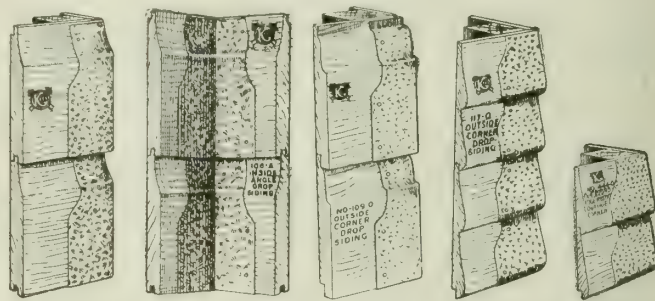
Pattern No. 109—No. 109-O for square outside corners.

Pattern No. 117—No. 117-O for square outside corners.

Four-inch Round Edge "Rustic" Siding—No. 444-O for square outside corners.



Octagon or Bay Window Outside Corner Inside Corners or Angles  
APPLICATION OF "KEES" METAL BUILDING CORNERS FOR LAP SIDING OR SHINGLES



No. 106-O No. 106-A No. 109-O No. 117-O No. 444-O  
APPLICATION OF "KEES" METAL BUILDING CORNERS FOR DROP SIDING

PERFECT MITER CORNERS—By using "Kees" metal building corners, a perfect miter corner is secured with an immense saving in labor. The corner is stronger, more durable and better looking than if the ends of the board are beveled in the usual way. A corner like this will never open.

Compared with the old style corner board construction, there is a saving in both time and material.

DURABILITY—Buildings finished in this way over

## Material and Finish.

All made of No. 28-gage tight coated galvanized iron, chemically treated so that it will take and hold paint or stain the same as wood. Pierced with nailholes.

## Distribution, Prices, Samples, etc.

Sold by dealers in building material or direct from the factory.

Prices, samples and views of building finished in this way will be furnished on request.



RESIDENCE OF DR. GREEN, WISCONSIN  
STATE HOSPITAL, MENDOTA, WIS.  
F. D. ROCKWELL, Builder; CLAUDE & STARCK,  
Architects, Madison, Wis.



RESIDENCE OF JAS. CRONKHITE, NEWFANE, N. Y.  
Designed and built by  
GEORGE D. TAYLOR



RESIDENCE OF E. T. TRAMP, NORTH PLATTE, NEBR.  
HOWARD McMICHAEL, Builder



# WHITAKER-GLESSNER COMPANY

Manufacturers of Rust Resisting Portsmouth Iron

GENERAL SALES DEPARTMENT  
WHEELING, W. VA.

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BEECH BOTTOM, W. VA.

MILLS AND FACTORIES

MARTINS FERRY, OHIO

PORTSMOUTH, OHIO

## Products.

PORTSMOUTH IRON SHEET METAL ARTICLES for building purposes. From our own mills are furnished BLUE ANNEALED and BOX ANNEALED SHEETS, FLAT GALVANIZED and GALVANIZED CORRUGATED SHEETS, for every purpose where a sheet metal of most reliable durability and working qualities is desired.

Portsmouth Iron is also furnished in a variety of FORMED ROOFINGS, painted or galvanized, namely, CORRUGATED, PRESSED STANDING SEAM, 2-, 3-, 4-, 5-, and 6-V CRIMP, SELF-CAPPING ROLL, ROLL and CAP ROOFING, RIDGE ROLL, EAVES TROUGH, CONDUCTOR PIPE, BOX and ROOF GUTTERS, MITRES, FORMED VALLEYS, etc.

## Construction.

Portsmouth Iron is one of the first products of its kind developed from the open hearth furnace. It resulted after years of experiment with various formulæ used in the manufacture of iron and steel. The necessity of producing an iron that would afford at once the workable qualities of mild steel and the permanency of old fashioned wrought iron was emphasized by utter failure of Bessemer and open hearth steel on some projects. For instance, in metal roofings the newer and modern steels were not lasting under exposure more than a few years.

Exhaustive tests under every possible condition show that the construction of Portsmouth Iron approaches very close to the ideal in meeting modern needs.

Portsmouth Iron is manufactured with the sole idea of putting into it the requisites for long life; not for any particular or individual use, but for all purposes, without destroying its ductility, and such qualities that make it easy for fabrication.

It is just as pure as a commercial iron can afford to be. Were it purer, it would lose much of its value as a serviceable metal for universal use. What few impurities exist in its structure are evenly distributed by special heat treatment, preventing segregation, the principal cause of inceptive corrosion. It can, as well, combat successfully the effects of the elements and withstand time and wear to a very unusual extent.

The furnaces in which Portsmouth Iron is made are operated by experts exclusively. The same is true from the selection of the ore to the packing and shipping of finished sheets and formed products.

The materials used in its manufacture are the best that can be obtained, consisting of carefully culled No. 1 pig iron stock of known analysis, and scrap, largely from our own crop ends, which must conform to a very



TRADE-MARK

high standard of analysis. These materials are reduced in open hearth furnaces fired exclusively by natural gas, a fuel containing little or no sulphur, which also accounts considerably for the high purity of Portsmouth Iron.

The body of Portsmouth Iron is homogeneous, fibrous and clean, containing no slag or cinder. Expert rolling puts a finishing touch to the uniformity and evenness of its structure.

A small amount of copper is added to Portsmouth Iron while the metal is in a molten state. This copper is diffused throughout the heat and enlarges the iron's factors of resistance to rust and corrosion, a practice which has been universally advocated. This has been our practice for several years, and the results obtained from Portsmouth Iron bear out our earlier discovery.

In short, Portsmouth Iron fits well into every requirement for a durable and workable iron, and has never failed to give entire satisfaction for all sheet metal work.

## Ranges of Use for Portsmouth Iron.

Portsmouth Iron, because of its durable and workable qualities, has many uses which experienced metal workers will readily recognize. The following are a few of the large number of articles in the manufacture of which Portsmouth Iron has demonstrated itself as exceptionally practical and desirable:

Roofing	Cornices	Furnaces
Siding	Skylights	Stoves
Metal shingles	Ventilators	Stacks
Metal ceilings	Metal sash and casings	Tanks
Eaves trough	Metal doors	Standpipe
Conductor pipe	Elevators	Metal garages

## Tests.

Portsmouth Iron stands every practical structural test; and the results of some of these made by manufacturers, users, and disinterested laboratories will be furnished, as desired, to interested architects.

## Gauges and Sizes.

Portsmouth Iron is manufactured in all standard United States gauges Nos. 14 to 29, inclusive; and in lengths up to 144 ins. and widths up to 42 ins., black or galvanized.

## References.

Numerous testimonials to the quality and durability of Portsmouth Iron for various uses are in our files, and copies will be furnished to reliable parties who desire them. Write for literature, which explains in detail the manufacture of this modern iron and reasons for its preference among architects who "build for the future."

# WHEELING CORRUGATING DEPARTMENT

## OF WHITAKER-GLESSNER COMPANY

Manufacturers of Sheet Metal Building Specialties

WHEELING, W. VA.

BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 16 Desbrosses Street  
ST. LOUIS, MO., 1006 Spruce Street  
CHICAGO, ILL., 2547 Arthington Street

PHILADELPHIA, PA., 1224 Hamilton Street  
CHATTANOOGA, TENN., Main and Boyce Streets  
KANSAS CITY, MO., 214-222 W. Third Street

RICHMOND, VA., 801-805 McDonough Street

MILLS AND FACTORIES

WHEELING, W. VA. BEECH BOTTOM, W. VA. MARTINS FERRY, OHIO PORTSMOUTH, OHIO

### Products.

"CORCO" METAL CEILINGS, SIDEWALLS and WAINSCOTING; SHINGLES and HIP SHINGLES; CORNER BEADS and BRIDGING; Metal Tile; "Whitaker" Old Style Terne Plate, Black and Galvanized Sheets; Steel Roofings, Galvanized or Painted, Plain, Corrugated or Beaded Steel Sheets; Long Terne or Kalamined Sheets; Tin Roofing, Valley and Gutter in rolls; Formed Roofings; Sidings; Pilasters; Corner Finishes; Metal Lath; Roll Roofings; Angle Caps; Ridge Rolls; Box and Roof Gutters, Copings, Crestings, Finials, Flashings, Roofing Buttons; Nails, Cement, Paint, Lead Washers and Solder; Eaves Troughs, Miters, Endpieces, Caps, Outlets and Hangers; Conductor Pipe, Elbows, Shoes, Strainers, Cut-offs, Hooks; Janitor's Cans, Waste Cans, Fire Buckets and Tanks; Rubbish Burners.



TRADE-MARK  
Reg. U. S. Pat. Off.

**ADAPTABILITY**—Suitable for all kinds of buildings and classes of construction, including offices, stores, churches or school-rooms, hallways, lobbies, and foyers. "Corco" metal ceilings are not ordinary stamped steel ceilings, and for this reason they are being used on work of the very highest class. They are specified by architects of established prominence.

**ADVANTAGES**—They are fireproof, dust-proof and verminproof; also, permanent, perfect fitting and economical; artistic and attractive, but not gaudy. Are sanitary and easily washed with soap and water, and they will take paint with greater economy than wood or plaster. With these ceilings, there is an absolute elimination of falling plaster, sifting dust and expensive repairs.

**FACILITIES**—Large stocks of patterns are carried at the factory and at all warehouses of the company. No order is too small for best attention, and none too large for prompt shipment.

**ESTIMATES, PRICES, CATALOGUES**—Prices made per 100 sq. ft. or on the entire contract. Drawings showing definite arrangement of designs for any class of room will be made free of charge on receipt of plans and sketches, with dimensions. Large catalogue of 272 pages or portfolio of particular designs, on request.

### "Corco" Metal Ceilings.

Made only from first class steel, iron, zinc or copper sheets, in the largest and most complete plant of its kind. Most artistic, tasteful and appropriate designs are embossed by machine tooled steel dies on heavy presses.

Every sheet is inspected critically before and after embossing, to insure only perfect material and workmanship. Each piece of cornice, moulding, panel, miter or filler is designed and embossed with the object of obtaining the correct and most harmonious effects in the finished ceiling. The outside or nailing beads are re-pressed in dies that are true to 1/1000 of an inch, and nailholes are die-cut.

Beads are exactly alike in size, shape, depth, and alignment. In laying a thousand panels, the edges can not run off a perfectly straight furring strip. They lap true and tight, without the slightest variation to the right or left, up or down, forward or back. There are no open joints in a "Corco" metal ceiling, because of these superior features, and the smallest to the very largest installation can easily be handled so successfully as to justify thorough pride on the part of the architect and entire satisfaction on the part of the owner.

The die-cut nailholes remove the necessity of driving nails through two or more thicknesses of metal, with consequent saving in time of erection and labor costs. Fully 25% can be saved in this manner by the use of "Corco" metal ceilings.

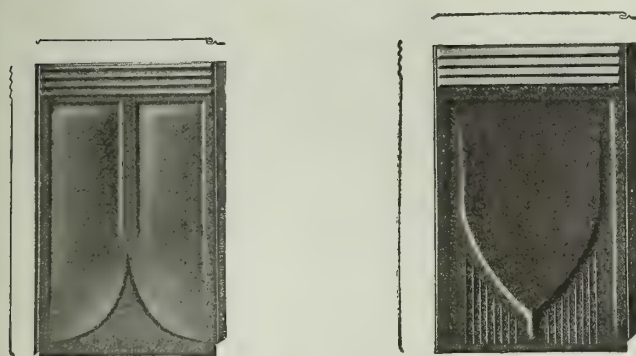


EXAMPLE OF METAL CEILING DESIGN

### "Corco" Metal Shingles.

Made in 5 distinct patterns, in 4 sizes, from prime common ternes or old style ternes, galvanized or painted after stamping. Some are stamped from galvanized sheets or sheet copper as required.





Virginia  
Wheeling  
TWO STYLES OF "CORCO" METAL SHINGLES

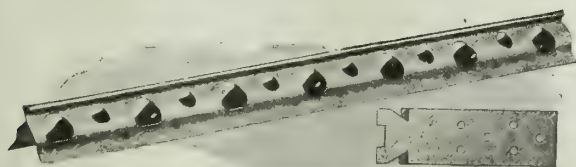
**BRANDS**—Dixie, Virginia and Wheeling, sizes 7 by 10 ins., 10 by 14 ins., and 14 by 20 ins., with no raw edges. Ohio Cluster, size 20 by 28 ins. only. Tennessee, 10 by 14 ins. only.

Suitable for all roofs of one-quarter pitch, or greater, particularly adapted to bay and dormer windows, gables, mansards, porches, towers, etc. Also suitable for siding. They are absolutely fireproof, weatherproof and waterproof, and are applied without the need of experienced or skilled tanners. Contraction and expansion fully provided for by improved side locks and end laps.

**PRICES, ETC.**—Price per square on application. Catalogue free on request.

### "Corco" Metal Corner Beads.

**OUTER CORNER**—For use in connection with wood or steel lath, or brick. Makes it possible for the plasterer to execute clean and straight edges with least time or trouble. The bead is so formed that the objectionable featheredge, usually breaking and chipping away, is entirely eliminated. The "Corco" outer corner bead provides for efficient keying of plaster by means of generous holes punched in the aprons *near the head*. It allows the plaster to get in behind the metal to form a strong and permanent bond.



OUTER CORNER BEAD AND CLIP

Special metal clips, as illustrated, are furnished with corner beads intended for use with brick, which give rigid anchorage to the brick several inches from the corner of the brick and enable quick finding of mortar joints.

This bead can also be used on archways by clipping through the aprons at large holes and bending to suit. Made in both Nos. 24- and 26-gauge from tight-coat galvanized sheets in lengths of 6, 7, 8, 9 and 10 ft. Bundled 10 pieces to the bundle. Clips packed in boxes in quantities as needed.

**INNER CORNER**—The corner bead can be used on any inside corner in connection with wood or metal lath or brick.

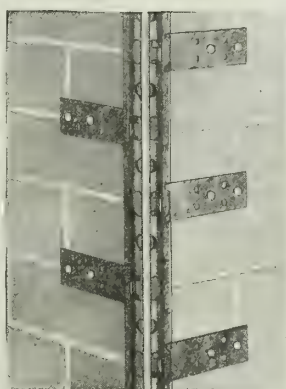
This bead eliminates the necessity for skill in making inside plaster corners and is so designed as to eliminate corner cracks caused by plaster pulling away from corner.

The undercut construction of the bead positively prevents plaster from pulling away from the bead. Short lengths can be utilized and all waste avoided. Corners next to ceilings are made by butting the ends of 3 pieces and lapping the aprons before nailing. Clips, such as are used with outer corner bead, are furnished for use against brick.

Made from tight-coat galvanized sheets in lengths of 6, 7, 8, 9 and 10 ft. Bundled 10 pieces to the bundle.



INNER CORNER BEAD AND CLIP



Application to Outer Corner



Application to Inner Corner

"CORCO" CORNER BEAD

### "Corco" Metal Bridging.

This is an aid to efficient and rapid floor construction. It comes from the factory ready for use; requires no sawing, mitering, or measuring, and is furnished for short or shallow, as well as the deepest joists.

"Corco" metal bridging is made from galvanized sheets and stamped into a strong and firm angle with nailing flanges at both ends. Made for joists 10, 12 and 14 ins. deep, spaced 12, 16 and 24 ins. on centers.

Prices and full particulars will be furnished promptly on request.



"CORCO" METAL BRIDGING



"CORCO" METAL BRIDGING  
Application to beams

### Prices and Catalogues.

Complete catalogue of the "Corco" line of sheet metal building material, also prices and full particulars, furnished on request. The items shown on these pages are but a few of the popular labor and time saving materials manufactured by this company.

# ANKYRA MANUFACTURING CO.

Manufacturers of Expansion Bolts

149 Berkley Street, Wayne Junction  
PHILADELPHIA, PA.

## Product.

ANKYRA ANKOR (Expansion) BOLTS.

## Purpose.

The purpose of the bolt is to provide a device which can be used in place of ordinary toggle or expansion bolts, and also in instances in which the latter are difficult to affix. Withal, the purpose includes ease and rapidity of installation, in any kind of wall or ceiling, and without reference to reinforcements of any kind, where the material is inherently weak. It is intended especially for use in glazed and hollow tile, stucco, concrete, lath-and-plaster—either wood or wire—expanded metal, compo-board and similar materials, and in hollow sheet metal, such as window frames and doors, interior trim, etc.

*Ankyra Ankor Bolts are not recommended for heavy work in solid walls.*

## Advantages.

The Ankyra Ankor Bolt (or sleeve) combines the principles of toggle and expansion bolts; differing from them, however, in that the nut is an integral part of the sleeve itself, and that it is, practically speaking, self-adjusting to any thickness of wall.

Ankyra consists of a longitudinally perforated metal sleeve (Fig. A), which is inserted into a hollow or solid wall as desired. In the former case, the expanding tool pulls up on the sleeve and forms the wing



TRADE-MARK  
(Reg. U. S. Pat. Off.)

nut (Fig. C). Fig. B shows how Ankyra holds in solid walls.

Ankyra has eight prime advantages.

- (1) It is a one-piece construction (integral nut).
- (2) Is quickly and easily applied.
- (3) Becomes a permanent part of wall.
- (4) Can not loosen unless purposely done.
- (5) Fixture held by it can be removed and replaced at any time, and repeatedly.
- (6) Holds securely in any part of any wall, without grip in studdings or other reinforcement.
- (7) Ordinary standard wood screws are used with Ankyra.
- (8) Ankyra is always stronger per unit area than the wall itself.

Those familiar with other forms of anchor bolts, in which the nuts are separate from the sleeves, will appreciate the advantages of the integral nut, as combined in Ankyra. This feature permits repeated insertion and withdrawal of the screw, without possibility of derangement or loss of the sleeve.

The more extensive use of sheet metal for interior work has been hindered, to a large degree, by the necessity for predetermining the location of fixtures and hardware, so that suitable means of fastening may be provided. Ankyra eliminates this difficulty entirely,



FIG. A. ANKYRA BOLT  
WITH WOOD SCREW  
BEFORE EXPANSION

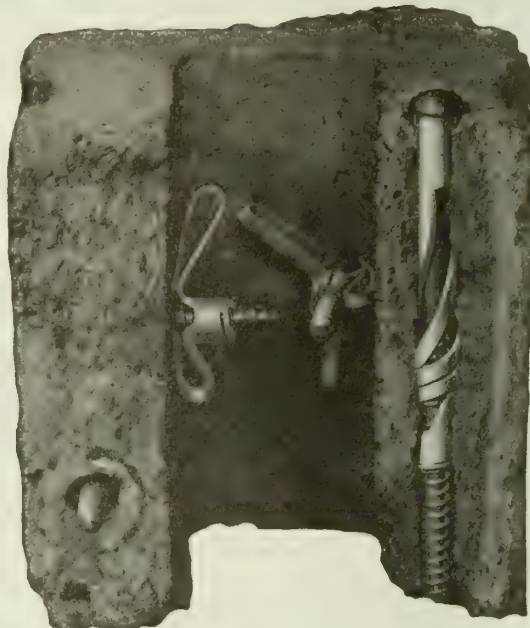


FIG. B. HOW ANKYRA HOLDS IN HOLLOW TILE  
OR SOLID WALLS

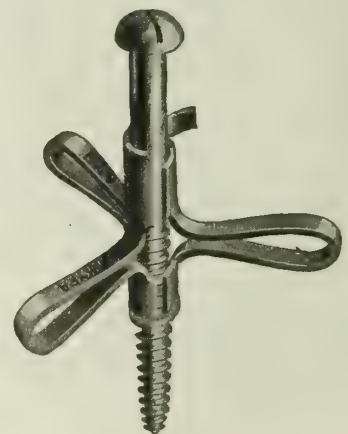


FIG. C. ANKYRA BOLT EXPANDED  
Note wood screw





1 Ankyra expanded with this tool

2 Insert the tool shank into the Ankyra sleeve

3 Ankyra screwed onto shank till it meets the base plate. Push into wall through previously drilled or punched hole

4 After insertion, hold base plate firmly against wall, and pull down evenly on handle

5 Ankyra partially expanded by cam action of handle

6 Ankyra now fully expanded. After removal of tool, fixtures may be applied by inserting an ordinary wood screw

7 Expansion tool (special) for extra thick walls

8 Expansion tool as used in connection with sheet metal work (Fig. I)

SHOWING EASY APPLICATION OF ANKYRA

since it permits fixtures to be placed anywhere, without previous reinforcement.

The fact that standard wood screws (the proper size number of which is stamped on each sleeve) are used with Ankyra Ankor Bolts indicates a practical and economical appliance.

### To Architects, Builders, Plumbers and Others.

For affixing grounds to hollow tile, no other known method provides the flexibility of Ankyra, and there is no other way in which ground alignment can be controlled so accurately.

The wedges naturally make it possible to take up between the wall and the ground any irregularities which may exist in the alignment of the wall (Fig. D).

The larger illustration (Fig. E) shows exactly how Ankyra holds grounds to hollow tile. The speed with which grounds can be laid by one man is astonishing.

In Fig. F is shown a part of the roof of the Bellevue-Stratford Hotel in Philadelphia, from which practically all the slates were blown in a severe wind storm about five years ago. Ankyra is now used to fasten the slates to the tile subroof, and holds them with absolute security.

Ankyra is used extensively in the largest and

finest buildings for supporting wall radiators and other moderately heavy fixtures on hollow tile and other hollow walls (Fig. G).

The towel rack (Fig. H) illustrates the efficacy of Ankyra for holding bathroom and other fixtures to hollow and glazed tile. The difficulty of this is appreciated by every builder, architect and plumber.

The shade fixture (Fig. I) is typical of the way in which Ankyra is used in connection with sheet metal work.

Ankyra is used in many of the most prominent buildings in the country, among which some of the best known are the Woolworth, Metropolitan and Equitable Buildings in New York, and the big new Widener Building in Philadelphia.

It is being specified in constantly increasing quantities, and for new uses, by the leading architects.

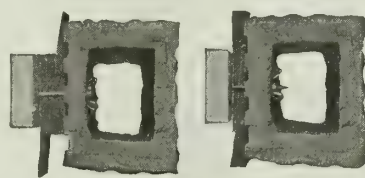


FIG. D. ANKYRA METHOD OF ALIGNING GROUNDS

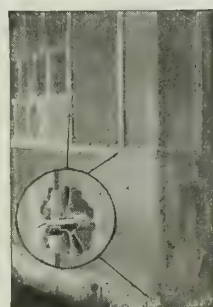


FIG. E. HOW ANKYRAS HOLD GROUNDS



FIG. F. SLATES HELD TO TILE SUBROOF

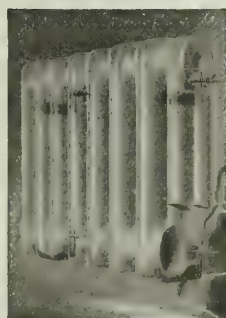


FIG. G. WALL RADIATOR PLACED ON TILE WALL

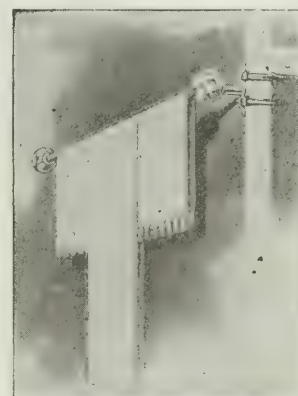


FIG. H. ANKYRAS USED ON BATHROOM FIXTURES  
Not injurious to walls and holds permanently

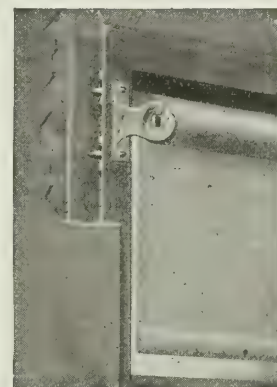


FIG. I. ANKYRAS IN HOLLOW METAL WORK  
Easily removed and replaced

LIST PRICES, ANKYRA ANKOR BOLTS

Stock No.	Size, ins.	Price per 100	Stock No.	Size, ins.	Price per 100
6M	1/4 x 1 1/2	\$2.15	8	3/8 x 2 1/2	\$3.50
8M	1/4 x 1 1/2	2.15	10	3/8 x 2 1/2	3.75
10M	3/8 x 1 1/2	2.45	12	3/8 x 2 1/2	3.75
12M	3/8 x 1 1/2	2.45	14	1/2 x 2 1/2	4.15
8E	3/2 x 1 1/2	2.90	16	1/2 x 2 1/2	4.15
08	3/2 x 1 1/2	2.90	18	1/2 x 2 1/2	4.15

EXPANDING TOOLS

No. 6M to No. 12M.....	\$0.45
No. 8 to No. 18.....	.45
No. 8 to No. 18 ("Extension").....	.75

# THE DAYTON MALLEABLE IRON CO.

Makers of High Grade Malleable Iron Castings

DAYTON, OHIO

## AGENCIES FOR THE SALE OF CONCRETE INSERTS

NEW YORK, N. Y., INTERNATIONAL CASEMENT CO., INC.  
 PHILADELPHIA, PA., JANNEY, STEINMETZ & CO.  
 CHICAGO, ILL., OLNEY J. DEAN & CO.  
 BOSTON, MASS., ROBERT B. CAMPBELL CO.  
 BALTIMORE, MD., MARSHALL & BIEDLER  
 ATLANTA, GA., STRAFFORD R. HEWITT  
 BUFFALO, N. Y., BUFFALO BUILDERS SUPPLY CO.  
 CINCINNATI, OHIO, THE J. K. NICKERSON CO.  
 CLEVELAND, OHIO, JOSEPH W. LOEB CO.  
 DAYTON, OHIO, THE JOHN G. POOL CO.  
 DANVILLE, VA., PLUMER WISEMAN  
 DENVER, COLO., COLORADO BUILDERS SUPPLY CO.  
 HOUSTON, TEX., EVERETT BRADT & CO.  
 INDIANAPOLIS, IND., THE FIREPROOFING CO.

KANSAS CITY, MO., J. P. SPRAGUE CO.  
 LOUISVILLE, KY., THOMAS L. BARRET  
 LOS ANGELES, CAL., WATERHOUSE CO.  
 MINNEAPOLIS, MINN., CHAS. HOUSTON  
 PITTSBURGH, PA., WITHEROW STEEL CO.  
 PORTLAND, ORE., F. T. CROWE & CO.  
 ST. LOUIS, MO., RANDOLPH SALES CO.  
 SAN FRANCISCO, CAL., PACIFIC BUILDING MATERIALS Co.  
 SEATTLE, WASH., F. T. CROWE & CO.  
 SPOKANE, WASH., F. T. CROWE & CO.  
 SYRACUSE, N. Y., THE PARAGON PLASTER CO.  
 MONTREAL, CAN., WM. H. WARDWELL  
 CALGARY, CAN., GORMAN, CLANCEY & GRINDLEY, LTD.

### Products.

DAYTON or BIGELOW PATENTED INSERTS (No. 803089, Oct. 31, 1905).

### Design and Use of Dayton Inserts.

Designed with a rectangular socket, having a key-hole slot, and supported by two columns and flanged top or loop, they are fastened to the wooden floor, wall or ceiling forms by driving nails through the notched lugs, and are thus rigidly held in position when the concrete is poured.

When the forms are removed, the slotted face is exposed, flush with the concrete, providing for insertion of bolts and lateral adjustment, to secure perfect alignment of shafting, etc.

The bolts are readily inserted by entering the head at right angles to the sockets and turning the bolt as it enters, which prevents it from leaving the socket when being laterally adjusted. The various sizes have a wide margin of safety over safe working load of bolts used.

Our inserts provide for the quick and easy installation or of later readjustment of shafting, machinery and all fixtures to be attached. The drilling of the hardened concrete slabs for lag screws or expansion bolts is eliminated, effecting a material saving.

DATA, NO. 3 DAYTON INSERTS

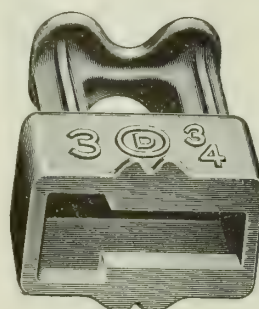
Size of bolt, ins.	Height over all, ins.	Length of slot, ins.	Depth of slot, ins.	Weight per 100 pcs., lbs.
$\frac{1}{4}$ and $\frac{3}{8}$	2	$1\frac{3}{4}$	$\frac{1}{8}$	32
$\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{4}$	75
$\frac{3}{4}$	4	$2\frac{1}{2}$	$\frac{3}{8}$	125
$\frac{7}{8}$	$4\frac{1}{4}$	$2\frac{1}{2}$	$1\frac{1}{8}$	140
$1\frac{1}{8}$	$4\frac{1}{4}$	$2\frac{5}{8}$	$1\frac{1}{8}$	150

DATA, NO. 5 DAYTON INSERTS

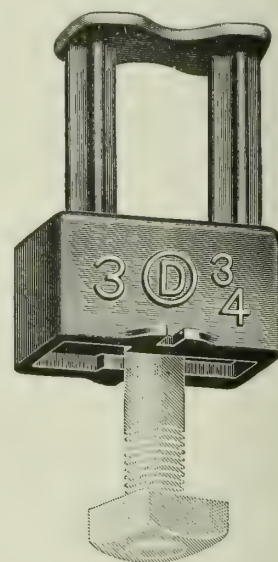
Size of bolt, ins.	Height over all, ins.	Length of slot, ins.	Depth of slot, ins.	Weight per 100 pcs., lbs.
$\frac{3}{8}$	$2\frac{1}{8}$	$1\frac{3}{4}$	$\frac{1}{2}$	27
$\frac{1}{2}$	$2\frac{1}{2}$	2	$\frac{5}{8}$	50
$\frac{5}{8}$	$2\frac{7}{8}$	$2\frac{1}{4}$	$\frac{5}{8}$	60
$\frac{3}{4}$	$3\frac{1}{4}$	$2\frac{1}{2}$	$\frac{3}{4}$	85

Dayton patented inserts are made only of high grade malleable iron casting. They successfully resist sudden shocks and continuous vibration. They are not to be classed with ordinary gray iron casting.

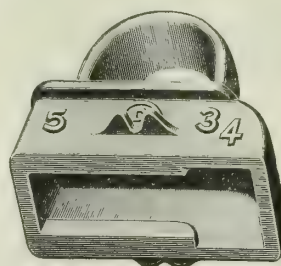
The sectional dimensions of No. 3 inserts were scientifically figured by a malleable iron expert. They provide the maximum strength required.



Bottom View of No. 3 Insert  
Showing slot that receives head of the bolt



No. 3 Dayton Insert  
Showing bolt inserted.  
Bolts are not furnished with inserts



Bottom View of No. 5 Insert  
Showing slot that receives head of the bolt



No. 5 Dayton Insert  
Showing bolt inserted.  
Bolts are not furnished with inserts

DAYTON INSERTS  
(Patented Oct. 31, 1905)



ESTABLISHED 1895

INCORPORATED 1911

THE DONLEY BROTHERS COMPANY

Building Specialties  
East 74th Street and Aetna Road  
CLEVELAND, OHIO

Products.

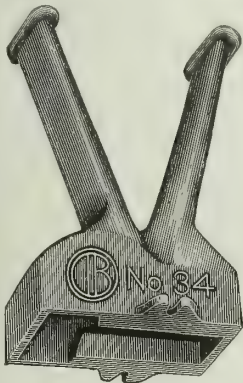
D-B SLOT INSERTS; D-B HEAVY DUTY INSERTS; D-B COAL CHUTES; D-B FIREPLACE DAMPERS.  
Manufacturers and distributors of a wide line of Metal Building Specialties of interest to architects, engineers and contractors.

D-B Concrete Inserts.

For use wherever anchorage to ceilings, walls, or columns is required for shafting, trolley and conveyor tracks, heating and plumbing pipes, sprinkler systems, etc.  
Where the location of the equipment is indeterminate, specify insert by size required, to be placed 4 ft. to 5 ft. apart in rows spaced 4 ft.

D-B Slot Inserts.

These inserts are in one piece and made of malleable iron. The design provides for the ultimate load carried by the bolt at 60,000 lbs. per sq. in., 40,000 lbs. in the insert, and 200 lbs. in the concrete.  
The intersection of the legs coincides with the center line of the adjustment. Any location of the load therefore produces no excess stress.



D-B SLOT INSERT

DATA, D-B SLOT INSERTS

No.	Size bolt, in.	Height over all, ins.	Approximate shipping weight, lbs., per 100	Length, ins.
34	3/4	6	175	27 7/8
58	5/8	5	125	25 3/8
12	1/2	4	75	21 1/8

D-B Heavy Duty Inserts.

Made in two pieces, a socket and a bearing plate.  
Furnished in two sizes of sockets with bearing plates for sizes of bolts as listed.  
If for any reason it becomes necessary to change the size of bolts, they may be inserted in the same sockets by means of the interchangeable bearing plates.



D-B HEAVY DUTY INSERT

DATA, D-B HEAVY DUTY SOCKET AND BEARING PLATES

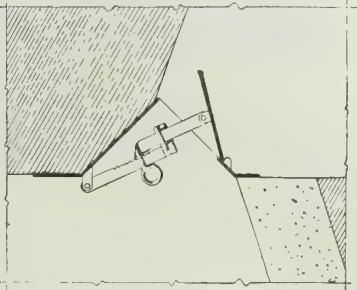
Socket No.	Bearing plates made for bolts	Shipping weight, lbs. per 100	
		Sockets	Bearing plates
1	1/4 in., 3/8 in., 1/2 in., 5/8 in.	110	15
2	1/2 in., 3/4 in., 1 in., 5/8 in., 3/4 in., 1 in.	220	31

D-B Fireplace Damper.

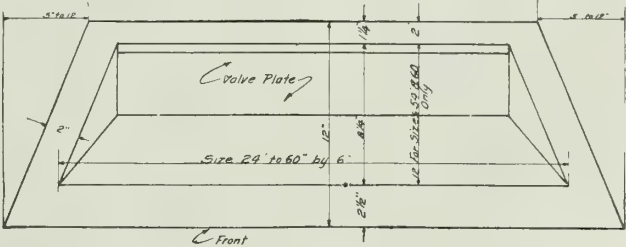
The D-B fireplace damper is a correctly formed cast iron throat for the fireplace, having a valve plate for regulating the draft.  
The valve plate is simple of operation and can be easily removed.  
The damper has a flange which supports the brickwork above the fireplace opening. No other supporting bar is necessary.

The D-B dampers are made in sizes of 24 to 60 ins., in 6-in. steps.  
The flue area should be one-tenth the area of the fireplace opening.

Complete information on fireplace construction sent on request.



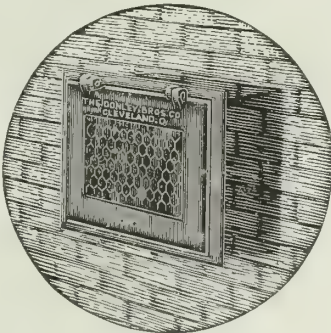
OPERATING DEVICE OF D-B FIREPLACE DAMPER



PLAN OF D-B FIREPLACE DAMPERS

D-B Coal Chutes.

Made of iron and steel and built to stand rough usage.  
Unlocked from inside only and operated without entering the coal bin. The door opens up, protecting the building above the opening. Glazed doors when opened have a shield, which automatically protects the glass.  
D-B grade-line chutes for houses set close to ground or terraced.



D-B FOUNDATION COAL CHUTE

DATA, D-B FOUNDATION COAL CHUTES

No.	Wide, ins.	High, ins.	Deep, ins.	Description	Shipping weight, lbs.
10	24	17	13	Glass and hopper.....	95
11	24	17	13	Glass without hopper.....	80
12	24	17	13	Cast iron door with hopper.....	85
13	24	17	13	Cast iron door without hopper.....	65
14	24	17	8	Cast iron door without hopper.....	59
15	24	17	8	Glass door without hopper.....	58
20	33	22	18	Glass and hopper.....	180
21	33	22	18	Glass without hopper.....	160
22	33	22	18	Cast iron door and hopper.....	155
23	33	22	18	Cast iron door without hopper.....	135

# KOHLER DIE & SPECIALTY CO.

## Pressed Steel Concrete Inserts

DEKALB, ILL.

### Product.

PRESSED STEEL CONCRETE INSERTS.

### Description.

The Kohler steel concrete insert is made of pressed steel, unbreakable, and is stronger and more satisfactory in every way than any cast insert. It is used in industrial plants, public buildings, garages, schools, warehouses, elevators, tunnels, docks, etc.

### Adaptability.

The Kohler insert is the only insert adapted for use with either wood or steel forms. They afford the most secure method for supporting shafting, radiation, sprinkling systems, elevator guides and all appliances attached to either the walls, ceilings, floors or columns of concrete structures.

### Advantages.

The Kohler insert is the easiest and quickest insert on the market to set in the forms.

No nails or pins are required for its use. The screw point, clearly shown in the cut, does the work.

A blow with the hammer and a couple of turns with the hand set this screw down so that the insert is held securely in a vertical position ready for the concrete to be poured.

The bottom of this insert is squared accurately with the thread, as illustrated, so that the insert must stand upright when the screw is turned down properly.

After the work is finished, the form is easily pulled away from the screws which are then quickly removed with the fingers leaving the insert free for the threaded bolt.

### Economy.

The Kohler steel insert conveniently spaced in the ceilings, floors or walls, of reinforced concrete buildings means a saving of time and heavy expense in attaching or rearranging shafting, piping or other interior equipment. They are a necessity in concrete construction.

### Strength.

Careful tests show that Kohler steel inserts have ample strength for all requirements. The  $\frac{5}{8}$ -in. size has repeatedly supported a load of over 5 tons.

### Sizes and Prices.

The Kohler steel inserts are made in the following sizes:

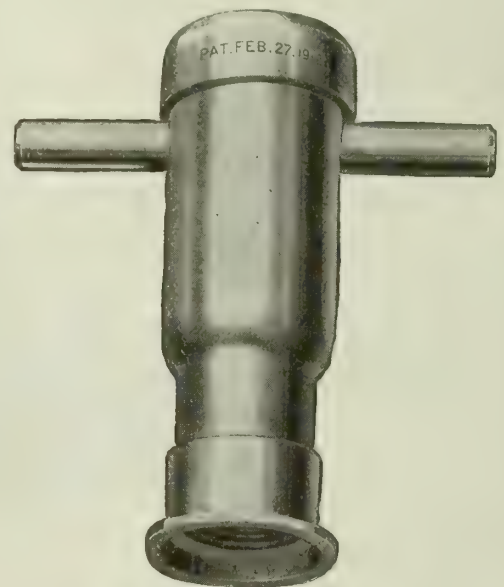
For  $\frac{3}{8}$ -in. bolt,  $2\frac{1}{2}$  ins. in height.

For  $\frac{1}{2}$ -in. bolt, 3 ins. in height.

For  $\frac{5}{8}$ -in. bolt,  $3\frac{1}{4}$  ins. in height.

For  $\frac{3}{4}$ -in. bolt,  $3\frac{1}{2}$  ins. in height.

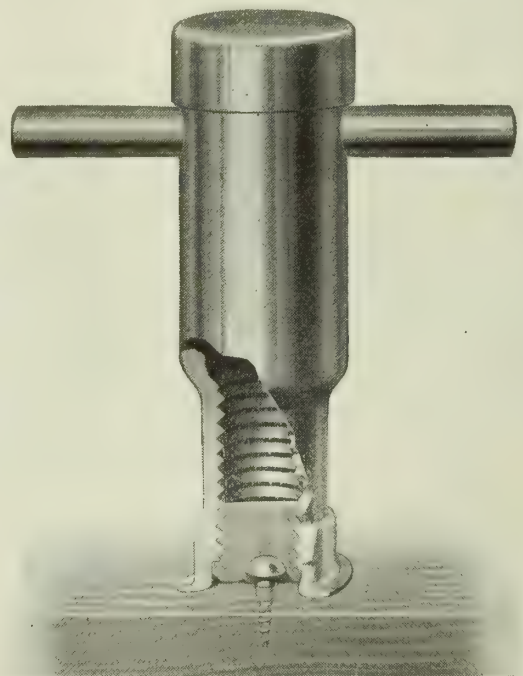
Prices on the Kohler patented steel insert will be quoted on application.



INSERT WITHOUT SCREW



PRESSED STEEL  
INSERT



INSERT ON BOARD WITH SCREW POINT IN PLACE



RICHMOND SCREW ANCHOR CO.

Pulitzer Building  
NEW YORK, N. Y.

CABLE ADDRESS, "JURICH, NEW YORK"  
A. B. C. Code, 5th Edition

TELEPHONE:  
BECKMAN 4000

AGENCIES

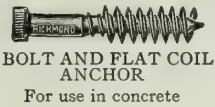
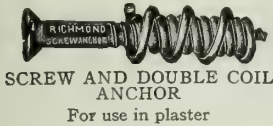
PHILADELPHIA, GILES & RANSOME, Commonwealth Bldg.  
MONTREAL, J. A. MASTERS & Co., Shaughnessy Bldg.  
CHICAGO, SELLAR SUPPLY Co., 557 West Quincy St.  
PARIS, FRANCE, JEAN THIOLLIER, 92 Blvd. Haussmann

Products.

RICHMOND SCREW ANCHORS for fastening all styles of screws into masonry or composition materials. Also, Expansion, Anchor, Form and Centering Bolts; Wall Plugs; Expansion Shields; Concrete Pole Steps, and Concrete Inserts.

Richmond Screw Anchors.

These anchors are made in two types, and can be set before concrete is poured, by affixing to forms; or, later on, by drilling a hole into masonry and setting screw anchor and screw together into it, in Portland cement. Screw anchor can not loosen before bolt or screw breaks, or masonry gives way.



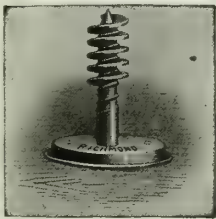
Richmond screw anchors have been adopted, for years, by largest equipment concerns as standard for installation of their products in concrete industrial buildings.

Advantages.

The only one-piece steel anchor made.  
The strongest bedding for the least metal.  
Not a weakening bubble in concrete like a cast insert.  
Not a loose knot in masonry like a wooden plug; nor a wedge like an expansion shield, depending entirely upon friction, and bearing only at a few points.  
Placed in concrete it becomes integral with the work, and can not vibrate or loosen without destruction of entire surrounding medium.

Its small size allows it to fit easily in any scheme of reinforcement, however complex.  
When cemented into a hole the latter can be of any shape or size and correspondingly cheaply drilled.

In gravel concrete, where drill deflects and expansion shields are useless, and in vertical walls Richmond screw anchors are rapidly, accurately and solidly set.



Shown in position on forms, before concrete is poured

Strength.

Made of steel, a minimum of metal provides a maximum of strength; all stresses are transmitted to surrounding masonry.

Tests show that bolt breaks before anchor loosens. Copies of certified tests, conducted at Syracuse University and by the United States Government at Rensselaer Polytechnic Institute, sent on request. Government tests indicate freedom from adhesion for bolts, even in largest sizes, after a lapse of 28 days. We guarantee non-adhesion.



RICHMOND SCREW ANCHOR, SHOWING ITS STRENGTH

In 1: 3: 5 concrete, bolt breaks before anchor loosens when embedded at depth of 10 times diameter of bolt. Bolts are sufficiently coated with mill scale and oil to prevent adhesion, which would be easily broken anyhow, as bolt is unscrewed and not pulled out like a reinforcing rod, which is usually deformed expressly to prevent slipping

PRICE LIST PER 100 (SUBJECT TO DISCOUNT)  
FLAT HEAD IRON WOOD SCREWS AND DOUBLE COIL GALVANIZED STEEL ANCHORS

Length over all, ins.	Trade No. and diameter of screw in decimals of an inch					
	No. 8 .1631	No. 12 .2158	No. 16 .2684	No. 20 .3210	No. 24 .3737	No. 30 .4526
2	\$3.70	\$4.75	\$5.55	.....	.....	.....
3	4.40	5.40	6.20	\$8.30	\$10.10	.....
4	.....	6.25	7.00	9.35	11.40	\$17.00
5	.....	.....	7.95	10.60	12.95	19.00
6	.....	.....	9.10	11.95	14.70	21.00

Double Coil Anchors Only						
...	\$3.00	\$4.00	\$5.00	\$6.50	\$8.00	\$11.00

Screws of other lengths at proportionate prices.

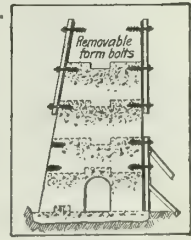
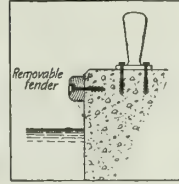
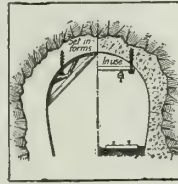
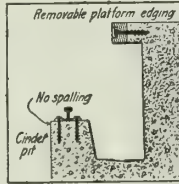
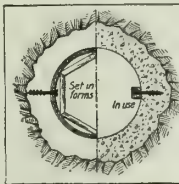
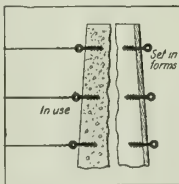
Length under head, ins.	Diameter of bolt in inches							
	¼ & ⅜	½	⅝	¾	⅞	1	1¼	1½
4	\$9.00	\$12.60	\$17.00	\$24.30	.....	.....	.....	.....
5	9.50	13.30	18.00	25.70	\$36.00	\$47.90	.....	.....
6	10.00	14.00	19.00	27.10	38.00	50.50	.....	.....
8	.....	15.40	21.00	29.90	42.00	55.70	.....	.....
10	.....	16.80	23.00	32.70	46.00	60.90	.....	.....
12	.....	18.20	25.00	35.50	50.00	66.10	\$160.00	\$225.00
18	.....	.....	.....	.....	.....	.....	180.00	275.00

Flat Coil Anchors Only								
....	\$6.00	\$8.00	\$12.00	\$16.00	\$21.00	\$26.00	\$60.00	\$100.00

Bolts of other lengths at proportionate prices.

Stocks and Deliveries.

Large stocks insure prompt deliveries.



TYPICAL USES OF RICHMOND SCREW ANCHORS

Grandstands: Yale Bowl; University of Chicago; University of Michigan; McGill University, etc.  
Posts and Poles: Removable screws permit stripping vertical forms. N. Y. Barge Canal, Catskill Aqueduct.  
Mine shafts: Removable screws permit stripping vertical forms; cage guides, Catskill Aqueduct, Vulcan Iron Mines  
Railroads. Rails to concrete ties; platform edgings, etc., N. Y., N. H. & H. R.R., B. R. T. R.R., D., L. & W. R.R., etc.  
Tunnels: Removable screws permit stripping forms. Overhead transmission; C. P. R. in Mt. Royal tunnel  
Docks: Used by N. Y. State Barge Canal, U. S. Army and Navy engineers, Montreal, Philadelphia, New York, Baltimore  
Cantilever forms: Walls and dams. The anchor only remains in the work; light to handle, easy to set

# SECURITY INSERT COMPANY

## Ceiling Sockets for Concrete Work

Thirty-third and Arch Streets  
PHILADELPHIA, PA.

### Product.

SECURITY INSERTS, or CEILING SOCKETS, for Concrete Work.

### Security Inserts.

The Security insert solves the problem of the hanging of machinery or fixtures to be suspended from ceiling or wall in factories, warehouses and other buildings of concrete construction.

The Security insert was designed by engineers who made a careful study of this problem, and produced a socket overcoming all objectionable features inherent in others. The ease of installation, the absence of any fixed thread, the strength and many other commendable features of this socket, are shown in the illustrations.



INSERT BOLTED TO FORM

### Features.

The Security insert embodies the following valuable features:

(1) The design, distribution of metal, and anchorage in the concrete enable it to carry a greater load than either bolt or concrete.

(2) It has no fixed thread to become rusty or damaged.

(3) In place of fixed thread a standard steel nut (the strongest thread possible) is placed in the insert when ready to use.

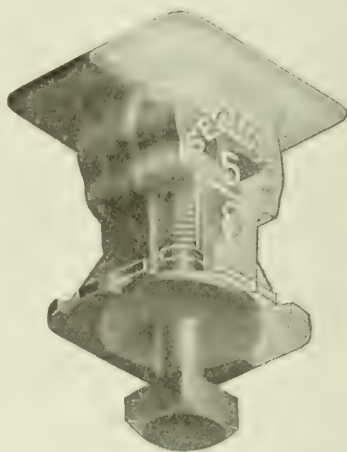
(4) This nut is renewable at any time.

(5) A stud or a bolt may be used, whichever is more convenient for the work.

(6) The Security insert permits play of stud or bolt while hanging machinery or other fixtures; but when washer is slipped into recess; the stud or bolt is held rigidly central.

(7) The Security insert has a large flat base, insuring upright position in the form, to which it is securely nailed, thus avoiding waste of time and lumber.

(8) It is desirable to place inserts in all parts of concrete



PHANTOM SHOWING INTERNAL CHAMBER WITH BOLT, NUT AND WASHER IN POSITION



INTRODUCING OR REMOVING NUT

buildings, such as offices, store-rooms, etc., as well as in those portions where machinery is to be installed.

(9) The Security insert is the only insert provided with a means for concealing the hole in wall or ceiling. This may be accomplished by use of a cardboard disk, which fits the washer recess and can be painted to harmonize with surroundings.

(10) There is absolutely nothing to get out of order or deteriorate in the Security.

(11) The Security insert is correct in principle, simple in construction, and so designed as to insure safe, permanent anchorage for anything, from the lightest partition to the heaviest crane.

(12) Once placed, Security inserts are always ready for use.

### Strength.

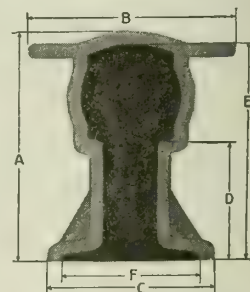
Security inserts will carry with a factor of safety the safe load of the bolt for which they are designed.

STRENGTH OF BOLTS  
Assumed Tensile Strength 60,000 lbs. per Sq. In.

Size	Ultimate strength	Safe load factor .5
3/8-in. bolt.....	4,100 lbs.	820 lbs.
1/2-in. bolt.....	7,600 lbs.	1,520 lbs.
5/8-in. bolt.....	12,100 lbs.	2,420 lbs.
3/4-in. bolt.....	18,100 lbs.	3,620 lbs.
7/8-in. bolt.....	25,200 lbs.	5,040 lbs.

TABLE OF MEASUREMENTS

Size of bolt, in.	A in.	B in.	C in.	D in.	E in.	F in.
3/8	2 1/4	1 3/4	1 1/8	1 3/8	2 3/8	1 3/4
1/2	2 3/4	2	1 7/8	1 5/8	2 5/8	1 7/8
5/8	3	2 3/4	2 1/4	1 7/8	2 7/8	2 3/8
3/4	3	3	2 1/2	1 7/8	2 7/8	2 1/2
3/4	4	3	2 1/2	2 1/8	3 7/8	2 1/2
7/8	4	3	2 3/4	2 3/8	3 7/8	2 3/4



DIMENSION DIAGRAM  
SECURITY INSERT

### PRICE LIST

Security Inserts Made for the Following Sizes of Bolts:

Diam. of bolts	Each
3/8-in.....	11 cents
1/2-in.....	13 cents
5/8-in.....	17 cents
3/4 by 3 ins.....	21 cents
3/4 by 4 ins.....	25 cents
7/8-in.....	30 cents

The company furnishes the insert only.



WRIGHT & ALEXANDER COMPANY

Manufacturers of Concrete Inserts

ROCHESTER, N. Y.

Products.

"WRIALCO," a patented CONCRETE INSERT.

Description.

The most practical and reasonably priced hanger yet devised for automatic sprinkler, shafting and general piping work in connection with concrete building construction.

Made of cast iron and so shaped as to give perfect anchorage in concrete.

The possibility of displacing the "Wrialco" insert by the necessary working of the concrete is effectually overcome. The insert remains where placed, and ready for attaching bolt or rod when wanted.

Installation.

The automatic sprinkler engineer, the building construction engineer or architect in charge will know from their general piping arrangement or layout the exact location of the lines of piping or shafting necessary for the erection of their work.

Just before the building contractors are ready to pour concrete, the engineer will determine the hanger requirements and location, and stretching a line lengthwise of the building will place the "Wrialco" inserts on the forms of the false work provided.

Advantages.

Compactness—a feature of strength and permanency of location.

The rod or bolt can be made rigid at any point of adjustment desired without the use of an additional nut.

Security of nut in adjustment chamber.

Shipped complete as shown in Fig. 2, all ready for attaching to forms.

Their use lessens the defacing of ceilings and walls.

They solve the hanger problem in buildings of concrete construction.

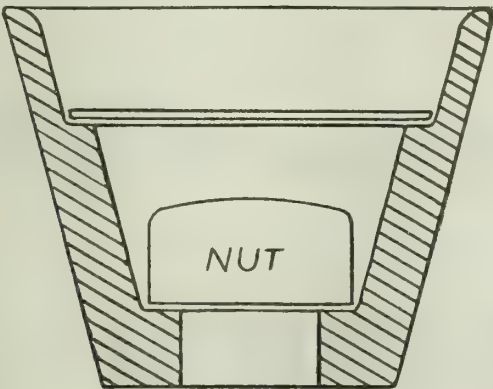


FIG. 1. CROSS SECTION

Showing arrangement of the adjustment chamber, making it possible to place nut in the chamber or to remove it after insert has been embedded in the concrete.

U. S. Standard or machine bolt nuts may be used

Strength Tests.

GENTLEMEN:

July 24, 1917.

Pulling tests on your various inserts were made at this Institute on July 19, 1917.

Inserts were placed in concrete blocks which were about 18 in. x 18 in. x 9 in. deep and concrete was one month old at test. Pull was applied directly to the insert bolt in each case: one insert of each size was in the test.

No.	Dia. of Bolt	Load	Character of Failure
1	$\frac{7}{16}$ -in.	6,000 lbs.	Broke out shelf on insert
2	$\frac{1}{2}$ -in.	5,840 lbs.	Broke out shelf on insert
3	$\frac{5}{8}$ -in.	11,890 lbs.	Broke bolt
4	$\frac{3}{4}$ -in.	17,700 lbs.	Broke out shelf on insert
5	$\frac{7}{8}$ -in.	15,150 lbs.	Broke out shelf on insert

The concrete, in each instance of test, remained undisturbed.

Respectfully yours,  
ALLEN S. CROCKER, M. E.

STATE OF NEW YORK, }  
County of Monroe, } ss.  
City of Rochester }

On this 24th day of July, 1917, before me personally appeared Allen S. Crocker, Superintendent of the Industrial Arts Department of the Mechanics Institute of Rochester, N. Y., who being by me duly sworn did depose and say that the above test was made under his personal supervision and that the report in connection is in all respects true.

WILLIAM H. VIANCO,  
Notary Public,  
Monroe County.

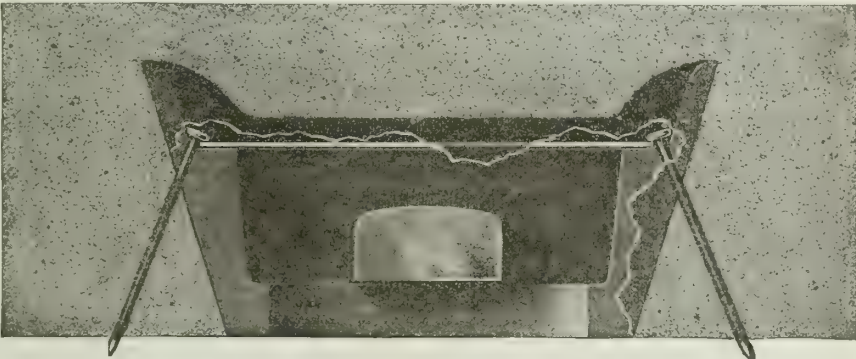


FIG. 2. "WRIALCO" INSERT EMBEDDED IN CONCRETE  
For  $\frac{3}{8}$ -,  $\frac{7}{16}$ -,  $\frac{1}{2}$ -,  $\frac{5}{8}$ -,  $\frac{3}{4}$ - and  $\frac{7}{8}$ -in. nuts

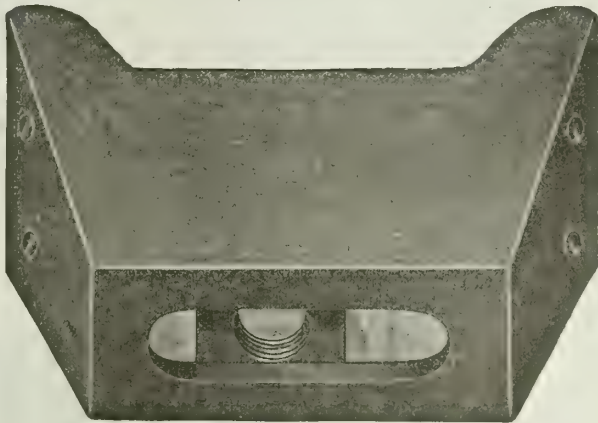


FIG. 3. PERSPECTIVE VIEW OF HANGER

Also shows nut to which rod or bolt is attached and the adjustment feature. Rod or bolt can be made rigid at any point of adjustment desired. This is an important feature in the necessary straightening up of the lines of piping

# THE W. J. CLARK COMPANY

Manufacturers of Joist and Timber Hangers

SALEM, OHIO

## Products.

"LANE" PATENT WROUGHT STEEL JOIST or TIMBER HANGERS, POST CAPS, BASES and WALL BOXES.

Bar, Plate and Sheet Metal Products, including Elevator Buckets, Factory Furnishings of all kinds, Lockers, Shelving, Pressed Steel Wheels, Couplers for air, steam, gas or water hose, Ideal Umbrella Holders for schools, churches, halls, etc., and Special Steel Work to order.

## Co-operative Service and Information.

In order to aid the architect in drawing up specifications for construction work, this company has published a very valuable pamphlet, No. 29, which will be mailed on request. A small model of the hanger will also be sent, if desired.

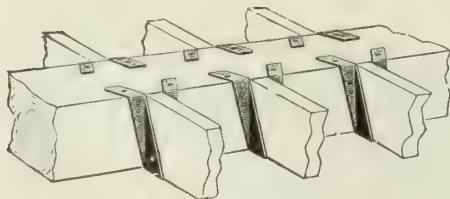
Pamphlet 29, besides amply illustrating and describing the hanger, contains tables of dimensions, estimated safe load strength, weight, actual load on hanger, etc., much of which matter is not in print elsewhere. The convenience of these reference tables warrants keeping the pamphlet handy.

In addition to the accompanying illustrations, the pamphlet shows many others, namely:

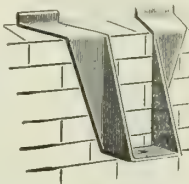
- Fig. 90 Reducer
- Fig. 91 For Concrete
- Fig. 92 Diagonal, Right or Left
- Fig. 93 Rafter, Right or Left
- Fig. 94 Wall Plate
- Fig. 95 For Concealed Spiking
- Fig. 281 Comb made Central
- Fig. 282 Hip Comb made Central
- Fig. 789 Diagonal made Central
- Fig. 1022 Hooks Forward for Spiking to Ceiling
- Fig. 1059 For Hanging Angle Timbers to Another
- Fig. 1111 For Hanging one Timber under Another

## Construction of Hangers.

Wrought steel of best structural grade used. Is shaped, while hot, to preserve strength. Width and thickness uniform throughout design. Each size made in regular, medium and heavy weight, and kept in stock. Metal in each hanger size gauged in width and thickness to secure correct proportion between

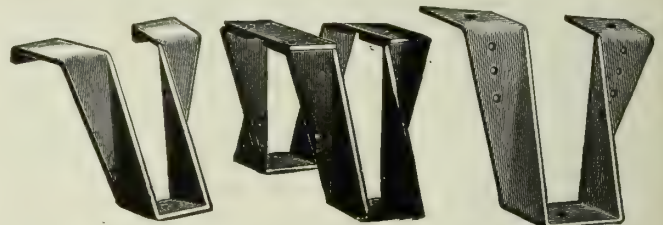


APPLICATION OF "LANE" PATENT JOIST HANGER  
Showing flat fit of all surfaces



STYLE B, "LANE" PATENT JOIST HANGER

bearing area and load. Any shape and size made to order.



Style D Joist Hanger Style E  
"LANE" PATENT JOIST HANGERS

Size of hanger	Thickness and width of steel in hanger	Estimated safe load of hangers	Actual load at which timber and hanger began to yield
2 x 8	No. 14 = $\frac{5}{64}$ x 2	3,905 lbs.	12,000 lbs.
2½ x 12	No. 12 = $\frac{7}{64}$ x 3	8,202 lbs.	16,000 lbs.
3 x 12	No. 12 = $\frac{7}{64}$ x 3	8,202 lbs.	16,000 lbs.
4 x 9	No. 11 = $\frac{1}{8}$ x 2½	7,030 lbs.	16,000 lbs.
4 x 14	No. 10 = $\frac{9}{64}$ x 3½	12,302 lbs.	20,000 lbs.
6 x 12	No. 7 = $\frac{3}{16}$ x 3	14,062 lbs.	30,000 lbs.
8 x 10	No. 7 = $\frac{3}{16}$ x 2½	11,717 lbs.	25,000 lbs.
10 x 10	No. 5 = $\frac{3}{32}$ x 2½	13,670 lbs.	30,000 lbs.
10 x 14	No. 3 = $\frac{1}{4}$ x 3½	21,875 lbs.	50,000 lbs.

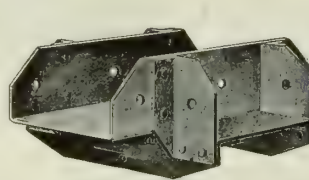
The hanger showed no sign of breakage in any test.

## Post Caps.

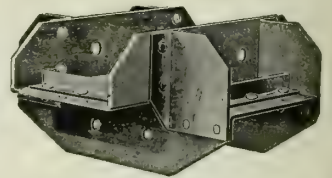
Regular post caps made in one-, two-, three- and four-way.

Each channel part supports its girder load without assistance from other parts, and the riveting of the side plates of the side girder seats is not depended on to carry the girder load.

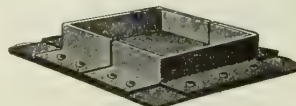
Medium and heavy post caps are extra heavy; the sides of the lower channel are bolted instead of spiked to the post. The girder anchorage is self-releasing, in case of fire.



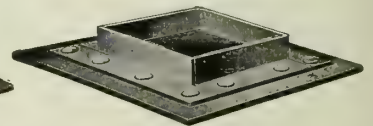
REGULAR FOUR-WAY POST CAP



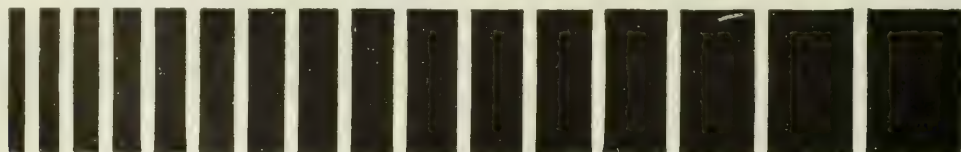
MEDIUM AND HEAVY POST CAP



Regular Style  
"LANE" PATENT WROUGHT STEEL POST BASE



Heavy Style



14 12 11 10 9 8 7 6 5 3 2 1 0 000 00000 0000000  
FULL SIZE THICKNESSES OF THE VARIOUS GAUGES OF STEEL IN "LANE" PATENT HANGERS



# THE DUPLEX HANGER CO.

GENERAL OFFICE AND WORKS

East 53rd Street and Lakeside Avenue

CLEVELAND, OHIO

BRANCH OFFICES

NEW YORK, 16 Warren Street  
PHILADELPHIA, 305 North 15th Street

CHICAGO, 16 North Jefferson Street  
BOSTON, 88 Broad Street

## Products.

We are the sole manufacturers of the "DUPLEX" JOIST, WALL and I-BEAM HANGERS; "DUPLEX" POST CAPS, POST BASES, WALL PLATES and WALL BOXES, both in Steel and Malleable Iron, for use in heavy mill construction, warehouses and factory buildings as well as in ordinary joist constructed buildings.

The "Cleveland" Galvanized Wall Ties and Snow Guards; "Duplex" Concrete Inserts.

## Indorsement.

"Duplex" hangers and post caps are recognized by architects and builders as the standard. Indorsed by the building commissioners of the large cities and approved by the National Board of Fire Underwriters. Insurance credit is given where "Duplex" is used.

## Specifications.

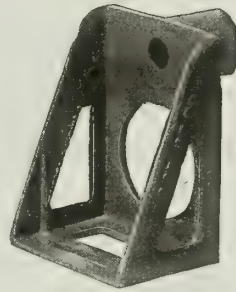
If architects and engineers will, when specifying hangers and post caps, mention the name "Duplex," the proper hangers and caps for the timbers will be furnished. "Duplex" hangers and post caps are designed with a large factor of safety to carry the timbers for which they are intended.

## Catalogue.

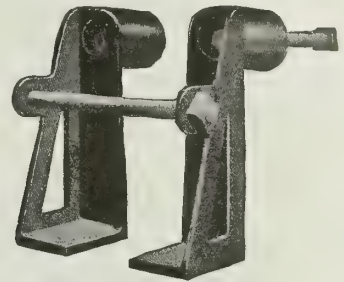
The latest catalogue, Edition No. 17, contains full information relative to "Duplex" line, and also valuable engineering information.

## Reference.

List of installations furnished on request.



"DUPLEX" JOIST HANGER



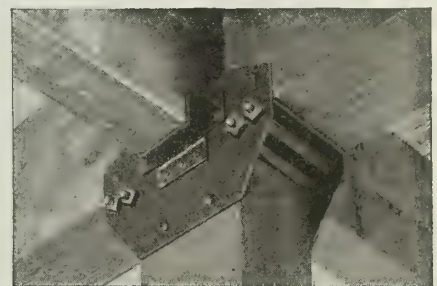
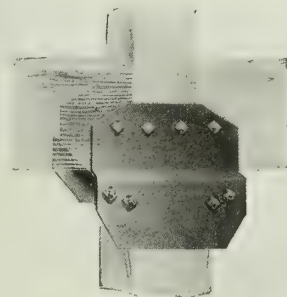
"DUPLEX" JOIST HANGER  
For very heavy mill construction



"DUPLEX" WALL HANGER

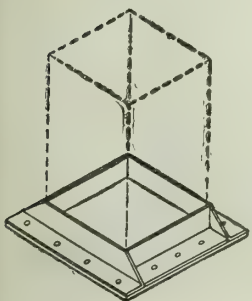


"DUPLEX" EXTRA HEAVY WALL HANGER

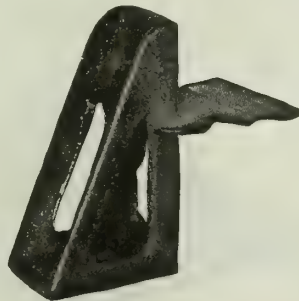


"DUPLEX" STEEL POST CAPS

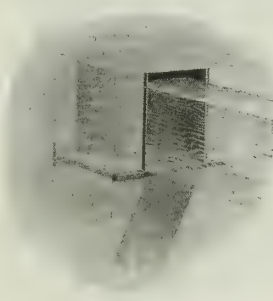
For one-, two-, three- or four-way to suit any framing



"DUPLEX" STEEL POST BASE



"DUPLEX" CONCRETE BLOCK WALL HANGER



"DUPLEX" WALL BOX



UNDERWRITERS' LABEL

# THE VAN DORN IRON WORKS COMPANY

Manufacturers of Post Caps and Joist Hangers

CLEVELAND, OHIO

## Products.

STEEL POST CAPS and POST BASES.

STEEL JOIST HANGERS.

Steel Wall Hangers, Cement Block Hangers, Double Hangers, I-beam Hangers, Wall Boxes and Anchors, Wall Plates, Wall Plugs, Floor Plugs.

For Metal Furniture, see page 1428; for Steel Jail Equipment, see page 1489.

## Description of Standard Post Caps.

STEEL POST CAPS—Van Dorn standard steel post caps have a girder carrying channel, 6 ins. deep, made of  $\frac{5}{16}$ -in. mild steel plate. The overhang of 6 ins. is reinforced by the riveted leg of the angle, which forms a closed socket fitting around the post.

BLUE PRINTS—Prints showing exact details of the separate designs of Van Dorn post caps are available.

Write for these details, which attest the desirability of Van Dorn material.



UNDERWRITERS' LABEL

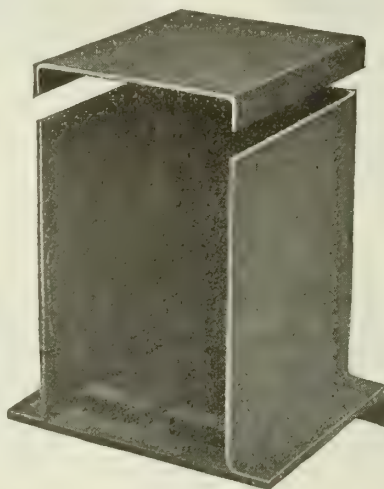
## Capacity of Post Caps.

Van Dorn post caps possess assured carrying capacity. A cap identical in design with those illustrated, and of standard stock material, carried a sustained load of 150,000 lbs. in test at Case School of Applied Science. Other tests substantiate this load.

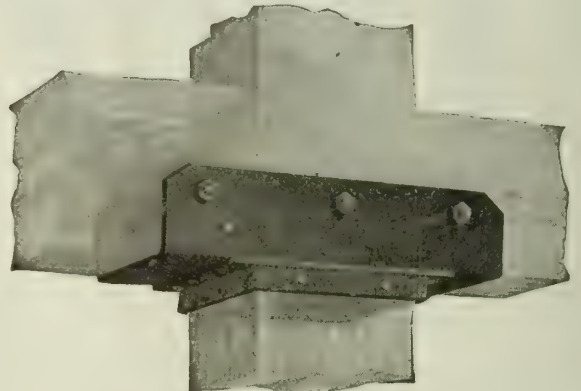
Approved by the National Board of Fire Underwriters (permitting reduced insurance) and the Building Departments of the larger cities.

## Steel Wall Box.

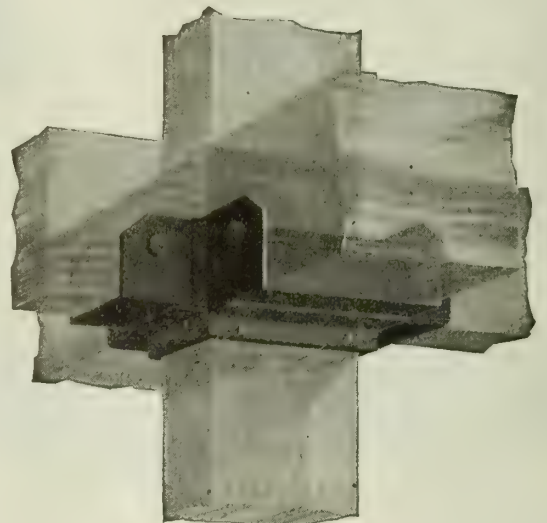
Van Dorn steel wall box, as shown, has a close fitting cover, ample anchorage at back of box; timber is self-releasing and provides for ventilation around beam.



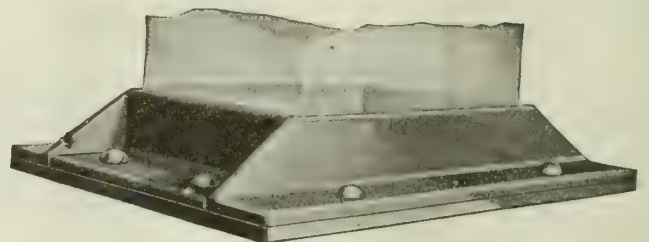
STEEL WALL BOX



TWO-WAY CAP



FOUR-WAY CAP

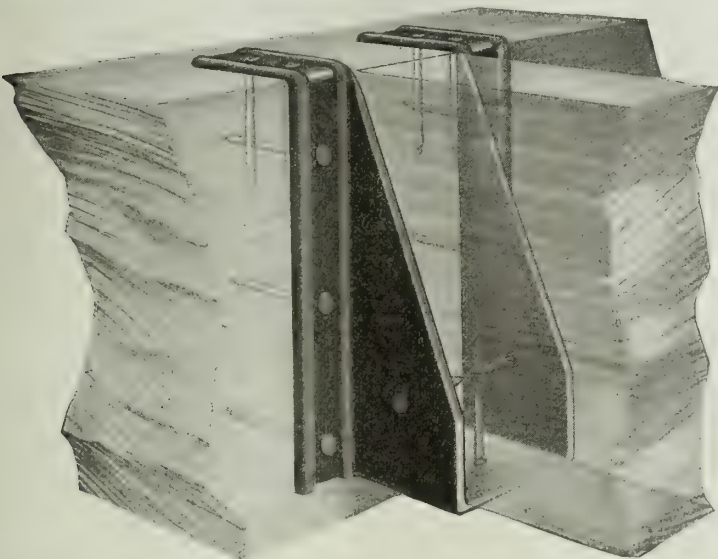


POST BASE



Description of Hangers.

No. 1, OR REGULAR HANGER—The side flanges are wrought with a groove and ridge, the ridges serving as additional strength, especially at the angle of the prong where the severe strain comes. The groove allows the spike head to come level with the ridge, giving an attractive appearance. The spikes have a great carrying capacity and also serve to hold joist and headers together so that season cracks will not affect the strength.



NO. 1 HANGER

DETAILS REGULAR HANGER No. 1

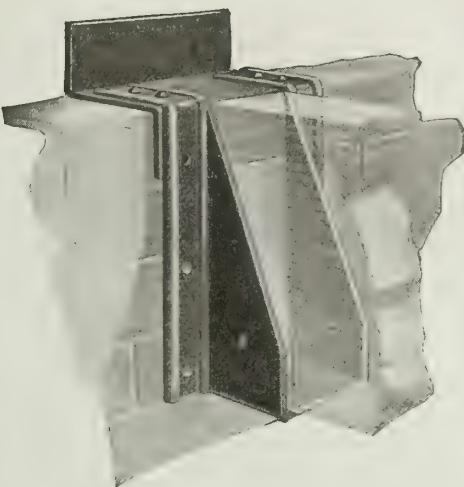
Size of hanger width all depths	Length of prong	Width of prong	Width of seat	Thickness of metal in seat
2 ins.	2 ins.	1½ ins.	3 ins.	⅛ in.
3 ins.	3 ins.	1½ ins.	3 ins.	⅛ in.
4 ins.	4 ins.	1½ ins.	3 ins.	⅛ in.
5 ins.	4 ins.	1½ ins.	3 ins.	⅛ in.
6 ins.	4 ins.	1½ ins.	3 ins.	¼ in.
8 ins.	5 ins.	2 ins.	3½ ins.	¼ in.
10 ins.	5 ins.	2 ins.	3½ ins.	¼ in.
12 ins.	5 ins.	2 ins.	3½ ins.	⅜ in.

ADAPTATIONS—No. 1 Hanger is readily adapted to the production of different styles for a variety of purposes, by riveting bent plates of the desired shapes to the No. 1 Hanger, as shown in illustrations following.

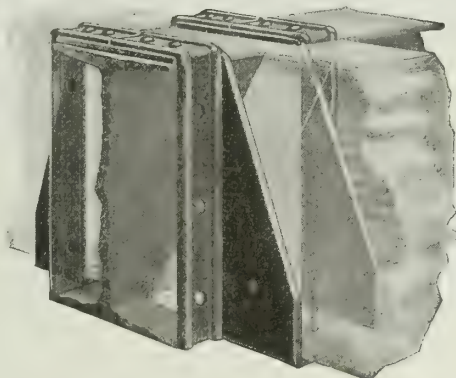
Materials and Guarantee.

The steel employed is the best obtainable. Every bar is subject to both surface and analysis inspection; and the construction is such that the best results can be obtained from any section of material.

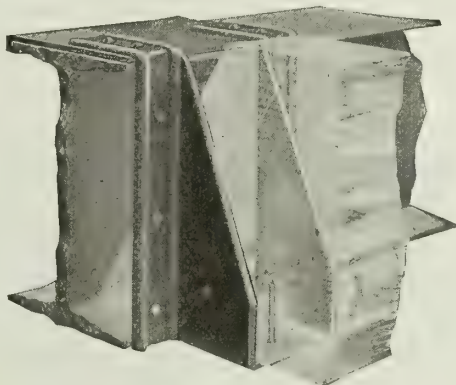
All goods are guaranteed to be first class and “just as represented,” and will be replaced if found to be defective.



NO. 4 WALL HANGER



NO. 6 DOUBLE HANGER



NO. 7 I-BEAM HANGER  
(Hooking over flange of back)

Catalogue.

Catalogue No. 82 gives valuable information regarding the design and relative carrying capacity of Van Dorn material.

This catalogue and supplements furnished on request.

# THE IDEAL HANGER COMPANY

1270 East 53d Street  
CLEVELAND, OHIO

## Products.

"IDEAL" STEEL JOIST HANGERS, WALL HANGERS,  
POST CAPS, POST BASES.

Wall Plates, Wall Boxes, Building Anchors, Wall  
Ties, Concrete Inserts.

## Application.

The "Ideal" hangers are made of open hearth steel bars, and so formed that the hanger fits flat against the timber. This permits spikes or lag screws to fasten the hanger to the timber and gives the advantage of holding the hanger close to the girder, increasing the carrying capacity of the hanger.

Double hangers are made by riveting single hangers to straps as shown.

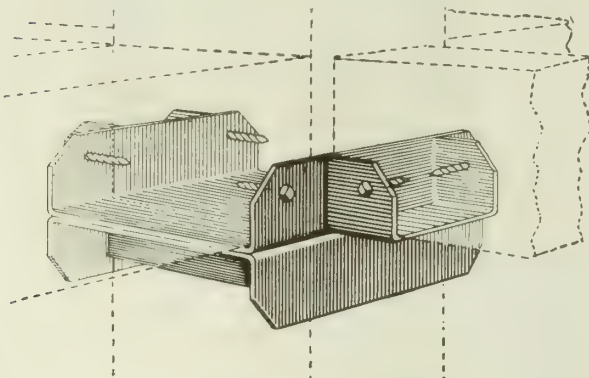
"Ideal" steel post caps require no expensive framing as they are set directly on the post and carry 1-, 2-, 3- or 4-way construction as required.

## Stock.

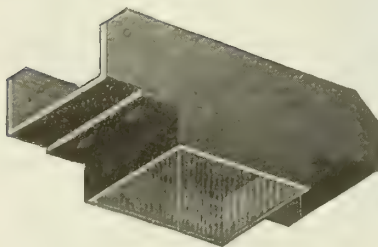
"Ideal" joist hangers, post caps and bases are standard construction, and every size is carried in stock for immediate shipment.

## Catalogue.

Catalogue "F" gives list prices and information.



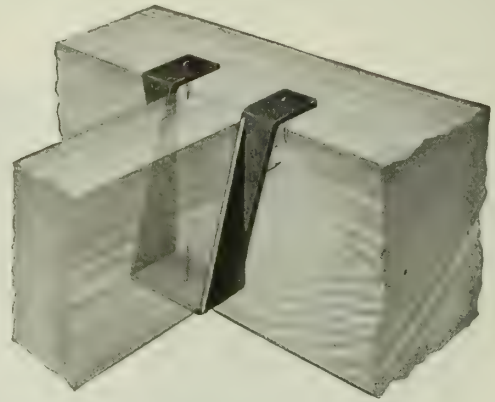
"IDEAL" STEEL POST CAP  
Showing 3- or 4-way construction



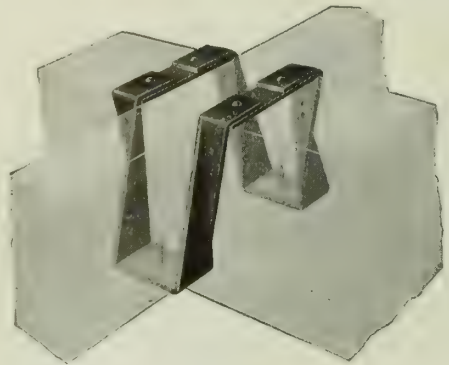
"IDEAL" STEEL POST CAP, NO. 2



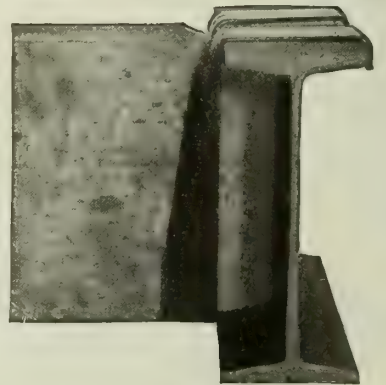
UNDERWRITERS' LABEL



"IDEAL" SINGLE HANGER, STYLE "A"



"IDEAL" DOUBLE HANGER, STYLE "B"



"IDEAL" SINGLE HANGER, STYLE "C"



# THE BESSLER MOVABLE STAIRWAY CO.

AKRON, OHIO

## Product.

The BESSLER CEILING-SUSPENDED FOLDING STAIRWAY.

## Description.

The Bessler ceiling-suspended folding stairway is designed to give convenient access to attics, lofts, roofs, etc., with maximum economy in floor space.

It consists of a strong, well built flight of stairs, which is indirectly hinged to the end trimmer of opening in the ceiling beneath the room or other place to be reached.

This stairway is so counterbalanced by its own weight and by spring wound cables, that a slight push is all that is necessary to swing it up through the ceiling opening and out of the way when not required. When needed again, a light pull on a suspended chain brings the stairway down easily, complete with hand rail, ready for use.

A child can operate it.

The neatness with which opening in ceiling is closed by hinged panel on which stairway slides when not in use, the ease in operation, the effective economy in floor space and the simplicity of the whole arrangement are the essential features which should commend this stairway to the architect.

## Adaptability.

The Bessler stairway is adapted for (1) service in connection with attics, lofts or storage floors; (2) a fire escape when arranged from porch to porch; (3) a stairway to roof gardens and church steeples; (4) bungalows, garages, schoolhouses and hospitals.

It is also of advantage for installations where this stairway arrangement provides not only an economical means of access, but also offers opportunity for ready ventilation of rooms not frequently used.

It does not occupy a single square inch of floor space when not in use.



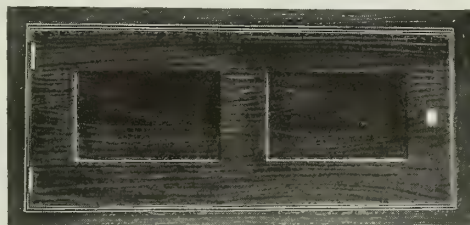
INTERIOR OF BUNGALOW SHOWING BESSLER STAIRWAY  
A room, otherwise inaccessible, was thus virtually added to this bungalow

## Further Details.

Complete data will be furnished any architect on request. This company furnishes handy tables showing the correct measurements and distances required in figuring plans. Explicit directions for installing accompany every stairway.



BESSLER STAIRWAY OPEN



CEILING PANEL, STAIRWAY FOLDED



BESSLER STAIRWAY FOLDED INTO CEILING  
Out of the way; no waste floor space

PRICES, F. O. B. AKRON, OHIO

Ceiling	Pine	Oak	Ceiling	Pine	Oak
7 ft. 0 ins. ....	\$45.00	\$48.00	10 ft. 0 ins. ....	\$49.00	\$52.00
7 ft. 6 ins. ....	45.00	48.00	10 ft. 6 ins. ....	49.00	52.00
8 ft. 0 ins. ....	47.00	50.00	11 ft. 0 ins. ....	51.00	54.00
8 ft. 6 ins. ....	47.00	50.00	11 ft. 6 ins. ....	51.00	54.00
9 ft. 0 ins. ....	47.00	50.00	12 ft. 0 ins. ....	51.00	54.00
9 ft. 6 ins. ....	49.00	52.00			

# THE SAMUEL J. CRESWELL IRON WORKS

Twenty-third and Cherry Streets  
PHILADELPHIA, PA.

## Products.

ARCHITECTURAL WROUGHT and CAST IRON WORK, and GENERAL FOUNDRY WORK, including Columns, Spiral Stairs, Wheel Guards, Lamp Brackets and Standards, Manhole Doors and Frames, Roadway Drain Grates and Frames, Vault Plates and Frames, Ash Pit Doors and Frames, Trench Covers and Frames, Cess-pools, Drain Gutters, Pavement Doors, Gates and Grilles, Post Caps, Elevator Enclosures, Railings, etc.

## Facilities.

THE SAMUEL J. CRESWELL IRON WORKS is one of the largest and best equipped plants in the vicinity of Philadelphia for the production of the various kinds of architectural wrought and cast iron work mentioned above. Further, this company is prepared to submit estimates, or designs and estimates, for any ornamental work for large or small buildings, etc., on short notice.

## General Foundry Work.

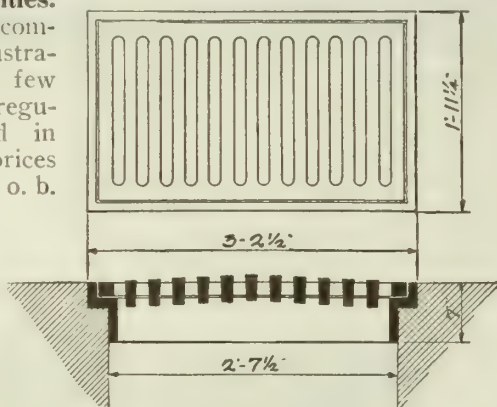
In addition to architectural work, a fully equipped foundry is prepared to produce special castings and do general foundry work, including cast iron ornamental or plain columns from stock designs (sent on request) or to architects' designs.

## Stock Specialties.

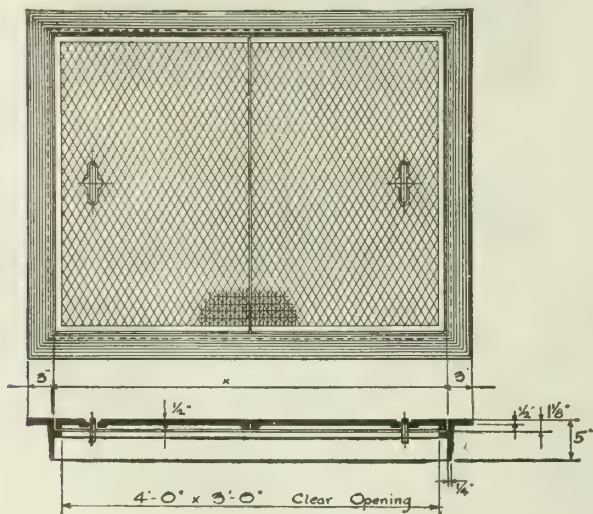
The accompanying illustrations show a few specialties regularly carried in stock. The prices quoted are f. o. b. Philadelphia.

## Catalogue.

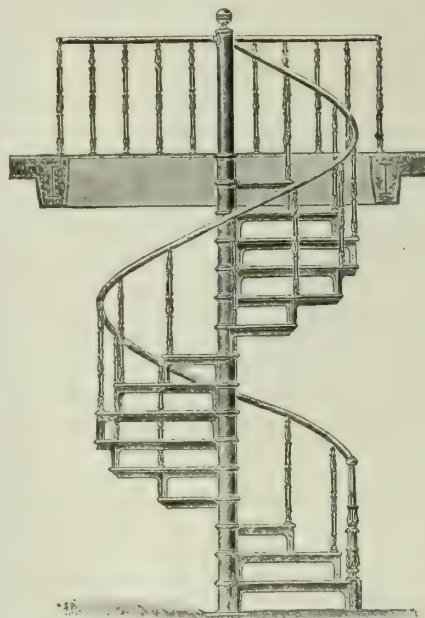
A catalogue illustrating the entire line, and discounts will be sent on request.



NO. 3 SEWER INLET  
Price, \$22.00



NO. 34 MANHOLE COVER  
Price, \$35.00. Extra heavy pattern, price, \$55.00



SPIRAL STAIRWAY

Following sizes stock pattern 3'6", 4', 4'6", 5', 5'6" and 6' diameters. Any height.



NO. 1

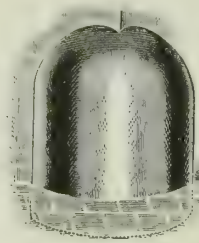
LAMP STANDARD  
Price, \$90.00



NO. 15 FENDER  
9" projection  
3' 5" high

Wall	Price
9"	\$12.00
13"	13.50
18"	18.00
22"	19.00
24"	24.00

Can be made for  
walls to 36 ins.  
thick

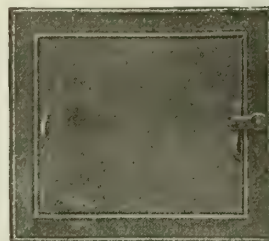


NO. 22 FENDER

Pro- jection	High	Price
8"	1' 6"	\$7.50
8"	1' 9"	8.00
8"	11"	5.00
5"	1' 9"	5.00
6"	2' 1"	7.50
6"	1' 2"	5.50
7 3/4"	1' 6"	7.50
8 1/2"	1' 9"	8.50
9"	1' 6"	8.00
9 1/4"	1' 7"	9.00

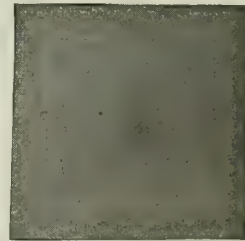


NO. 201  
LAMP  
BRACKET  
Price, \$30.00



NO. 7 ASHPIT DOOR  
AND FRAME

Opening	Price
10" x 12"	\$1.75
8" x 10"	1.50
6" x 8"	1.25
4" x 6"	1.00



NO. 9 ASH DUMP FOR  
FIREPLACES

Opening	Price
6" x 6"	\$1.25
6" x 8"	1.50

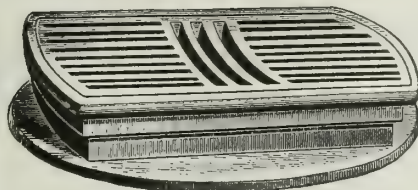




NO. 1 MANHOLE DOOR AND FRAME

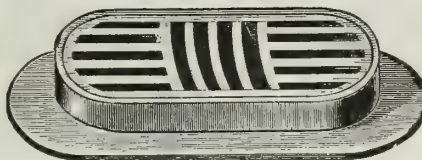
Width	Height	Price	Width	Height	Price
36"	72"	\$70.00	24"	30"	\$11.75
36"	36"	30.00	24"	24"	11.00
33"	49"	30.00	20"	24"	10.00
24"	48"	20.00	18"	24"	8.50
24"	36"	12.50			

All manhole doors and frames have return flanges 4 ins. deep



NO. 10 ROADWAY DRAIN GRATE AND FRAME

13 1/4" x 24 1/2" grating.....	\$7.00
12" x 18" grating.....	6.00



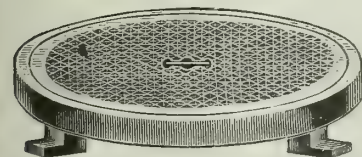
NO. 11 ROADWAY DRAIN GRATE AND FRAME

11" x 22 1/2" grating.....	\$6.00
8 1/4" x 17 1/4" grating.....	4.00



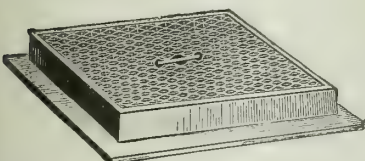
NO. 3 MANHOLE DOOR AND FRAME

Width	Height	Price	Width	Height	Price
24"	24"	\$11.00	16"	20"	\$7.25
18"	33"	10.00	16"	10"	4.50
18"	24"	8.50	12"	16"	4.50
18"	18"	7.50	12"	12"	4.00
16"	24"	8.00	12"	10"	3.50
			12"	8"	2.50

NO. 1 VAULT PLATE AND FRAME;  
NO. 2 VAULT GRATINGS AND  
FRAME

Size	Price
14".....	\$3.00
16".....	3.25
18".....	5.00
20".....	6.50
24".....	8.75
36".....	20.00

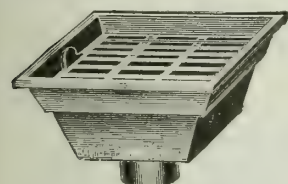
Depth of frame, 3 ins.

NO. 7 VAULT PLATE AND FRAME;  
NO. 8 VAULT GRATING AND  
FRAME

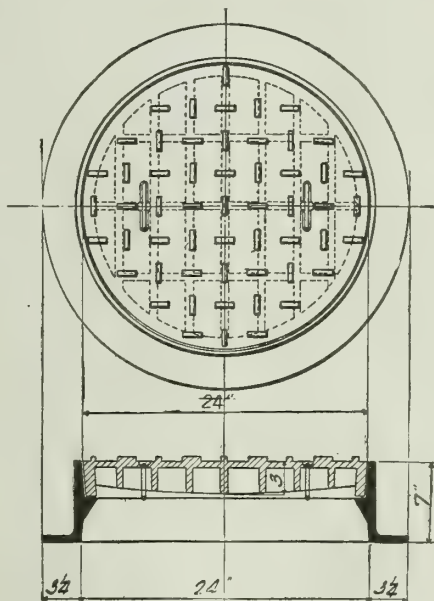
Size	Price	Size	Price
36" x 36"	\$27.00	7 1/2" x 7 1/2"	\$2.00
30" x 30"	18.00	14" x 24"	7.00
24" x 24"	10.00	18" x 24"	8.50
20" x 20"	8.50	18" x 30"	10.00
18" x 18"	7.50	18" x 36"	12.50
16" x 16"	6.50	24" x 30"	13.50
12" x 12"	3.00	24" x 36"	18.00
		24" x 42"	20.00
		24" x 48"	25.00

Depth of frame, 3 ins.

All sizes can be made extra heavy at additional cost

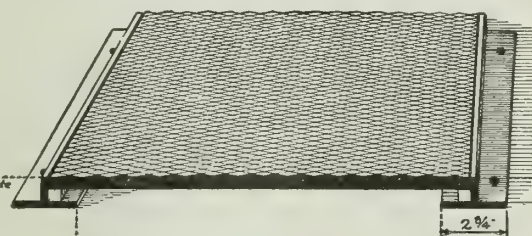
NO. 23 CESSPOOL  
13" x 13", 4-in. outlet  
Price, painted..... \$3.00

SWEET'S CATALOGUE



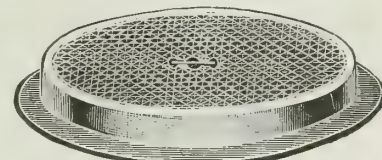
NO. 19 MANHOLE COVER

Extra heavy for city use.....	\$17.00
With concrete or asphalt filled cover.....	22.00



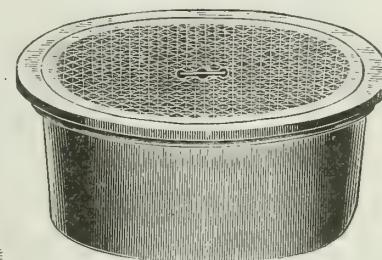
COVER AND CURBING FOR DUCTS OR TRENCHES

Plates made to suit conditions. Curbing carried in stock.  
Prices on application

NO. 3 VAULT PLATE AND FRAME;  
NO. 4 VAULT GRATING AND  
FRAME

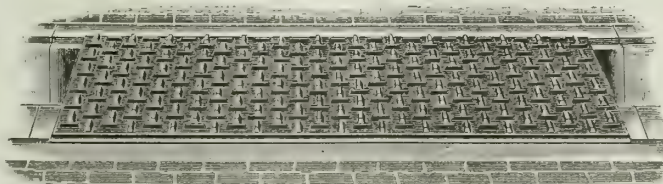
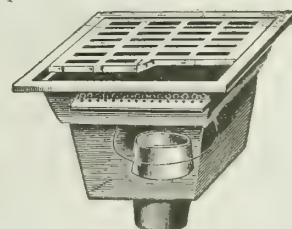
Size	Price
16".....	\$5.00
18".....	6.00
20".....	7.00
24".....	9.50
30".....	22.00
34".....	25.00

Depth of frame, 3 ins.

NO. 5 VAULT PLATE AND FRAME;  
NO. 6 VAULT GRATING AND  
FRAME

Size	Price
14".....	\$4.00
18".....	7.25
20".....	9.00
24".....	10.00
30".....	15.00
36".....	30.00

Depth of frame, 9 ins.

NO. 28 GUTTER COVER PLATE  
18" wide, 1" thick, \$3.00 per lineal ft.  
24" wide, 1 1/2" thick, \$6.00 per lineal ftNO. 22 BELL TRAP CESSPOOL  
16" x 16", 4-in. outlet  
Price .....\$5.00



# PIERRE DUVINAGE

Manufacturer of Spiral Stairs and Iron and Steel Work for Buildings

TELEPHONE:  
BARCLAY 6319

253 Broadway  
NEW YORK, N. Y.

## Products.

DUVINAGE IRON SPIRAL STAIRS, POST CAPS, WALL PLATES, PIER PLATES and BRACKETS, SILL PLATES, WOOD ROOF TRUSS CASTINGS and RODS.

All types of Iron and Steel Work, including:

Steel Trusses, Trussed Girder Rods and Struts, Cast Iron Columns, Bases and Plates, Wheel Guards, Jamb Guards, Saddles or Sills, Shutter Eyes, Cast Iron Clean-out Doors, Trap Pit Covers.

Wrought Iron Fire Escapes, Balconies, Railings, Wire Fences, Pipe Railing, Door and Window Guards, Area Gratings, Sheet Steel Shutters and Doors.

Steel Stairs; Special Castings; Special Iron and Steel Fittings for sewage disposal plants, water works and powerhouses; Revolving Domes for astronomical observatories.

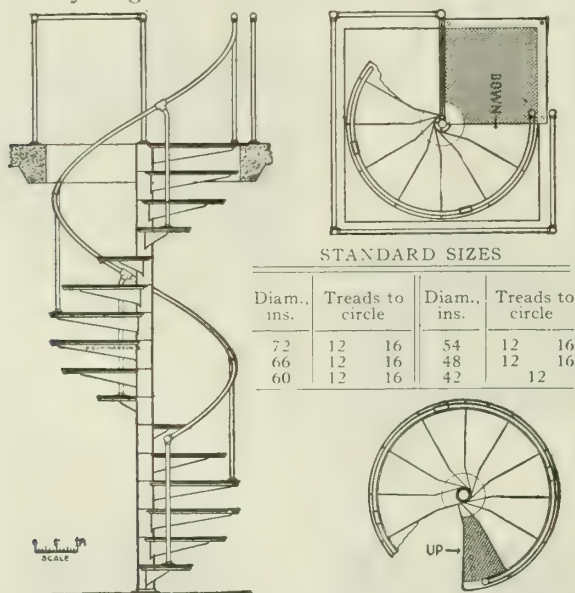
Ornamental Iron Work and Structural Steel.

## Duvinage Iron Spiral Stairs (Patented Feb. 13, 1917).

Duvinage spiral stairs have been erected and approved for their simple, durable construction as well as their economy in floor space, in offices, stores, mezzanines, boiler rooms, sewage disposal pumping wells, power plants, gas houses, water towers, etc.

They are made of the best grade of iron; have single 1-in. pipe railing on stairs and around well; and center pipe is 3 or 4 ins., according to size and height of stairs.

The regular stock treads of these stairs are made so that they can be used either right or left hand (illustration shows right hand) and 12 or 16 treads to the circle, as tabulated. Modifications in riser heights are affected by height between floors.



ELEVATION AND PLANS OF PIERRE DUVINAGE SPIRAL STAIRS

To provide sufficient headroom under top platform, the risers should not be less than  $8\frac{1}{4}$  ins. high. By calculating the number of risers required, the relative positions of starting and landing points can be determined, so as to decide whether a right or left hand stair would be best suited.

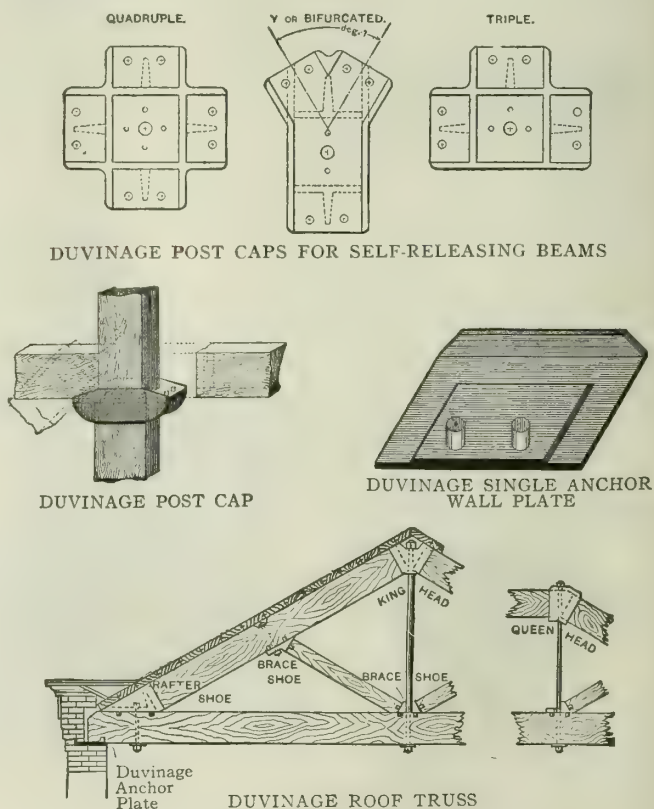
Prices, catalogue and further information on application. In ordering, give diameter, distance between floors, starting point and position of landings desired.

REFERENCES—Among the many purchasers of Duvinage spiral stair may be mentioned:

Consolidated Gas Co., Boiler House, Highbridge, N. Y.  
125th Street Theater, New York, N. Y.  
J. C. Greenleaf, Architect, Farm Building, Lenox, Mass.  
Army Department U. S. Government, Storage Building, Mill Rock, East River, New York, N. Y.  
Sterling Piano Co.'s Building, Gust. Ericsson, Contractor, Brooklyn, N. Y.  
City of Albany, N. Y., Sewage Disposal Plant  
Lehigh Valley R. R., Pier 44, East River, New York, N. Y.  
Department of Health, City of New York, Otisville, N. Y.  
Lackawanna Railroad, Signal Tower, Buffalo, N. Y.  
Wm. Flanagan, Contractor, Store, 430 Pearl Street, New York, N. Y.  
Vacuum Oil Co., Powerhouse, Paulsboro, N. J.  
Southern Cotton Oil Co., Factory, Bayonne, N. J.  
Architectural League of New York, N. Y.  
Henry-Wright Manufacturing Co., Hartford, Conn.  
Brooklyn Rapid Transit Substation, Ridgewood, Brooklyn, N. Y.  
Cosmopolitan Club, 133 East 40th Street, New York, N. Y.  
Hotel Woodstock, 127 West 43d Street, New York, N. Y.  
Thompson & Binger, Syracuse, N. Y.  
Bullard Machine Tool Co., Bridgeport, Conn.  
Kings County Courthouse, Frank Quinby, Architect, Brooklyn, N. Y.

## Duvinage System of Anchoring.

The Duvinage system for anchoring of buildings consists of post caps, wall plates, pier plate, pier brackets, sill plates and roof truss castings having projecting hubs which fit into holes bored in beams.





# CENTRAL ARCHITECTURAL IRON WORKS

3105-3111 West 27th Street  
CHICAGO, ILL.

## Products and Service.

ORNAMENTAL and MISCELLANEOUS IRONWORK for BUILDINGS, specializing in FIREPROOF STAIRS, PRESSED STEEL TREADS and RISERS and other BENT SECTIONS.

This company installs work throughout the country; also sells to manufacturers.

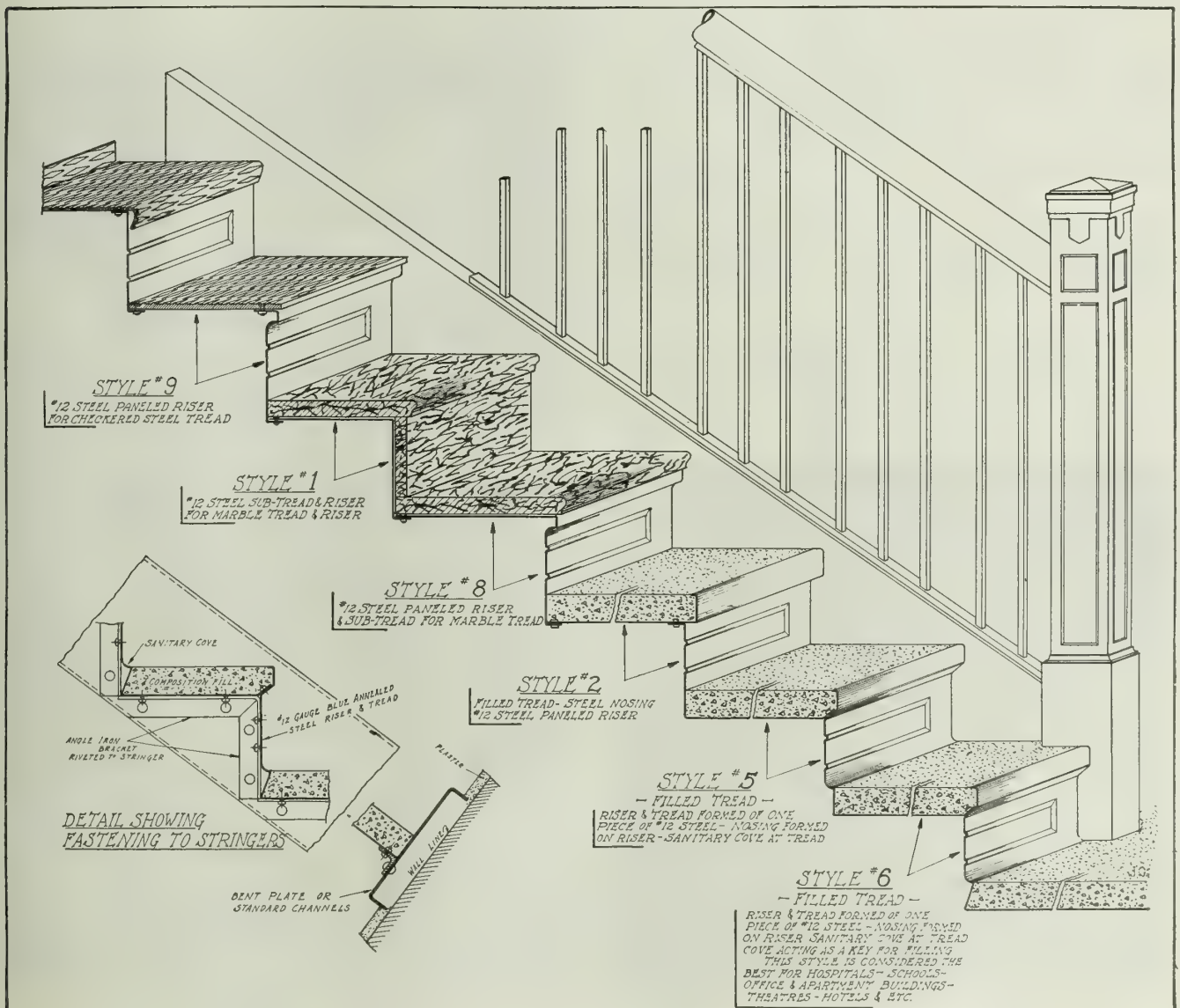
## Advantages.

"Centrals" patented steel and composition constructed stairs have been accepted as the most perfect type of fireproof steel constructed stairs in the market and are being specified by architects throughout the United States.

They have been found to be cheaper than cast iron, more durable and do not have the irregularities of cast iron.

## Installations.

Brede Building, Chicago, Ill.  
Brewer Building, Chicago, Ill.  
Cook County Hospital, Chicago, Ill.  
Equitable Building, Chicago, Ill.  
Franklin Building, Chicago, Ill.  
Fuchs Theater, Chicago, Ill.  
Holy Trinity School, Chicago, Ill.  
Rialto Theater, Chicago, Ill.  
Ayers Building, Indianapolis, Ind.  
Bryant High School, Bryant, Ind.  
Court House, Danville, Ind.  
Lebanon Bank Building, Lebanon, Ind.  
First National Bank, Rock Island, Ill.  
Y. M. C. A., Galesburg, Ill.  
St. Mary's Hospital, Davenport, Iowa  
Emmanuel School, Dayton, Ohio  
Central Grades School, Warsaw, Ind.  
Columbia School, Hammond, Ind.  
Swaledale School, Swaledale, Iowa  
Dayton View School, Dayton, Ohio  
Dayton Pure Milk and Butter Co., Dayton, Ohio



DETAILS OF "CENTRALS" PATENTED STEEL AND COMPOSITION CONSTRUCTED FIREPROOF STAIRS

# SEXAUER & LEMKE, INC.

Ornamental Iron Work, Steel Stairs and Windows  
LONG ISLAND CITY, N. Y.

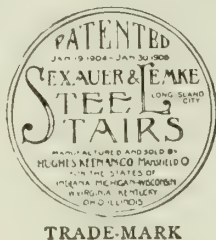
THE HUGHES-KEENAN CO.  
MANSFIELD, OHIO

FOR INDIANA, MICHIGAN, WISCONSIN, WEST VIRGINIA, KENTUCKY, OHIO AND ILLINOIS

## Products.

Manufacturers of ORNAMENTAL IRON WORK, including "S & L" PATENT FIRE-PROOF STEEL STAIRS, and STEEL FRAMES for Doors and Partitions.

Atlas Steel Sash and Frames; general Iron and Steel Staircase Construction; Iron Grilles, Railings, Entrance Doors, Marquises; Elevator Enclosures; Store Fronts; Gratings; Fire Escapes; Fur Racks for cold storage plants, etc.



to every type of public, office, warehouse, hospital, school and factory building construction.

It is formed, primarily, of rolled steel stringers and continuous bent plate steel risers and treads, securely bolted together as shown in line details herewith. The stairs can be furnished in any length and width, and the steps are bent from one sheet of steel,

according to height and depth of step.

The strings are formed with inward projecting flanges, on which the continuous riser and tread con-

## Facilities.

The plants are complete in every respect and equipped with the most modern types of machinery and tools, enabling this organization to meet promptly and efficiently all demands for their products.

## Co-operative Service.

The thoroughly equipped estimating and draughting departments are at the service of architects. Estimates and suggestive working details will be gladly submitted on request.

## Sexauer & Lemke ("S & L") Patent Steel Stair.

Simple, strong, rigid, exceptionally light and easily erected, this patented steel stair lends itself admirably



"S & L" STAIRCASE IN BOYS' DORMITORY, UNIVERSITY OF WOOSTER, WOOSTER, OHIO



"S & L" STAIRCASE IN APARTMENT BUILDING 1 LEXINGTON AVENUE, NEW YORK, N. Y.



struction rests, and to which the latter is bolted. The construction is firmly reinforced by tie rods, one to each step, which run under the nosing angles from stringer to stringer, as shown on this page. The fitting of the stairs between the stringers is so firm that the construction is practically watertight, before any paint is applied.

The assembled stair forms a mass which is practically free from vibration under loading stress, both vertically and sideways. This strength of construction, with its great resistance to torsional stress (see Test Reports), insures the highest limit of efficiency against damage or failure by fire.

DESIGN—The “ S & L ” stair can be built plain, or may be ornamented to any extent, to suit architectural requirements and design, with railings and newels to match. The risers may be plain, or paneled and ornamented; the treads can be arranged for either slate, marble, wood, cement, composition, ribbed steel, or safety treads of any manufacture. This permits of its adoption for any class of building requiring fireproof stairways.

For cement or composition treads, a patented nosing and re-entrant construction is provided, which forms a pocket or lock for the treads and provides a sanitary cove treatment to the risers.

See detail drawing below.

The soffits of stairs are left open for painting, and

present a neat finished appearance, but can also be arranged for plaster finish, if desired.

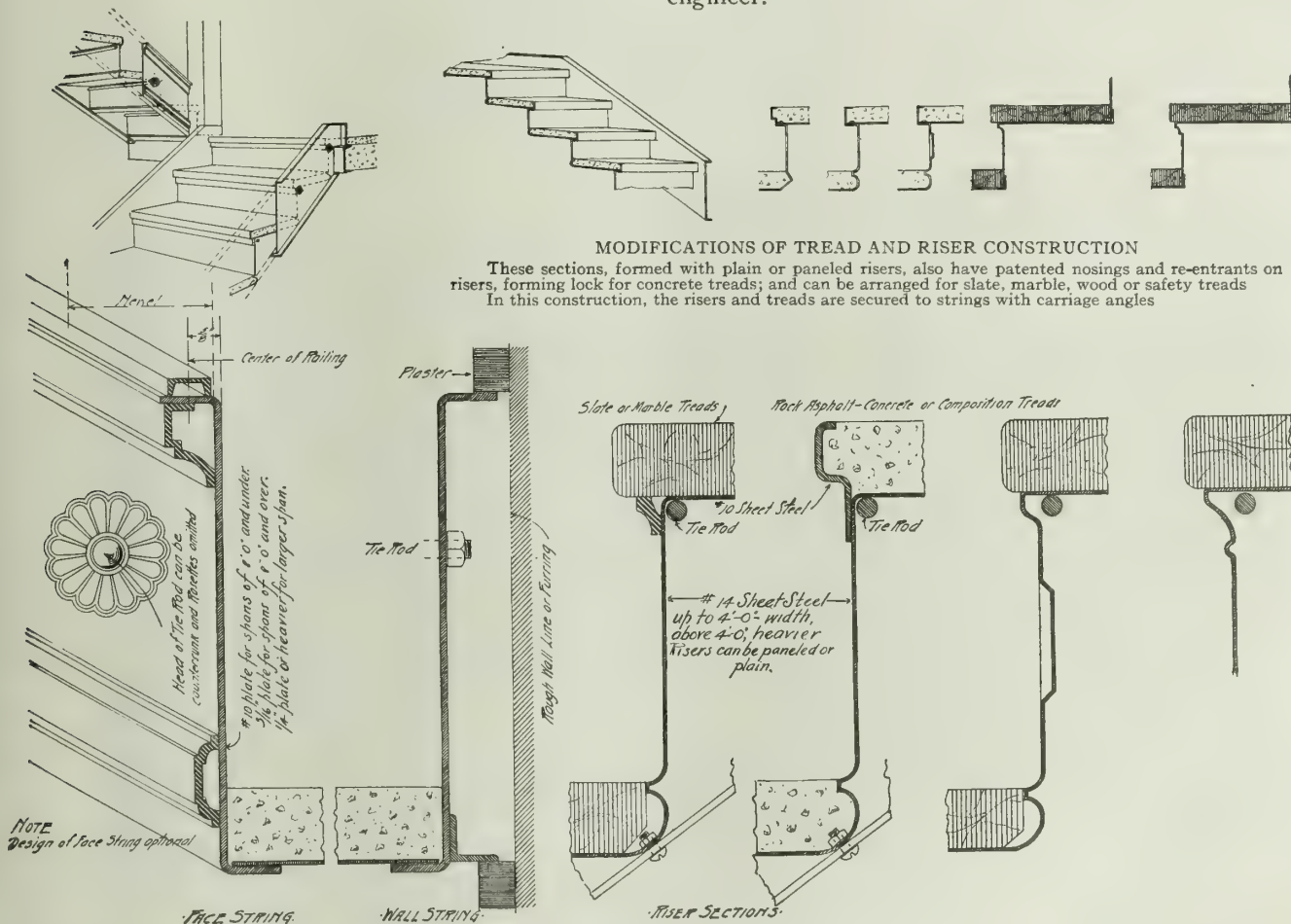
INSTALLATION—These stairs are particularly easy to erect, as each run is manufactured and shipped complete in itself, ready to set up. This feature insures quick and economical installation; and also permits of the stair being erected with the framework of the building, thus insuring immediate serviceableness, before the installation of the finish treads.

GENERAL COST AND ESTIMATES—This stairway, furnished complete with railing and newel (with concrete treads), is practically as low in cost as stairways of concrete construction with iron railings, and has the advantage of providing a neater and more durable installation. It permits, moreover, a saving in cost of structural supports, on account of special lightness.

The thickness of metal employed, depth of strings, and so forth, are governed by the size of stair, loading conditions and so on.

If general layout of stair together with memoranda of requirements is furnished, the estimating departments will be pleased to submit specifications and estimates.

TESTS—On the next page are given report and illustrations of tests on two “S & L” staircases under the supervision of an engineer from the New York Bureau of Buildings and this organization’s consulting engineer.



## DETAILS OF "S & L" STAIRCASES

NEW YORK, 39 Cortlandt Street,  
December 29th, 1908.

MESSRS. SEXAUER & LEMKE, INC.,

Astoria, L. I.

DEAR SIR:

I beg to report the results of the tests made by me with Mr. Schwartz of the Building Department on the two flights of your sheet steel stairs at your shop on December 21st.

The stairs were made from your drawings No. 1753 and No. 1754, which show clearly the dimensions and construction of the strings and risers.

Both flights were set up in the shop, supported at the bottom on the floor and at the upper end on vertical angle irons resting on the same floor and placed against the wall of the building. The strings were free and clear and received no support from a side wall, as is usually the case in actual practice.

The area of each tread was 2.8 square feet. In loading the stairs, 280 pounds of pig iron, by weight, were applied to each tread, beginning at the bottom and working up to the top, when the total load on the stairs was 100 pounds per square foot. This was repeated four times and then additional weights were applied, making the total load 470 pounds per square foot on one flight and 456 pounds per square foot on the other flight.

The load on the smaller, or 8-foot, flight was applied in the morning and left on for two hours. The load on the larger, or 12-foot, flight was applied in the afternoon, left on during the night and removed the next day about noon. In both flights the strings returned to their original condition after the load was removed, showing no permanent deflection.

#### STAIRS FROM DRAWING NO. 1753:

Horizontal span—8 ft.

Width of tread—3 ft. 6 ins.

String steel plate—12 ins. x  $\frac{1}{8}$  in., flanged top and bottom.

Stairs loaded to 100 lbs. per sq. ft. ....deflection  $\frac{1}{32}$  in.

Stairs loaded to 200 lbs. per sq. ft. ....deflection  $\frac{1}{16}$  in.

Stairs loaded to 300 lbs. per sq. ft. ....deflection  $\frac{3}{32}$  in.

Stairs loaded to 400 lbs. per sq. ft. ....deflection  $\frac{1}{8}$  in.

Stairs loaded to 470 lbs. per sq. ft. ....deflection  $\frac{9}{64}$  in.

Total Load 13,160 lbs.



METHOD OF TESTING FLIGHTS OF "S & L" STAIRCASES

Span of 8 ft. Test made at "S. & L." Works, on Dec. 21st, 1908, on two stairways, under supervision of an engineer from the New York Bureau of Buildings and our consulting engineer



METHOD OF TESTING FLIGHTS OF "S & L" STAIRCASES  
Span of 12 ft.

#### STAIRS FROM DRAWING NO. 1754:

Horizontal span—12 ft.

Width of tread—3 ft. 6 ins.

String steel plate—14 ins. x  $\frac{3}{16}$  in., flanged top and bottom.

Stairs loaded to 100 lbs. per sq. ft. ....deflection  $\frac{1}{32}$  in.

Stairs loaded to 200 lbs. per sq. ft. ....deflection  $\frac{3}{32}$  in.

Stairs loaded to 300 lbs. per sq. ft. ....deflection  $\frac{5}{32}$  in.

Stairs loaded to 400 lbs. per sq. ft. ....deflection  $\frac{7}{32}$  in.

Stairs loaded to 456 lbs. per sq. ft. ....deflection  $\frac{1}{4}$  in.

Total Load 19,175 lbs.

The loads to which these stairs were subjected were at least five times the live load which would ever come upon them in use, and the limit of loading which the stairs were capable of sustaining was not by any means reached in these tests, as was evident by their behavior while under load. They were very rigid and showed hardly any vibration either to vertical pressure or presume applied sideways, and the deflection was insignificant.

I would call attention to the construction of these treads and risers. These being made from one piece of sheet steel, and, being continuous, furnish excellent bracing horizontally to the strings, which are also further strengthened by the wrought iron mouldings, applied in such a way as to become a part of the top and bottom flange of the strings.

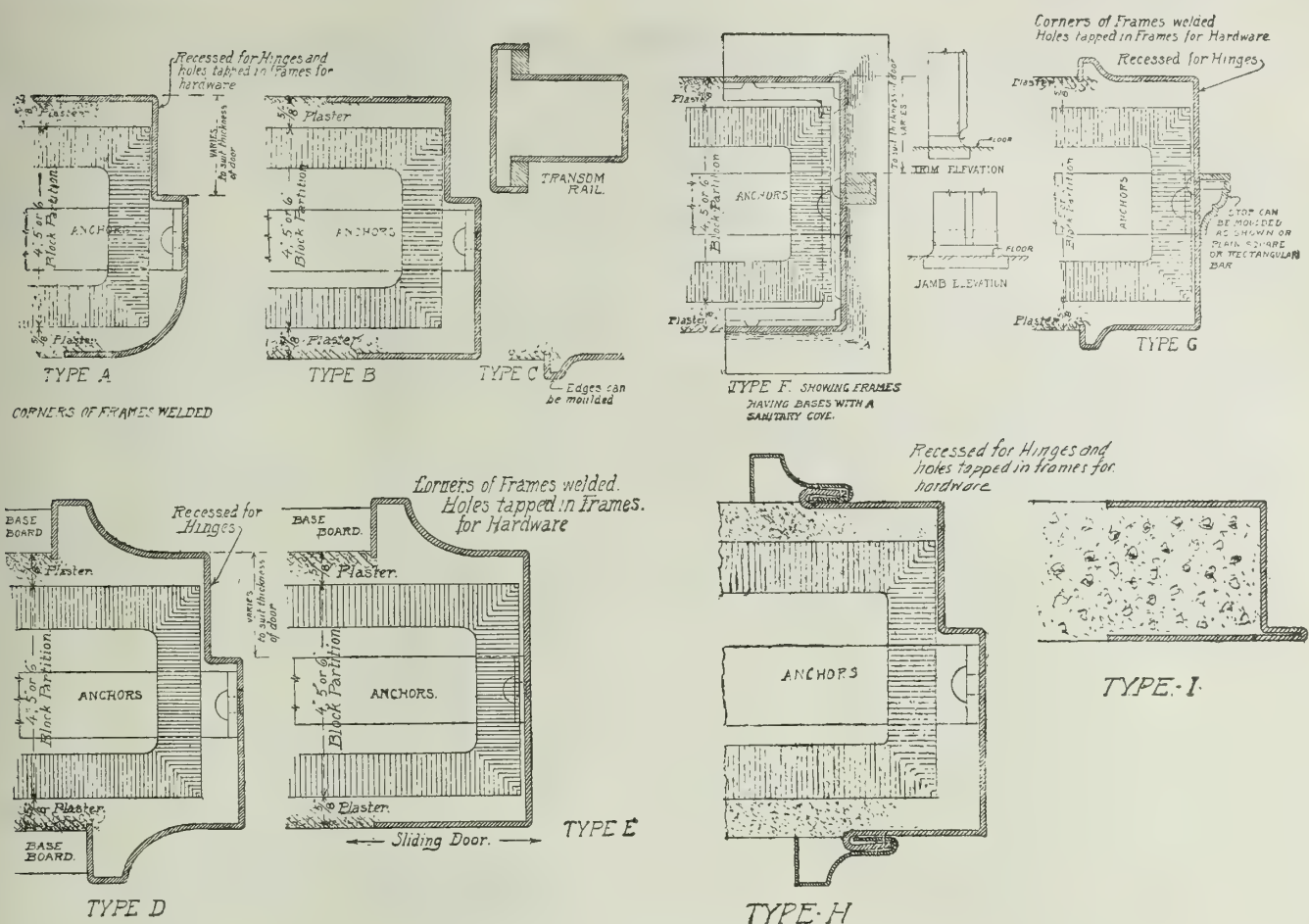
In my opinion, these stairs stood a very severe and satisfactory test and have been proven sufficient to meet any requirement of actual service.

Yours very truly,  
(Signed) ST. JOHN CLARKE,  
Civil Engineer.

#### Steel Door Frames.

These frames can be formed to meet requirements of all classes of fireproof partition construction and finished as shown by illustration. They are formed of No. 14-gage or No. 12-gage steel, and the miters and connections are all welded, making a one-piece frame.





These frames can be furnished with or without transoms and to fit any size partition or style of door; also, if desired, furnished with plinth blocks or sanitary cove base particularly suited for hospitals. The frames

are provided with anchors on each side for the purpose of building into walls or partitions. All provisions for securing hardware are made in accordance with samples furnished.



VIEW OF SEXAUER & LEMKE WORKS

# STANDARD FIRE ESCAPE CO.

Manufacturers of Standardized Fire Escapes

TELEPHONE:  
HAYMARKET 585

164-166 North May Street

CHICAGO, ILL.

## Products.

IDEAL EMERGENCY STAIRWAYS: STANDARDIZED FIRE ESCAPES.

### Ideal Emergency Stairway.

This construction is guaranteed to meet the requirements of any law enacted for the protection of life and limb.

Made in three widths: 24, 30 and 36 ins., measured between the stair stringers.

ADAPTABILITY—The Ideal emergency stairway is especially adapted to schools, hospitals, asylums, factories, office buildings, coal mines, etc.

### Specification Data.

#### 24-INCH STAIRWAY FIRE ESCAPE—

Brackets	1" square
Platform frame	2" by 2" by 1/4" angle
Platform grating	1/2" square bars set on edge, 2" on centers
Cross bars	2" by 3/8" plate, 24" on centers
Stringers	Two 2" by 3/8" plates
Treads	Five 1/2" square bars set on edge
Tread plates	2" by 3/8" plate
Railing	Three bars, top bar 1" round, two lower bars 3/4" round
Posts	1 1/2" by 1 1/2" by 3/16" angle
Post brace	1" by 1" by 1/8" angle

#### 30-INCH STAIRWAY FIRE ESCAPE—

Brackets	1 1/4" square
Platform frame	2" by 2" by 1/4" angle
Platform grating	1/2" square bars set on edge, 2" on centers
Cross bars	2" by 3/8" plate, 24" on centers
Stringers	Two 3" by 5/16" plate
Treads	Six 1/2" square bars set on edge
Tread plates	2" by 3/8" plate
Railing	Three bars, top bar 1" round, two lower bars 3/4" round
Posts	1 1/2" by 1 1/2" by 3/16" angle
Post brace	1" by 1" by 1/8" angle

#### 36-INCH STAIRWAY FIRE ESCAPE—

Brackets	1 1/4" and 1 1/2" square
Platform frame	2 1/4" by 2 1/4" by 1/4" angle
Platform grating	1/2" square bars set on edge, 2" on centers
Cross bars	2" by 3/8" plate
Stringers	Two 3" by 5/16" plates
Treads	Six 1/2" square bars set on edge
Tread plates	2" by 3/8" plate
Railing	Three bars, top bar 1" round, two lower bars 3/4" round
Posts	1 1/2" by 1 1/2" by 3/16" angle
Post brace	1" by 1" by 1/8" angle

Standardized stairway fire escapes are equipped with self-adjusting counterbalance section between second story and ground. Counterbalance section should be pivoted not less than 14 ft. vertically above ground.

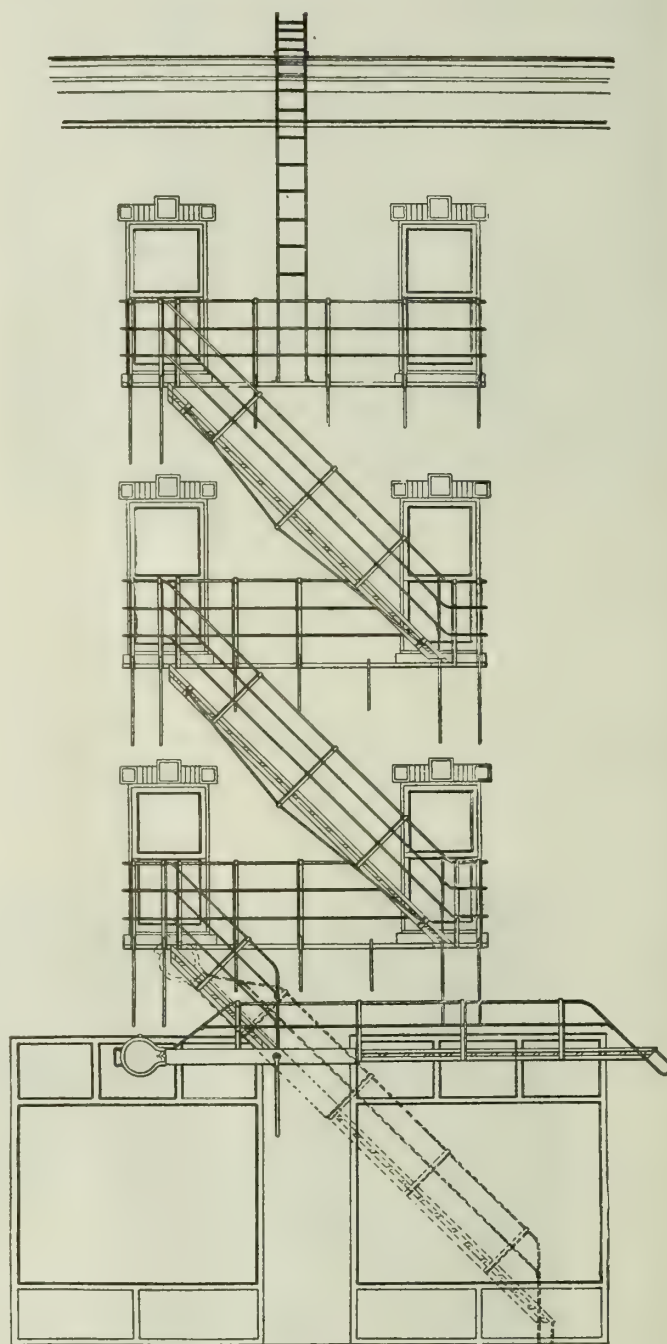
### Estimates.

Quotations will be supplied upon receipt of measurements and other essential information.

### Installations.

A few of many, with building, location and architect:

Board of Education, Chicago, Ill., A. F. Hussander  
University of Chicago, Chicago, Ill., Hodgdon & Coolidge  
20th Century Building, Chicago, Ill., Holabird & Roche  
Continental Can Co., Clearing, Ill., Davidson & Weiss  
Turner Mfg. Co., Chicago, Ill., A. S. Alschuler  
Hamilton Club, Chicago, Ill., S. S. Beman  
Mentor Building, Chicago, Ill., Howard Shaw



DOUBLE PLATFORM STANDARDIZED STAIRWAY FIRE ESCAPE

Swedish-American National Bank, Rockford Ill., Peterson & Johnson  
State Bank Building, Freeport, Ill., Frank A. Carpenter  
Shipper & Block Building, Peoria, Ill., Reeves & Bailey  
Whitney Building, Detroit, Mich., Graham, Anderson, Probst & White  
Central National Bank Building, Peoria, Ill., Graham, Anderson, Probst & White  
Rusk County Manual Training School, Ladysmith, Wis.  
Superior Coal Co., Mine No. 1, Litchfield, Ill.  
Johnston City Coal Co., Mine No. 2, Johnston City, Ill.



ESTABLISHED 1884

# WISCONSIN IRON & WIRE WORKS

Fire Escapes, Stairs and Miscellaneous Iron

TELEPHONE:  
LINCOLN 196

1640 Booth Street  
MILWAUKEE, WIS.

## Products.

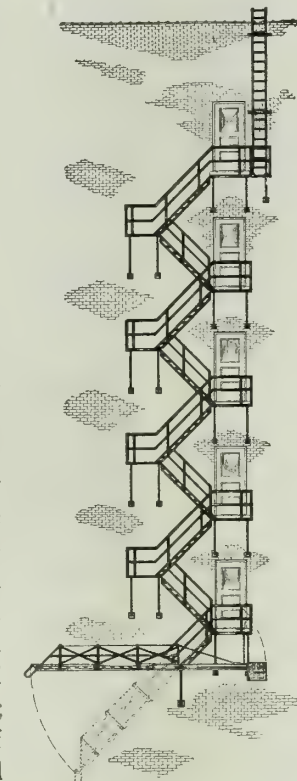
FIRE ESCAPES; STAIRS; WOVEN WIRE WORK.

For Ornamental  
Bronze and Iron and  
a more complete list  
of Miscellaneous  
Iron Work, see  
page 533.

## Fire Escapes.

Manufactured in accordance  
with the state laws  
and local ordinance  
requirements.

When writing  
for estimates, etc.,  
give sketch, with  
elevation of building  
to which fire escape  
is to be attached; distance  
from finished  
floor to finished  
floor; thickness and  
nature of floor and  
wall construction;  
size and location of  
all windows and  
door openings.



FIRE ESCAPE

## Woven Wire Work.

The woven wire partition affords an economical method of sub-dividing space without interfering with lighting and heating arrangements.

Made in a variety of designs and to your requirements.

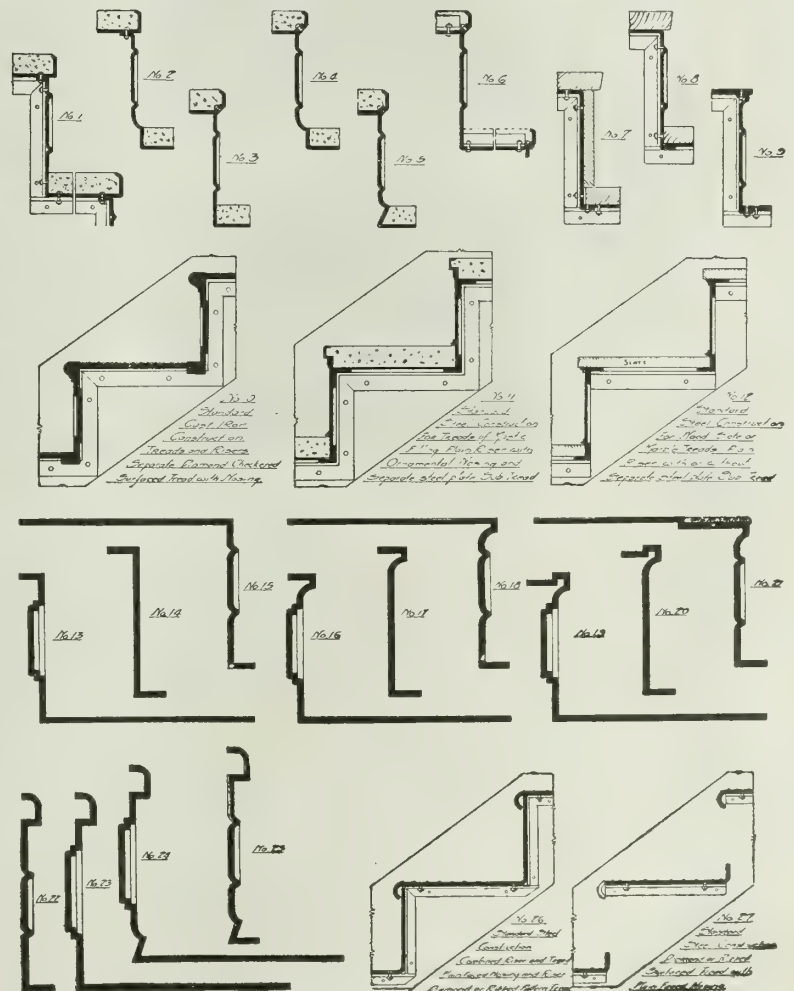
## Stairs.

The 27 sections shown herewith represent the various types of risers and treads manufactured by this company in connection with their stair work.

No. 1 to No. 8, inclusive, illustrate various forms of sheet metal combined riser and subtreads. Material supplied in No. 10 and No. 12 gages. No. 1 to No. 6, inclusive, are used in connection with 2-in. mastic filling for

treads. No. 7 and No. 8 are used in connection with hard maple wood, slate or marble treads. No. 9 riser section is used in connection with non-slip treads, such as diamond or ribbed steel plate, feralun treads, diamond checkered cast iron treads, Mason safety, etc.

No. 13 to No. 25, inclusive, illustrate additional forms of sheet metal risers and subtreads. No. 13 to No. 18, inclusive, are used in connection with hard maple, slate or marble treads. No. 19 to No. 21, inclusive, are used to receive various non-slipping devices, such as Mason Safety treads, steel checkered or ribbed plate, feralun treads, cork, etc. No. 22 to No. 25, inclusive, are designed to use treads of mastic filling, such as concrete, composition, etc. All designs can be supplied with plain riser or sunk or raised panel, as desired.



RISER AND TREAD CONSTRUCTION

# THE COLUMBIA IRON & WIRE WORKS CO.

Builders' Iron, Wire, Brass, Bronze and Ornamental Iron Work

CANTON, OHIO

## Products.

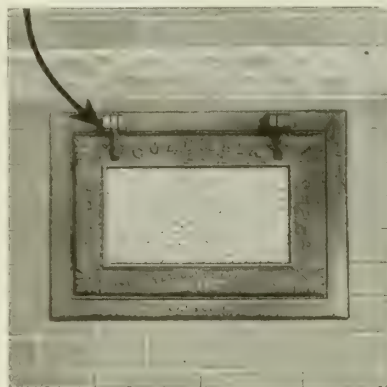
COLUMBIA WINDOW COAL CHUTES (patented) and GRADE LINE CHUTES (patented); COLUMBIA SAFETY SIDEWALK DOORS (patented); PANIC EXIT DOOR BOLTS (patented).

Columbia Coalhole Covers and Rims; Sidewalk Ventilators, etc. Ornamental Iron, Wire, Brass and Bronze Work. Fire Escapes a specialty.

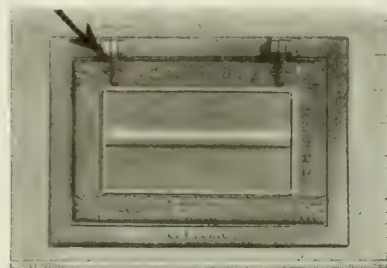
## Columbia Window Coal Chute (Patented).

A window and a patented coal chute in combination, both designed for insertion and permanent installation in basement walls, to permit entry of coal, etc., without damage to building. The window itself is provided with metal frame, burglarproof hinges, ribbed and wired glass, together with other required accessories. Window, which sets within frame, cannot be removed when closed; therefore is proof against the weather, breakage and burglary.

**OPERATION—**Window is opened by means of a small chain in basement or room above— $\frac{1}{2}$ -in. pull—which can be manipulated by a little girl. Next, window is raised by coal man, locks it-



Glass in Closed Window



Solid Metal Window Throughout; Window Closed

COLUMBIA WINDOW COAL CHUTE

self automatically in vertical position and hopper is readily drawn down on its pivots into proper position by the same man. When coal operation is concluded, the coal operator revolves hopper to its original location at top of opening and closes window, which positively *locks* by an enclosed locking device.

**HOPPER—**When not in use hopper sets *at top of chute out of the way*, permitting light to enter basement freely and window to be utilized for passage of other products. *Hopper extends far out to catch the coal.*

**SPECIFICATION DATA—***Window Frame, Shield, Chute and Hopper—*Frame, made of cast gray iron; window hinges are cast solid on frames and have neither bolts nor rivets; metal shield, attached to window frame to cover glass during coaling operations, is made of No. 16 plate iron and operates automatically chute body, of No. 14 plate iron; pivoted hopper, of No. 12 steel.

**Window Sash—**Sash, or hinged window, made of metal; glazed with ribbed and wired glass  $\frac{1}{4}$  in. thick. The window is also made of solid metal throughout (without glass), if desired.

**Sizes of Window and Chute—**No. 1, for residences. No. 2, for large residences or apartment houses. No. 3, for public buildings.

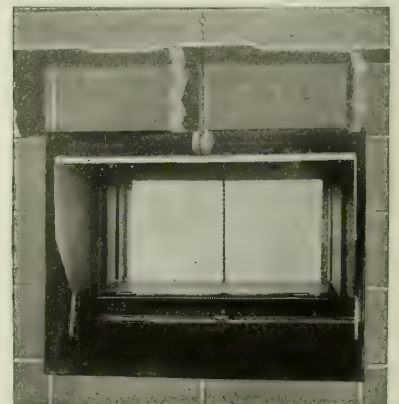
## Distinctive Features of the Columbia Window Coal Chute.

(1) It opens automatically from first floor or basement. (2) Hinges have no rivets or bolts. (3) Window is absolutely burglarproof, with improved locking device. (4) Shield for glass operates automatically when opening or closing window. (5) Hopper is *at top of chute*, out of the way, when not in use. (6) Window and chute are artistic in design.

Send for illustrated catalogue; address Department S.



COLUMBIA WINDOW COAL CHUTE IN OPERATION



INSIDE VIEW OF WINDOW AND CHUTE

Shield at bottom attached to closed window; hopper at top; light enters freely

DIMENSIONS AND LIST PRICES COLUMBIA WINDOW COAL CHUTE

Columbia Window Coal Chute	No. 1 for residences		No. 2 for residences and apartments		No. 3 for public buildings	
	Wide, ins.	High, ins.	Wide, ins.	High, ins.	Wide, ins.	High, ins.
Out of frame.....	25	19	28 $\frac{1}{4}$	20 $\frac{1}{4}$	36	28
Out of chute at front....	22	16 $\frac{1}{4}$	24	17	32	24
Out of chute at rear....	22	19	24	19	32	28
Wall opening required....	22 $\frac{1}{2}$	16 $\frac{1}{2}$	25	17	32	24
Depth of chute.....	12	...	12	...	18	...
Door opening.....	21 $\frac{3}{4}$	16	24	16	32	24
Glass opening.....	16	10	18	10	24	16
Hopper opening.....	20 $\frac{1}{2}$	14 $\frac{1}{2}$	23	14 $\frac{1}{2}$	31	21
Description	Wt., lbs.	Price	Wt., lbs.	Price	Wt., lbs.	Price
Complete with glass door	90	\$17.00	107	\$19.00	170	\$28.00
Complete with solid door	80	16.00	96	18.00	155	26.00
Without hopper, glass door	77	14.00	88	16.00	153	24.00
Without hopper, solid door	56	13.00	80	15.00	137	22.00

Prices subject to change, depending on market conditions.



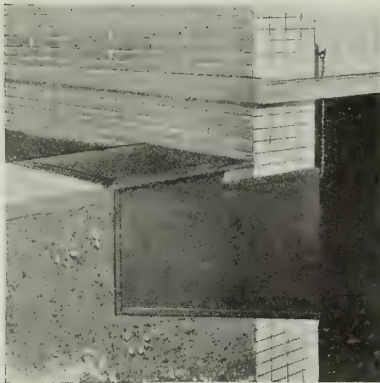
No. 4. Grade Line Chute (Patented).

Designed for service where space between outside grade and basement ceiling will not permit installation of window chute described on preceding page.

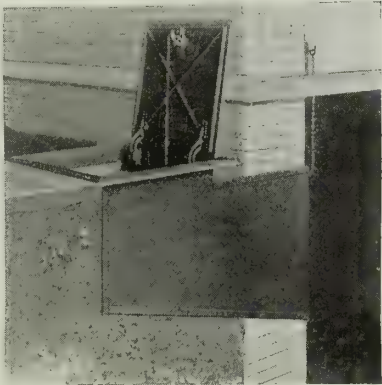
To open, pull chain 1/2 in. from first floor or basement; coal man can then open door; when coal man closes door, it locks automatically.

Hinges are malleable iron incased and never break; both hinge and handle are flush; no other chutes on the market possess these important features.

When ordering give thickness of wall.



Door Closed and Locked



Door Open  
NO. 4 GRADE LINE CHUTE

DIMENSIONS AND LIST PRICES No. 4 GRADE LINE CHUTE

No. 4 Grade Line Chute	Size, ins.	Weight, lbs.	Price
Door opening.....	20 x 20	165	\$34.00
Door opening.....	27 x 27	242	\$8.00

Prices subject to change, depending on market conditions.

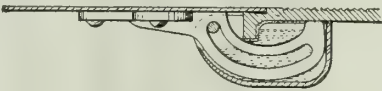
Columbia Safety Flush Sidewalk Door (Patented)

A wrought steel, diamond top sidewalk door; top is absolutely flush and its diamond shapes eliminate danger of slipping; malleable iron handle on top is self-releasing, watertight and never freezes (no receptacle to catch water).

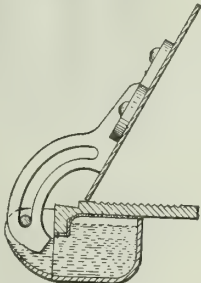
HINGES AND LOCK—Each hinge is invisible and works in a case filled with lubricant; does not rotate on a pin, hence it can not rust, bind or break; both hinge and case are made of malleable iron; no strain on hinge at any time; no chain is required to hold doors open. (See sectional view.) The lock on Columbia sidewalk doors can be operated with key outside or lever inside; door complies with city ordinances.

Send for catalogue No. 10 "Iron Work for the Sidewalk"; address Department W.

WHEN ORDERING—Opening in sidewalk to be not less than width by length of doors, 36 by 48 ins., etc.; but, if 3 ins. larger each way, door frame will lap 1 1/2 ins. all around opening.



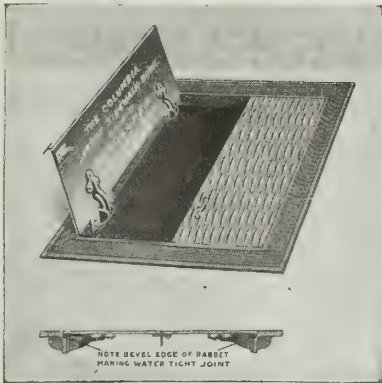
Door Closed



Door Open

DIAGRAMS SHOWING INTERNAL CONSTRUCTION OF SIDEWALK DOOR HINGES

Note changed position of hinge as door is opened or closed



COLUMBIA DOUBLE SIDEWALK DOOR

One-half of door is open and remains open without use of chain or other sustaining device

DIMENSIONS AND LIST PRICES COLUMBIA SIDEWALK DOORS—STOCK SIZES  
DOUBLE DOORS

Width out to out of frame, ins.	Width of doors, ins.	Length out to out of frame, ins.						
		54	58	62	66	70	74	78
		Length of doors, ins.						
		48	52	56	60	64	68	72
42	36	\$88.00	\$90.00	\$91.00	\$93.00	\$95.00	\$97.00	\$98.00
46	40	89.00	92.00	93.00	94.00	97.00	99.00	101.00
50	44	92.00	94.00	96.00	98.00	99.00	101.00	105.00
54	48	94.00	96.00	98.00	100.00	102.00	105.00	107.00
56	50	95.00	97.00	98.00	101.00	103.00	106.00	108.00
60	54	97.00	99.00	101.00	103.00	105.00	109.00	111.00
62	56	98.00	101.00	103.00	105.00	107.00	110.00	112.00
66	60	99.00	102.00	105.00	107.00	110.00	113.00	115.00
78	72	105.00	109.00	112.00	114.00	117.00	122.00	126.00

SINGLE DOORS

36	30	\$71.00	\$73.00	\$74.00	\$76.00	\$78.00	\$80.00	\$80.00
42	36	74.00	76.00	77.00	79.00	80.00	82.00	84.00

Intermediate sizes take next higher list. Special sizes made to order. Prices subject to change, depending on market conditions.

The Columbia Improved Panic Exit Door Bolt.

A device that secures exit doors, prevents intrusion from the outside, but will permit doors to open outward when pressure is applied from inside, insuring opening of doors in case of panic or overcrowding caused by fire or other excitement.

ADAPTABILITY—Particularly necessary for theaters, churches, schools, society and other buildings where a number of people congregate.

CONSTRUCTION — Bolt designed to be applied to any door, either right or left, and on stiles as narrow as 2 1/2 ins. It has adjustable lock nuts connecting rods with operating device and permitting the lengthening or shortening thereof; adjustability, 1 1/2 ins. Catalogue sent on request; address Department E.

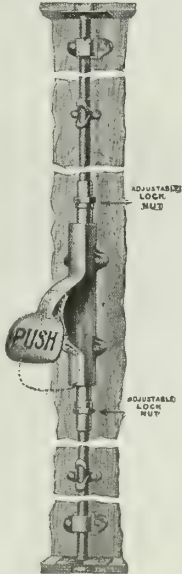
LIST PRICES

BRONZE FINISHES	
Natural high polish.....	\$10.50
Natural brush polish.....	10.00
Polished and oxidized.....	9.50
Statuary.....	10.50
BRASS FINISHES	
Natural high polish.....	\$10.00
Natural brush polish.....	9.50
Polished and oxidized.....	9.50
COPPER FINISHES	
Natural buff.....	\$10.00
Polished and oxidized.....	9.50
Oxidized and steel blue.....	9.00
Oxidized and mottled.....	10.00

Prices subject to change depending on market conditions.

Fire Escapes.

If interested, send for catalogue F.



COLUMBIA PANIC EXIT DOOR BOLT



# THE CANTON FOUNDRY & MACHINE CO.

## Sidewalk Doors and Coal Chutes

### CANTON, OHIO

#### Products.

Manufacturers of SIDEWALK DOORS; "CANTON" IMPROVED COAL CHUTES; CONDUCTOR CONNECTIONS and BOOTS.

Coalhole Rings and Covers, Area Gratings, Sidewalk Gutter Boxes, Sidewalk Ventilators, Cross-walk Gutter Plates, Water Meter Covers, Corner and Jamb Wheel Guards, Ash Pit and Stack Doors, Cast Iron Columns, Catchbasin and Manhole Covers, Valve Covers for street and inside use, and other Street Castings.

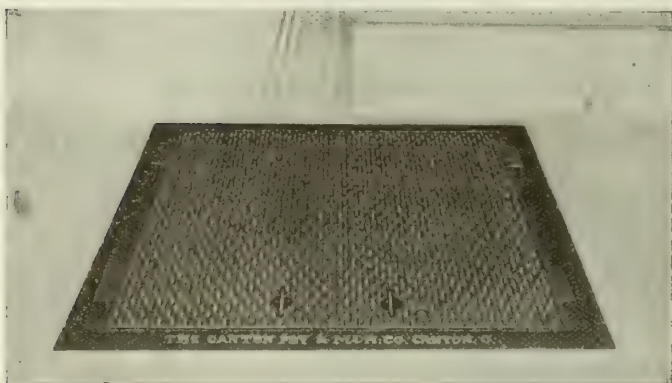
For Automobile Turntables, see page 1486.

#### Sidewalk Doors.

These doors comply with all city ordinances and regulations. They present *absolutely flush and checkered* surfaces throughout. They are substantially built, having wrought steel leaves and solid one-piece frames. Having continuous water drain around four sides, with two outlets at foot tapped for pipe, they are as nearly waterproof as flush doors can be made.

Made in 50 sizes and also in illuminated style.

Ask for Catalogue B-S, and prices.



Closed—Showing Flush and Checkered Surface.  
No slipping or tripping



Open—Showing Water Drains, Stay Rods, Chains, and Reinforced Steel Leaves.  
Locks and unlocks from outside, unless otherwise specified

CANTON SIDEWALK DOORS

#### "Canton" Improved Coal Chutes.

A practical and sensible self-locking, burglarproof chute. Locks automatically when the hopper is closed. Also has independent outside locking device operated only by special key furnished. No necessity for crawling over the coal pile to unlock this chute.

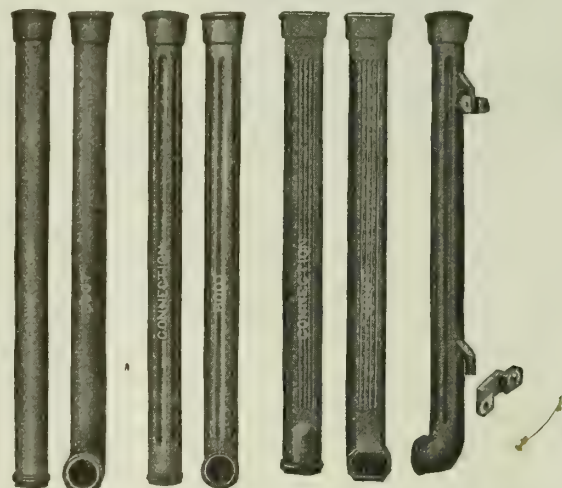
Ask for catalogue B-S, and discounts.



THE "CANTON" IMPROVED COAL CHUTE

STANDARD SIZES			
Size	Wall opening necessary		Price
"A"	21¾ ins. wide—16	ins. high	\$10.00
"D"	25½ ins. wide—21¾	ins. high	12.50
"G"	32 ins. wide—24	ins. high	19.00

#### Conductor Connections and Boots.



No. H G D C F E Descriptive

"UNIVERSAL" CAST IRON CONDUCTOR CONNECTIONS AND BOOTS

#### PRICE LIST

Size, galvanized pipe	Style, H and G, each	Style, D and C, each	Style, F and E, each	Inside top measurements, Style F and E
3 ins. ....	\$3.00	\$3.20	\$3.60	2¼ x 3½ ins.
4 ins. ....	3.75	4.20	4.50	3¼ x 4½ ins.
5 ins. ....	4.75	5.00	6.00	4¼ x 5½ ins.
6 ins. ....	5.50	6.00	6.75	5¼ x 6½ ins.

All 4½ ft. long. Quotations will be made on any special lengths desired.

These sizes are listed in accordance with standard galvanized conductor pipe.

Clearance of ¼ in. all around is allowed in bell end.

No charge for wall brackets. 1½-in. from wall regularly furnished; 2-in., 2½-in. or 3-in. if required.

Ask for circular A-S, and discounts.



# THE MAJESTIC COMPANY

Manufacturers of Building Specialties

HUNTINGTON, IND.

## DISTRIBUTORS

NEW YORK, N. Y., E. A. JACKSON & BRO., 50 Beekman Street  
CHICAGO, ILL., FRED LIEBRICH, 1102 Monadnock Block  
CHICAGO, ILL., ANGERT WIRE & IRON Co., 6024 Grove Avenue

KANSAS CITY, MO., TOWNLEY METAL & HARDWARE Co.  
ST. LOUIS, MO., P. A. HARADON, 613 Fullerton Building  
ST. LOUIS, MO., SHAPLEIGH HARDWARE Co.  
SAN FRANCISCO, CAL., W. W. MONTAGUE & Co.  
SAN FRANCISCO, CAL., PACIFIC HARDWARE & STEEL Co.  
EL PASO, TEX., THE EQUIPMENT Co.  
DALLAS, TEX., GAINES & DEWEES

INDIANAPOLIS, IND.,

CLEVELAND, OHIO, DONLEY BROS.  
COLUMBUS, OHIO, SEIBERT-MILLBURN Co.  
MINNEAPOLIS, MINN., FOWLER & PAY  
DENVER, COLO., QUEEN CITY WIRE & IRON WORKS  
SALT LAKE CITY, UTAH, SALT LAKE HARDWARE Co.  
SEATTLE, WASH., KOHLER SUPPLY & TILING Co.  
DES MOINES, IOWA, CENTURY LUMBER Co.  
BOSTON, MASS., WALDO BROS.  
PHILADELPHIA, PA., MURTA, APPLETON Co.  
CHATTANOOGA, TENN., PRICE-EVANS FOUNDRY Co.  
NEW ORLEANS, LA., A. BALDWIN Co.  
EWALD OVER FOUNDRY

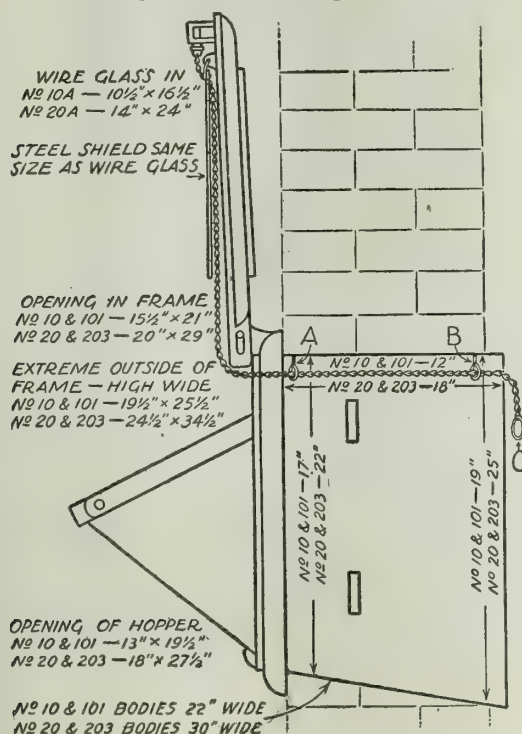
## Products.

MAJESTIC COAL CHUTES; BUILT-IN and UNDERGROUND GARBAGE RECEIVERS; MAJESTIC MILK BOTTLE and PACKAGE RECEIVER; DUPLEX ONE-REGISTER HEATING SYSTEM for residences and stores.

Street and Park Refuse Receivers; Rubbish Burners; All-metal Flower Boxes; Cistern Rings and Covers; Cellar Wall Grates; Ash Dumps; Ash Pit or Flue Clean-out Doors; Cast Iron Flue Thimbles; Porch Column Bases; Burglarproof Basement Windows.

## Majestic Coal Chutes.

The Majestic coal chute is easily installed. Provision should be made for it when building, but in a house already erected it can be installed in space now occupied by basement window. It has a heavy steel body, cast semisteel door and frame, and boiler plate hopper. The patented Majestic gravity lock holds door open, protecting building above opening, and when closed, it locks it automatically with door flush with foundation. Can be unlocked from inside only. Chain attached to latch permits unlocking at distance from coal bin.

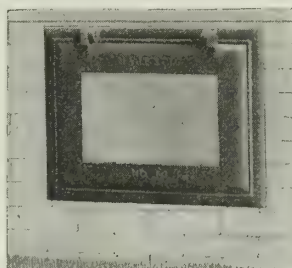


SECTIONAL DETAIL, MAJESTIC COAL CHUTE INSTALLATION

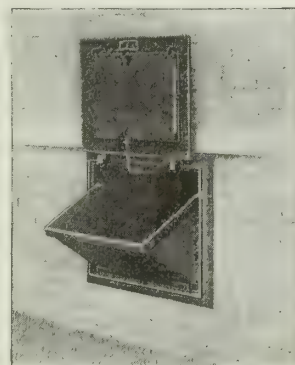
Nos. 10-A and 20-A CHUTES—Steel shield hangs in front of ¼-in. wire glass, and hopper is pulled out

when chute is open. When closed, hopper and shield lie in bottom of chute body, allowing light to shine in.

Nos. 10-B and 20-B CHUTES—Style "B" is exactly the same as style "A," except it is not provided with ¼-in. wire glass. Panel can be removed at any time, however, and glass substituted.



No. 10, with Glass Panel

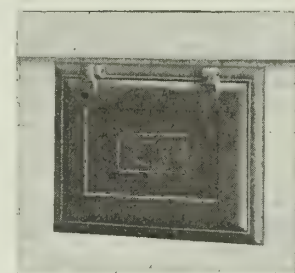


With Door Open

## MAJESTIC COAL CHUTES

STYLES "C" AND "D" CHUTES—Style "C" is the same as "A," but without hopper. Style "D," same as "B," but without hopper.

Nos. 101 and 203 CHUTES—Provided with solid cast semisteel doors. Same frames, bodies and hoppers used in the Nos. 101 and 203 as in the Nos. 10 and 20 respectively.



MAJESTIC NO. 101 COAL CHUTE

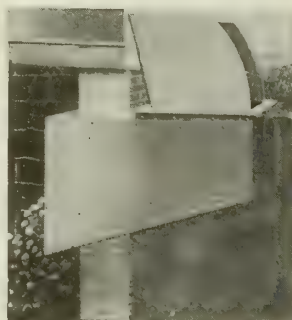
## SIZES AND PRICES

No.	Style	Description	Width, ins.	Height, ins.	Depth, ins.	Weight lbs.	Price
10	A	With glass and hopper	24	17	13	85	\$15.00
10	B	Without glass	24	17	13	75	14.00
10	C	Without hopper	24	17	13	70	12.00
10	D	Without hopper or glass	24	17	13	60	11.00
20	A	With glass and hopper	33	22	18	160	26.00
20	B	Without glass	33	22	18	140	24.00
20	C	Without hopper	33	22	18	140	22.00
20	D	Without hopper or glass	33	22	18	120	20.00
101	B	With hopper	24	17	13	80	14.00
101	D	Without hopper	24	17	13	65	11.00
203	B	With hopper	33	22	18	150	25.00
203	D	Without hopper	33	22	18	130	21.00
500	S	C. I. door without hopper	24	17	9	57	9.50
600	S	Glass door without hopper	24	17	9	63	11.00

GRADE LINE CHUTE—Unlocked only from inside, it is used where floor is close to level of sidewalk. Door and frame, of very heavy cast semisteel, will permit driving over. Sides forming hopper are made of heavy steel, and body projecting through wall is made of heavy steel plate and angle iron.



Closed



Open

SECTIONAL VIEWS, SHOWING INSTALLATION OF GRADE LINE CHUTE

SIZES AND PRICES

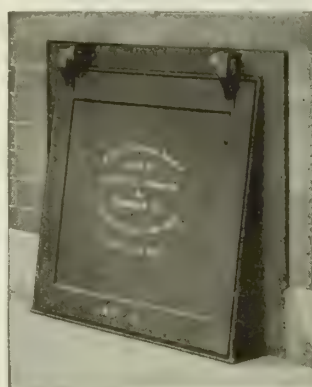
No.	Size door, ins.	Wall opening, ins.		Length, ins.	Weight, lbs.	Price
		Width	Height			
16	18 x 24	25	24	36	190	\$31.50
18	24 x 30	31	31	42	290	55.00

**MAJESTIC STORE CHUTE**—Designed for store and office buildings, but also used in homes or apartments where grade line and floor are on same level. Used in hotels and hospitals for receiving vegetables.

Same chute is made so that coal can be put under sidewalk or in basement. This style is called the Duplex store chute. Prices on application.



Sectional View Open



Exterior View Closed

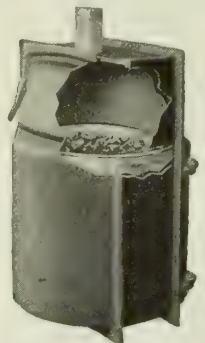
MAJESTIC STORE BUILDING COAL CHUTE

SIZES AND PRICES

No.	Size of door, ins.		Total height, ins.	Opening at grade, ins.	Weight, lbs.	Price	
	Width	Height				With hopper	Without hopper
12	22	20	48	24 x 16	180	\$35.00	\$31.50
15	30	24	52	30 x 20	235	47.00	42.50

### Majestic Garbage Receivers.

**BUILT-IN KITCHEN TYPE**—Consists of cast iron front and back joined by a steel body, adjustable to thickness of wall. Front is oval, with adequate door opening directly over garbage pail. Door is close fitting and locks with a refrigerator-type latch. Steel hopper prevents garbage falling outside. Back or outside castings consist of frame and hinged door large enough for removal of garbage can. Body is made of heavy gage steel in two telescoping sections, drawn together by heavy drawn bolts on either side. Cast thimble, to receive a 3-in. round conductor pipe, is fastened to top of body. Conductor may

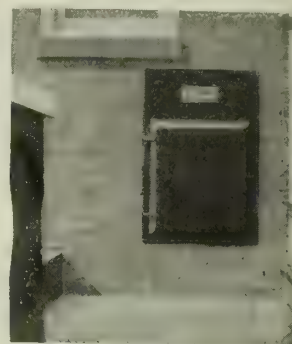
SECTIONAL VIEW  
MAJESTIC BUILT-IN  
GARBAGE RECEIVER

be installed as a ventilator, opening directly over garbage pail, passing up in wall through roof, or connected to flue in attic.

**Dimensions**—Inside and outside castings are each 20½ ins. wide and 31 ins. high. Body or size of opening in wall is 19 ins. wide and 29 ins. high. Body is adjustable for 8-in. to 12-in. walls. For narrower walls, use casing on each side.



Inside View



Outside View

INSTALLATION OF MAJESTIC BUILT-IN GARBAGE RECEIVER

SIZES AND PRICES

Description	Weight, lbs.	Price
No. 5K Receiver, one 12-gal. can.....	195	\$27.50
No. 7K Receiver, two 12-gal. cans; also underground container, with iron lid, for extra can.....	230	37.50
No. 9A Receiver.....	110	20.00

**UNDERGROUND TYPE**—Comes in three sections: ingot iron receptacle for can, galvanized can and cast iron top lid. The only part exposed is the top and door. Top is chained to shell.



SECTIONAL VIEW, MAJESTIC UNDERGROUND GARBAGE RECEIVER

SIZES AND PRICES

No.	Shell diam., ins.	Shell depth, ins.	Can capacity, gals.	Weight, lbs.	Price
18	16	18	9	45	\$ 9.00
22	16	22	11	50	10.00
26	16	26	15	55	12.00
28	19	28	20	90	17.00
30	19	30	25	100	18.00

Approved by Good Housekeeping Institute.

### Majestic Milk Bottle and Package Receiver.

Consists of two cast iron frames and doors connected by a steel body adjustable to varying thickness of walls. Gravity lock on outside door can be unlocked from inside only. Inside door is provided with nicked refrigerator latch and handle.

**OPERATION**—Chain attached to gravity latch runs through three cast iron eyes to inside frame, where a cast ball is suspended. When empty bottles are placed



in receiver, pull ball down. Its weight and friction of chain will hold latch on outside door unlocked. Close inside door and lock with refrigerator latch. When outside door is opened, chain is drawn outward and held by friction. This leaves gravity latch in locking position, and when door is closed, it locks automatically.

**CAPACITY**—6 quart bottles in 6-in. wall.

**COATING**—Castings and steel body are painted with Pecora No-Rust, to be finally finished by owner to suit finish.

**SIZES**—Outside measurements of frames are 16¼ ins. wide, 14 ins. high; of body or wall opening, 14 ins. wide, 11½ ins. high. Depth equals thickness of wall. Made in two different depths of adjustable body.



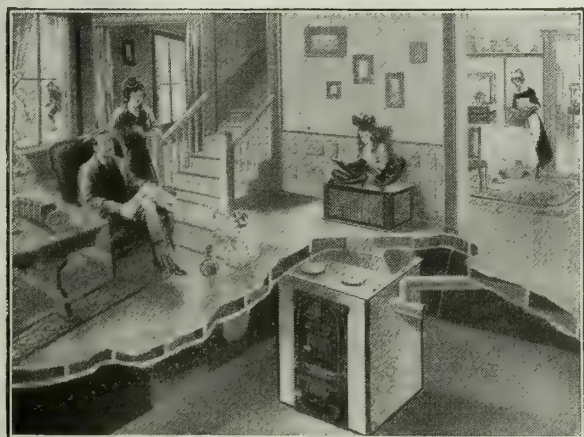
INTERIOR AND EXTERIOR VIEW OF MAJESTIC MILK BOTTLE AND PACKAGE RECEIVER

SIZES AND PRICES

No.	Description	Weight, lbs.	Price
1	Adjustable, from 5 to 8 ins. ....	47	\$8.50
2	Adjustable, from 8 to 14 ins. ....	50	8.50

### Duplex One-register Heating System.

**FOR RESIDENCES**—The Majestic Duplex one-register heating system is set in cellar like ordinary furnaces. There are no pipes run through basement to different parts of house. Heat comes up from one large central register above furnace and is projected into room, where it is diffused into the whole house. At each end of projected register is a separated section leading back cold air to furnace for reheating. Entire house is constantly receiving a current of fresh air warmed to desired temperature.



SECTIONAL VIEW, INSTALLATION OF MAJESTIC ONE-REGISTER HEATING SYSTEM FOR RESIDENCES

**Advantages**—The secret is the projecting principle of register construction. Grillwork on Majestic register never overheats. Built-in bookcases can be placed directly on top of register. Entirely different from any other type.

**FOR STORES**—Occupies the least space; eliminates all friction possible in both warm and cold air conductors; provides a cool basement, and supplies a large volume of healthful warm air with a minimum consumption of fuel.

**Duplex Register**—Made like a seat and can be placed against the wall, under a counter or table, in the center of the room, or, in fact, anywhere that the furnace can be placed beneath it. The top of the register is insulated with heavy asbestos mill board, so that it can be used as an auxiliary counter or table and any kind of merchandise piled on top of the register without the least possible damage. Register has free air opening equal in capacity to the warm and cold air connections with the furnace.

**Description**—System consists of the high grade Majestic gasproof and dustproof furnace, casing, Duplex register complete with 1-piece connection and two extra extension pieces for different depth basements, 10 ft. of smoke pipe, one smoke ell, one smoke tee, check damper, regulator plate, chains and all necessary fittings for installing complete under ordinary conditions.

**Construction Data**—Front and back of casing are all assembled. Cold air partitions are easily put in place with a few bolts and outer casing sheets slipped into grooved angles of front and back. Register box is then connected between casing top and register and remainder of casing top covered with galvanized iron and sand. The only tools needed are a saw, hammer, screwdriver, awl and snips. Two men can install the system in less than a day.



SECTIONAL VIEW, INSTALLATION OF MAJESTIC ONE-REGISTER HEATING SYSTEM FOR STORES

SIZES—(PRICES ON APPLICATION)

No.	Diam. fire bowl, ins. 1	Diam. radiator, ins.	Heating capacity, thousand cu. ft.	Casing, ins.			Register, ins.			Size opening to cut in floor, ins.
				Width	Depth	Height	Length	Depth	Height	
2142 D	21	35	15 to 25	45	42	57½	38½	19½	20	19½ x 36½
2447 D	24	39	25 to 45	50	45	62	43½	19½	20	19½ x 40½



# STERLING FOUNDRY CO.

Manufacturers of Cast Iron Structural Specialties

STERLING, ILL.

## Products.

"BEST" COAL CHUTES; REVOLVING CHIMNEY TOPS; STUD SOCKETS.

Chimney Caps, Chimney Copings, Clean-out Doors, Cistern Covers, Cesspools, Foot Scrapers, Pump Stand, Hog Waterer, and Step Ladder Stools.

## "Best" Fuel Chutes (Patented).

"Best" fuel chutes are installed in foundations of buildings and sheds where fuel, sand, rock, etc., are stored.

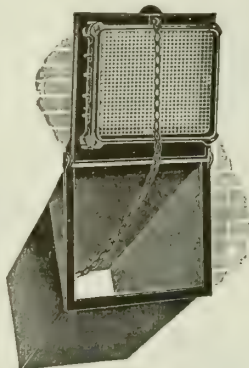
**CONSTRUCTION**—They consist of a cast iron frame and door, and steel tube. Frame sets flush with wall. Flange overlapping door prevents rain from entering chute. Cast iron door has a heavy reinforced wire glass front, held in place by a collar on back of door. Glass is prevented from breaking by a heavy screen placed between collar and a light cast iron frame bolted to it. If desired, glass may be removed and an insect screen inserted, making chute serve the purpose of a ventilator.

**OPERATION**—Door opens vertically and is held by hook in frame, which engages with hook in door frame. When door is closed, it is automatically locked by a gravity catch. A small chain, attached to catch, may readily be extended so that door can be unlocked from any part of coal room.

**STYLES AND SIZES**—Made in 2 styles and 3 sizes, with and without steel tubes. All chutes are painted throughout. No. 3 chute, designed for soft coal, is made entirely of cast iron, with solid door only.



Closed



Open

"BEST" FUEL CHUTES

DIMENSIONS AND PRICES, "BEST" FUEL CHUTES

No.	Size outside, ins.	Description	Weight, lbs.	Price
1A	18x18	Glass door, complete	80	\$8.00
1C	18x18	Glass door, without tube	60	6.50
1	18x18	Solid, C. I. door, complete	70	6.50
1B	18x18	Solid C. I. door, without tube	50	5.00
2A	18x24	Glass door, complete	95	10.00
2C	18x24	Glass door, without tube	75	8.00
2	18x24	Solid C. I. door, complete	85	8.00
2B	18x24	Solid, C. I. door, without tube	65	6.00
3	18x24	Solid C. I. door and cast tube	220	12.00

## "Best" Revolving Chimney Tops (Patented).

"Best" revolving chimney tops are simple, durable, easy to attach and hold firmly.

**CONSTRUCTION**—Made of all cast iron, with the

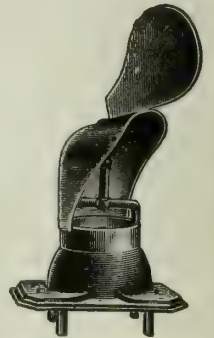


exception of steel vane and ball bearing. Cast iron has proved to be the most durable material when exposed to weather and chimney gases. Legs have slotted holes and radial adjustment, so that each size will fit any chimney up to the largest for which designed.

**INSTALLATION**—See that top of chimney is level, adjust legs, and set chimney top in place.

**OPERATION**—Vane causes back of hood to turn to wind, and, being adjusted on ball bearings, responds instantly to the slightest breeze. Shape is such that force of wind creates suction at front or mouth of top, drawing a continuous current of air up chimney.

**FINISH AND PACKING**—Each top is neatly finished with black japan. Packed knocked down in crates, with hoods and bases packed separately.



"BEST" REVOLVING CHIMNEY TOP

CHIMNEY TOPS, GLASS FRONT TYPE

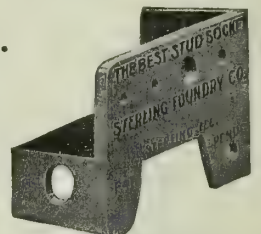
Size No.	For Chimneys		Diam. collar, ins.	Length post, ins.	Dimensions, base.	Weight, each, lbs.
	No. bricks	Size flue, ins.				
1	1½x2	4x8	6¾	7	12x15	26
	2x2	8x8				
	1½x2	4x8				
1½	1½x2½	4x12	7¾	7¾	12x16	24
	2x2	8x8				
	2x2½	8x12				
2	1½x3	4x16	7¾	7¾	12x19¾	31
	2x2½	8x12				
	2x3	8x16				
3	1½x3	4x16	7¾	7¾	15x19½	37
	2x3	8x16				
	2½x3	12x16				

NOTE.—No. 1½ is most popular and best seller. Crates weigh about 8 lbs.

## "Best" Stud Sockets (Patented).

"Best" stud sockets are small castings used in concrete construction for anchoring feet of studding in barns, garages, corn cribs, hog houses, and other buildings having concrete foundations.

Placed in floor after concrete has been deposited and while still green.



STANDARD SOCKET

3 styles, 1 size each  
Standard.....25 lbs. doz.  
Partition.....18 lbs. doz.  
Corner.....42 lbs. doz.



LAYOUT FOR GARAGE OR BARN FLOOR



# WATERTITE DRAIN & SCUPPER CO., INC.

## Hooded Warehouse Scuppers

351 Lexington Avenue

NEW YORK, N. Y.

TELEPHONE:

MURRAY HILL 7666

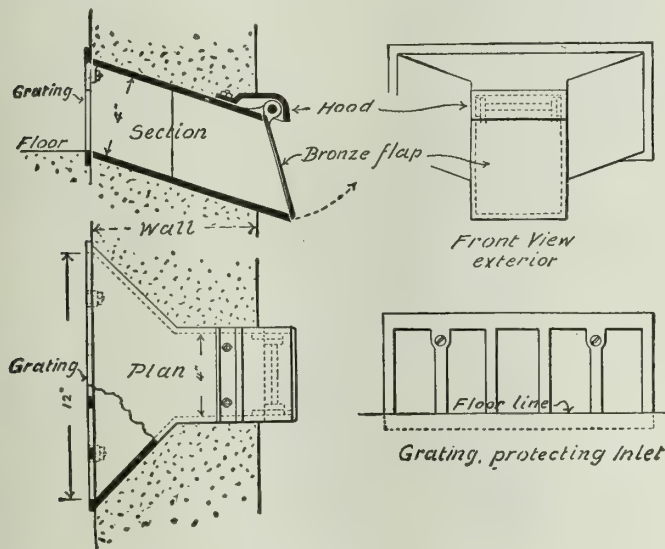
### Products.

#### HOODED SCUPPERS.

Interior Scupper System; "Dryceil" Pipe Sleeves; "Anticlog" Floor Drains.

#### Hooded Scuppers.

Underwriters make a substantial reduction in the rate of insurance on mills, factories, warehouses, lofts, etc. (especially sprinklered buildings), when scuppers are installed, because the risk of damage by water is thereby greatly reduced, the scuppers affording a ready and quick escape for the water from sprinkler heads or hose. As the underwriters virtually pay for the scuppers in the lower rate of insurance, the architect should specify a scupper that meets their requirements and is approved by them. Our scuppers are approved by all underwriters.

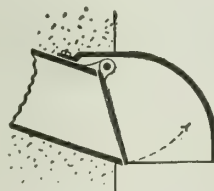


HOODED SCUPPERS, TYPES A AND B  
Patented November 18, 1913

**WINDPROOF**—Scuppers have a cast bronze valve at the outer end, so hung and set that it is practically windproof and airtight. It is hinged with a copper or brass pin with lead bushed bearings to prevent corrosion.

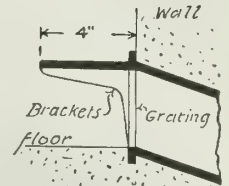
#### Special Features.

**COMPLETE HOOD**—The complete hood gives absolute protection to the valve against being clogged or sealed by mortar, ice or snow, so that it is ready for service at all times and under all conditions and circumstances. For this reason it is well worth its slight extra cost, as the one essential in an emergency device is that it be always ready for instant service. Also acts as a wind break, making it impossible for the valve to be moved by high winds.



COMPLETE HOOD

**FENDER GRATING**—The fender grating prevents packing cases, etc., being placed against the inlet to block it. This feature is referred to in the "recommendations" of the National Fire Protection Association.



FENDER GRATING

PRICE LIST OF SCUPPERS  
Subject to discount

Thickness of wall, ins.	Type A		Type B	
	Painted	Galvanized	Painted	Galvanized
6, 7, 8	\$4.25	\$5.00	\$3.75	\$4.50
9, 10, 11	4.50	5.25	4.00	4.75
12, 13, 14	4.75	5.75	4.25	5.25
15, 16, 17	5.00	6.00	4.50	5.50
18, 19, 20	5.25	6.25	4.75	5.75
21, 22, 23	5.50	6.50	5.00	6.00
24, 25, 26	5.75	6.75	5.25	6.25

NOTE—Type A is  $\frac{3}{8}$ " metal cast in one piece. Type B is the type usually used and is  $\frac{1}{4}$ " metal, with cover and grid cast separate. Complete hood 40¢ net, extra. Fender grating 30¢ net, extra.

#### Specification.

The following specification will secure the best scupper service that can be obtained and secure the maximum reduction in rate of insurance:

Furnish and set in exterior walls where indicated on plans (they are usually placed in the curtain walls under windows, at least one scupper to every 1000 sq. ft. of floor surface), at the level of each floor above the ground, cast iron (painted or galvanized) scuppers with 12 by 4-in. inlet and 4 by 4-in. outlet. To have grade or pitch of not less than 2 ins. in 12 ins. Inlet to have cast iron grid with vertical bars not over 2 ins. apart. Outlet to pass beyond outside of wall at least 2 ins. and to be closed with cast brass or bronze gravity valve about  $\frac{3}{16}$  in. thick, hinged at top with brass or copper pin bushed with lead to prevent corrosion. Valve to be protected by cast iron complete hood enclosing valve on top and on three sides, as made by WATERTITE DRAIN & SCUPPER CO., INC., 351 Lexington Avenue, New York, N. Y.

#### Installations of Scuppers.

A few installations are as follows:

406 West 31st Street, New York, N. Y., 16-story loft building  
Bush Terminal Buildings, Brooklyn, N. Y.  
Hill Publishing Company, New York, N. Y.  
American Ever-Ready Co., Long Island City, N. Y.  
Reymann Abattoir and Packing House, Wheeling, W. Va.  
Mica Insulator Company Building, Schenectady, N. Y.  
American Cigar Company Factory, Hartford, Conn.  
Illuminating Building, Cleveland, Ohio  
Fulton County Silk Mills, Gloversville, N. Y.  
Diamond Match Company Building, Oshkosh, Wis.  
Bradley Building, Worcester, Mass.  
Addressograph Company Building, Chicago, Ill.  
Bagby Furniture Company Building, Baltimore, Md.  
Holtzer-Cabot Building, Cambridge, Mass.  
Ralston-Purina Company Building, Buffalo, N. Y.  
Keystone Leather Company, Philadelphia, Pa.  
Printing Crafts Building, New York, N. Y.  
Sunbury Converting Works, Sunbury, Pa.  
Aluminum Ore Co., East St. Louis, Ill.  
Schoellkopf Agricultural & Chemical Works, Buffalo, N. Y.  
Belleville Warehouse, New Bedford, Mass.  
United Drug Co., Boston, Mass.  
Harris Bros. Mill, Paterson, N. J.  
Davenport Building, Greenfield, Mass.

# WINDSHIELD SCUPPER COMPANY

16 Warren Street  
NEW YORK, N. Y.

## AGENTS

BUFFALO, E. B. LAWSON, 50 Builders' Exchange  
CINCINNATI, THE BRICK SALES CO., 705-6 St. Paul Building  
PHILADELPHIA, HARRY KAHN, 305 North 15th Street  
INDIANAPOLIS, THE F. O. DUVAL CO., Fletcher American Bank Building

MINNEAPOLIS, HYDRAULIC-PRESS BRICK CO., 211 South 4th Street  
PITTSBURGH, FORT PITT HARDWARE CO., 807 Liberty Avenue  
ROCHESTER, AMERICAN CLAY & CEMENT CORPORATION  
SYRACUSE, E. H. GOODRICH, 130 Fitch Street

## Products.

### WINDSHIELD SCUPPERS.

### Windshield Scuppers.

This device should be installed in the walls of all mercantile buildings, such as factories, warehouses, and lofts. Its chief function is to drain off excess water in case of fire; but it has proved invaluable as an emergency drain in case of bursting pipes, defective sprinklers, etc.

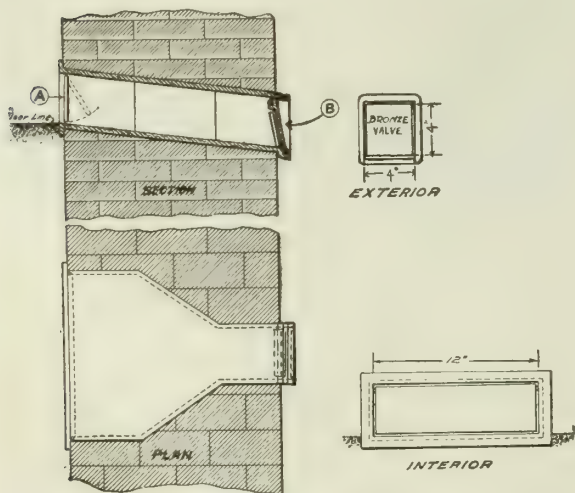
### Value of the Windshield (Patented).

The old type scuppers with grating cause drafts which seriously hamper employees in their work, with the result that they stuff them with waste material, which defeats the purpose for which the scuppers are intended, and renders them useless.

Windshield scuppers positively prevent drafts. The slightest air current closes the Windshield.

The Windshield, in addition, acts as a fire retardant. When an adjoining building is burning, there is a tendency for the flames to communicate through an open scupper and ignite merchandise on the floor. The Windshield, by shutting off the drafts and fire, acts as a retardant or shield to keep out the flames.

See "Kidder's Handbook," 16th edition, page 767.



DETAILS OF WINDSHIELD SCUPPERS

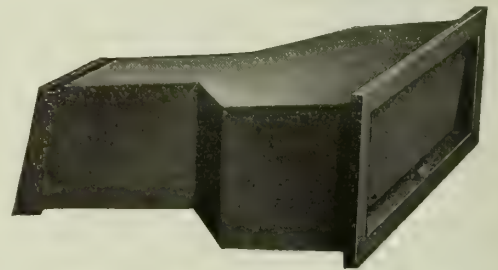
"A" shows patented windshield. "B" shows external storm gate

### Reduced Insurance Rates.

More actual damage is done by water than by fire. Buildings equipped with these scuppers are subject to a reduction in insurance rates from 2% to 5%. (See

article 377  
of Insurance  
Schedule  
Form No.  
115.)

This great saving is far out of proportion to the small initial cost of the scuppers.



INSIDE VIEW OF WINDSHIELD SCUPPER

### PRICES AND SIZES

Thickness of wall	Type K	Type L	Type M	Type N
6 to 8 ins.	\$4.30	\$4.10	\$3.50	\$2.40
9 to 11 "	4.50	4.20	3.80	2.65
12 to 14 "	4.90	4.55	4.10	2.90
15 to 17 "	5.15	4.80	4.40	3.15
18 to 20 "	5.40	5.10	4.75	3.40
21 to 23 "	5.75	5.45	5.00	3.75
24 to 26 "	5.95	5.70	5.30	3.85

Type K, of heavy  $\frac{3}{8}$ -in. metal, with windshield.

Type L, of heavy  $\frac{3}{4}$ -in. metal, with windshield.

Type M, of heavy  $\frac{3}{4}$ -in. metal, with grating (no windshield).

Type N, straight, 4 by 4 ins. (not flared), of  $\frac{3}{4}$ -in. metal, without windshield or grating.

NOTE—All equipped with exterior bronze valves and brass hinge pins. For polished brass windshield, add 75¢ each, net. For copper windshield, add 50¢ each, net.

## Specification.

Provide for each bay in exterior walls as shown on plans, Windshield Scuppers. Exterior door to be of bronze or copper hung on bronze pins; equipped with Windshield hung on bronze hinge pins, manufactured by WINDSHIELD SCUPPER COMPANY, 16 Warren Street, New York, N. Y.

## References.

Note the class of firms installing Windshield scuppers. It indicates their superiority.

Underhill Building, New York, N. Y.  
Austin, Nichols & Co. Building, New York, N. Y.  
Chelsea Warehouse, New York, N. Y.  
Lord & Taylor Building, New York, N. Y.  
Fulton Bag & Cotton Mills, Brooklyn, N. Y.  
National Casket Co., Brooklyn, N. Y.  
Baker Shoe Co., Brooklyn, N. Y.  
Standard Oil Co., Long Island City, N. Y.  
Studebaker Building, Long Island City, N. Y.  
Walker & Gibson Building, Albany, N. Y.  
Sauquoit Toilet Paper Co., Utica, N. Y.  
Robertson Cataract Electric Co., Buffalo, N. Y.  
Brewster-Gordon Warehouse, Rochester, N. Y.  
Endicott-Johnson Co., Lestershire, N. Y.  
Colgate & Co., Jersey City, N. J.  
Premier Briar Pipe Co., Jersey City, N. J.  
Banister Shoe Co., Newark, N. J.  
General Electric Co., Harrison, N. J.  
American Cigar Co., Garfield, N. J.  
Crown Mfg. Co., Valley Falls, R. I.  
Victor Talking Machine Co., Camden, N. J.  
Naumkeag Steam Cotton Mills, Salem, Mass.  
Merchants Terminal Warehouse, New Bedford, Mass.  
Packard Motor Co., Chicago, Ill.  
Missouri Can Co., Kansas City, Mo.  
American Can Co., San Francisco, Cal.



# C. H. STEPHENSON

## Manufacturer of Household Specialties

TELEPHONE:  
944-W

48 Furrar Street  
LYNN, MASS.

ALL GOODS SOLD DIRECT FROM FACTORY

### Products.

"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVERS, UNDERGROUND STREET SWEEPINGS RECEIVERS, UNDERFLOOR ASH RECEIVERS, UNDERGROUND EARTH CLOSETS, SPIRAL TRUSS RIBBED ASH BARRELS.

Portable Earth Closets, Always Closed Fireproof Barrels (Patented), Portable Metal Houses (for contractors and campers), Portable Metal Garages, Gasoline Pumps and Tanks.

### Trade-mark.

Architects should note carefully our construction, and when specifying should designate all our goods by our name, as all are trade-marked "The Stephenson." Our 14 years' practical experience, with thousands of satisfied users, has made possible this trade-mark which protects architects, their clients and us from substitution.

Architects' specification card on request.

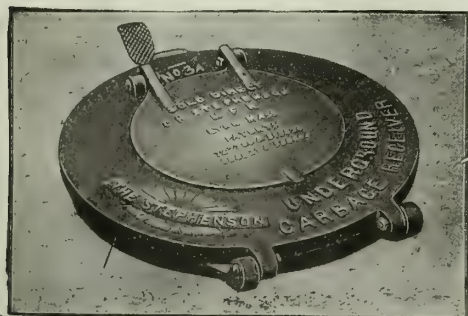
### Underground Garbage Receiver.

"The Stephenson" standard underground garbage receiver sets deep in the ground, holding a heavy galvanized bucket with bail. It thus avoids the unsightly and injurious effects of wooden boxes, with their attendant annoyance of rats, cats, dogs and flies, attracted by scattered refuse. It is



"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVER

As it appears when out of the ground, showing maid using foot trip  
Sold direct from factory



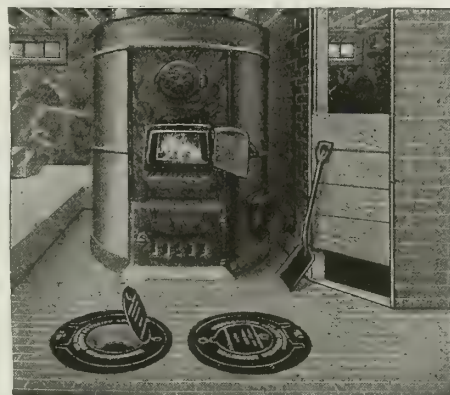
"THE STEPHENSON" STANDARD UNDERGROUND GARBAGE RECEIVER

As it appears when in the ground. Note carefully our construction

Sold direct from factory



impossible to spill garbage between bucket and receiver, as the chute empties directly into the barrel. It is practical for all seasons; the objectionable features in the above ground garbage bucket nuisance are eliminated.



"THE STEPHENSON" FIREPROOF UNDER-FLOOR ASH RECEIVER

A clean and sanitary cellar  
Sold direct from factory



"THE STEPHENSON" STREET SWEEPINGS RECEIVER AT FIFTH AVENUE AND 24TH STREET, NEW YORK, N. Y.

1000 in use here

Sold direct from factory



"THE STEPHENSON" SPIRAL TRUSS RIBBED ASH BARREL

Note construction carefully

Sold direct from factory



"THE STEPHENSON" ALL STEEL ASH BARREL TRUCK

Wheels up steps

Sold direct from factory



"THE STEPHENSON" UNDERGROUND EARTH CLOSET

Showing wooden seat with the cover open

Sold direct from factory

# CHATTANOOGA ROOFING & FOUNDRY COMPANY

Manufacturers of Fireplace Fixtures

CHATTANOOGA, TENN.

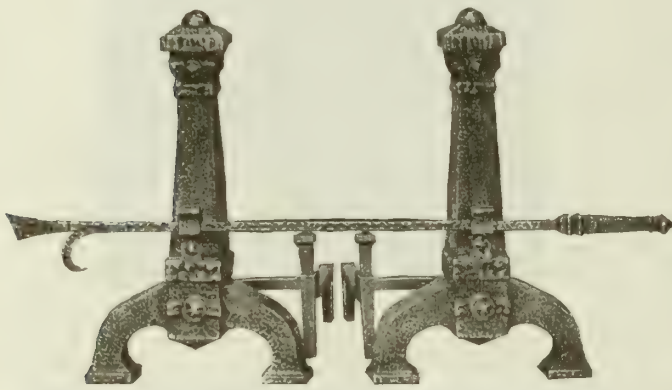
## Products.

FIREPLACE EQUIPMENTS and FURNISHINGS: Portable Baskets, Andirons, Brass and Wrought Iron Trimings.

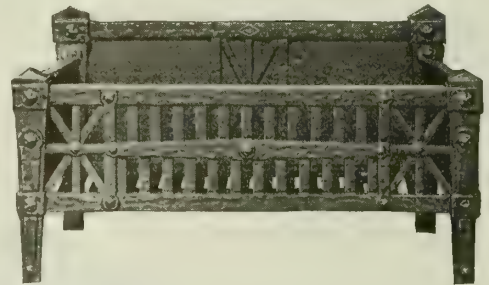
Cahill Grates.

## Catalogue.

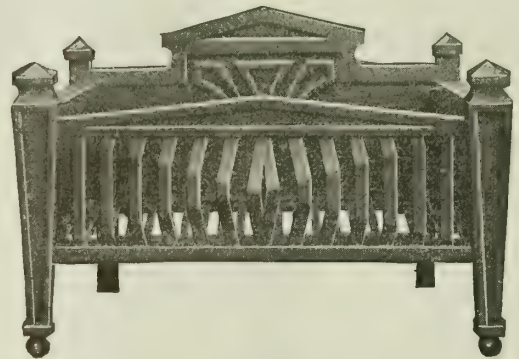
Architects are invited to write for catalogue No. 32.



NO. 802B. ANDIRON



NO. 172. PORTABLE BASKET



NO. 168. BASKET  
20-, 22-, 24-, 26- and 30-in. sizes



NO. 194. ANDIRON



NO. 46. HOOD AND ARCH BAR

Equipped with arch bar. Provided with slot and key for attaching in place



NO. 38. BRASS FRAME

16-, 17- or 18-tile (stock sizes), 1¼-in. face. Adjustable corners. Made special for any size opening



# COLONIAL FIREPLACE COMPANY

4644 West Twelfth Street  
CHICAGO, ILL.

## Products and Services.

The IMPROVED COLONIAL HEAD THROAT and DAMPER for Fireplaces.

Fireplaces; Fireplace Trimmings, Fenders, Grates and Andirons; Special Brass and Wrought Iron Work for Fireplaces.

Bestovall Garbage Receivers.

## Improved Colonial Head Throat and Damper for Fireplaces.

The Colonial head throat and damper is *not* a one-piece casting; it is a *built-up* damper of the best gray iron castings, *reinforced* with steel angle, *locked* and *bolted* in such a manner that it can sustain great weight and stand intense heat. This construction provides automatically for *expansion* and *contraction* within itself, thus avoiding any possibility of *cracking* the face of the fireplace, and *prevents warping* of castings when heated.

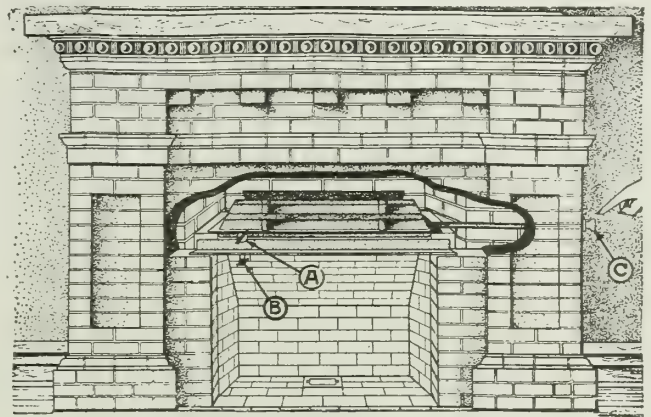
The simplicity of its shape and construction *insures* the architect of a fireplace *properly built* at the *most vital part*, even by incompetent workmen.

The Colonial head throat and damper is easy to set, and adapts itself to all conditions of construction. The draft is controlled from the outside by a key placed either in the front or the end of the fireplace (see drawings of Style A, B and C). Style C can be used only on fireplaces which stand 7 ins. or more into the room. By means of this external key, the damper may be adjusted to any weather condition, because it can be opened or

closed a *fraction of an inch* at a time. The position of the damper door when opened prevents down-drafts.

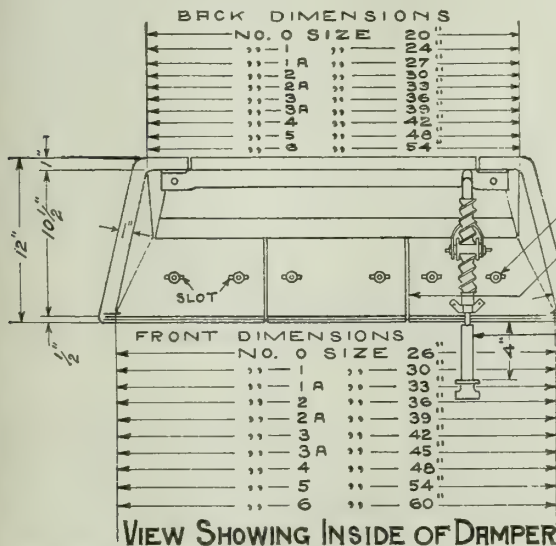
Nothing is so important as perfect construction where the fire opening joins the throat to the flue, and the *Colonial head makes faulty construction here impossible*. It will save its entire cost in the labor ordinarily required to properly construct this part of the fireplace.

Note, in section drawings below, steel angle ledge and its importance in carrying brick backing over opening.



INSTALLATION

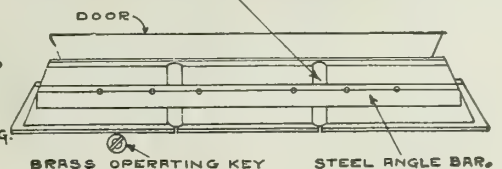
Showing 3 methods of operating damper door. Note section drawings below, also sizes of back and front measurements.  
Blue print details and Catalogue No. 14 of fireplace designs sent to architects on request



## DETAILS OF THE COLONIAL HEAD THROAT AND DAMPER

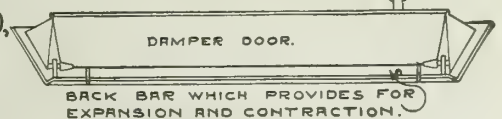
CAST IRON LUGS WHICH COVER EXPANSION JOINT

SLOT WITH BOLT AND WASHER.  
JOINT WHICH ALLOWS FOR EXPANSION AND CONTRACTION IN CASTING.  
BRASS SLEEVE FOR PROTECTION OF ROD.



### FACE OF DAMPER

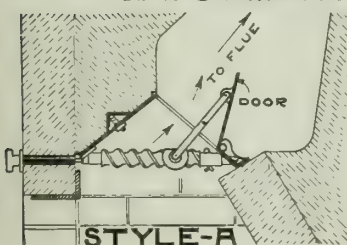
OPERATING KEY.



### BACK OF DAMPER

MANUFACTURED BY  
COLONIAL FIREPLACE CO.  
CHICAGO ILL

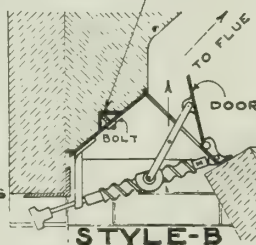
STEEL ANGLE AND METHOD OF BOLTING FRONT.



STYLE-A

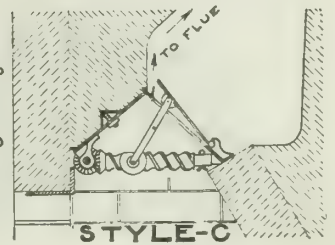
STYLE A SHOWS KEY THROUGH FLUE. CAN BE SET ONE TWO OR THREE COURSES OVER OPENING.

STYLE B SHOWS OPERATING KEY DROPPED UNDER OPENING.



STYLE-B

STYLE C SHOWS END OR SIDE OPERATED DAMPER. CAN BE USED ONLY WHEN FINISHED RETURN IS 7" OR OVER



STYLE-C

DETAILS OF COLONIAL HEAD THROAT AND DAMPER

# THE H. W. COVERT COMPANY

Manufacturers of Fireplace Specialties

351 Lexington Avenue  
NEW YORK, N. Y.

## Products.

COVERT PATENT IRON FIREPLACE THROAT and DAMPER.

Iron Coal Windows; Clean-out Doors; Ash Dumps; Iron Plinths for Porch Columns; Texture Brick Fireplaces complete.

## Covert "Improved" Fireplace Throat and Damper.

Illustration shows proper construction of fireplace to secure best results. The wind shelf is important for checking down-drafts which are liable to occur under certain atmospheric conditions.

This damper is good for fireplaces not over 20 ins. deep; but in large fireplaces, where the height is 3 ft. or over, it may be used up to 24 ins. deep. For wider and deeper fireplaces use "Old Style" dampers shown in our catalogue.

The slope of the back should be started well down in the fireplace, as shown, and should be a straight, and not a curved line.

NOTE—The Covert steel smoke-chamber former should be used in connection with the damper, insuring a properly shaped and smooth connection from throat to flue, reducing friction, increasing flue power 25%, and making it practically impossible for a careless workman to "queer" the fireplace.

The operating device is under the arch at the front, but in an inconspicuous position. Any mechanical device showing on the arch or face of the fireplace is an architectural blemish.

Its lines are so designed as to induce the flow of the smoke and gases of combustion into the flue and not into the room.

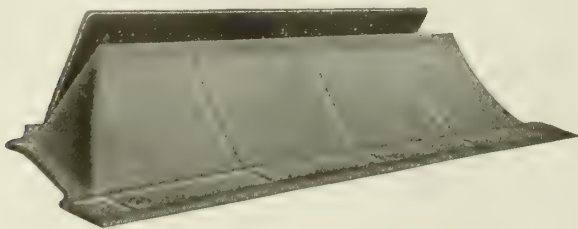
The valve plate is readily removable.

Perfect control of the draft is assured, by means of the ratchet handle.

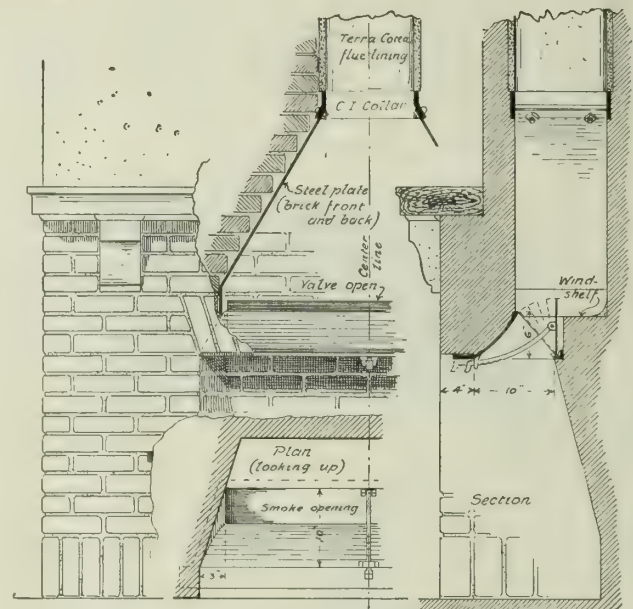
Its strength as a lintel is guaranteed. Thousands have been sold and none have been known to fail.

## Specification.

"Every fireplace to have a Covert 'Improved' iron throat and damper built in over the fireplace, same acting as a lintel. To be built as shown on detail drawings or as illustrated in the printed matter of THE H. W. COVERT COMPANY, New York. Form wind break or shelf at the level of the upper edge of the throat, and connect the iron throat with the flue by setting a Covert steel smoke-chamber former with cast iron collar of proper size."



PERSPECTIVE VIEW OF IMPROVED DAMPER



CONSTRUCTION OF FIREPLACE WITH IMPROVED DAMPER AND STEEL SMOKE-CHAMBER FORMER

## PRICE LIST

IMPROVED THROAT AND DAMPER				STEEL SMOKE-CHAMBER FORMER		
Damper number	Front width of fireplace, ins.	Telegraphic code-word	Price	Proper flue lining exterior dimensions, ins.	Code-word	Price
524	24	Intro	\$5.50	8½ x 8½	Force	\$3.25
530	30	Impart	6.00	8½ x 13	Freak	3.50
532	32	Impel	6.25	8½ x 13	Face	3.75
536	36	Inert	6.50	8½ x 13	Fronc	4.00
542	42	Infer	7.00	13 x 13	Fold	4.25
548	48	Impost	7.75	13 x 13	Friend	4.50
554	54	Incur	8.50	13 x 18	Fleece	5.00
560	60	Impale	9.50	13 x 18	Field	5.50

## Catalogue.

Send for catalogue and booklet "Hints on Fireplace Construction."

## References.

The following is a partial list of the architects who specify Covert products for fireplace construction:

McKim, Mead & White	Wilson Brothers and Co.
Clinton & Russell	Cope & Stewardson
Warren & Wetmore	Frank Miles Day & Brother
Carrère & Hastings	Charles Barton Keen
Grosvenor Atterbury	Wilson Eyre
John Russell Pope	Stearns & Castor
Rutan & Russell	William Warren Sabin
Bragdon & Hillman	Delano & Aldrich
Kirby, Petit & Green	Davis, McGrath & Kiessling
Beatty & Stone	John Cox, Jr.
George A. Freeman	Jackson & Rosencrans
F. G. Hasselman	Radcliffe & Kelly
Walter Leslie Walker	A. E. Barlow



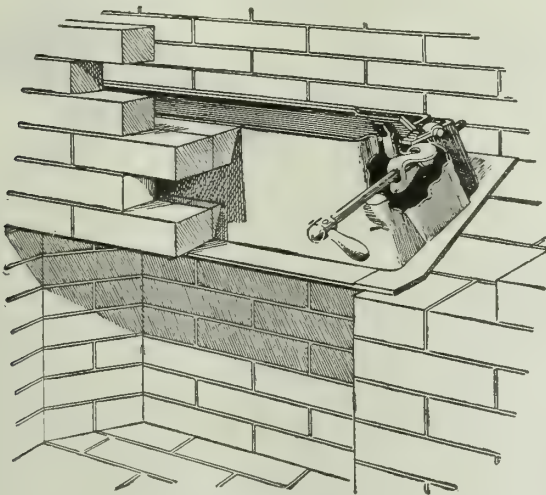
PEERLESS MANUFACTURING CO., INC.

Fireplace Fixtures  
LOUISVILLE, KY.

Products.  
DOME DAMPERS.  
Fireplace Accessories.

Description.  
To insure a good free draft, a perfect dome damper should be so constructed as to regulate the opening of the throat at the top of the fireplace and be properly contracted to the size of the opening into the flue.  
It should have all walls about same height to give a smooth lining in the throat, with damper door hinged in center to prevent any accumulation of soot and dirt on the door, which tends to clog and prevent free operation, also a simple, easy mode of operating free from complicated mechanism and arranged to show position of damper door when opening or closing.  
The width of the base of the dome at front should be as near as possible to width of fireplace so as to have as little flat surface as possible, to prevent puffing of smoke into the room.

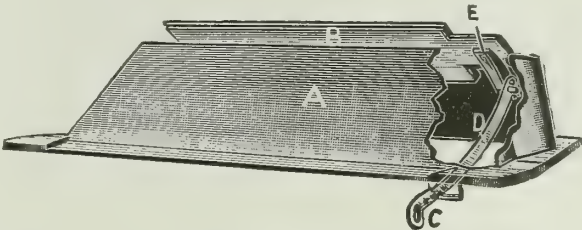
No. 17 Dome Damper.  
When it is possible to use the operating rod through the face of mantel, No. 17 dome damper is recommended as being the best and easiest operated damper made.  
SPECIAL FEATURES—So constructed that the door automatically locks itself any desired opening while operating the handle.  
Operating rod and handle at extreme right of damper, away from heat of fire.  
Requires but three-quarters turn of handle to open or close the door, and handle will always indicate position of door.



SECTIONAL VIEW OF NO. 17 DAMPER INSTALLED IN FIREPLACE  
Operating cam and rod

The mechanism is exposed inside of dome so as to be able to adjust the damper rod to proper position after face of fireplace is completed.  
The door can be removed and replaced at will without removing any screw or works, permitting of free access to flue when building or cleaning the flue.  
The handle and casing through which operating rod works is of brass.

No. 21 Dome Damper.  
When not desirable, or it is impossible to place operating rod through face of mantel, No. 21 is offered, using same body and door as in No. 17, with underslung mechanism at extreme right side of dampers operating in the side pocket exposed and free from the fire.  
The pull is of forged steel notched, with a brass handle, working through a loop fastened underneath front flange of body. The rod is notched so as to regulate the different openings of the door.  
When damper is closed the handle is not exposed, being back underneath the flange and when full open extends only about one inch in front.  
Easily operated.



NO. 21 PEERLESS DOME DAMPER

A—body; B—door; C—brass handle; D—steel rod operating ratchet; E—pinion; F—loop

DIMENSIONS OF PEERLESS DOME DAMPERS

Outside			Dome		
Front, ins.	Back, ins.	Depth, ins.	Front, ins.	Back, ins.	Depth, ins.
NOS. 17 AND 21 DAMPERS					
28	20 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	24	18 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>2</sub>
32	28	15 <sup>1</sup> / <sub>2</sub>	28	22	12 <sup>1</sup> / <sub>2</sub>
34	26 <sup>1</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	30	24	12 <sup>1</sup> / <sub>2</sub>
37	33	15 <sup>1</sup> / <sub>2</sub>	33	27	12 <sup>1</sup> / <sub>2</sub>
40	32	15 <sup>1</sup> / <sub>2</sub>	36	30	12 <sup>1</sup> / <sub>2</sub>
43	39	15 <sup>1</sup> / <sub>2</sub>	38	33	12 <sup>1</sup> / <sub>2</sub>
46	38	15 <sup>1</sup> / <sub>2</sub>	42	36	12 <sup>1</sup> / <sub>2</sub>
52	44 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>2</sub>	48	42	12 <sup>1</sup> / <sub>2</sub>
58	50 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	54	48	12 <sup>1</sup> / <sub>2</sub>
64	59 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>2</sub>
No. 17B Damper					
28	20 <sup>1</sup> / <sub>2</sub>	13	22 <sup>1</sup> / <sub>2</sub>	18	10
31 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	13	27 <sup>1</sup> / <sub>2</sub>	23	10
34	26	13	28	24	10
40	32	13	34	30	10
46	37 <sup>1</sup> / <sub>2</sub>	13	40	35	10

# STOVER MFG. & ENGINE CO.

Manufacturers of Fireplace Dampers

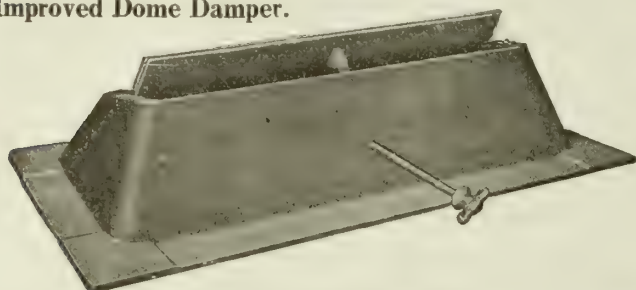
746 East Street  
FREEPORT, ILL.

## Products.

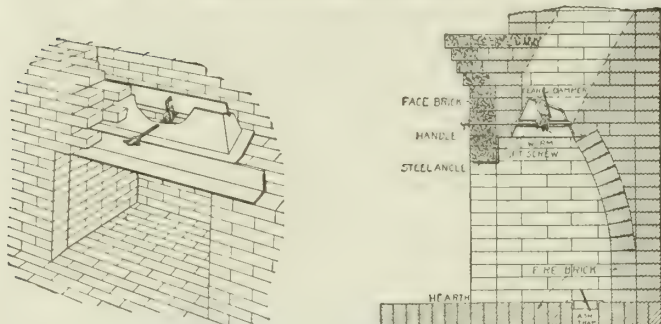
### FIREPLACE DAMPERS.

Ash Traps, Clean-out Doors and a general line of Fireplace Fixtures; Builders' and Household Hardware.

### Improved Dome Damper.



IMPROVED DOME DAMPER

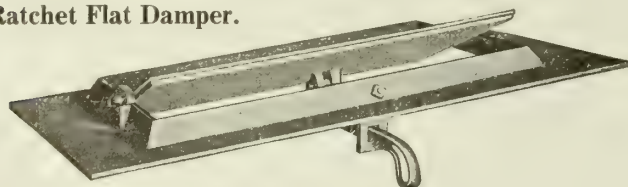


PROPER INSTALLATION OF IMPROVED DAMPER WHEN STEEL ANGLE IS USED

High dome to form throat of fireplace; wide flanges; length of rod instantly changed without machine work; operates with worm gear; brass knob showing direction to turn to open.

	Length			Base of Dome			Weight
	Front	Rear	Depth	Front	Rear	Depth	
No. 15..	30"	25"	13 $\frac{3}{4}$ "	24 $\frac{1}{2}$ "	21"	10"	30 lbs.
No. 16..	34"	29"	13 $\frac{3}{4}$ "	28 $\frac{1}{2}$ "	25"	10"	34 lbs.
No. 17..	38 $\frac{1}{2}$ "	33 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	33"	28 $\frac{1}{2}$ "	10"	39 lbs.
No. 18..	44 $\frac{1}{2}$ "	39 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	39"	35"	10"	44 lbs.
No. 19..	54"	49"	13 $\frac{3}{4}$ "	49"	45"	10"	61 lbs.
No. 20..	60"	55"	13 $\frac{3}{4}$ "	55"	51"	10"	73 lbs.
No. 21..	78"	73"	13 $\frac{3}{4}$ "	72"	68"	10"	80 lbs.

### Ratchet Flat Damper.



RATCHET FLAT DAMPER

Like Ratchet dome damper without the dome feature

	Length		Depth	Opening	Weight
	Front	Rear			
No. 30..	24"	21 $\frac{1}{2}$ "	10"	17" x 6"	13 lbs.
No. 30X..	24"	21 $\frac{1}{2}$ "	10"	17" x 6"	13 $\frac{1}{2}$ lbs.
No. 31..	28"	25 $\frac{1}{2}$ "	10"	21" x 6"	18 lbs.
No. 31X..	28"	25 $\frac{1}{2}$ "	10"	21" x 6"	18 $\frac{1}{2}$ lbs.
No. 32..	32"	29 $\frac{1}{2}$ "	10"	25" x 6"	20 lbs.
No. 32X..	32"	29 $\frac{1}{2}$ "	10"	25" x 6"	20 $\frac{1}{2}$ lbs.
No. 33..	37 $\frac{1}{2}$ "	34 $\frac{3}{4}$ "	10"	29" x 6"	27 $\frac{1}{2}$ lbs.
No. 33X..	37 $\frac{1}{2}$ "	34 $\frac{3}{4}$ "	10"	29" x 6"	28 lbs.
No. 34..	44"	41 $\frac{1}{4}$ "	10"	35 $\frac{1}{2}$ " x 6"	32 lbs.
No. 34X..	44"	41 $\frac{1}{4}$ "	10"	35 $\frac{1}{2}$ " x 6"	32 $\frac{1}{2}$ lbs.

X Dampers have long lever and bracket so a 4 by 4-in. steel angle can be set below edge of damper.

### Ratchet Dome Damper.

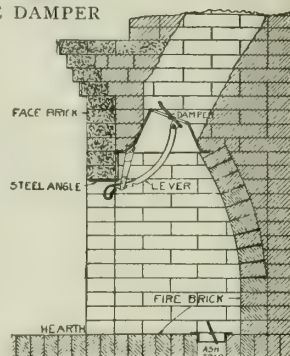


RATCHET DOME DAMPER

This damper has same frame and cover as the improved damper, but is operated with a ratchet lever that sets just under the first row of brick.

Lever locks in position when released by hand. Is very accessible and easily operated.

The dampers marked X have long lever and bracket to allow a 4 by 4-in. steel angle to be used.



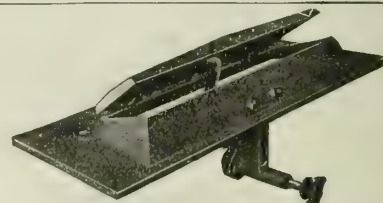
PROPER INSTALLATION OF RATCHET DOME DAMPER WITH ANGLE STEEL

DATA, RATCHET DOME DAMPERS

	Length			Base of Dome			Weight
	Front	Rear	Depth	Front	Rear	Depth	
No. 39..	30"	25"	13 $\frac{3}{4}$ "	24 $\frac{1}{2}$ "	21"	10"	30 lbs.
No. 39X..	30"	25"	13 $\frac{3}{4}$ "	24 $\frac{1}{2}$ "	21"	10"	30 $\frac{1}{2}$ lbs.
No. 40..	34"	29"	13 $\frac{3}{4}$ "	28 $\frac{1}{2}$ "	25"	10"	34 lbs.
No. 40X..	34"	29"	13 $\frac{3}{4}$ "	28 $\frac{1}{2}$ "	25"	10"	34 $\frac{1}{2}$ lbs.
No. 41..	38 $\frac{1}{2}$ "	33 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	33"	28 $\frac{1}{2}$ "	10"	39 lbs.
No. 41X..	38 $\frac{1}{2}$ "	33 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	33"	28 $\frac{1}{2}$ "	10"	39 $\frac{1}{2}$ lbs.
No. 42..	44 $\frac{1}{2}$ "	39 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	39"	35"	10"	44 lbs.
No. 42X..	44 $\frac{1}{2}$ "	39 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	39"	35"	10"	44 $\frac{1}{2}$ lbs.
No. 43..	54"	49"	13 $\frac{3}{4}$ "	49"	45"	10"	61 lbs.
No. 43X..	54"	49"	13 $\frac{3}{4}$ "	49"	45"	10"	61 $\frac{1}{2}$ lbs.
No. 44..	60"	55"	13 $\frac{3}{4}$ "	55"	51"	10"	73 lbs.
No. 44X..	60"	55"	13 $\frac{3}{4}$ "	55"	51"	10"	73 $\frac{1}{2}$ lbs.
No. 45..	78"	73"	13 $\frac{3}{4}$ "	72"	68"	10"	80 lbs.
No. 45X..	78"	73"	13 $\frac{3}{4}$ "	72"	68"	10"	80 $\frac{1}{2}$ lbs.

### Combination Dome Damper.

Same as adjustable dome damper, except that the frame has 4 by 4-in. angle cast on it.



ADJUSTABLE DOME DAMPER

Lever extends under brick. Length rod instantly adjustable. Flange 4 ins. each side of dome. For straight openings, use a 4 by 4-in. angle steel

DATA, COMBINATION AND ADJUSTABLE DOME DAMPERS

	Length			Base of Dome			Weight
	Front	Rear	Depth	Front	Rear	Depth	
SIZES AND WEIGHTS, COMBINATION DOME DAMPERS							
No. 6...	34½"	30½"	*16"	26"	22"	7½"	73 lbs.
No. 7...	36½"	34½"	*16"	30"	26"	7½"	80 lbs.
No. 8...	43½"	40"	*16"	35"	31"	7½"	89 lbs.
SIZES AND WEIGHTS, ADJUSTABLE DOME DAMPERS							
No. 11...	33"	30½"	11"	26"	22"	7"	48 lbs.
No. 12...	37¾"	34¼"	11"	30"	26"	7"	53 lbs.
No. 13...	40¼"	38"	11"	36"	32"	7"	57 lbs.
No. 14...	48"	46"	11"	44"	40"	7"	65 lbs.
No. 14½	54"	52"	11"	44"	40"	7"	70 lbs.

\*This measurement includes angle 3 $\frac{3}{8}$  ins. wide.



# DAVIS MARBLE COMPANY

1713 Flatiron Building  
NEW YORK, N. Y.

CHICAGO, 1450 West North Avenue

PHILADELPHIA

WASHINGTON

## Products and Services.

Contractors for INTERIOR MARBLE WORK; MARBLE, CERAMIC and GLASS MOSAICS; TERRAZZO WORK; WALL and FLOOR TILING.

This company is in a position to get the choicest selections of all foreign and domestic marbles and tiles.

By giving personal attention to all contracts, first class work is done in any part of the United States.

## Marble Mosaic.

Carefully designed and well laid marble mosaic floors are attractive and durable.

## Glass Mosaic.

Glass and enamel mosaic imported for artistic mural decorations.

## Ceramic Mosaic.

Is practical and effective when used for bottom and sides of swimming pools, or for similar places.

## Terrazzo.

Makes a solid floor and can be furnished with cove base. It is particularly adapted to hospitals or other buildings where large areas are to be covered at low cost.

## Floor Tiling.

Vitrified floor tiles make a sanitary and durable floor. All kinds of these tiles are furnished and set.

## Wall Tiling.

Glazed tiles are both sanitary and decorative, being desirable material for walls and ceilings.

## Faience Tiles.

Used for inserts in tile walls, for pictorial panels or for a complete decorative color treatment.

## Weatherproof Tiles.

Handmade for wall surfaces exposed to the weather. They can be obtained in all shapes and colors.

## References.

The following are a few of the buildings in which the marble work, mosaic, terrazzo or tiling was supplied by DAVIS MARBLE COMPANY:



MARBLE STAIRWAY, CORN EXCHANGE BANK, CHICAGO, ILL.

NEW YORK, N. Y.  
Plaza Hotel  
New Subway Stations  
Hudson Terminal  
National City Bank

BALTIMORE, MD.  
B. and O. Building  
Savings Bank of Baltimore

CHICAGO, ILL.  
People's Gas Building  
Armour Oleo Building  
Detention Hospital  
West Side Hospital  
A. G. Spaulding's Store

LA SALLE, ILL.  
St. Mary's Hospital

MILWAUKEE, WIS.  
Plankinton Arcade

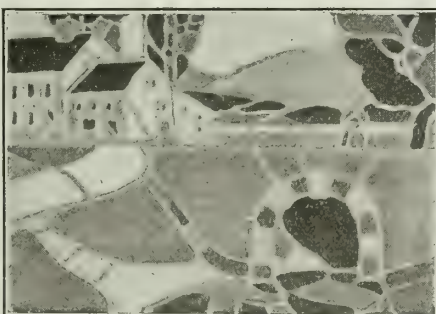
NEWARK, N. J.  
Park Place Terminal

PHILADELPHIA, PA.  
Bellevue-Stratford Hotel  
Misericordia Hospital  
Land Title Building

PITTSBURGH, PA.  
Hammond Packing



SPECIAL TERRAZZO WITH MARBLE MOSAIC BORDER



FAIENCE TILE PLACQUE  
Old Stone Bridge and Tavern at Canal Street  
A. D. 1800. Part of New York Subway decoration



DESIGN MARBLE MOSAIC FLOOR,  
CHICAGO PUBLIC LIBRARY

# THE ASSOCIATED TILE MANUFACTURERS

Tile, Ceramic Mosaic and Faience

BEAVER FALLS, PA.

MEMBERS OF THE ASSOCIATION ARE

## ALHAMBRA TILE COMPANY

Newport, Ky.

## AMERICAN ENCAUSTIC TILING CO., LTD.

Factories: Zanesville, Ohio, and Maurer, N. J.

New York Office, 16 East 40th Street

## ATLANTIC TILE MANUFACTURING CO.

Matawan, N. J.

## BEAVER FALLS ART TILE COMPANY

Beaver Falls, Pa.

New York Office, 156 West 49th Street

Chicago Office, 202 South State Street

## BRUNT TILE AND PORCELAIN COMPANY

Columbus, Ohio

## CAMBRIDGE TILE MANUFACTURING COMPANY

Covington, Ky.

New York Office, 2-4 West 19th Street

## GRUEBY FAIENCE AND TILE COMPANY

Boston, Mass., corner K and 1st Streets

## MOSAIC TILE COMPANY

Zanesville, Ohio

New York Office, 35 West 35th Street

San Francisco Office, 230 Eighth Street

## MATAWAN TILE COMPANY

Matawan, N. J.

## NATIONAL TILE COMPANY

Anderson, Ind.

New York Office, 1328 Broadway

Chicago Office, 59 East Adams Street

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## OLD BRIDGE ENAMEL BRICK AND TILE CO.

Old Bridge, N. J.

Chicago Office, 30 North Michigan Boulevard

## C. PARDEE WORKS

Perth Amboy, N. J.

## PERTH AMBOY TILE WORKS

Perth Amboy, N. J.

## U. S. ENCAUSTIC TILE WORKS

Indianapolis, Ind.

New York Office, 101 Park Avenue

Chicago Office, 918 First National Bank Building

## WHEELING TILE COMPANY

Wheeling, W. Va.

### Products.

Members of THE ASSOCIATED TILE MANUFACTURERS specialize in the manufacture of VITREOUS, SEMI-VITREOUS, INLAID, CERAMIC MOSAIC and ART CERAMIC MOSAIC TILE for floors, GLAZED, ENAMELED, EMBOSSED, DECORATED and TRIM TILE for walls, ceilings, etc., and FAIENCE for walls and floors in all standard and many special sizes and shapes in a great diversity of colors.

### Co-operative Service.

Architects are cordially invited to consult us on any question pertaining to tile and its many uses. The service department of this Association will gladly assist in selecting and specifying tile best suited for any purpose, or in solving problems that involve special conditions or requirements.

### Merits of Tile.

The practical advantages of tile include: Absolute sanitation, easy cleaning qualities, unexcelled wearing qualities and durability, and permanency of colors. It is absolutely fireproof, and acidproof to all acids, except hydrofluoric.

The great range of colors and textures makes tile a very desirable material for decorative purposes, and its use in the architectural triumphs of all ages speaks plainly for its artistic merit.

### Scope of Use.

All classes and sizes of buildings or other places requiring sanitary, durable, fireproof or attractive treatment are proper fields for tile, and there is no limit to either its usefulness or appropriateness. Its scope is as wide and varied as the work of the architect.

Any one of the kinds of tile enumerated above is suitable for interior work. For exterior surfaces, especially in colder climates, the vitreous varieties and Faience are to be preferred.

Stucco and concrete buildings are now decorated to an ever increasing extent with tile borders, panels and inserts. This form of decoration is the simplest and most satisfactory means of adding color to concrete houses.

### Certificate of Quality.

Special attention is called to the necessity of incorporating into specifications on tile work a clause requiring that the tile contractor furnish a certificate of quality for all tile used. These certificates of quality will be issued by each member of this association on request at time of shipment, with such identifying information as may be necessary.

### Publications.

THE ASSOCIATED TILE MANUFACTURERS have issued books on use of tile in hospitals, swimming pools and butcher shops, which are available and will be mailed free to architects on request. Others are in course of preparation.

In addition, photographic reproductions of some tile installations are distributed among architects at frequent intervals, and will be mailed regularly to those desiring them.

### Standard Methods for Setting Tile.

#### FLOORS

*Section 1, Foundation*—A perfectly solid and level foundation free from spring or vibration is absolutely necessary.

Tile must be laid on:

A, a concrete bed of not less than  $2\frac{1}{2}$  ins. thickness (cinder concrete beds should be not less than  $3\frac{1}{2}$  ins.).

Or B, a concrete bed of  $1\frac{1}{2}$  to 2 ins. with a leveling coat of a thickness to complete  $2\frac{1}{2}$  ins. on top.

Or C, a sand concrete bed of not less than  $2\frac{1}{2}$  ins. thickness, laid in successive layers of about 1 in. each.

The surface of this bed must be uniformly rough, and brought to within 1 in. of the finished floor line, leaving  $\frac{1}{2}$  in. for cement mortar setting bed, if tile of  $\frac{1}{2}$ -in. thickness is to be laid, or according to the thickness of the tile to be used. (See Fig. 1.)

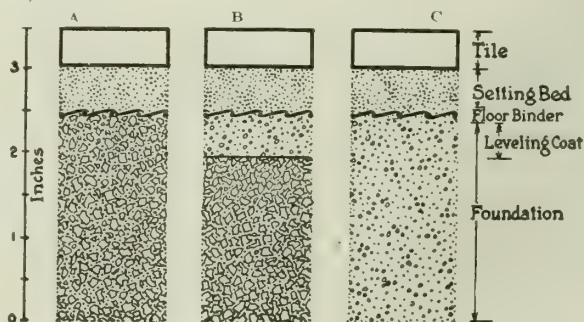


FIG. 1. FOUNDATIONS FOR FLOOR TILE



**Section 2, Concrete**—Shall consist of 1 part Portland cement, 2 parts clean, washed sand, and 4 parts clean gravel, broken stone or clean, washed cinders.

Cinders containing sulphur in any form shall not be used for work requiring steel reinforcing material. In all cases, cinders (vitreous clinkers) shall be washed free of unburned coal and ashes or particles smaller than  $\frac{1}{4}$  in. in diameter. (The strength of cinder concrete is very low, being about one-half that of good stone or gravel concrete, but it is very much lighter).

Thoroughly mix cement and sand dry; add gravel, broken stone or cinders, and mix again; then add sufficient water to make a firm mortar when tamped or floated to a bed.

Concrete shall be allowed to harden thoroughly before laying the tile, and care taken that it is perfectly clean. If concrete has been installed for any length of time, all dust must be brushed from it, and the surface shall then be thoroughly saturated with clean water, and dry cement evenly sprinkled over it to a thickness of about  $\frac{1}{16}$  in., before cement mortar is spread.

The leveling coat shall consist of 1 part Portland cement and 4 parts clean, washed sand, and shall be placed immediately after the concrete.

The sand concrete shall consist of 1 part Portland cement and 5 parts clean, washed sand.

**Section 3, Floors in New Buildings**—Joists shall be set  $4\frac{1}{2}$  ins. below the finished floor line (for small floor areas  $3\frac{1}{2}$  ins. is sufficient), spaced 12 ins. on centers, thoroughly bridged to make a stiff floor, free from spring or vibration, covered with 1-in. rough boards not over 6 ins. wide,  $\frac{1}{4}$  in. apart to allow for swelling, and thoroughly nailed. Place a layer of tar paper on top of rough floor to protect boards from the moisture of the concrete and prevent water from dripping through to the ceiling below.

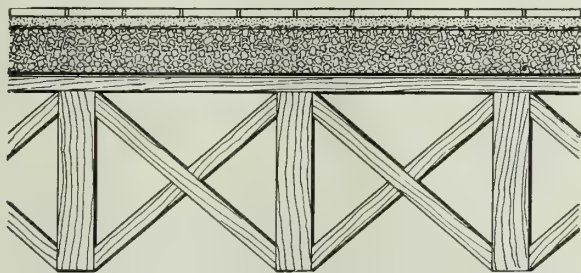


FIG. 2. CONSTRUCTION FOR TILE IN NEW BUILDINGS

**Section 4, Iron Beams**—Shall be set 3 ins. below finished floor line, to permit an adequate foundation for the tile floor. A metal or hollow tile cover shall be placed on top of the beams to take care of expansion and contraction and obviate the likelihood of cracks from this source (Fig. 3).

Where hollow tile arches are used the covering coat must conform to the requirements of Sections 1 and 2.

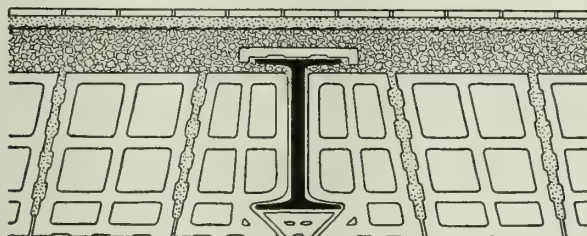


FIG. 3. LAYING TILE OVER IRON BEAMS AND HOLLOW TILE

**Section 5, Floors in Old Buildings**—Joists shall be thoroughly bridged and free from spring or vibration. Where strength of joists permits, 1 in. or more should be cut off the top. Where joists are too weak, they shall be strengthened by securely nailing cleats, 6 ins. wide, the full length of the joists. The upper edges of the joists must be chamfered off to a sharp point, thus reducing the bearing and the chance of cracking in case of settlement.

Cleats shall be nailed to the joists  $4\frac{1}{2}$  ins. below finished floor line (for small floor areas  $3\frac{1}{2}$  ins. is sufficient), and short pieces of board (not over 6 ins. wide),  $\frac{1}{4}$  in. apart, fitted between the joists, on the cleats and well nailed. A layer of tar paper shall be placed over the boards and carried up the joists; separate pieces shall then be put closely over the joists and overlapping those on the boards (Fig. 4).

The method described in Section 3 should be used wherever possible.

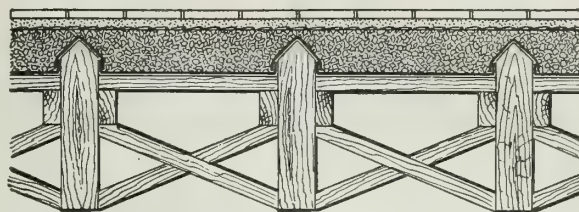


FIG. 4. CONSTRUCTION FOR TILE IN OLD BUILDINGS

**Section 6, Floor Binder**—Open and well painted, expanded metal or galvanized wire netting shall be placed on top of leveling coat or concrete, overlapping at least 6 ins. where more than one width is required. Wire netting should be stretched tightly and fastened at ends. This reinforcement will tend to counteract volume changes within cement mortar as well as distribute strains, and thus prevent floor cracks.

**Section 7, Cement Mortar**—Shall consist of 1 part Portland cement and 3 parts clean, washed sand, thoroughly mixed as directed for concrete (Section 2). Cement mortar must be used while fresh, before it reaches its initial set.

Before laying tile, dry cement shall be dusted over the cement mortar to a thickness of about  $\frac{1}{16}$  in.

**Section 8, Laying Floor Tile**—Set screed strips as guides for leveling the cement mortar over as large a section of the floor area as possible. The top of strips shall come to within  $\frac{3}{8}$  in. of finished floor line (when tile of  $\frac{1}{2}$  in. thickness are to be laid). The surface of the concrete or leveling coat shall then be saturated thoroughly with clean water. Sprinkle dry cement over concrete to a thickness of about  $\frac{1}{16}$  in. With a trowel spread cement mortar between the strips along one end of the room as evenly as possible. Put a screed edgewise over strips and with a sawing motion distribute and smooth the mortar till entire surface is true and even with the strips. The larger the area thus covered, the better, provided tile can be laid on it before the mortar reaches its initial set. Remove screed strips and fill the grooves with cement mortar. Sprinkle dry cement over the mortar to a thickness of about  $\frac{1}{16}$  in. This sprinkling of dry cement shall not be done over the entire setting bed at one time, but shall proceed with the laying of the tile.

All tile, except vitreous, shall be thoroughly soaked in clean water before laying.

Tile shall then be placed upon and firmly pressed into the cement mortar and tamped with block and hammer about  $\frac{1}{8}$  in., or until exactly true and even with the finished floor line (Fig. 5).

When more cement mortar has been spread than can be covered with tile on the same day, all mortar of the unfinished portions shall be removed and brought to a clean, beveled edge along the tile of the finished portion.

Joints shall be grouted with Portland cement mixed with water to the consistency of cream. Force the grout into the joints with a flat trowel or thin board. After dry cement has been sprinkled on the floor remove all surplus of the grout with sawdust and excelsior or bagging.

All floor tile laid on one day shall be grouted not later than the following morning to insure a proper bond between grouting and cement mortar.

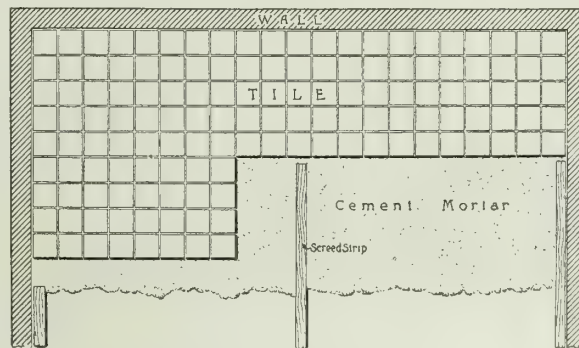


FIG. 5. METHOD OF LAYING FLOOR TILE

**Section 9, Cleaning Floor Tile**—A white scum, caused by cement, sometimes appears on the surface of the floor tile. This can generally be removed by frequent washing with plenty of soap and water. If this proves ineffective, use diluted commercial muriatic acid (6 oz. of acid to a bucket of water) and apply with a scrubbing brush. Agitate the acid and allow it to remain on the floor for a few minutes only, then wash off thoroughly with clean water.



**Section 10, Laying of Ceramic Mosaic Tile**—The border of a ceramic floor shall be laid before the center in the following manner: place short screed strips at right angles to the walls of the room and level with the finished floor line (Fig. 6). Surface of leveling coat or concrete shall then be saturated thoroughly with clean water. Sprinkle dry cement over concrete to a thickness of about  $\frac{1}{16}$  in. With a trowel spread cement mortar between strips as evenly as possible for a width slightly exceeding that of the border. Put a screed edgewise over strips and with a sawing motion distribute and smooth out the mortar till it is even with the strips. Sprinkle dry cement over the mortar to a thickness of about  $\frac{1}{16}$  in. Mark the inner edge of the border on the mortar with a chalk line. Remove the screed strips, fill grooves with cement mortar, and proceed with laying the border as described below.

Inner edge of border must be kept straight and all cutting of tile for irregularities in the wall line shall be done along the outer edge. Any cement mortar extending beyond the inner edge of the border shall be removed before hardening.

Field of the floor and floors without borders shall be laid as follows: set screed strips across the room and level with the finished floor line (Fig. 6). Thoroughly saturate the leveling coat or concrete with clean water. Sprinkle dry cement over concrete to a thickness of about  $\frac{1}{16}$  in. With a trowel spread cement mortar between screed strips as evenly as possible. Put a screed edgewise over strips and with a sawing motion distribute and smooth the mortar till the entire surface is true and even with the strips. The larger the area thus covered, the better, provided the sheets of ceramic mosaic can be laid on it before the mortar reaches its initial set. Remove the screed strips and fill the grooves with cement mortar. Sprinkle dry cement over the mortar to a thickness of about  $\frac{1}{16}$  in. The sprinkling of dry cement shall not be done over the entire setting bed at one time, but shall proceed with the laying of the sheets.

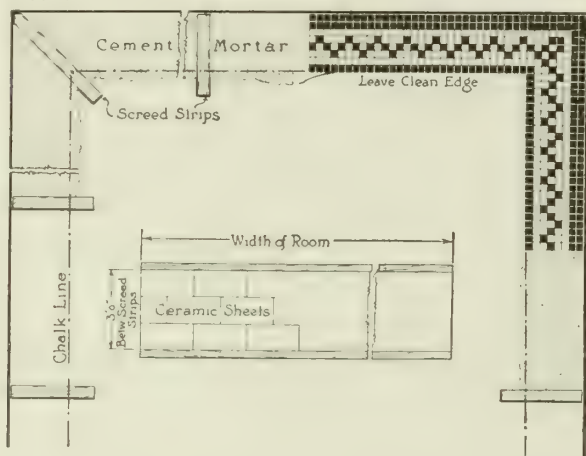


FIG. 6. METHOD OF LAYING CERAMIC MOSAIC TILE

Lay sheets of ceramic mosaic carefully on the mortar. Care must be taken to keep the joints between sheets the same general width as those between the mounted tile; the finished floor must not show where the sections join. In large areas of floor work, every third or fourth row of sheets shall be laid to a straight edge in order to avoid irregularities in the lines and design of the work.

Beat the tile down until the mortar shows in the joints through the paper, however, without breaking the paper. The paper shall then be moistened, and when well soaked, removed by carefully pulling it off backwards, starting with a corner. After removing the paper, sprinkle the tile with a dry mixture of white sand and cement in equal parts before finishing the beating, so that the tile will not adhere to the beater. Corrections of surface shall then be made by leveling with block and hammer.

Where the laying of the entire floor can not be finished on the same day, the last row of ceramic mosaic including the cement mortar shall be cut off (to be replaced before laying is continued), leaving the finished part of the work with a clean beveled edge.

Joints shall be grouted with Portland cement mixed with water to the consistency of cream. Force the grout into the joints with a flat trowel or thin board (not with a broom which often scrapes out the joints). After dry cement has been sprinkled on the floor remove all surplus of the grout with sawdust and excelsior or bagging. All ceramic mosaic laid on one day shall be grouted not later than the following morning to insure a proper bond between the grouting and cement mortar.

A day or two after grouting, the whole floor shall be rubbed with sharp sand and a piece of soft lumber to remove the last traces of cement.

**Section 11, Hearth**—Concrete foundation shall be placed on a subfloor constructed in the following manner. Lay 2-in. T-irons, 8 ins. apart, from the brick shelf at the chimney to a cleat nailed along the joist header. Common brick shall then be placed flat upon the irons and the joints filled with Portland cement mortar (Fig. 7). Sheet or corrugated iron can be used instead of brick (never use wood).

The setting of hearth and facing tile shall then be done in the same manner as directed for floors and walls respectively.

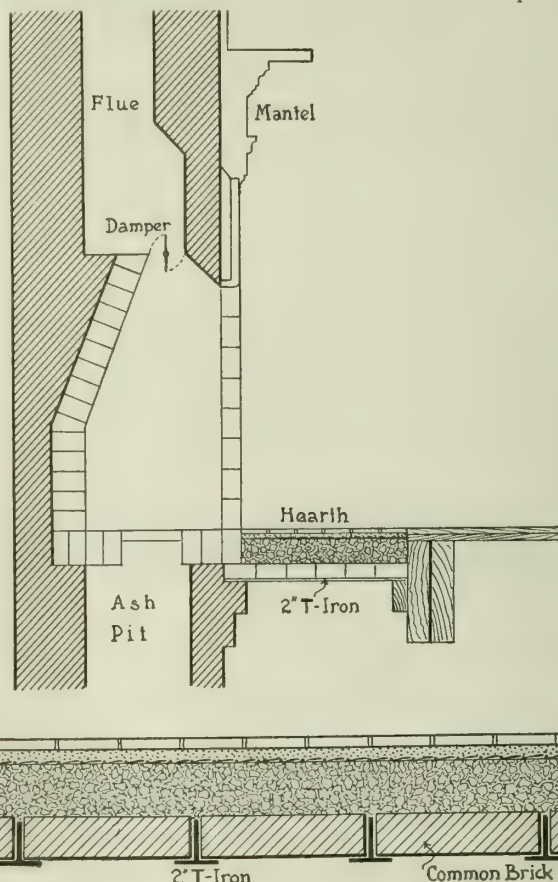


FIG. 7. FOUNDATION FOR HEARTH

#### WALLS

**Section 12**—A perfectly solid and plumb foundation free from spring or vibration is absolutely necessary.

**Section 13, On Studding**—Studding should be placed 16 ins. on centers, thoroughly braced to prevent vibration, and covered with tar paper (Fig. 8). Metal lath or expanded metal shall then be fastened securely to the studding.

**Section 14, On Brick Walls**—Some of the mortar must be raked out of joints of brickwork to provide a proper key for scratch coat. Before applying scratch coat saturate wall thoroughly with clean water.

**Section 15, On Cork Insulation**—Where tile is to be set on cork insulation (as for refrigerators or cold storage boxes), wire netting or metal lath shall be securely fastened to this insulation and the scratch coat shall contain waterproofing compound to prevent condensation from penetrating it.

**Section 16, On Gypsum Blocks**—When placed on gypsum blocks, these blocks shall be coated with waterproof paint and a wire netting or metal lath securely fastened to them, or holes shall be punched into the blocks to provide a proper anchor for the scratch coat.

**Section 17, Never on Wood or Plaster**—Tile shall never be placed on wood lath or plaster.

**Section 18, Scratch Coat**—Scratch coat shall consist of 1 part Portland cement and 2 parts clean, washed sand. Thoroughly mix the cement and sand dry, and add sufficient water to form a thick mortar. On metal lath, the scratch coat should be  $\frac{1}{2}$  in. thick, or sufficient to make an even and true surface to within  $\frac{3}{4}$  in. of finished wall surface (when tile of  $\frac{3}{8}$  in. thickness are to be used). Scratch coat shall be scratched horizontally, and allowed to harden for at least 1 day before com-



mencing to set tile. It shall then be brushed to remove all dust, and thoroughly saturated with clean water.

**Section 19, Cement Mortar**—Shall consist of 1 part Portland cement, 2 parts clean, washed sand, and not more than 15% of well slaked lime, thoroughly mixed. Great care must be taken to have the lime well slaked, and free from all lumps by passing it through a fine sieve (this guards against "heaving" or "swelling," and thus against "loosening" or "lifting" of tile). Hydrated or finishing lime can be used. Before setting tile, and after carefully placing the last coat of cement mortar to receive the tile, apply a very light coat of pure Portland cement mixed with water to the consistency of thick cream over this mortar coat with a plasterer's trowel.

**Section 20, Soaking Tile**—All tile, except vitreous, shall be thoroughly soaked in clean water before placing on the wall. Dirty water or water off cement will stain tile, cause variation in shade and an unsatisfactory job.

**Section 21, Setting Tile for Walls or Wainscoting**—Done by one of two methods: Floating or Buttering. Good work can be done by either method.

**Section 22**—When a cove base is used, it may be set first; in all cases it must be well supported on the concrete. If guide strips are used temporarily in place of base they must be even with finished wall line.

**Section 23, Floating Wall Tile**—Soak wood laths of about 30 ins. length in water and then place them as guide strips on the wall to be tiled by putting a small amount of cement mortar on one side of the laths. Apply plumb rule, and tap the laths against scratch coat until they are perfectly plumb (Fig. 8). With a large brush thoroughly saturate scratch coat with clean water and then apply cement mortar with hawk and plastering trowel, bringing the coat of cement as nearly flush with laths as possible. Then use a float rod by placing it edgewise against the wood laths and "sawing" it from the bottom up until an even coat results. Before placing tile on this coat, remove the wood lath guide strips and fill the grooves with cement mortar. Then mix a small quantity of pure cement, quite thinly, and apply a small amount on the back of each tile, place tile on the wall, and beat it carefully with block and hammer. Never rub face of tile with the block, since it will surely cause scratches.

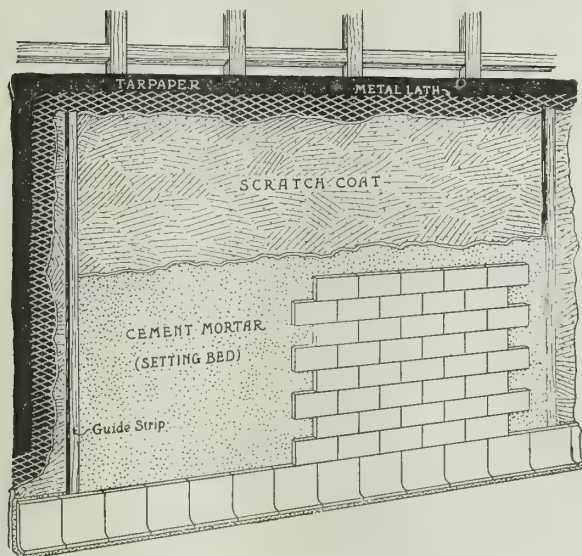


FIG. 8. METHOD OF SETTING WALL TILE BY FLOATING

**Section 24, Buttering Wall Tile**—After tile base is set, wall shall be spotted about 30 ins. apart, with small pieces of tile (fastened with mortar) which must be absolutely plumb with face of finished wall. These spots are to act as guides to make the tile wall or wainscot perfectly plumb (Fig. 9). With a large brush thoroughly saturate the scratch coat with clean water. Apply a small amount of neat Portland cement on the back of each tile. Spread the proper amount of cement mortar evenly on the back of each tile, place tile on the wall, and tamp gently until firmly united with the wall and plumb with the spots, frequently using a wooden straightedge which reaches from lower course of tile or base to all the spots. Any tile projecting beyond or receding from the straightedge shall be tamped or brought out as may be necessary to insure a plumb and straight wall.

Every fourth course of tile shall be brought to a level and straight line by inserting small wooden wedges between the

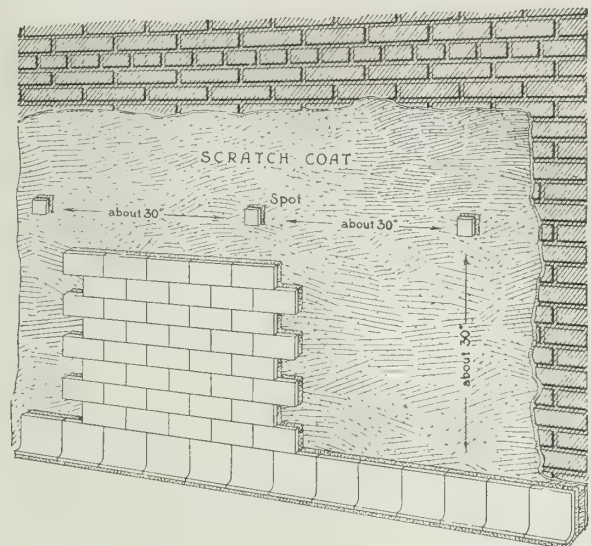


FIG. 9. METHOD OF SETTING WALL TILE BY BUTTERING

joints. These wedges are to be removed after tile is set and before grouting is done.

**Section 25, Grouting**—After all tile is set, joints must be carefully washed out and neatly filled with thinly mixed white or light gray Portland cement. (White cement should always be mixed in a porcelain or enameled vessel; if mixed in a tin, it is apt to be discolored by rust and show yellow stains after drying.)

All traces of cement on surface of tile must be wiped off carefully before hardening.

**Section 26, Fixtures**—Such as plumbing in bathrooms, etc., shall be attached to the wall by drilling through tile and fastening with screws set in metal expansion shells of proper size.

#### CEILINGS

**Section 27, Scratch Coat and Cement Mortar**—Shall be same as in Sections 18 and 19.

**Section 28, On Iron or Concrete Beams**—Heavy metal lath, well painted, shall be tightly stretched, securely wired and fastened to the beams. Scratch coat shall then be applied and worked well through the lath, so that upper side is fully covered. A leveling coat of cement mortar shall then be put on and brought to an absolutely true and uniformly rough surface.

**Section 29, On Hollow Tile or Reinforced Concrete Construction**—Carefully clean the entire surface, saturate it thoroughly with clean water and apply scratch coat, which should contain 2% of a reliable waterproofing compound. This insures a uniform rate of setting of the next coat. The leveling coat of cement mortar shall then be applied and brought to an absolutely true and uniformly rough surface.

**Section 30, On Wooden Joists**—Joists should be spaced 12 ins. on centers, thoroughly bridged, and free from spring or vibration. Stretch well painted metal lath of sufficient strength tightly over the joists and fasten securely. Then apply scratch coat and leveling coats as directed in Section 28.

**Section 31, Suspended Ceilings**—Where there is heavy traffic or trucking on the floor above, tile should be placed on a suspended foundation entirely independent of floor support.

**Section 32, Floating Tile**—When tile is set by floating method the setting bed should be about  $\frac{1}{4}$  in. thick. Over this coat use a very thin skim coat of pure cement and set tile as directed for walls in Section 23.

**Section 33, Buttering Tile**—In buttering of tile for ceiling work the same method of "spotting" as described for walls (Section 24) shall be used.

**Section 34, Soaking Tile**—In both methods all tile must be thoroughly soaked in clean water before placing on the ceiling.

#### PRECAUTIONS

**Section 35, No Walking or Pounding**—Care must be taken to allow no one to walk upon or carry anything heavy over tile floors, nor permit any pounding about the wall and ceiling work for several days, or until tile is firmly set. Unless these precautions are taken, it will be impossible to guarantee a first class job. (Tile work is frequently condemned when the fault lies with the rush of other contractors to finish their work.)

**Section 36**—Do not allow tile to get wet and lie in sawdust, as it will stain the tile.



## J. FRANCIS BOORAEM, M. E.

### Sanitary Swimming Pool Construction and Equipment

TELEPHONE:  
MURRAY HILL 8787

52 Vanderbilt Avenue  
NEW YORK, N. Y.

MEMBER OF AMERICAN SOCIETY  
OF MECHANICAL ENGINEERS

#### Products.

SWIMMING POOL CONSTRUCTION and EQUIPMENT.

#### Contracts Executed.

Over one hundred and fifty operations furnished with this equipment under patents controlled by J. FRANCIS BOORAEM.

#### Swimming Pool Equipment.

Index to details featured in large scale on pages 342-346, SWEET'S ARCHITECTURAL CATALOGUE, 1917 Edition; also in cut below.

(1) T. C. LIFE RAIL, PATENTED—Combination flush, level uniform life rail with symmetrically spaced *integral life rail inlets* for surface cleaning and skimming of water. See No. 6.

(2) T. C. GUTTER, PATENTED—Longitudinally sloping gutter with symmetrically spaced *integral gutter flushing outlets* to promptly remove scum. See No. 4.

(3) T. C. CAP, PATENTED—Arranged optionally with cap course non-slip enamel finish, or rabbetted for non-slip tile; cement, or cork insert for safe footing.

No rights and lefts to produce the sloping gutter.

(4) BRONZE OUTLETS—Bronze thimbles with lock nuts and removable strainers, arranged to make watertight joint and standardized to fit all terra cotta sections. For outlets in sloping gutter, see No. 2; also for bottom outlets.

(5) T. C. VENTILATING OUTLET, PATENTED—Special integral T. C. gutter outlet unit ventilators, con-

(8) LADDERS AND FOOT REST, PATENTED—Flush and non-obstructing step ladder units, and horizontal foot rest.

(9) SLOPING SANITARY COVE BASE—To avoid cutting and fitting of enameled brick at intersection of side walls and sloping bottom.

(10) ENAMELED BRICK—For sides, ends and bottom of pool with lane and guard marks in color.

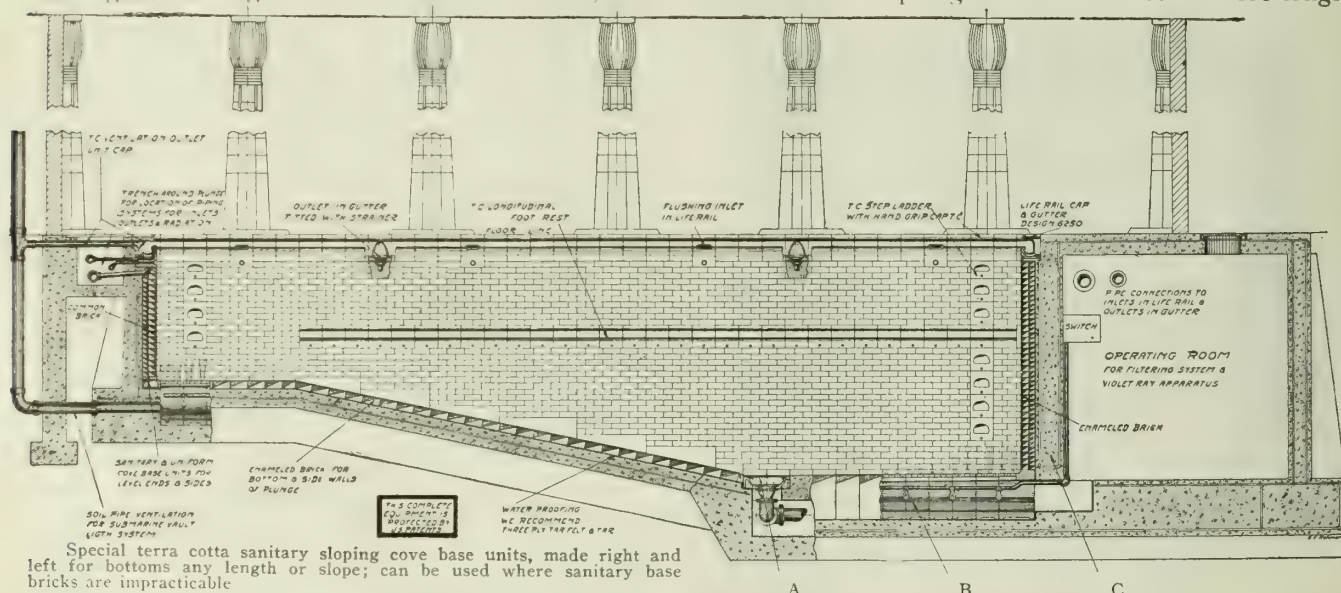
(11) LETTERING ON TERRA COTTA—Under-glaze lettering: "Deep Water," "Shallow Water" signs; yard marks with numerals and intermediate foot marks on cap course face.

(12) WATERPROOFING—Fabric waterproofing with or without waterproofing compounds.

(13) NEW WHITE ENAMELED CAST IRON, COMPOUND, ADJUSTABLE SPRINGBOARD HOLDER—Smooth, uniform, unbroken enameled surface, with cork insert tread, covering an interior grip portion in bronze and electro-galvanized cast iron. Proof against rust and corrosion. Specially designed to drain drip from bather and prevent water entering the springboard holder.

(14) COMPOUND HICKORY SPRINGBOARD—Standard widths, 16 ins., 10 to 15 ft. long, 2¼ ins. thick, tapered to 1¼ ins., with battens and rubber mat. Specially designed to drain drip from bather and keep water from springboard holder.

(15) SUBMARINE VAULT LIGHT—Illuminating the entire bottom of plunge in two or three or more longi-



(A) Bottom outlet leading to sump or filtering system in operating room. (B) Submarine vault light system for bottom of plunge, unit reflectors made of enameled terra cotta. Continued throughout entire length in one or more lanes. (C) Retaining wall, see Booraem's chart of dimensions and formula for plunges of different depths.

nected to ventilating system to remove smell of fermented organic matter in gutter outlet system.

(6) WHITE ENAMELED CAST IRON FLUSHING INLET, PATENTED—Integral with life rail (see No. 1) arranged in batteries on one side of plunge, one valve control. Nickelplated flush hose connection for cleaning empty tank. Also adaptable for suction cleaning of the bottom of the full tank, without emptying.

(7) PIPE TRENCH—Surrounding pool containing and making all piping systems accessible. Trench covered with standard non-slip floor plates.

tudinal lines, serving for lane lines as well as for illumination. The terra cotta reflectors permit passage of a man's body throughout entire length to repair electric equipment, and are accessible from operating room.

(16) FABRICATION PLANS AND SETTING INSTRUCTIONS—Standard samples, fabrication plans, and skeleton specification furnished on application with full size cross section of all equipment.

NOTE—See previous issues of SWEET's, preferably 1917, for further details, or write for further particulars, including one-half full size detail blue prints.



ESTABLISHED 1827

**WM. H. JACKSON COMPANY**

Tile for Swimming Pools and General Decorative Purposes

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NEW YORK, N. Y.

OFFICES

CHICAGO, ILL., 746 South Michigan Boulevard

MONTREAL, CAN., 112 St. James Street

FACTORIES AND SHOPS: BROOKLYN, N. Y., 335 Carroll Street

**Products.**

TILE for the LINING of SWIMMING POOLS, and for FLOORS, WAINSCOTING, FIREPLACES and General Decorative Purposes.

For Ornamental Bronze and Iron Work, and Metal Windows, see page 512.

**Co-operative Services.**

In addition to its general service in the study of decorative tile applications, this firm will co-operate with architects and others in the study of swimming pool design and waterproofing, and will furnish drawings and specifications for the general construction, together with estimates for furnishing and installing the tile.

**Jackson Mosaic Tile.**

This tile is applicable in simple or highly elaborate designs and color effects to floors, wainscoting, walls, fireplaces, interior columns, etc. The Jackson tile has a beautiful, soft and restful finish, and is impervious to moisture, grease, alkalis and most acids. The large color field to choose from, as offered by the Jackson stock, together with the co-operative service of the designing department, insures most effective and rich results in this kind of work.

A large list of instances in public and private buildings in which Jackson tile was specified and was installed by this firm will be supplied on request.

**Jackson Tile Lined Swimming Pools.**

The illustration shows one example of Jackson tile lined swimming pool construction. These pools have been installed by this firm in many private and institutional buildings, clubs, colleges and so on. The same material being applicable to the pool, the floor, and the walls, it is possible to obtain with it a most satisfactory unity of effect.

The mosaic tile is applied by this firm to the rough concrete or brick

basic construction, which is taken care of by other contractors. Special tile shapes are used as well as standard straight and curved units, which, from their small size, are easily applicable to any desired layout.

Special advantages in Jackson pool lining are:

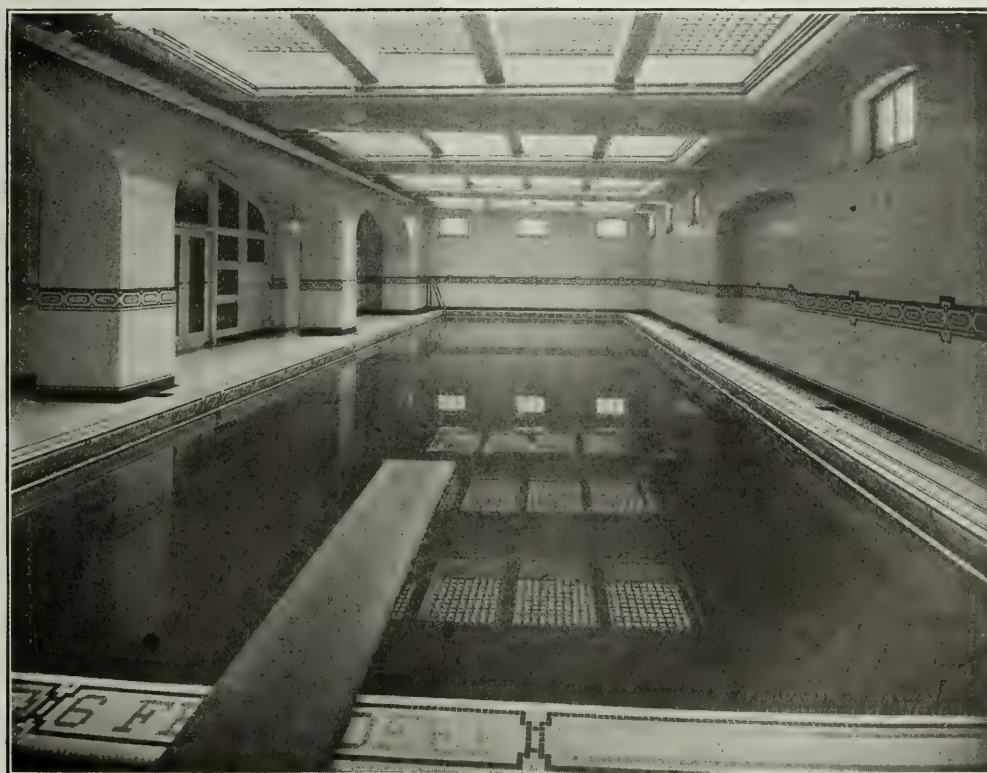
(1) Proper waterproofing; (2) life rail; (3) grip coping; (4) longitudinally sloping overflow gutter; (5) depth and distance numerals; (6) safety lines, etc.

Further information regarding expert installation, comparative cost, etc., supplied on receipt of details of requirements.

**References.**

The following are a few of the pools recently installed by this firm:

Y. M. C. A., Boston, Mass.  
Y. M. C. A., Montreal, Canada  
Syracuse (New York) University  
Stevens Institute of Technology, Hoboken, N. J.  
Central Y. M. C. A., Brooklyn, N. Y.  
Broadmoor Hotel, Colorado Springs, Colo.  
J. C. Brady, Gladstone, N. J.  
Rutgers College, New Brunswick, N. J.  
Detroit Athletic Club, Detroit, Mich.  
Captain J. R. De Lamar, Glen Cove, L. I.  
Racquet and Tennis Club, New York, N. Y.



SWIMMING POOL, STEVENS INSTITUTE OF TECHNOLOGY, HOBOKEN, N. J.  
LUDLOW & PEABODY, Architects



# AFRICAN CERAMIC AND TILE CO. OF TUNIS, INC.

Importers of African Tile

110 East 59th Street  
NEW YORK, N. Y.

## Products.

### AFRICAN TILE.

#### African Tile.

A clay product sold in New York and produced commercially by but one family in northern Africa.

Rare designs are taken from Bardo Museum and from old mosques and palaces in Tunis and other rich treasure spots of the artist, under the supervision of the French Government architect, and modeled with true precision. They are painted with those mysterious colors peculiar to the ancient art that give the effects of old tapestry, the mellow tints of the Mediterranean and the fascinating, gleaming, barbaric impressions of their native land.

African tile are the true ancient artist's product, made available commercially for the decoration of the modern home and garden.

They are particularly adaptable in the treatment of interesting interior wall or floor decoration, in mantels, tables, window boxes and lamps, and they are equally interesting in the enrichment of exterior cement walls or in combination with brick-work, or in the general landscape development where they are frequently inlaid in walks, walls, fountains, urns or entrance gateways, or in the many other prominent features of this type of architectural work.

Unaffected by atmospheric conditions, African tile are as practical as well as an artistic creation and their wide range of usefulness is amply demonstrated in the interesting exhibit at the company's rooms.

Architects are invited to communicate with this company on the subject, and to visit the exhibition.

#### Installations.

Deering Estate, Miami, Fla.

Paul Chalfin, Architect

Hotel McAlpin, New York, N. Y.

Warren & Wetmore, Architects

Philip W. Henry Residence, Scarborough, N. Y.

Bertram G. Goodhue, Architect

Will also be used in the

Hotel Commodore, New York, N. Y.

Warren & Wetmore, Architects

LION OF TUNIS



TRADE MARK



A WALL TREATMENT OF AFRICAN TILE



# DE SMET QUARTZ TILE COMPANY

Manufacturers of Colored Cements and Tile for Floors and Walls

TELEPHONE:  
MAIN 1065

MAIN OFFICE AND SALESROOM  
Chamber of Commerce Building  
CHICAGO, ILL.

## Products.

Manufacturers of Colored Cement and Tile for floors, walls, etc., namely: DE SMET COLORED PORTLAND CEMENT, DE SMET QUARTZ TILE, DE SMET CARBOTILE, DE SMET QUARTZ COVE BASE, DE SMET QUARTZ STRAIGHT BASE.

### De Smet Colored Portland Cement.

A true Portland cement to be used exactly as any other Portland cement. Meets all requirements of American Society for Testing Materials. It is absolutely non-fading, and can be exposed to all weathers without the slightest injury or deterioration. It is lime-proof, waterproof and sun-proof.

When coloring matter is added to ordinary cement, the cement is naturally weakened, cloudy effects are often produced, and the handsomest floor becomes unsightly.

**USES**—De Smet Colored Portland Cement is used as a facing or finish coat on any concrete construction. It is especially adapted to top finish work of floors where decorativeness must be combined with economy and durability. For theater auditoriums, garages, porches, stores, corridors, stair halls, gymnasiums, sidewalks and driveways, no better material could be procured.

**COLORS**—De Smet Colored Portland cement can be produced in any color desired. Stock colors are red, black, yellow, ecru, pearl gray, brown and green.

**COST**—The cost for using this product for top finish work of concrete floors is from  $3\frac{1}{2}\phi$  to  $6\phi$  per sq. ft. higher than ordinary Portland cement topping, thus making it the cheapest durable colored flooring.

**HOW TO SPECIFY**—All colored finished concrete floors, stair treads, etc., shall be made with De Smet Colored Portland Cement as manufactured by the DE SMET QUARTZ TILE COMPANY, Chamber of Commerce Building, Chicago, Ill. (State color or colors wanted; if several colors, state where they are to be placed.)

This colored cement shall be used throughout the entire top finish, which must be at least  $\frac{1}{2}$  in. thick in the proportion of 4 parts De Smet Colored Portland Cement and 7 parts fine, clean, sharp sand, provided the sand is an excellent grade. If the sand is not of superior quality, use a mixture of 4 parts De Smet Colored Portland Cement and 5 parts sand. All this work shall be done in strict accordance with the manufacturer's directions and the recommendations of the Portland Cement Association for the best method of installing and protecting the finished work.

### Quartztile and Carbotile Floors.

**DESCRIPTION**—Quartztile are made of De Smet Colored Portland Cement and quartz under heavy pressure. The quartz insures a beautiful texture and renders the tile practically wearproof.

Carbotile are made in the same manner, of De Smet Colored Portland Cement and carborundum, producing a perfect non-slip surface. The carborundum also adds a most artistic finish. Such a floor never wears out, as carborundum ranks next to the diamond in hardness.

Both Quartztile and Carbotile have a backing of best grade Portland cement and selected aggregates, which is welded in steel moulds to the facing (about  $\frac{1}{4}$  in. thick) by especially constructed presses, under a minimum pressure of 4000 lbs. to the sq. in.

The tile is then cured and hardened by a special process. This process produces a tile exceedingly dense, absolutely non-warping, and geometrically exact, which insures close fitting edges and a perfectly level floor, a floor that is waterproof and highly impervious to moisture, etc.

**ADAPTABILITY**—For a handsome, artistic, durable floor, these tile are unsurpassable. Used extensively in palatial residences, apartment houses, public and private libraries, hotel and private dining rooms; in vestibules, churches, banks, hospitals, halls, offices, restaurants, schools and stores. They are wearproof and highly impervious, and are equally applicable for inside and outside porches, sun parlors and the finest type of interior work.

The non-slippery character of Carbotile adapts it especially for elevator approaches, entrance vestibules, stair treads, and all inclined surfaces.

**COLORS**—Both Quartztile and Carbotile are furnished in black, near white, rich distinctive tints of red, pearl gray, yellow and green. Special colors made to order. The colors are guaranteed non-fading.

**SIZES AND GENERAL WEIGHT**—Regularly made in 8 by 8 by  $\frac{7}{8}$  ins., 10 by 10 by  $\frac{7}{8}$  ins., 8 by 16 by 1 ins. and 12 by 12 by  $1\frac{1}{8}$  ins. The tile can be cut to any desired smaller size, including diagonal halves, diagonal quarters, etc.

Cove base are  $1\frac{1}{4}$ -in. radius, 6 ins. high and 12 ins. long.

Straight base, 6 ins. high and 12 ins. long.

Cavettes at  $1\frac{1}{4}$ -in. radius and 12 ins. long.

Inside and outside corners, plinth blocks, etc., supplied as required.

Special sized tile, such as 9 by 9 ins., etc., will be made if the quantity ordered warrants.

Weight approximately: 8 by 8 ins., 11 lbs.; 12 by 12 ins., 15 lbs. per sq. ft.

**HOW TO SPECIFY**—All floors, where indicated, shall be covered in patterns and sizes shown on plans with De Smet Quartz Tile [or, De Smet Carbotile], using cove bases, cavettes, plinths, etc., where shown; all as manufactured by the DE SMET QUARTZ TILE COMPANY, Chamber of Commerce Building, Chicago, Ill.

These tile shall be laid on a solid, perfectly level foundation, not less than  $2\frac{1}{2}$  ins. below finished floor surface. The tile shall be embedded in fresh Portland cement and sand mortar, stiff enough not to work between joints. When the mortar is sufficiently set (in about 2 days), joints shall be grouted with cement of consistency of cream.

### Territory.

No point too distant. Work has been executed in New York and California; also in Honolulu, T. H.

### References.

The DE SMET QUARTZ TILE COMPANY's products are specified by many prominent architects throughout the country. List of names and jobs supplied on application.



TRADE-MARK

# GRUEBY FAIENCE & TILE COMPANY

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GRUEBY MAT GLAZED WALL and FLOOR TILES, ARCHITECTURAL FAIENCE, GRUEBY QUARRIES and UN-GLAZED TILES, NON-SLIPPING FLINT TILES, BRINDLED GRAY FLOOR TILES.

GRUEBY MOSAICS, OPUS SECTILE and all manner of special products.

REFRACTORY TILES and SHAPES; CRUCIBLES and ACID RESISTING LININGS.

## Description.

Grueby tiles are manufactured from pure natural clays and metallic oxides fired at intense heats. They exhibit most interesting variations of tone and texture, having an "old" quality that is inimitable.

All regular tile sizes and shapes are made and any special shapes can be furnished.

## Grueby Mat Glazed Tiles and Faience.

Made in a wide range of colors carefully chosen for their suitability in conjunction with general building materials.

A most interesting variety of decorated tiles is available and special designs, panels, etc., can be readily produced.

## Grueby Quarries and Unglazed Tiles.

Kiln toned red and gray quarries machine or hand made from natural clays.

Non-slipping flint tiles impervious to water, oils or acids; the toughest and hardest tiles made. Slipping is impossible on a floor of these tiles and their peculiar texture has the effect of deadening sound, thus making the floor more nearly noiseless than if ordinary tiles were laid.

## Brindled Gray Floor Tiles.

A recently perfected product of supreme excellence. Their color is aptly described by the name *Brindled Gray*, a soft brownish gray of varied shades, a color that looks old and one which falls into natural harmony with almost any scheme of decoration. Their texture is slightly granular, giving a perfect non-slipping surface, while they are extremely hard and durable.

## Grueby Mosaics.

Of non-slipping flint tiles, either plain or enriched with colored inserts in original and distinctive designs at most attractive prices.

## Opus Sectile.

For decorative panels. Opus sectile permits un-

limited scope in color and design and affords a most practical method of executing individual designs where repeats are not required.

## Grueby Refractories.

In this line are plumbago crucibles, special fire resisting tiles and shapes for foundry use, acid resisting tiles for tank linings, etc.; special antifriction non-abrasive tiles, of such intense hardness as to show practically no wear under the severest imaginable conditions, for lining coke chutes, coal hoppers and the like.

## Specifications.

The use of the word *Grueby* when specifying insures that the intention of the document will be carried out so far as the tiles are concerned, while reference to the standard specification of the Associated Tile Manufacturers will insure proper setting.

## Service.

Designs, suggestions, samples, estimates and consultations entirely free.

An expert representative fully equipped to handle any particular problem will meet architects by appointment.

## Installations.

Forsythe Dental Infirmary, Boston, Mass.  
Edison Electric Light & Power Station, Boston, Mass.  
Bay State Apartments, Cambridge, Mass.  
Coliseum, Springfield, Mass.  
Dunlap's Baldwin Restaurant, Manchester, N. H.  
Scovill Mfg. Co., Turbine House, Waterbury, Conn.  
Subway Stations, New York, N. Y.  
Cathedral of St. John the Divine, New York, N. Y.  
Orthopaedic Hospital, New York, N. Y.  
Arthur Curtis James Residence, New York, N. Y.  
Circle Building, Columbus Circle, New York, N. Y.  
Park & Tilford Company, Offices, New York, N. Y.  
Ellis Island Immigration Station, New York, N. Y.  
Sewage Pumping Station, Brooklyn, N. Y.  
Cadillac Motor Company, Showrooms, New York, N. Y., and Newark, N. J.  
Hotel Military Plaza, Newark, N. J.  
First Junior School, Trenton, N. J.  
Akron Pure Milk Company, Showroom, Akron, Ohio  
Hotel Bellevue-Stratford, Philadelphia, Pa.  
Curtis Publishing Co., Philadelphia, Pa.  
Central Steel Co., Offices, Massillon, Ohio  
New York Central R.R. Station, Rochester, N. Y.  
Dime Savings Bank, Detroit, Mich.  
Synagogue Shaarey Zedek, Detroit, Mich.  
Stroh Brewery, Detroit, Mich.  
Kimball Building, Chicago, Ill.  
Edison Electric Light & Power Station, Chicago, Ill.  
Edison Electric Light & Power Station, Joliet, Ill.  
Swift Packing Co., Offices, Chicago, Ill., and Toronto, Ont.  
Canadian Pacific Railway Station, North Toronto, Ont.  
Walton Restaurant, Montreal, Can.  
Mayo Brothers Hospital, Rochester, Minn.  
Dallas Station, Dallas, Tex.  
U. S. Government, Engine Houses, Panama Canal



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### Faience Mosaics.

Regular tesserae laid in desirable patterns for mural work, bathrooms, swimming pools, etc.

### Faience Art Mosaics.

Florentine and Roman styles.

### Pictorial Faience.

Artistic mural decorations in every style; enamel painting.

### Faience Floor and Wall Tile.

In all conventional sizes and patterns, special shapes and sizes. Frostproof.

### Ecclesiastical Work.

Church floors and walls in correct styles.

### Architectural Members.

Caps and base mouldings, brackets, perforated tile, etc.

### Flemish Tile.

Handmade unglazed tile of natural clays, burnt to great hardness. A fine, artistic product.

### Non-slip Tile Pavements.

For swimming pools and bathhouses.

### Colors.

Practically unlimited selection of faience enamels.

### Designs and Propositions.

Upon receipt of necessary data sketches will be prepared and offered with illustrative samples.



SECTION OF MUELLER FAIENCE, GRAND CENTRAL STATION, C. P. R. R. CO., QUEBEC, CANADA  
HARRY E. PRINDLE, Architect  
DOWNING-COOK CO., Builders

# THE ROOKWOOD POTTERY COMPANY

MAIN OFFICE AND WORKS

TELEPHONE:  
CANAL 3033

CINCINNATI, OHIO

EASTERN BRANCH OFFICE

NEW YORK, N. Y., Architects Building, 101 Park Avenue—Telephone, Murray Hill 6459

## Products.

MAT GLAZED ARCHITECTURAL FAIENCE and TILE in all colors, for exterior and interior use, including Tiles for walls and floors, wainscoting, mantel facings and hearths, and complete Mantels, Mouldings, Base Tiles (sanitary or plain foot), Fountains, Friezes and Wall Panels, Column Caps and Brackets.

Garden Ornaments, Pottery and other Specialties. From architects', or Rookwood designs.

## Facilities.

Complete architectural and pottery plants unrivaled in their technical resources and representing 26 years' experience in the making of faience bodies and colored glazes.

## "Rookwood" Mat Glazes.

The charm of "Rookwood" mat glazes lies largely in their variations of shade and texture.

These arise from delicate changes in the glaze

structure occurring in the fire and calculated upon in the composition of the glazes.

These variations are not great nor sufficient to throw any color out of harmony, but only such as stamp the material with its true character as a product of one of the arts of fire. No attempt is made to have it otherwise, and those who seek the monotonous uniformity of a painted wall will not find it in Rookwood.

## Special Designs.

The plants are thoroughly equipped to execute the designs of architects and decorators, or special designs by Rookwood artists, working in collaboration or independently.

## Adaptability.

The widest range of decorative possibilities in color, combined with absolute permanence, sanitary merit and fireproof qualities.



FAIENCE SUN ROOM IN PRIVATE RESIDENCE

Faience in colored mat glazes: mantel, pilasters and caps, radiator grilles and floor



**Estimates and Co-operation.**

Assistance will be given in the adaptation of material and architects' designs, and in estimating costs for appropriations. Satisfactory results require that Faience should be specified under allowance, reserving to the architect the right of selection. Appropriate

forms sent on request. The company does not contract for installation.

**Honors.**

Grand Prizes: Paris, 1900; St. Petersburg, 1901; Turin, 1902; St. Louis, 1904; and other awards.

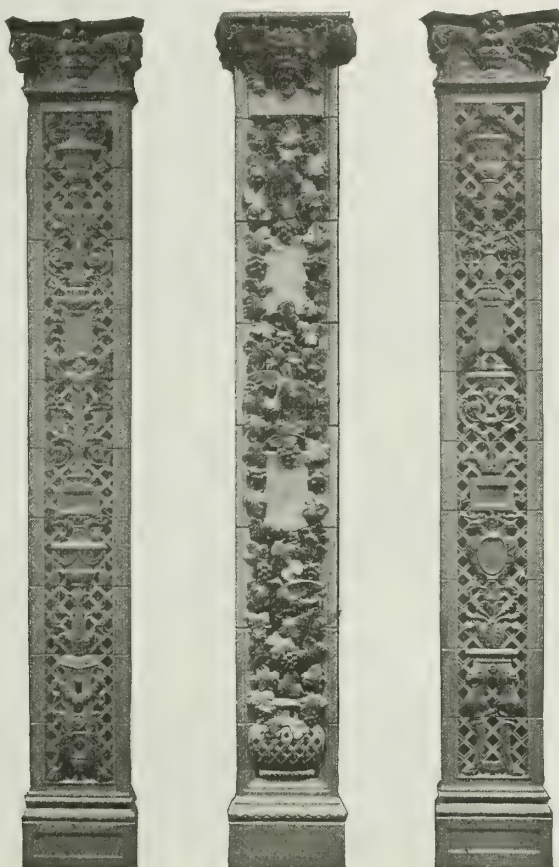


ROOKWOOD FAIENCE COUNTERS, WAINSCOTING, VAULT AND FLOORS IN THE LAFAYETTE SOUTH SIDE BANK, ST. LOUIS, MO.  
WIDMAN & WALSH, Architects



ROOKWOOD BATHROOM

The walls and floor of this room are of Rookwood mat glaze, in delicate colors, harmonizing with connecting apartments.



DETAIL OF PILASTERS IN SUN ROOM AND SUMMER DINING ROOM, ISAAC GUGGENHEIM RESIDENCE, PORT WASHINGTON, L. I.  
H. VAN BUREN MAGONIGLE, Architect



DETAIL OF GRILLE IN CUT FLOWER DEPARTMENT, LORD & TAYLOR STORE, NEW YORK, N. Y.  
STARRETT & VAN VLECK, Architects

## B. RIDGWAY & SON

### Manufacturers of Natural Rock Tiling

9th Street and Columbia Avenue

PHILADELPHIA, PA.

MILL AT MESHOPPEN, PA.

#### Products and Services.

"PROTECTILE," a Natural Rock Tiling.

CUT STONE CONTRACTORS.

This company is prepared, upon receipt of necessary data and information indicative of the uses to which "Protectile" is intended to be applied, to send sketches or plans of projected installations to architects and other interested persons, together with such samples as may be required to illustrate the materials.

#### Description.

"Protectile" is a natural rock tile, not a composition, as durable and of same structure as the natural stone from which it is cut; a fine grained flagstone. It neither chips nor splits, lacks the harshness and brittleness of artificial tile and, when used for flooring, makes a rare combination of safety, art, utility and economy. Neither wear nor dampness can make "Protectile" slippery, a firm footing being assured at all times. It never changes under use as do manufactured, composition or artificially colored products made for flooring. "Protectile" offers a wider field for design and color combinations than usual and its non-slip and non-slide qualities suggested its trade-name "Protectile."

**ADAPTABILITY**—This non-slip and non-slide rock is the most practical tiling for public buildings, churches, lobbies and stair treads or for garden walks, porch floors, terraces, conservatories and any other places where exposure to dampness or very hard wear tends to cause dangerous conditions.

#### TESTS

ROBERT W. HUNT & Co.  
Engineers

Bureau of Inspection, Tests and Consultation  
General Offices, 2200 Insurance Exchange  
Chicago, Ill.

NEW YORK OFFICE, West Street Building

File No. —9220—1 —G—78907

B. Ridgway & Son Tests

GENTLEMEN—

We give below results of compression and absorption tests of two samples of tile which you submitted.

#### COMPRESSION TESTS

Sample .....	Light	Dark
Shape .....	Cube	Cube
Size .....	2 x 2 x 2 ins.	2 x 2 x 2 ins.
Area .....	4 sq. ins.	4 sq. ins.
First crack, lbs.....	71540	64600
Ultimate strength, lbs.....	71540	64600
Ultimate strength, lbs. per sq. in.....	17885	16150

#### % WATER ABSORPTION

30 min.....	.93	.35
6 hrs.....	1.16	.71
24 hrs.....	1.62	1.24

The samples have been submitted to an expert mason in our employ, who reports that, in his opinion, they should prove very durable in service.

Respectfully,

ROBERT W. HUNT & Co.,  
Engineers.

COLORS—"Protectile" comes in soft tones of blue,



gray and brown; these colors possess the regularity and permanency of all products out of nature's workshop; the variety fits well into any plan of decoration and the shades, being neutral, contribute to unusual artistic effects; while the beautiful dull finish is an aid to perfect harmony with almost every color scheme.

**SIZES**—The following sizes are carried in stock: 12 by 12, 12 by 24, 18 by 18, 18 by 36, 24 by 24, 24 by 48 ins.

**Thickness**—Smaller sizes: 1 to 1 1/4 ins.; larger sizes: 1 1/2 to 1 3/4 ins.

**Special Sizes**—"Protectile" will also be furnished in any desired special sizes or patterns, for which prices will be quoted on application.

**PRICES**—On stock sizes (mentioned above) the price is 30¢ per sq. ft., f. o. b. Meshoppen, Wyoming County, Pa.



TERRACE FOR J. K. MITCHELL, 3RD, VILLA NOVA, PA.  
STEWARTSON & PAGE, Architects

#### References.

"Protectile" has been satisfactorily and efficiently used in such buildings and by the architects mentioned hereunder:

- Girard College High School, John T. Windrim, Architect
- Masonic Home, Elizabethtown, Pa., Zantzinger, Borie & Medary, Architects
- Residence, Charles I. Corby, Garrett Park, Md., Charles Barton Keen, Architect
- Public School, Cynwyd, Pa., Savery, Sheetz & Savery, Architects
- Southern High School, Philadelphia, Pa., J. Horace Cook, Architect
- Residence, J. K. Mitchell, 3rd, Villa Nova, Pa., Stewartson & Page, Architects
- Residence, C. H. Ludington, Ardmore, Pa., Horace Wells Sellers, Architect
- Residence, Charlton Yarnall, Newtown Square, Pa., Day & Klauder, Architects
- Residence, A. K. Luke, Irvington-on-Hudson, N. Y., William Adams, Architect
- Residence, Sidney F. Tyler, Elkins Park, Pa., Horace Trumbauer, Architect
- Residence, Alan Cunningham, Elwyn, Pa., David Knickerbocker Boyd, Architect



S. CHENEY & SON  
Cast Iron Porch Column Base  
MANLIUS, N. Y.

Product.

Manufacturers of the ZIMMERMAN CAST IRON PORCH COLUMN BASE (C. E. Zimmerman patent).

Advantages.

A wood column or wood base set on a porch floor always decays in a few years, because of the constant moisture in the joint. This means regular repair bills to the property owner. The Zimmerman patent base does away with these repair bills, because it stops decay. It is set directly on the floor, and the column on top of it, leaving no joint for moisture to collect in.

Superiority.

The superiority of the Zimmerman base over other porch column bases lies in its central bearing, in addition to the 4 corner bearings. Bases 24 by 24 ins. and upward have 4 corner and 4 inside bearings which are planed level and all bear alike, relieving the casting of any strain, and carry the weight without causing corner supports to sink into floor.

It is necessary that the turned wood base have an open center a trifle smaller than opening in column to ventilate column shaft. Our base is no experiment, but an economic necessity which has been on the market for years and has given absolute satisfaction.

Model.

A miniature nickeled base will be mailed free on application. Write today and see for yourself the merit of this base.

Sizes and List Prices.

On orders, state whether floor is wood or stone, and give diameter of turned wood base, as this determines the size of iron base required. This also applies to square column when separate wood base is used.

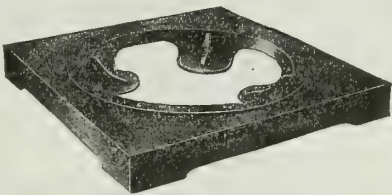
IRON BASES, ROUND COLUMNS			IRON BASES, SQUARE COLUMNS		
8 x 8 x 1 7/8	ins.....	\$ .60	4 ins.....	\$ .25	
9 x 9 x 1 7/8	"	.65	5 "	.35	
10 x 10 x 2	"	.80	6 "	.45	
11 x 11 x 2 1/8	"	.95	7 "	.55	
12 x 12 x 2 1/8	"	1.20	8 "	.70	
13 x 13 x 2 1/8	"	1.40	9 "	.75	
14 x 14 x 2 1/4	"	1.60	10 "	.80	
16 x 16 x 2 1/2	"	2.10	11 "	1.05	
17 x 17 x 2 1/2	"	2.25	12 "	1.10	
18 x 18 x 2 1/2	"	2.35	13 "	1.30	
20 x 20 x 2 3/4	"	3.50	14 "	1.60	
22 x 22 x 3	"	3.70	16 "	2.10	
24 x 24 x 3 1/8	"	6.00			
26 x 26 x 3 1/4	"	7.50			
28 x 28 x 3 3/8	"	9.75			
30 x 30 x 3 1/2	"	11.50			
32 x 32 x 4	"	14.00			
36 x 36 x 4 1/2	"	16.75			
42 x 42 x 5 1/2	"	26.00			
48 x 48 x 6	} Prices on application.		These sizes are ready to ship. Other sizes made to order.		
50 x 50 x 6					

Method of Installation.

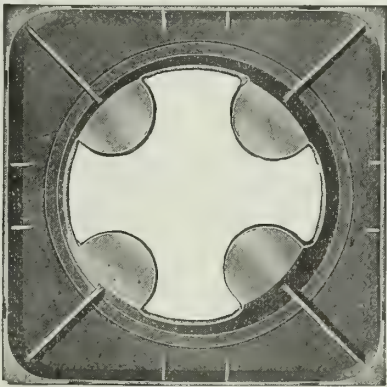
First screw the turned wood base to the iron base; then screw the iron base to the floor, and fit the column upon the wood base.

Before fastening the column, paint the end of the column and paint up in; also, paint the wood block upon which the column rests. Where base is used on stone it should be set in cement. Paint base before using.

When the iron base is used on tin or canvas floors, place a rubber packing between the iron base and tin or canvas through which the screw will pass. When screwed down it will be watertight.



TOP VIEW OF BASE



BOTTOM VIEW OF BASE

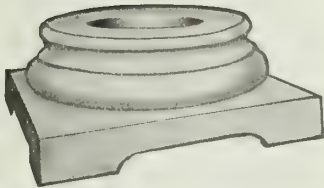
Showing bearings on sizes from 24 x 24 ins. and upward



FRONT VIEW OF BASE



FOR HALF SQUARE PILASTER



OPEN CENTER OF TURNED WOOD BASE

# HARTMANN-SANDERS CO.

Exclusive Manufacturers of Koll's Patent Lock-joint, Staved and Turned Columns

EASTERN OFFICE  
6 East 39th Street  
NEW YORK, N. Y.

MAIN OFFICE AND FACTORY  
2155-2187 Elston Avenue  
CHICAGO, ILL.

PACIFIC COAST BRANCH  
A. J. KOLL PLANING MILL  
LOS ANGELES, CAL.

## Products.

KOLL'S PATENT LOCK-JOINT WOOD STAVE COLUMN for exterior and interior use: Hardwood Staved and Veneered; PILASTERS and SQUARE COLUMNS to match; COMPOSITION ORNAMENTAL CAPITALS.

Pergolas, Lattice Work, Sundials and Garden Accessories.

## Architects' Details.

Columns conform accurately to any detail, are of the best materials, and at as reasonable rates as are consistent with good work.

## Our Patent Correct Entasis.

CORRECT ENTASIS, SECURED IN FORMING STAVE ITSELF—The staves in all columns manufactured *under Koll's patent* are, in order to secure the proper entasis, *straight one-third and swell-tapered upper two-thirds*, so that when shaft is formed the correct entasis is obtained securing sufficient stock at top and bottom of shaft to permit turning to detail without cutting too close to joint.

Columns furnished with any style of fluting or reeding desired.

## Spliced Butt Joint.

In addition to the perfect lock joint of the staves, a joint has been devised to splice the butts of the staves should the length of column call for material longer than can be secured in one piece. In this process joints are put together with screw pressure and hot glue, another feature which adds to make these columns mechanically perfect.

## Steel Reinforcement.

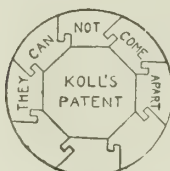
A corrugated steel band or ferrule reinforcement is applied to the bottom end of all Doric columns. The steel band, while adding considerable strength to the shaft, permits some flexibility so that no injury can be done by moisture that may be absorbed. This reinforcement is also added to both ends of all large column shafts.

## Waterproofing.

The inside of all columns and pilasters 16 ins. and over are waterproofed with a special waterproofing compound.

## Thickness of Stock.

As the price of a column is regulated largely by the amount and kind of lumber that enters into its construc-



TRADE-MARK

tion, it is very important to state the thickness of stock of which columns are to be made. Many years of experience as specialists in column construction has demonstrated that the thickness of stock for the various sizes, as called for in the table on the following page, provides enough material to carry out properly

the architectural detail and afford sufficient strength. Should an unusual load be placed on the columns, they can easily be reinforced by inserting a timber or iron column.

## Facts in Regard to Installation.

Columns are primed with one coat of lead and oil before shipment, but should be thoroughly painted as soon as possible after being placed in position. The ends of the columns should be temporarily covered with weatherproofed paper, if for any reason they can not be used immediately or if roof is not in position.

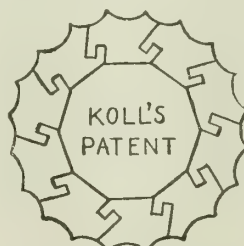
Ornamental capitals should be flashed with sheet lead or copper for protection. If the entire top of the capital is not covered with flashing, the water that strikes the cornice or fascia is bound to run down into the cap, which would disintegrate the cap as well as injure the column. This feature of flashing is so frequently omitted that it is considered advisable to call attention to it, and the architect should see that this very important matter is not overlooked in the specifications.

## Iron Plinths.

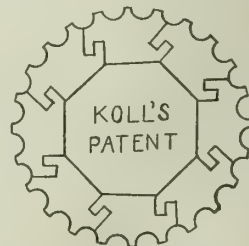
When columns rest on cement or brick floor, the use of cast iron ventilated plinths is recommended. The company is prepared to furnish these in all sizes.

## Catalogues.

Catalogue No. 40-8 on wood columns, and Catalogues No. 30-8 and No. 31-8, showing new designs for pergolas and garden accessories—lattice fences, garden houses and arbors—will be sent on request.

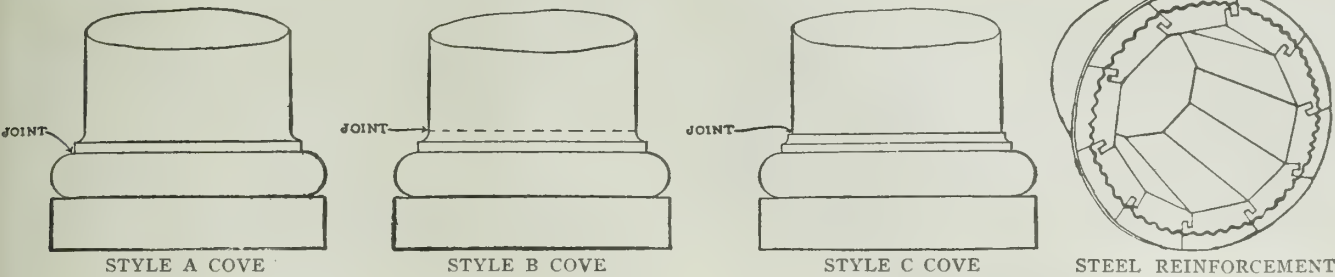


DORIC FLUTING  
COLUMNS, 195, 195 2/3,  
215 AND 215 2/3



IONIC FLUTING USED  
ON ALL OTHER  
FLUTED COLUMNS  
SHOWN IN  
CATALOGUE





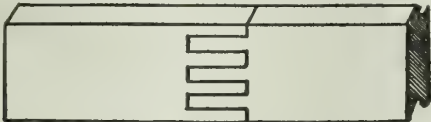
DATA, KOLL'S PATENT COLUMNS  
WITH COVE ON SHAFT LIKE STYLE A

	2-in. stock	2½-in. stock	3-in. stock	4-in. stock
Plain shaft.....	up to 18 ins.	19 to 22 ins.	23 to 30 ins.	31 ins. and up
Ionic fluted.....	up to 16 ins.	17 to 19 ins.	20 to 27 ins.	28 ins. and up
Doric fluted, No. 195...	up to 20 ins.	21 to 28 ins.	29 to 39 ins.	40 ins. and up

COVE PLANTED ON LIKE B, OR MADE A BASE MEMBER LIKE C

	2-in. stock	2½-in. stock	3-in. stock	4-in. stock
Plain shaft.....	up to 22 ins.	23 to 30 ins.	31 to 40 ins.	41 ins. and up
Ionic fluted.....	up to 20 ins.	21 to 28 ins.	29 to 38 ins.	39 ins. and up

NOTE—Before ordering columns, it would be well to examine detail closely and note whether the cove is to be part of the shaft, or whether this can be planted on. This company can make the column either way, but of course must be guided by what specifications and details call for.



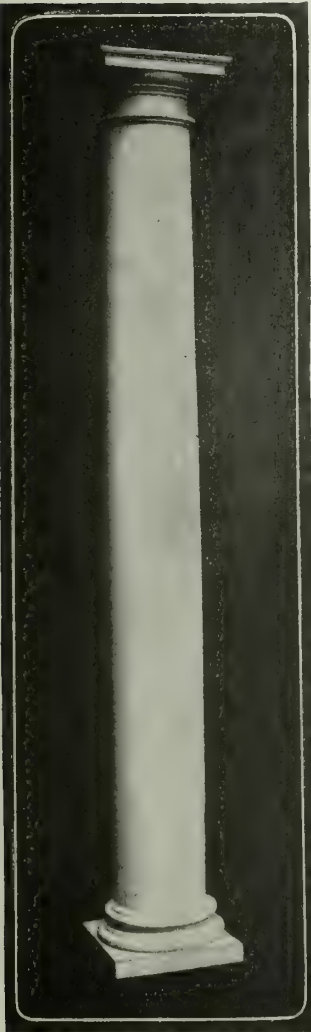
SPLICED BUTT JOINT



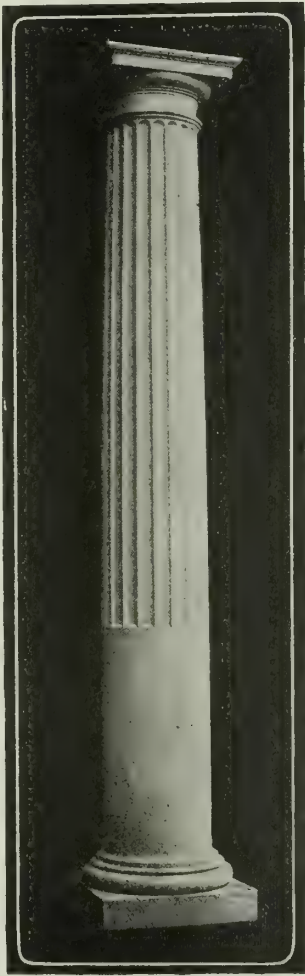
GATE ENTRANCE



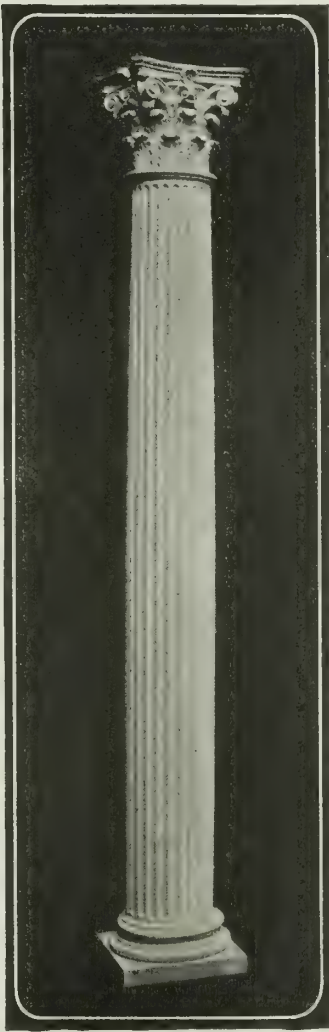
PERGOLA BUILT WITH KOLL'S PATENT  
LOCK-JOINT COLUMNS



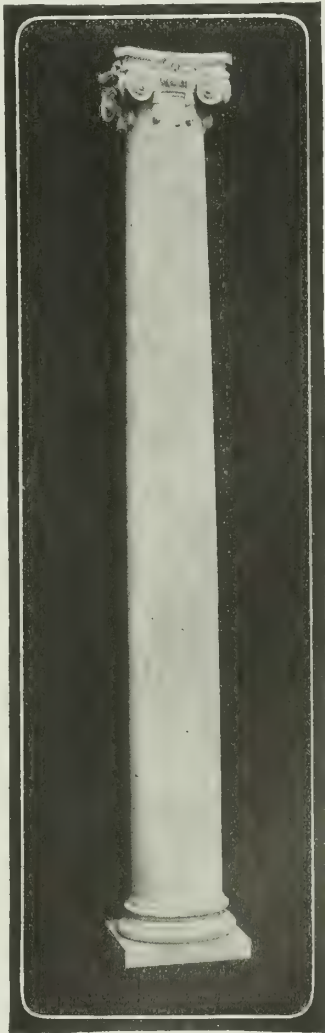
H. S. Co. No. 220



H. S. Co. No. 215 2/3



H. S. Co. No. 255



H. S. Co. No. 310

EXAMPLES OF PLAIN AND FLUTED COLUMNS UP TO 54 INS. DIAMETER AND 35 FT. LONG

# MILFORD IRON FOUNDRY

## Manufacturers of Concrete Filled Columns

### MILFORD, MASS.

#### Products.

##### STEEL CONCRETE FILLED COLUMNS.

#### Milford Steel Concrete Filled Columns.

In making its concrete filled columns, the MILFORD IRON FOUNDRY uses new pipe stock combined with the best grade of Portland cement, well graduated sand, and crushed trap rock, machine mixed, in the proportion of 1: 2: 3.

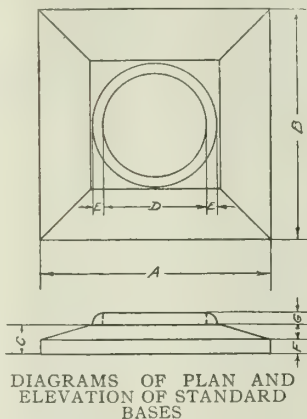
The method employed to compact the concrete is an important factor in creating the strength, rigidity and durability of the columns. The pipe is stood on end and filled with concrete from an overhead hopper. Then the pipe and its filling are repeatedly raised together and dropped bodily on a heavy solid base. The direction of the compacting force is along the axis of the pipe, so that every particle of the concrete gets the benefit of every shock. It should be noticed that the concrete takes its position from a shock which is in the same direction as that which the column is subjected to when in place. The concrete acts as a hammer on itself. The greater the mass of the filling the greater the density obtained. The concrete becomes close and dense at the very first blow.

The stone is comparatively fine, only  $\frac{1}{2}$  in. screened; and there are no pieces of it that have sufficient mass to drive down through the concrete and gather in the lower end of the column.

#### Standard Bases.

There are in general two types of bases—light weight bases for light weight columns, and heavy weight bases for heavy weight columns. The MILFORD IRON FOUNDRY is, however, in a position to make bases to special design.

Each base is designed to carry the maximum weight for the column for which it is made; and it has sufficient thickness and, consequently, sufficient stiffness, to distribute the load uniformly under the base. The design is figured on the basis of an allowable load of 30 tons to the sq. ft. on concrete.



DIAGRAMS OF PLAN AND ELEVATION OF STANDARD BASES

#### STANDARD BASES FOR HEAVY WEIGHT COLUMNS

Size column	A	B	C	D	E	F	G
27 8"	6"	6"	7 8"	3 "	1 1/2"	3 8"	1 1/2"
31 2"	8"	8"	11 1/2"	3 5/8"	1 1/2"	5 1/2"	1 1/2"
4 "	9"	9"	11 1/2"	4 1/8"	1 1/2"	5 1/2"	1 1/2"
4 1/2"	10"	10"	13 1/2"	4 5/8"	1 1/2"	5 1/2"	1 1/2"
5 "	11"	11"	13 1/2"	5 1/8"	1 1/2"	5 1/2"	1 1/2"
5 1/2"	12"	12"	15 1/2"	5 3/4"	1 1/2"	5 1/2"	1 1/2"
6 1/8"	14"	14"	17 1/2"	6 3/4"	1 1/2"	5 1/2"	1 1/2"
7 1/8"	16"	16"	19 1/2"	7 3/4"	1 1/2"	5 1/2"	1 1/2"
8 3/8"	18"	18"	21 1/2"	8 3/4"	1 1/2"	5 1/2"	1 1/2"
9 3/8"	20"	20"	23 1/2"	9 3/4"	1 1/2"	5 1/2"	1 1/2"
10 3/8"	22"	22"	25 1/2"	11 "	1 1/2"	5 1/2"	1 1/2"
11 3/8"	24"	24"	27 1/2"	12 "	1 1/2"	5 1/2"	1 1/2"
12 3/8"	25"	25"	28 1/2"	13 "	1 1/2"	5 1/2"	1 1/2"

NOTE—Bearing surfaces of bases for 6 3/8" columns and larger are machined

#### STANDARD BASES FOR LIGHT WEIGHT COLUMNS

Size column	A	B	C	D	E	F	G
3 "	6"	6"	7 8"	3 1/8"	1 1/2"	3 "	1 1/2"
3 1/2"	7"	7"	1 "	3 5/8"	1 1/2"	3 "	1 1/2"
4 "	8"	8"	1 1/8"	4 1/8"	1 1/2"	3 "	1 1/2"
4 1/2"	8"	8"	1 1/4"	4 5/8"	1 1/2"	3 "	1 1/2"
5 "	9"	9"	1 3/8"	5 1/8"	1 1/2"	3 "	1 1/2"
6 "	11"	11"	1 1/2"	6 1/8"	1 1/2"	3 "	1 1/2"

#### Standard Caps.

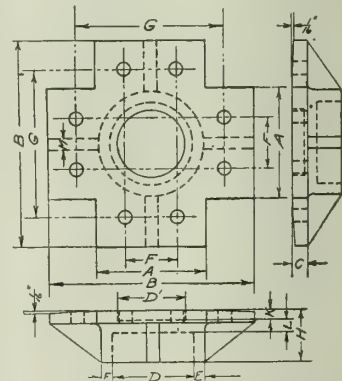
Caps are made to suit any type of framing and can be classified under the following headings:

- (1) Flat caps for single wooden girders or double I-beams.
- (2) Flat caps for single I-beams.
- (3) Bracket caps for single wooden girders or double I-beams.
  - (a) 1-way
  - (b) 2-way
  - (c) 3-way
  - (d) 4-way
- (4) Bracket caps for single I-beams.
  - (a) 1-way
  - (b) 2-way
  - (c) 3-way
  - (d) 4-way
- (5) Standard socket caps.
- (6) Heavy socket caps.

As in the case of the bases, the MILFORD IRON FOUNDRY is in a position to make caps from any special design.

#### Standard Bracket Caps for Single Wooden Girders or for Double I-beams.

In these strong, compact, inconspicuous bracket caps there are several new and important features. The wings are made as short as is practicable in order to keep the eccentric load as close as possible to the axis of the column. Furthermore, the ends of the wings are beveled off to give 1/16-in. clearance under the beam at the outer edge. This important feature in column construction makes it impossible for the greater part of the weight to bear down on the outer edge of the wing.



DIAGRAMS OF STANDARD FOUR-WAY BRACKETS FOR SINGLE WOODEN GIRDERS OR DOUBLE I-BEAMS

#### BRACKET CAPS FOR SINGLE WOODEN GIRDERS OR DOUBLE I-BEAMS

Size col.	A	B	C	D	D'	E	F	G	H	K	L	M
27 8"	6"	10 "	5 8"	3 1/8"	Diameter of upper column (if there is one)	1 1/2"	3"	7 "	3 "	1 1/2"	5 8"	1 1/2"
31 2"	8"	10 "	5 8"	3 1/8"		1 1/2"	3"	7 "	3 "	1 1/2"	5 8"	1 1/2"
3 1/2"	6"	11 "	5 8"	3 5/8"		1 1/2"	3"	8 "	3 "	1 1/2"	5 8"	1 1/2"
4 "	9"	11 1/2"	5 8"	4 1/8"		1 1/2"	3"	8 1/2"	3 "	1 1/2"	5 8"	1 1/2"
4 1/2"	8"	12 "	5 8"	4 5/8"		1 1/2"	3"	9 1/2"	3 "	1 1/2"	5 8"	1 1/2"
5 "	10"	12 1/2"	1 "	5 1/8"		1 1/2"	3"	9 1/2"	3 "	1 1/2"	5 8"	1 1/2"
5 1/2"	10"	13 "	1 "	5 5/8"		1 1/2"	3"	10 1/2"	3 "	1 1/2"	5 8"	1 1/2"
6 "	10"	13 1/2"	1 "	6 1/8"		1 1/2"	3"	10 1/2"	3 "	1 1/2"	5 8"	1 1/2"
6 5/8"	10"	14 1/2"	1 "	6 3/4"		1 1/2"	3"	11 1/2"	3 "	1 1/2"	5 8"	1 1/2"
7 1/8"	12"	15 1/2"	1 "	7 1/8"		1 1/2"	3"	12 1/2"	3 "	1 1/2"	5 8"	1 1/2"
8 3/8"	12"	16 1/2"	1 "	7 3/4"		1 1/2"	3"	13 1/2"	3 "	1 1/2"	5 8"	1 1/2"
9 3/8"	12"	17 1/2"	1 "	8 3/4"		1 1/2"	3"	14 1/2"	3 "	1 1/2"	5 8"	1 1/2"
10 3/8"	14"	18 1/2"	1 "	11 "		1 1/2"	3"	15 1/2"	3 "	1 1/2"	5 8"	1 1/2"
11 3/8"	14"	19 1/2"	1 "	12 "		1 1/2"	3"	16 1/2"	3 "	1 1/2"	5 8"	1 1/2"
12 3/8"	16"	20 1/2"	1 "	13 "		1 1/2"	3"	17 1/2"	3 "	1 1/2"	5 8"	1 1/2"

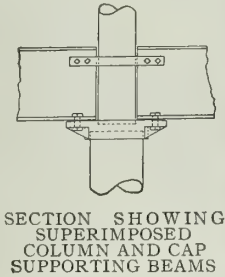


To receive a superimposed column, a recess is made in the upper side of the cap. If no column is to be superimposed, the recess is not made; and the top of the cap is flat except for the beveled edge feature.

For columns 65⁄8 ins. in diameter and larger, the bearing surfaces of the caps are machined to make a true parallel bearing.

When the wing of the cap is 10 ins. wide or more, 2 brackets are cast under it instead of 1, as shown in the diagram.

Usually, when a column is placed on another, the upper column is less in diameter than the lower one. When this is so, the beams can reach at least a small distance over the lower column; and they should, if possible, be made to do so, as they will reduce the eccentric load on the cap by putting it on the column.



When the upper and lower column are of the same diameter, a special cap may be required. Write to the MILFORD IRON FOUNDRY for information about this.

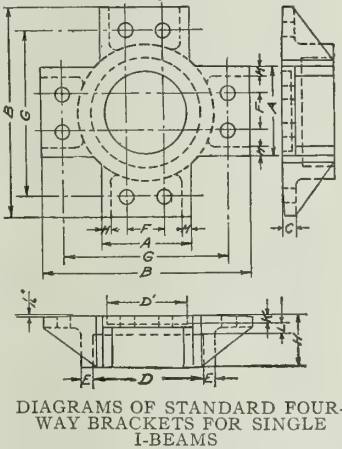
If there is no superimposed load, a bracket cap is very seldom needed. When beams meet over the center of the column, flat caps are to be used.

In ordering these caps, give size of bolt holes required and any change desired in their location. Unless ordered otherwise, the bolt holes are located as shown in the diagram and are made for 3⁄4-in. bolts.

If beams are of different heights, cast iron bolsters are used to enable the beams to finish off level at their top.

Standard Bracket Caps for Single I-beam Construction.

The same features are in these caps as are in those for wooden girder or double I-beam construction, except that 2 brackets are cast under each wing. The location of the bolt holes is made to correspond with the size of the beam to be carried, and must always be specified in an order.



BRACKET CAPS FOR SINGLE I-BEAMS

Size col.	A	B	C	D	D'	E	G	H	K	L	M
27⁄8"	6"	10"	5⁄8"	3"	Diameter of upper column (if there is one)	1 1⁄2"	7"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
3"	6"	10"	5⁄8"	3 1⁄8"		1 1⁄2"	7"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
3 1⁄2"	6 1⁄2"	11"	5⁄8"	3 3⁄8"		1 1⁄2"	8"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
4"	6 1⁄2"	11 1⁄2"	3⁄4"	4 1⁄8"		1 1⁄2"	8 1⁄2"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
4 1⁄2"	6 1⁄2"	12"	3⁄4"	4 3⁄8"		1 1⁄2"	9"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
5"	6 1⁄2"	12 1⁄2"	1"	5"		1 1⁄2"	9 1⁄2"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
5 1⁄2"	7"	13"	1"	5 1⁄8"		1 1⁄2"	10"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
6"	7"	13 1⁄2"	1"	6 1⁄8"		1 1⁄2"	10 1⁄2"	3"	1 1⁄4"	5⁄8"	1 1⁄2"
6 5⁄8"	8"	14 1⁄2"	1"	6 3⁄4"		1"	11 1⁄2"	3"	1"	1"	1"
7 5⁄8"	8"	15 1⁄2"	1"	7 3⁄4"		1"	12 1⁄2"	3"	1"	1"	1"
8 5⁄8"	8"	16 1⁄2"	1"	8 3⁄4"		1"	13 1⁄2"	3"	1"	1"	1"
9 5⁄8"	8"	17 1⁄2"	1"	9 3⁄4"		1"	14 1⁄2"	3"	1"	1"	1"
10 3⁄4"	8"	18 1⁄2"	1"	11"	Diameter of upper column (if there is one)	1"	15 1⁄2"	3 1⁄4"	3⁄8"	1 1⁄4"	1"
11 3⁄4"	8"	19 1⁄2"	1"	12"		1"	16 1⁄2"	3 1⁄4"	3⁄8"	1 1⁄4"	1"
12 3⁄4"	8"	20 1⁄2"	1"	13"		1"	17 1⁄2"	3 1⁄4"	3⁄8"	1 1⁄4"	1"
						1"					

Column Reinforcement.

A column can be reinforced by a round steel rod running through its length, by an inner pipe placed concentrically, or by 4 angle irons placed back to back and forming a star column. This last type of reinforcement gives the best distribution of steel and strength. It is



TYPICAL INSTALLATION OF MILFORD COLUMNS

extremely rigid in itself; and when it is placed inside a piece of heavy pipe and embedded in concrete compacted by the Milford process, its strength is almost incredible. The rivet heads, usually about 6 ins. apart, are wonderful anchors in the concrete; and the bond between steel and concrete is tremendously increased.

Tests.

During December, 1914, 36 column specimens and 5 concrete block specimens, all about 2 1⁄2 months old, were tested at the Massachusetts Institute of Technology. The tests were made to determine safe working loads for the columns and to study their action under loads. The columns ranged from 4-in. lightweight sizes to 65⁄8-in. heavyweight sizes. Two lengths of column were tested, those between which the greatest number of columns actually in use range. The concrete specimens were 8 by 8 by 24 ins. The concrete was the standard Milford 1: 2: 3 mixture of Portland cement, clean, sharp, well graded sand, and 1⁄2 in. size screened, crushed trap rock, machine mixed.

The strain readings show that the filled columns are perfectly elastic at the lower loads, and that there is no permanent set in the concrete until after the elastic limit is reached. It is evident, therefore, that the steel tube prevents the permanent set in the concrete until that limit is reached. The assumption is that the stress strain diagram for this concrete restrained by the pipe is the same as would be obtained from unrestrained concrete with sets deducted.

Complete data and plots covering these tests will be sent on application.

Typical Installations.

- Stevens-Duryea Co., East Springfield, Mass., Automobile Body Building; Engineers, F. W. Dean, Inc., Boston, Mass.
- S. Slater & Sons, Inc., Webster, Mass., 2 Mill Buildings; Engineer, Chas. T. Main, Boston, Mass.
- Joseph Bancroft & Sons Co., Reading, Pa., 2 Manufacturing Buildings; Engineers, Lockwood, Greene & Co., Boston, Mass.
- M. F. Cahill, Boston, Mass., Manufacturing Building; Engineers, H. M. Haven and Wm. M. Crosby, Boston, Mass.
- Otis Company, Ware, Mass., Mill Building; Engineers, Lockwood, Greene & Co., Boston, Mass.
- Plymouth Mills, Lawrence, Mass., Manufacturing Building; Engineers, H. M. Haven and Wm. M. Crosby, Boston, Mass.
- Lycoming Rubber Company, Williamsport, Pa., Manufacturing Building; Engineers, Lockwood, Greene & Co., Boston, Mass.



**L. J. MENSCH**

MEMBER OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

# Manufacturer of Reinforced Concrete Structures

138 North La Salle Street

CHICAGO, ILL.

## Products.

EMPERGER'S HOOPED CONCRETE COLUMNS with Cast Iron Cores; REINFORCED CONCRETE PRECAST PILES and POLES; HOLLOW CONCRETE PILES; and COMBINATION WOOD and CONCRETE PILES.

Reinforced Concrete Water Tanks;  
Reinforced Concrete Raft Foundations;  
General Concrete Construction.



TRADE-MARK

## Emperger's Hooped Concrete Columns.

These columns consist of concrete columns reinforced with 1% of spiral and 1% of vertical reinforcement, and a cast iron reinforcement, generally in the shape of a cast iron column.

The United States Bureau of Standards made very elaborate tests of Emperger columns and recommended the following formula for the ultimate strengths per square inch if 1:1:2 concrete is used:  $5300(1-P) + 63000 \frac{P}{D}$ ; L = length, D = diameter of column, both in the same units, and P the ratio of the area of cast iron to concrete core area.

The table below is based on the unit stresses of 1,400 lbs. per sq. in. on hooped concrete, and 14,000 lbs. per sq. in. on the cast iron reinforcement, and will give a factor of safety of from 4 to 5 if high grade cast iron, cast vertical, is used.

Emperger's columns can be made 20% less in diameter than hooped concrete columns which are designed for a stress of 900 lbs. per sq. in., at no additional expense.

Emperger's columns will save 50% in cost over hooped concrete columns designed for 1,500 lbs. per sq. in. They will save 66% from the cost of a fireproof steel column.

### Other Products.

L. J. MENSCH also manufactures reinforced concrete precast piles and hollow concrete piles for dock work, and combined concrete piles.

A great saving of time and cost is made by the use of "Mensch" reinforced concrete raft foundations instead of wood or concrete piles.

### Facilities.

By arrangement with the largest factories in the United States, we are enabled to furnish cast iron cores of absolutely uniform section on very short notice, guaranteeing quick delivery.

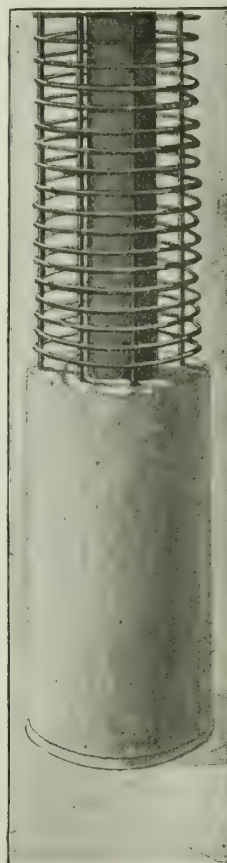
### Co-operative Service.

Details of Emperger construction and other Mensch products sent on request. Tentative plans and estimates gladly furnished.

SAFE LOADS OF EMPERGER COLUMNS IN 1000 POUNDS

[illegible]

Outside diam- eter of con- crete column	Outside diameter of cast iron column	Thickness Area Weight per ft.	11 1/8"																13 1/2"															
			5/8"	1 1/8"	3 3/8"	7/8"	1"	1 1/8"	1 1/2"	1 3/4"	1 7/8"	1 5/8"	1 3/4"	2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	2"	2 1/4"								
			19 1/2"	23 1/2"	27 7/8"	28 3/4"	32"	36"	39"	43"	46 1/2"	50 1/2"	53 3/4"	59 1/2"	79 1/2"	95"	109 1/2"	123"	137"	151"	167"	185"	79 1/2"	95"	109 1/2"	123"	137"	151"	167"	185"				
			59 1/2"	72 1/2"	77 1/2"	80 1/2"	90 1/2"	102 1/2"	113 1/2"	124 1/2"	135 1/2"	145 1/2"	156 1/2"	167 1/2"	185 1/2"	79 1/2"	95"	109 1/2"	123"	137"	151"	167"	185"	79 1/2"	95"	109 1/2"	123"	137"	151"	167"	185"			
20"			521	571	593	644	692	736	782	824	867	935	952	1027	675	739	791	852	908	965	1018	1071	1121	1173	1269	1356								
22"			596	646	668	719	767	811	857	899	942	1010	1027	1107	757	821	873	935	991	1048	1102	1154	1204	1256	1352	1439								
24"			679	729	751	802	850	894	940	982	1025	1093	1110	1185	758	822	879	935	991	1048	1102	1154	1204	1256	1352	1439								
26"			772	822	844	895	943	987	1032	1075	1118	1186	1203	1278	851	915	972	1028	1084	1141	1195	1247	1297	1349	1445	1532								
28"			871	921	943	994	1042	1086	1132	1174	1217	1285	1302	1377	950	1014	1071	1127	1183	1240	1292	1346	1396	1448	1544	1631								
30"			984	1032	1054	1105	1153	1197	1243	1285	1328	1396	1413	1488	1061	1125	1182	1238	1294	1351	1405	1457	1507	1559	1655	1742								
32"			1100	1150	1172	1223	1271	1315	1361	1403	1446	1514	1531	1606	1179	1243	1300	1356	1412	1469	1523	1575	1625	1679	1773	1860								
34"			1230	1280	1302	1353	1401	1445	1491	1533	1576	1646	1661	1736	1309	1373	1430	1486	1542	1599	1653	1705	1755	1807	1903	1990								
36"			1365	1415	1437	1488	1536	1580	1626	1668	1711	1779	1796	1871	1444	1508	1565	1621	1677	1734	1788	1840	1890	1942	2038	2125								
38"			1510	1560	1582	1633	1681	1725	1771	1813	1856	1924	1941	2016	1589	1653	1710	1766	1822	1879	1933	1985	2035	2087	2183	2270								
40"			1665	1715	1737	1788	1836	1880	1926	1968	2011	2070	2096	2171	1744	1808	1865	1921	1977	2034	2088	2140	2190	2242	2338	2425								
42"			1830	1880	1902	1953	2001	2045	2091	2133	2176	2244	2261	2336	1909	1973	2030	2086	2142	2199	2253	2305	2355	2407	2503	2590								
44"			2000	2050	2072	2123	2171	2215	2261	2303	2346	2414	2431	2506	2079	2143	2200	2256	2312	2369	2423	2475	2525	2577	2673	2760								
46"			2180	2230	2252	2303	2351	2395	2441	2483	2526	2594	2611	2686	2259	2323	2380	2436	2492	2549	2603	2653	2705	2757	2853	2940								
48"			2368	2418	2440	2491	2539	2583	2629	2671	2714	2782	2799	2874	2447	2511	2568	2624	2680	2737	2791	2843	2893	2945	3041	3128								



EMPERGER'S HOOPED  
CONCRETE COLUMN  
WITH CAST IRON  
CORE



# THE TRUSSWALL MFG. CO.

Manufacturers of Reinforced Concrete Columns

KANSAS CITY, MO.

## Products.

TRUSSWALL TURNED CONCRETE PORCH COLUMNS.

Concrete Pilasters, Lamp Standards, Dimension Stone of all kinds, Balustrades, Railings, Garden Furniture, Urns, Vases and other Ornamental Cement Products.

## Description of Trusswall Turned Concrete Columns.

The Trusswall turned concrete column is a steel-reinforced concrete column actually turned in a lathe and not cast in a form.

A collapsible core is used as a mandrel on a lathe, which is coated with paper to prevent concrete from adhering. An even coat of concrete is applied and allowed to set. Wire is then spirally wound over this first concrete layer from end to end, back and forth, until the column is covered with an interwoven wire mesh. The size of wire varies according to size of column and load it is to carry. In very heavy load carrying columns steel rods are laid upon and securely wired to layer of spirally wound wire placed over the rods, making double layer of spiral mesh with vertical rods between.

The wire is then carefully covered with a plastic coat of concrete and turned up true and round without any surface or form marks. The columns are thoroughly cured from two weeks to one month before being delivered and are so solid that no special provision is made for hauling or transportation to the building.

This column is comparatively light, being hollow, and compares favorably in price with wood columns, yet has the looks and lasting qualities of stone. Illustration below shows reinforcing exposed; this forms the truss in wall of column. By placing reinforcing in the manner shown, there can be no displacement of rods,



and the greatest efficiency is secured. The method of applying concrete allows it to be thoroughly troweled and floated down, insuring great density.

## Finishes.

A very desirable finish is secured by means of a special trowel to finish or cut the surface. By varying the mixture any texture from very smooth to exceedingly rough may be secured.

By using different colors in the aggregate and different colored cements, stone of various kinds may be matched without causing the result to look like an imitation.

## True to Detail.

The value of the Trusswall column is greatly increased from the architect's standpoint, as details and ornaments of the periods and forms of architecture are true and carefully finished.

To make true to detail, there is a system of templates of wood and metal which are laid out from the architect's drawings and details. These are usually full size and the architect can depend upon the product being true and accurately made.

## Method of Handling.

The column is so solid that no special provision is made for hauling to the building. In case of smaller columns, timbers are placed lengthwise of a flat top wagon, and the columns are laid crosswise with small triangular blocks of wood between to keep them from rolling. To unload, the columns are rolled down a pair of skids, much as if they were logs. A column 12 ins. in diameter and 8 ft. 9 ins. long will weigh about 300 lbs.

Instructions to buyers are to handle the same as stone columns, but there is a very great saving in weight over stone.

## Information.

This company will be glad to advise architects and owners of the adaptability of Trusswall products to their needs. Prices and information gladly given without obligation.



LARGE TRUSSWALL COLUMN ON LATHE SHOWING FORM FOR SHAPING AND WIRE AND STEEL ROD REINFORCEMENT

# THE UNION METAL MANUFACTURING CO.

## Metal Columns, Pergolas, Lighting Standards and Garden Fixtures

### CANTON, OHIO

REPRESENTATIVES THROUGHOUT THE UNITED STATES

#### Products.

UNION METAL COLUMNS and PILASTERS (patented) for exterior and interior architectural use.

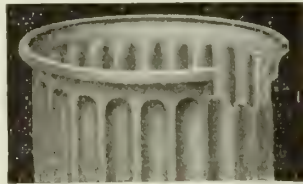
UNION METAL LAMP STANDARDS (patented) of Pressed Steel, Pressed Copper, and Bronze.

UNION METAL GARDEN FIXTURES, NEWELS, WALL BRACKETS, etc., for general decorative use.

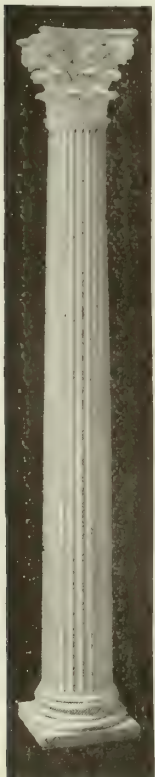
#### Union Metal Columns.

These columns are offered to the architectural profession as a means of overcoming splitting, checking, rotting, warping and other troubles which are common to wood columns. They are designed in such a way as to meet every demand for architectural correctness, strength and economy.

ENTASIS and STOPPED FLUTES—These characteristic features of the classical column are strictly observed in Union metal columns (see illustration). The machinery and dies for fluting and tapering the steel shafts are patented, and can be used only by THE UNION METAL MANUFACTURING CO.

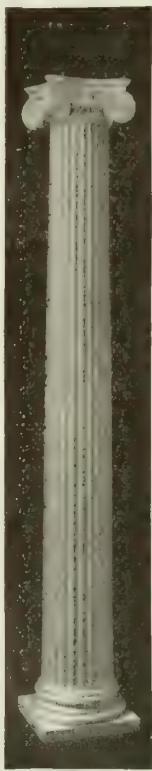


DETAIL OF STOPPED FLUTES AND END OF SHAFT



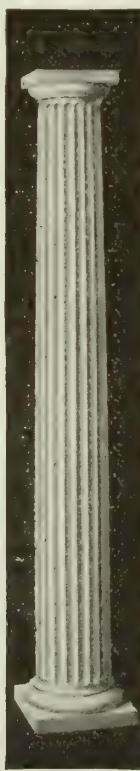
No. 212  
ROMAN CORINTHIAN

Composition capital, attic base (cast iron), steel shaft (Corinthian flute)



No. 237  
MODERN IONIC

Composition capital, attic base (cast iron), steel shaft (Ionic flute)



No. 240  
ALL-STEEL DORIC

Steel capital and base, steel shaft (Doric flute)

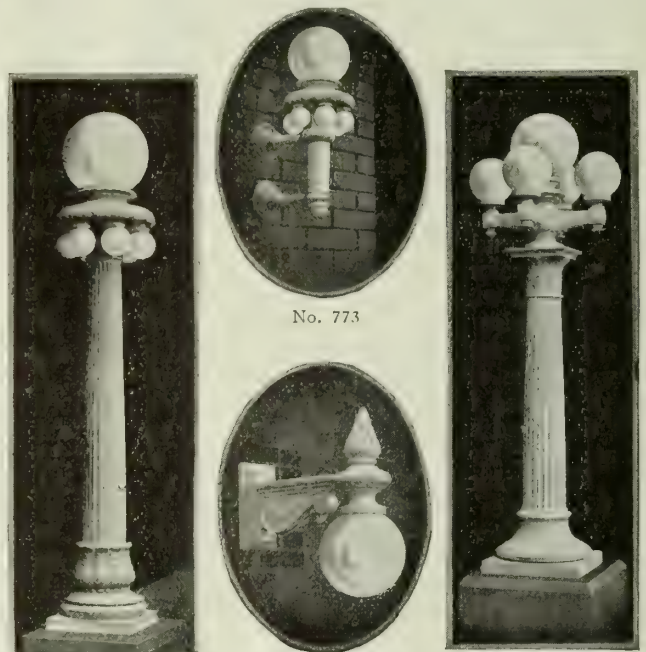
**UNION**  
**METAL COLUMNS**  
TRADE-MARK

DESIGNS—Union metal columns adhere strictly to classic proportions, except where special structural requirements may necessitate modifications in height, etc.

CONSTRUCTION—Shafts are made from the best grade open hearth steel, galvanized especially for this purpose. Shafts up to and including a base diameter of 14 ins. are made of one-ply No. 22-gage galvanized steel; base diameters over 14 ins. of two-ply No. 22-gage galvanized steel, pressed and fluted together.

The steel is rolled especially for this purpose, and is tight coated with spelter. Spelter adheres perfectly to the metal under all conditions, fully protecting it from the action of the elements.

As a further protection, all steel shafts are given an application of galvanized iron primer. Cast iron parts are coated with high grade metalastic paint before leaving the factory. This treatment insures the finishing coats of paint against peeling or cracking. Seams are securely locked, and are always turned on the inside of the shaft.



No. 735

No. 775

No. 749

LAMP STANDARDS AND BRACKETS

#### Catalogues.

Our portfolio of designs and installations gives full particulars concerning the construction of Union metal columns and shows many buildings where they have been used. Ask for Column Catalogue No. 14 and Pergola Catalogue No. 15P.

Catalogue S-102 is a handsome catalogue showing Union metal entrance standards, wall brackets, exterior newels, and garden fixtures.

Catalogue S-103 is a loose-leaf catalogue showing Union metal lamp standards for the lighting of business districts, parks, boulevards, private estates, and public grounds.



# UNITED STATES CAST IRON PIPE AND FOUNDRY CO.

## Manufacturers of Cast Iron Columns

GENERAL OFFICES  
BURLINGTON, N. J.

### SALES OFFICES

BUFFALO, N. Y., 957 East Ferry Street  
PHILADELPHIA, PA., 1421 Chestnut Street  
NEW YORK, N. Y., 71 Broadway  
PITTSBURGH, PA., Henry W. Oliver Building

BIRMINGHAM, ALA., 1002 American Trust Building  
ST. LOUIS, MO., Security Building  
CHICAGO, ILL., 122 South Michigan Boulevard  
SAN FRANCISCO, CAL., Monadnock Building  
PORTLAND, ORE., Northwestern Bank Building

### LIST OF WORKS

ADDYSTON, OHIO  
ANNISTON, ALA.  
BESSEMER, ALA.

BIRMINGHAM, ALA.  
BUFFALO, N. Y.  
BURLINGTON, N. J.

CHATTANOOGA, TENN.  
CLEVELAND, OHIO  
COLUMBUS, OHIO

LOUISVILLE, KY.  
SCOTTDAL, PA.  
SUPERIOR, WIS.

### Products.

KEYSTONE CAST IRON COLUMNS, BASE PLATES and CAPS.

KEYSTONE COMBINATION COLUMN CAPS.

Miscellaneous Building Castings; Special Heavy Castings for industrial and power plants, to order.

### Scope of Use.

Keystone columns are widely used in the construction of churches, schools, factories; mills, warehouses, sheds, stores and other commercial buildings; for highway and railway sign posts; and for many special purposes.

### Service.

This company offers the benefit of its varied experience to customers, by suggesting minor changes in design which will materially lessen the cost of special work.

### Cast Iron in Building Construction.

Cast iron is practically impervious to rust, possesses a high compressive strength and will give satisfactory service for many years.

Economy, service, safety and permanence are obtained by the use of cast iron in building construction.

### Superiority of Keystone Columns.

**DESCRIPTION**—Keystone columns are made of cast iron, supplied with specially designed base plates and caps, and combination caps where floor beam connections are required.

**FIREPROOF**—In a disastrous fire in Birmingham, Ala., Keystone columns withstood both the intense heat of the fire and the shock of the falling walls.

**CASTING**—Invariably cast in *solid moulds*—no unsightly side seams or gates. Cast vertically in dry sand. Flasks and patterns used in casting are of metal, insuring accuracy of dimensions.

**INSPECTION AND TESTS**—Uniformity and high quality are guaranteed for every column shipped, for besides rigid inspection and pressure tests, a physical and chemical test of the material is made in the laboratory.

**MAXIMUM STRENGTH**—Caps and bases are cast *separately* from the column, thus avoiding internal stresses due to uneven shrinkage during cooling, and maintaining the maximum strength of the material.



**SHIPMENT**—Keystone columns are shipped complete, ready for use.

### Keystone Basement Columns.

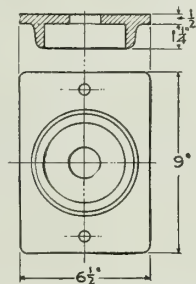
They require no basement filler. Furnished complete with cap and base.

In ordering, specify "Keystone basement columns," and state length.

Special designs to order.

DATA, KEYSTONE BASEMENT COLUMNS

Length over all, ft., ins.	Safe load in short tons	List price each, complete
4 0	22.4	\$4.90
5 0	21.5	5.90
6 0	20.6	6.90
6 6	20.1	7.40
7 0	19.7	7.90
7 6	19.2	8.40
8 0	18.8	8.90
8 6	18.3	9.40
9 0	17.9	9.90
9 6	17.4	10.40
10 0	17.0	10.90
10 6	16.5	11.40
11 0	16.1	11.90
11 6	15.6	12.40
12 0	15.2	12.90
12 6	14.7	13.40



PLAN AND SECTION OF CAP AND BASE

Length over all includes cap and base. Inside diam. of all columns listed above, 4 ins.; outside diam., 5 ins.; metal thickness, 1/2 in. Columns, caps and bases coated with pitch inside and out if desired. List price covers one column complete with cap and base.

### Building Columns.

The following tables, useful in selecting proper columns, caps and bases for ordinary conditions, refer only to building columns, and not to basement columns.

**SAFE LOADS**—The safe loads for building columns are calculated from the two formulæ:

$$S = \frac{PA}{2000} \text{ and } P = \frac{S_u}{F} - 40 \frac{L}{R}, \text{ where}$$

S=safe load, tons

P=allowable stress, lbs. per sq. in.

A=area of metal, sq. ins.

$S_u$ =ultimate compressive strength

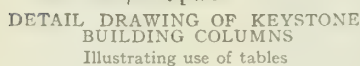
F=factor of safety

R=radius of gyration

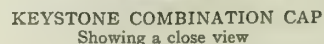
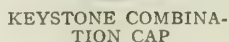
L=effective length of column, ins.

In the calculations in the following tables,  $S_u=90,000$  lbs. per sq. in., and  $F=10$ , this being the approved formula of the New York building code and widely adopted elsewhere. For lower safety factors, loads may readily be figured by simple substitution in the formulæ. For loads to the right of the heavy zigzag rule, L is greater than 70 R.

**SELECTION OF CAPS AND BASES**—The size of beams to be carried and the diameter of the column partly govern the selection of the caps, and the bases are determined by the nature of the foundation.



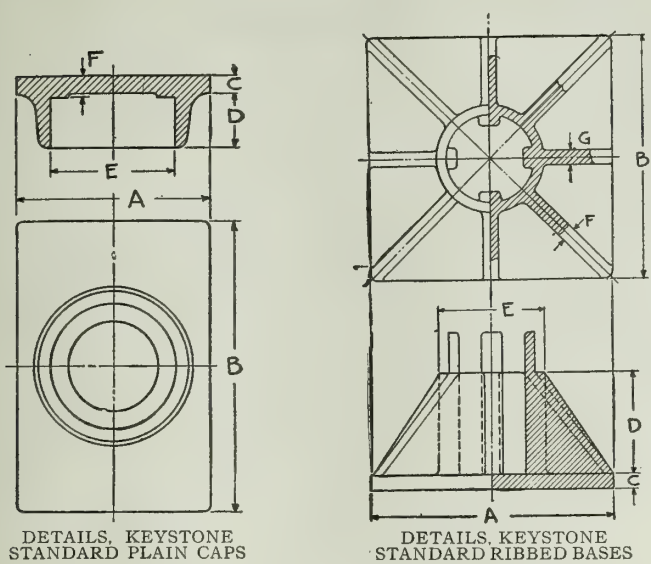
Loads are transmitted in a direct line, thus eliminating shearing strains. Keystone combination column caps are self-centering, and have due provision against eccentric loading. They comply strictly with the building laws. The use of expensive and complicated brackets can be avoided by using the Keystone combination cap. Made 1-, 2-, 3-, or 4-way, as desired. Brackets and lugs may readily be altered to suit beams of different depths. Other changes caused by special conditions can be made at slight extra



expense. Combination caps also furnished with special brackets and lugs for double I-beam girders.

Col. ref. number	Out-side diam.	Thickness	Area metal sq. in.	Radius of gyration	Price per lin. ft.	Safe loads, in tons of 2000 lbs.												
						Length of column in feet												
						6	7	8	9	10	11	12	13	14	15	16	17	
1-B	3.8	.42	4.46	1.20	\$ .71	14.7	13.8	12.9	12.0	11.1	10.2	9.3						
2-D	3.95	.48	5.23	1.24	.82	17.5	16.5	15.6	14.6	13.7	12.6	11.7						
3-G	4.8	.40	5.53	1.56	.86	19.8	18.9	18.0	17.1	16.3	15.4	14.7						
4-A	4.8	.42	5.78	1.55	.90	20.6	19.7	18.8	17.9	17.0	16.1	15.2						
5-B	5.0	.45	6.43	1.61	1.00	23.2	22.2	21.2	20.3	19.3	18.4	17.4	16.4	15.5				
6-C	5.0	.48	6.82	1.60	1.06	24.5	23.5	22.5	21.5	20.5	19.5	18.5	17.5	16.5				
7-D	5.0	.52	7.32	1.59	1.14	26.3	25.2	24.1	23.0	21.9	20.8	19.7	18.7	17.5				
8-A	6.9	.44	8.93	2.29	1.39	34.7	33.6	32.7	31.7	30.9	29.8	28.9	28.0	27.2				
9-B	7.1	.48	9.98	2.34	1.56	38.7	37.7	36.7	35.7	34.7	33.7	32.6	31.6	30.6	29.6			
10-C	7.1	.51	10.56	2.33	1.65	41.0	40.0	38.9	37.8	36.8	35.7	34.5	33.4	32.3	31.3			
11-D	7.1	.55	11.32	2.32	1.77	43.9	42.9	41.8	40.4	39.2	38.1	37.0	35.8	34.7	33.3			
12-E	7.25	.58	12.15	2.36	1.90	47.1	46.5	44.7	43.5	42.3	41.0	39.8	38.6	37.4	36.2	35.0	33.8	
13-F	7.25	.61	12.72	2.35	1.99	49.4	48.1	46.8	45.6	44.3	43.0	41.7	40.5	39.0	38.0	36.5	35.2	
14-G	7.38	.65	13.73	2.39	2.15	53.5	52.2	50.9	49.5	48.1	46.7	45.3	44.0	42.6	41.3	39.8	38.5	
15-H	7.38	.69	14.49	2.37	2.26	56.5	55.0	53.6	51.9	50.5	49.0	47.5	46.0	44.4	43.2	41.7	40.3	
16-S	7.1	.75	14.96	2.26	2.34	57.8	56.0	54.7	53.0	51.5	50.0	48.3	46.6	45.2	43.4	42.8	41.3	
17-S	7.38	.81	16.71	2.34	2.61	64.9	63.2	61.5	60.0	58.1	56.5	54.5	52.8	51.1	49.5	47.7	46.2	
18-S	7.1	1.55	27.03	3.04	4.22	101.2	99.5	96.2	93.0	89.7	86.5	83.4	80.5	77.2	74.0	70.5	67.5	
19-B	9.0	.51	13.60	2.00	2.12	54.7	53.6	52.5	51.4	50.3	49.2	48.1	47.0	45.9	44.8	43.7	42.6	
20-C	9.3	.56	15.38	3.09	2.40	60.2	60.8	59.6	58.4	57.2	56.0	54.8	53.8	52.4	51.4	50.1	48.7	
21-D	9.3	.60	16.40	3.08	2.56	66.2	64.9	63.6	62.3	61.0	59.6	58.3	57.0	56.0	54.7	53.5	51.9	
22-E	9.4	.66	18.12	3.10	2.83	73.1	71.7	70.5	68.9	67.5	66.1	64.9	63.4	61.9	60.5	59.0	57.2	
23-G	9.6	.75	20.85	3.12	3.25	84.3	82.5	81.0	79.3	77.9	76.3	74.7	73.1	71.3	69.6	68.4	66.0	
24-S	9.0	.87	22.22	2.89	3.47	88.9	87.1	85.4	83.5	81.3	79.7	77.8	76.0	74.3	72.5	70.6	68.2	
25-S	9.0	1.50	35.34	3.70	5.51	140.0	137.0	133.5	130.8	127.3	124.3	121.5	118.0	115.1	111.6	108.9	104.6	
26-S	9.6	.81	22.37	3.12	3.49	90.5	88.6	86.9	85.0	83.7	81.9	80.1	78.3	76.5	74.8	73.4	70.8	
27-S	10.0	.75	21.80	3.28	3.40			85.4	83.7	82.1	80.7	78.9	77.1	75.9	74.1	72.8	71.0	
28-S	10.0	.87	24.95	3.24	3.89			97.3	95.9	93.9	92.3	90.4	88.3	86.3	84.5	82.8	80.8	
29-S	10.0	1.00	28.28	3.20	4.42			110.2	108.0	105.8	104.0	101.8	99.5	98.0	95.5	93.3	91.0	
30-S	10.0	1.25	34.36	3.13	5.36			133.3	131.0	128.5	125.9	123.0	120.3	117.5	114.9	112.7	109.8	
31-A	11.1	.50	16.65	3.75	2.60			66.3	65.2	64.3	63.3	62.2	61.0	60.0	59.0	58.0	56.9	
32-B	11.1	.57	18.86	3.73	2.94			75.1	73.8	72.7	71.5	70.1	69.0	67.8	66.7	65.6	64.0	
33-C	11.4	.62	20.95	3.82	3.27			83.8	82.4	81.2	80.0	78.7	77.1	75.7	74.5	73.2	72.0	
34-D	11.4	.68	22.90	3.80	3.57			91.6	90.2	88.5	87.0	85.6	84.3	82.8	81.5	80.1	78.8	
35-E	11.6	.74	25.25	3.85	3.94			101.0	99.5	98.0	96.5	95.0	93.0	91.4	90.0	88.4	86.9	
36-G	11.6	.86	29.02	3.81	4.53			116.0	114.2	112.0	110.8	108.5	106.9	105.0	103.3	101.6	99.1	
37-S	11.1	1.05	33.15	3.57	5.17			131.3	129.3	126.6	124.8	122.7	120.0	118.0	116.0	113.3	111.4	
38-S	11.1	1.55	46.51	3.42	7.26			183.4	179.7	177.0	174.0	170.5	167.0	163.9	160.1	157.4	153.5	
39-S	11.6	1.78	54.91	3.61	8.57			217.5	214.0	211.0	207.5	203.0	199.9	196.8	192.0	188.8	185.8	
40-A	13.2	.54	21.48	4.48	3.35			87.6	86.3	85.0	84.1	82.9	81.6	80.8	79.5	78.3	77.3	
41-B	13.2	.62	24.50	4.45	3.82			99.5	98.4	97.0	96.0	94.6	93.1	91.6	90.7	89.3	87.8	
42-C	13.5	.68	27.39	4.54	4.27			111.8	110.0	109.0	107.3	105.6	104.6	102.9	101.3	100.2	98.6	
43-D	13.5	.75	30.04	4.51	4.68			122.6	120.8	119.0	117.6	116.0	114.1	112.5	111.2	109.3	108.0	
44-S	13.0	.75	28.86	4.34	4.91			117.2	115.6	114.0	112.4	110.8	109.2	107.6	106.0	104.4	102.8	
45-S	13.13	.81	31.45	4.44	4.51			128.0	126.5	124.8	122.9	121.4	119.7	117.8	116.0	114.4	112.9	
46-S	13.25	.88	34.20	4.38	5.34			139.0	136.8	135.4	133.5	131.4	129.8	128.0	126.0	124.0	121.9	
47-S	13.38	.94	36.74	4.39	5.73			149.3	147.2	145.3	143.3	141.2	139.3	137.5	135.9	134.0	132.0	
48-E	13.78	.82	33.38	4.59	5.20			136.4	134.1	132.8	130.9	129.2	127.4	125.6	123.8	122.0	120.8	
49-F	13.78	.89	36.10	4.57	5.63			147.3	145.4	143.5	141.6	139.3	137.5	135.9	134.0	132.0	130.2	
50-S	13.5	1.00	39.27	4.43	6.13			159.4	157.6	155.4	153.2	151.0	148.8	146.8	144.6	142.9	140.6	
51-S	13.75	1.13	44.80	4.48	7.00			182.6	179.9	177.2	175.2	172.6	170.2	168.1	165.4	162.8	161.0	
52-S	13.2	1.63	59.10	4.13	9.22			238.5	235.0	232.0	228.2	224.7	221.0	217.6	214.2	210.7	207.8	
53-S	13.5	1.75	64.60	4.20	10.10			261.3	257.5	253.9	250.2	246.8	242.8	239.0	235.4	231.7	228.0	
54-S	13.75	1.87	70.00	4.25	10.92			283.0	280.0	275.8	271.6	267.2	263.0	259.0	255.8	252.0	247.8	
55-S	14.0	1.25	50.10	4.53	7.80			204.0	201.4	198.8	196.0	193.4	190.8	188.0	185.4	182.8	180.2	





DETAILS, KEYSTONE  
STANDARD PLAIN CAPS

DETAILS, KEYSTONE  
STANDARD RIBBED BASES

DATA, KEYSTONE STANDARD PLAIN CAPS.

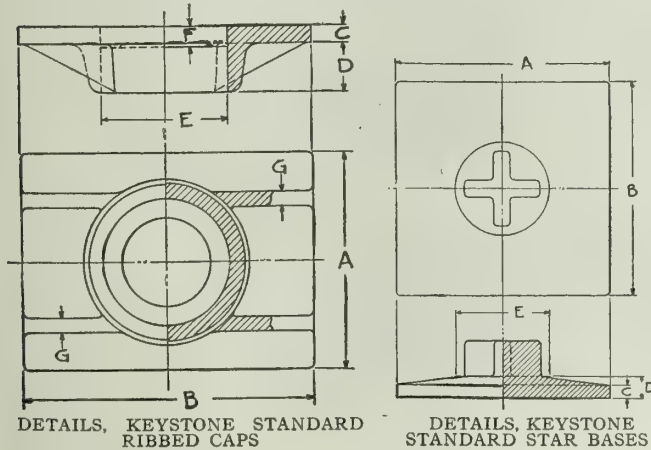
Pattern number	Ap'r'x o. d. col.	Dimensions in inches						List price, each
		A	B	C	D	E	F	
1—P.C.	5	6.5	9	.50	1.50	5.19	.63	\$0.90
2—	5	8.0	10	.75	2.00	5.19	.88	2.50
3—	5	8.0	12	.75	2.25	5.19	.88	2.80
4—R.P.C.	5	9.0	12	1.00	2.25	5.19	1.13	3.70
5—P.C.	5	10.0	10	1.00	2.25	5.19	1.13	3.50
6—	5	12.0	12	1.00	2.50	5.19	1.13	4.80
7—	7	9.5	14	1.00	2.50	7.25	1.13	4.80
8—	7	10.0	12	1.00	2.50	7.25	1.13	4.40
9—	7	11.0	14	1.13	3.00	7.25	1.25	6.50
10—	7	12.0	12	1.00	3.00	7.25	1.13	6.00
11—	9	12.0	14	1.13	3.00	9.56	1.25	7.50
12—	9	14.0	16	1.25	3.00	9.56	1.50	10.00

Order by pattern number, also giving reference number of corresponding building column, if possible.

DATA, KEYSTONE STANDARD RIBBED BASES

Pattern number	Ap'r'x o. d. col.	Dimensions in inches							List price, each
		A	B	C	D	E	F	G	
1—R.B.	5	12	12	.75	5	5.25	.75	.75	\$5.50
2—	5	14	14	1.00	5	5.25	.75	.75	8.00
3—	5	16	16	1.00	5	5.25	.75	.75	9.50
4—	7	14	14	1.25	6	7.25	.88	.88	10.00
5—	7	16	16	1.25	7	7.25	.88	.88	14.00
6—	7	20	20	1.25	8	7.25	.88	.88	23.00
7—	7	24	24	1.25	9	7.25	.88	.88	32.00
8—	9	24	24	1.25	12	9.25	.88	.88	36.00
9—	9.3	30	30	1.25	12	9.50	.88	.88	56.00
10—	10	24	24	1.50	12	10.50	.88	.88	41.00
11—	10	36	36	1.75	15	10.50	2.38	1.13	106.00
12—	11	24	24	1.75	12	11.50	1.25	1.00	51.50
12—R.B.S.	11	16	16	1.25	8	11.50	.88	.75	18.00
13—R.B.	11	36	36	1.75	15	11.50	2.38	1.13	112.00
14—	11.4	36	36	2.00	15	12.00	3.00	1.63	151.00
15—	11.4	42	42	2.00	15	12.00	1.88	1.00	155.00
16—	13.2	36	36	2.00	15	13.50	3.00	1.63	153.50
17—	13.2	42	42	2.25	15	13.50	2.63	1.38	182.00
18—	13.5	42	42	2.50	15	14.00	2.63	1.25	187.00
19—	13.5	48	48	2.50	18	14.00	2.50	1.50	280.00

All bases machined to fit columns. All bases above 24 x 24 ins. have secondary ribs. Special bases to order.



DETAILS, KEYSTONE STANDARD  
RIBBED CAPS

DETAILS, KEYSTONE  
STANDARD STAR BASES

DATA, KEYSTONE STANDARD RIBBED CAPS

Pattern number	Ap'r'x o. d. col.	Dimensions in inches							List price, each
		A	B	C	D	E	F	G	
1—R.C.	5	9	12	.75	2.00	5.19	.88	.63	\$3.20
2—	5	10	14	.75	2.25	5.19	.88	.63	4.50
3—	5	12	12	1.00	2.50	5.19	1.25	.75	5.50
4—	7	9.5	14	1.00	2.50	7.25	1.25	.75	6.00
5—	7	11	14	1.00	2.50	7.25	1.25	.75	6.50
6—	7	12	12	1.00	2.50	7.25	1.50	.75	5.50
7—	7	12	16	1.00	3.00	7.25	1.50	.88	7.00
8—	9	12	16	1.13	3.00	9.56	1.50	.88	9.00
9—	9	14	16	1.25	3.00	9.56	1.50	.88	10.50
10—	10	13	21	1.25	3.00	10.19	1.50	.88	12.50
11—	11	14	14	1.13	3.00	11.25	1.25	.88	9.50
12—	11	14	18	1.25	3.00	11.25	1.50	.88	12.50
13—	11.4	16	16	1.38	3.00	11.63	1.75	1.00	13.50
14—	11.4	16	18	1.50	3.00	11.63	1.75	1.00	15.50
15—	13.2	16	20	1.50	3.00	13.50	1.75	1.00	17.00
16—	13.2	20	20	1.50	3.00	13.50	1.75	1.00	20.50
17—	13.5	16	20	1.50	3.00	13.75	1.75	1.00	17.50
18—	13.5	20	24	1.75	3.00	13.75	2.00	1.00	28.00

DATA, KEYSTONE STANDARD STAR BASES

Pattern number	Ap'r'x o. d. col.	Dimensions in inches					List price, each
		A	B	C	D	E	
1—S.B.	5	7	8	.50	.75	.75	\$1.00
2—	5	8	10	.75	.75	.75	1.80
3—	5	10	10	.63	1.00	5.25	2.10
4—	5	10	12	.75	1.25	5.25	3.30
5—	5	12	12	.75	1.50	5.25	5.70
6—	5	14	14	1.00	1.50	5.25	7.00
7—	5	16	16	1.00	2.00	5.25	9.50
8—	7	12	12	.75	1.25	7.50	5.70
9—	7	14	14	.75	1.25	7.50	6.50
10—	7	16	16	1.00	1.50	7.50	9.50
11—	7	18	18	1.00	2.25	7.50	14.50
12—	9	18	18	1.00	2.50	9.75	15.50
13—	10	20	20	1.00	2.50	10.50	18.20
14—	11	24	24	1.00	2.75	11.75	28.00
15—	11.4	20	20	1.00	2.50	12.00	18.70
16—	11.4	24	24	1.25	2.75	12.00	26.70
17—	13.2	24	24	1.25	3.00	14.00	30.00

Order by pattern number, also giving reference number of corresponding building column, if possible.

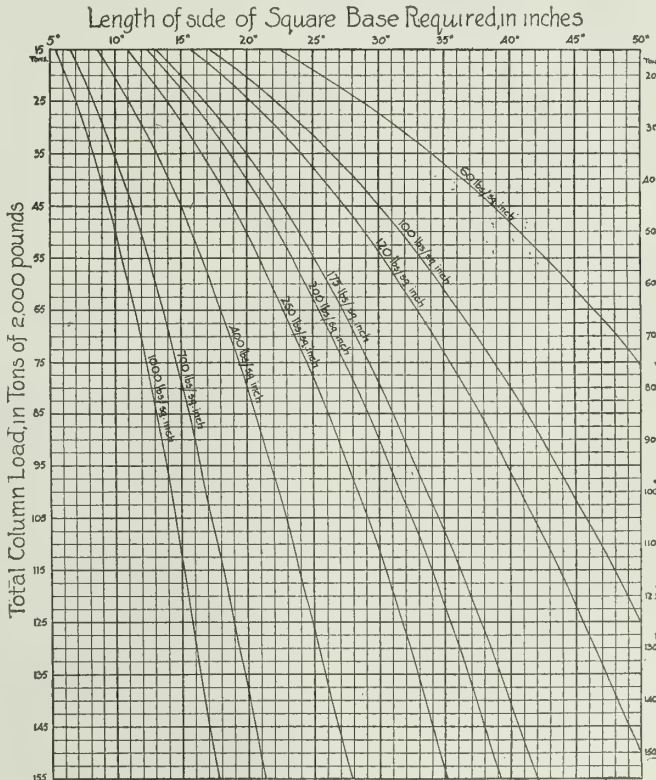


CHART FOR COLUMN BASE PLATES

Read horizontally, from total column load to intersection with proper curve (according to nature of foundation), then vertically to length of side, in inches of square base required.

Chart is based on following allowable foundation loads, in lbs. per sq. in:

Load allowances, lbs.	Foundation	Load allowances, lbs.	Foundation
60	Sand or gravel	250	Concrete (Portland)
100	Common brickwork lime	400	Soft sandstone
120	Hard brickwork lime	700	Hard sandstone
175	Hard brickwork cement	1000	Granite, slate, marble
200	Concrete (Rosendale)		

# THE HASTINGS PAVEMENT COMPANY

TELEPHONE:  
BROAD 1496

25 Broad Street  
NEW YORK, N. Y.

WORKS  
HASTINGS-ON-HUDSON, N. Y.

## Products.

Manufacturers of COMPRESSED ASPHALT PAVING BLOCKS and TILES.

## Asphalt Paving Blocks.

The logical material for the wearing surface of streets and roads, and of piers, warehouses, loading platforms, bridges, factory floors, driveways, court-yards, etc.

Manufactured at a permanent plant; shipped in block form ready to lay; and always obtainable in any quantity for extension or repairs.

**COMPOSITION AND SIZE**—A properly proportioned mixture of natural asphalt, crushed trap rock and limestone dust is heated to 300° Fahr., and shaped into uniform blocks under a pressure of 6000 lbs. per sq. in. The blocks are 5 ins. wide, 12 ins. long, and 2, 2½ and 3 ins. deep. Specific gravity, 2.40.

**ADVANTAGES**—Asphalt block pavements are pleasing in appearance, smooth, noiseless, dustless, sanitary because non-absorbent, and next to granite the most durable. Present a gritty, non-slippery, non-skiddable surface. Easily taken up and relaid. Reasonable cost. Not injuriously affected by extremes of temperature, or by automobile oils. Made to suit any climate and traffic conditions.

**METHOD OF LAYING**—Asphalt blocks are usually laid on a concrete foundation, upon which there is laid a cushion bed of cement mortar ½ in. thick, which is struck to a true and even surface. Upon this bed the blocks are immediately laid with close joints and uniform top surface, the joints being broken 4 ins. After being laid, the blocks are given a light coat of sharp, fine sand, well broomed into the joints. Traffic is permitted in 4 or 5 days.

## Asphalt Tiles.

A wearing surface especially designed for floors, cemetery and park walks, sidewalks, and other surfaces, subject to foot traffic.

These tiles are manufactured under the same successful methods used for the blocks. White limestone, used instead of trap rock, makes a more attractive surface. They are of great density, free from voids, non-absorbent, and extremely durable; as tile laid over twenty years ago are still in service, showing but little wear.

**METHOD OF LAYING**—The large hexagonal and square tiles set on edge, on a foundation of 6 to 8 ins. of gravel and sand, with a curbing or border of square tiles set on edge. The small hexagonal tiles are laid on a foundation of 3 ins. of concrete and ½ in. of mortar.

## References.

**MANUFACTURING PLANTS, ETC.**—Quintard Iron Works, Edison Electric Power Plant (201st Street), Shults Bread Co., Shaefer Brewing Co., New York, N. Y.; Remington Arms Co., Bridgeport, Conn.; Otis Elevator Co., Harrison, N. J.; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; U. S. Navy Yard, Brooklyn, N. Y.

**PIERS**—Bush Terminal Pier No. 6, Brooklyn, N. Y., largest pier in the world—30,000 sq. yds.; N. Y. Dock Co., Piers 17, 18 and 36, Brooklyn, N. Y.; Savannah Terminal Piers of Ocean Steamship Co., Savannah, Ga.—26,000 sq. yds.; Pennsylvania R. R. Pier, Greenville, N. J.—18,000 sq. yds.; Lamport and Holt Line Piers, Hoboken, N. J.—13,000 sq. yds.

**LOADING PLATFORMS**—Arbuckle Building, Brooklyn, N. Y.; B. R. & P. Warehouse, Rochester, N. Y.

**STABLE FLOORS**—Adams Express Co. and Hecker-Jones-Jewell Milling Co., New York, N. Y.

**CEMETERIES**—Greenwood Cemetery, Brooklyn, N. Y.; St. Peter's Rectory, Haverstraw, N. Y.

**HOSPITALS**—Roosevelt Hospital, New York, N. Y.; United Hospital, Port Chester, N. Y.

**BRIDGES**—New York Central R. R., New York and Westchester Co., N. Y.; Pennsylvania Railroad, Sunnyside Yards, Borough of Queens, N. Y.; Long Island R. R., Bay Ridge Improvement, Brooklyn, N. Y.

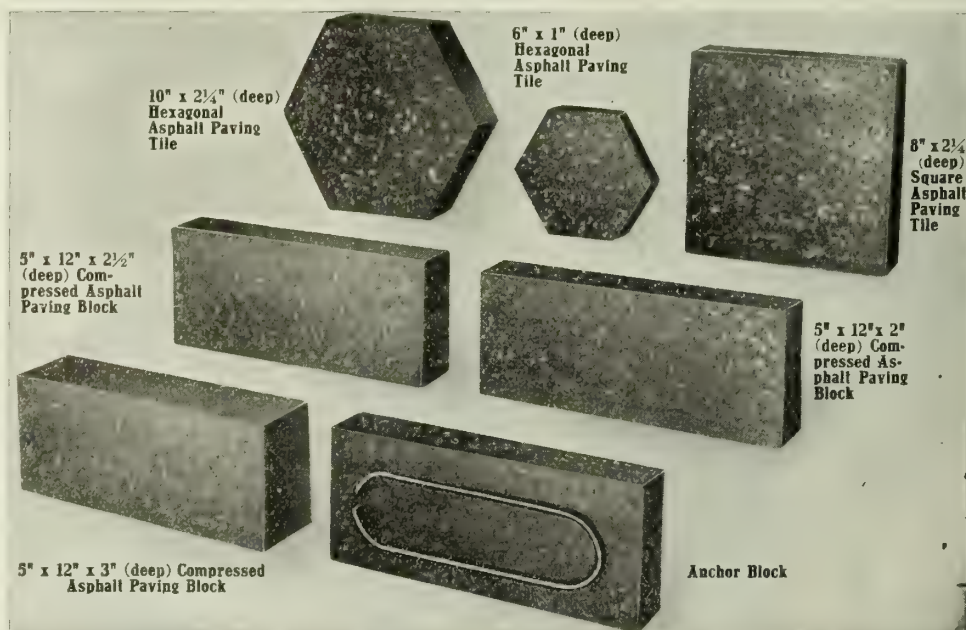
**DRIVEWAYS AND COURTYARDS**—St. Joseph's Seminary, Yonkers, N. Y.; Whitelaw Reid, Museum of Natural History, and Apthorp Apartments, New York, N. Y.

**CAB STANDS**—Biltmore Hotel and Grand Central Station, New York, N. Y.

**TILE SIDEWALKS**—Van Cortlandt Park, New York, N. Y.; Prospect Park, Brooklyn, N. Y., and numerous other parks around New York City.

**STREETS AND ROADS**—Over 4,000,000 sq. yds. laid in New York City; 10 miles on upper Broadway; 87th St., from Columbus Avenue to Central Park West, laid 1889; Bronx and Pelham Parkway, laid 1910. The Albany Post Road for several miles north of Tarrytown, N. Y., paved in 1910 and 1911 with 2-in. block on 4-in. concrete foundation. The Boston Post Road, Rye, N. Y., laid 1912.

**IN FOREIGN COUNTRIES**: Lima, Peru; Johannesburg, South Africa; Havana, Cuba; Manaus, Brazil; San Juan, Porto Rico; and Quebec, Canada, have streets paved with Asphalt Blocks.



TYPE OF BLOCKS AND TILE MANUFACTURED BY THE HASTINGS PAVEMENT COMPANY



# WARREN CHEMICAL & MFG. DIVISION

THE BARRETT COMPANY

Manufacturers of Asphalt Paving and Waterproofing Material

17 Battery Place  
NEW YORK, N. Y.49 Federal Street  
BOSTON, MASS.

## Products.

WARREN'S ANCHOR ROCK ASPHALT MASTIC FLOORS and PAVEMENTS; ACIDPROOF ASPHALT MASTIC FLOORS; PUROCK MAGDEBURG MASTIC, and SEYSEL MASTIC.

For other Asphalt Products, see pages 408-09.

## General Qualities.

Rock asphalt floors afford sure foothold. No joints. Elastic, silent, tough, durable, dustless, non-absorbent, sanitary, acid resisting, and waterproof. Can be used as soon as the mixture has cooled, eliminating protracted interruptions, so costly in busy plants.

## Acid Resistance.

The use of Acidproof Anchor Rock Asphalt Mastic solves one of the most troublesome problems confronting manufacturers and others who employ acid and alkali solutions and who have found by experience that the usual factory floor materials will not long withstand the action of such chemicals.

## Adaptability.

For breweries, packing houses, cold storage, canning and pickle establishments, dairies, ice cream plants, distilleries, tobacco, starch and glue factories, sugar, syrup and molasses refineries, hotel kitchens, bottling plants, stables, lavatories, comfort stations, tennis courts, jails, operating rooms, dampproof cellars, laundries, shower baths and swimming pools.

Storage battery rooms, laboratories, metal pickling and plating plants, tanneries and morocco factories.

Freight and passenger stations, piers, ferry terminals, roundhouses, shops, glass factories, miscellaneous factories, warehouses, shipping and baggage rooms, loading platforms, sidewalks, driveways, and armories.

Schoolhouse corridors, stair treads and landings, playrooms, gymnasiums, manual training rooms, toilets, locker rooms, and lavatories.

## Anchor Rock Asphalt Mastic.

A combination of natural asphalt and crushed rock tempered with natural asphaltic fluxes to a uniform consistency. When properly mixed with clean, sharp sand, grit, etc. (see specification), produces a wearing-surface superficially resembling cement, but much superior because of certain desirable qualities above mentioned.

Put up in round cakes weighing about 50 lbs. and branded as per illustration.

## Acidproof Anchor Rock Asphalt Mastic.

A super-acid-resisting grade, so treated as to render it immune to the corroding action of acid and alkali solutions such as are employed generally in manufacturing establishments.

Put up in round cakes weighing about 50 lbs., and branded as per illustration.



CAKE OF ANCHOR  
ROCK ASPHALT  
MASTIC



CAKE OF ACID-  
PROOF ANCHOR ROCK  
ASPHALT MASTIC

## Warren's No. 1 Hard Trinidad Flux.

A fluxing agent with a hardening tendency. Used where floors are to be subjected to high natural or artificial temperature. Put up in single head barrels weighing about 350 lbs. each. Barrels stenciled "Warren's No. 1 Hard Trinidad."

## Warren's Bitumen.

A fluxing agent with a softening tendency. Used where floors must remain elastic under reduced temperatures. In double head barrels weighing about 525 lbs. each, or in single head barrels weighing about 300 lbs. each. Barrels stenciled "Warren's Bitumen."

## Specification for Rock Asphalt Mastic Floors.

(To follow specifications for concrete or wood foundation):

All grades shall be properly established before the mastic is laid, so that latter shall be of uniform thickness.

By weight, the mixture shall consist of:

	From	To
Anchor Rock Asphalt Mastic §	55	57 parts
Sharp, dry sand and grit	36	38 parts
Warren's Bitumen or No. 1 Hard Trinidad Flux	9	5 parts
	100	100

The Mastic to be brought to the work in the original branded cakes, and the Bitumen, or No. 1, in the original barrels. The sand and grit to be dry, sharp and so graded that the voids shall be reduced to a minimum, none of the particles to run over  $\frac{1}{4}$  in. in diameter. The proportions of all ingredients, within the above limits, to be subject to the approval of the architect.

These materials to be mixed in mastic kettles, in the usual manner (the kettle temperature at no time to exceed 400° Fahr.), and spread at a temperature of from 300° to 325° Fahr., so that the finished floor shall have a uniform thickness of  $1\frac{1}{2}$  ins.†

After spreading, and as the hot mastic cools and sets, it shall be lightly sprinkled with fine, hard sand and rubbed up to a smooth surface finish by means of the usual smoothing tools or floats.

The architect reserves the right to reject any bid or bids; and the name of the contractor or subcontractor who is proposed to lay this floor must be submitted to him and receive his approval before the work can proceed.

### NOTES FOR ARCHITECT—

(a) §Where special protection against acids is important, change to "Acid-proof Anchor Rock Asphalt Mastic."

(b) \*This can be changed to any thickness between 1 and 2 ins., depending upon traffic expected; 1 in. is sufficient for ordinary foot traffic.

(c) †If finished floor is to be over 1 in. thick, insert here, "Mastic to be laid in two layers of equal thickness, breaking joints."

(d) Ordinarily it can be estimated that each 2,000 lbs. of mastic, with its quota of other ingredients, will cover about 200 sq. ft.  $1\frac{1}{2}$  ins. thick.

(e) We recommend that the full text of the specifications be used. If, however, an abbreviated form is desired, we suggest: "Floors shall be Warren's § Anchor Rock Asphalt Mastic\*, laid strictly in accordance with the printed specifications revised June 1, 1916, using the materials specified."

## Purock Magdeburg Rock Asphalt Mastic.

Used for the same purposes and laid by the same formulæ as the Anchor Mastic. Popular among the most discriminating architects and engineers. We aim to constantly keep a large supply in stock at New York.

Put up in round cakes weighing about 55 lbs.



# AYER & LORD TIE COMPANY

INCORPORATED

Manufacturers of Creosoted Wood Blocks for Floors

1515 Railway Exchange  
CHICAGO, ILL.

BRANCH OFFICES

NEW YORK, 2 Rector Street  
CLEVELAND, 1023 Illuminating Building  
DETROIT, 406 Empire Building

PHILADELPHIA, 902 Land Title Building  
KANSAS CITY, 1117 Rialto Building  
MEMPHIS, 1402 Exchange Building

## Products.

"INTERIOR" CREOSOTED WOOD BLOCK FLOORS for Machinshops, Foundries, Metal and Wood Working Plants, Bakeries, Paper and Textile Mills, Automobile Plants, Rolling Mills, Breweries, Barns, Loading Platforms and Warehouses; Railroad Shops of all kinds, Roundhouses, Freight Depots, Platforms and Driveways.

Creosoted Ties, Piling and Lumber of all kinds.

## Wood Block Floors.

A and L "Interior" wood block floors combine all the essential requirements of a good general purpose, heavy service floor. Their great durability and high efficiency recommend their use in any kind of industrial plant.

A notable feature of this floor is the extraordinary resistance it offers to wear under constant traffic and the most severe usage. It is capable of carrying great loads unimpaired. It is firm and hard enough to offer small rolling resistance, yet never becomes slippery or loses its resiliency. It is dry, clean, noiseless and highly sanitary; does not originate dust, and is always easy on the feet. It is proof against decay, impervious to water and withstands extremely high temperatures. Because of its small units any section of the floor can easily be taken up and quickly replaced and the surface restored. The dimensions of every block are so exact that they can be laid directly on smooth concrete and provide a perfectly level floor.

## Advantages.

Maintenance cost is eliminated. Use only makes the floor stronger and more compact.

Trucking can be carried on more rapidly and with less labor owing to its permanently level surface.

The absence of noise, vibration and light reflection; the warmth and dryness; the comfort afforded the feet, mean better, faster and more accurate work from all employees.

The freedom from sharp cutting dust saves machine bearings from injury.

The resiliency reduces damage to tools and breakage of castings that may happen to fall upon it.

## Construction.

Installations are made only after study of the conditions under which each floor must operate.

Our Engineering De-

partment will be glad to investigate, make recommendations, and furnish proper specifications on request.

## Cost.

Prices furnished on application. Measured by length of service, efficiency and low maintenance cost, A and L "Interior" wood block floors are more economical than any others.

## How to Specify for Blocks.

All creosoted wood blocks shall be A and L "Interior" Blocks and must conform to the following specifications:

**TIMBER**—Timber shall be air dried long leaf yellow pine and shall be sound, square edged, free from bark, loose or rotten knots, or any other defects detrimental to its strength or durability. The annual rings in 3 ins. measured radially from the center of the heart shall average not less than eight to the inch.

**SIZE OF BLOCK**—The block shall be 3 ins. in depth (parallel to the fiber), 4 ins. wide and 5 ins. to 10 ins. long.

**CREOSOTE OIL**—The creosote must be a pure distillate oil obtained entirely from coal gas or coke oven tar, and must not contain any admixture of tar, tar oils, petroleum or any other product.

The creosote must be complete liquid at 38° Centigrade, and not more than 3% of the water-free oil shall be insoluble in chloroform or benzol.

Its specific gravity at 38° Centigrade shall be not less than 1.05 and shall not exceed 1.09.

When 100 grams of the creosote are placed in a retort and subjected to a distilling test as described in Bulletin No. 96 of the American Railway Engineering and Maintenance of Way Association, the amount of distillation shall not exceed the following:

Up to 200° Centigrade, no distillate.

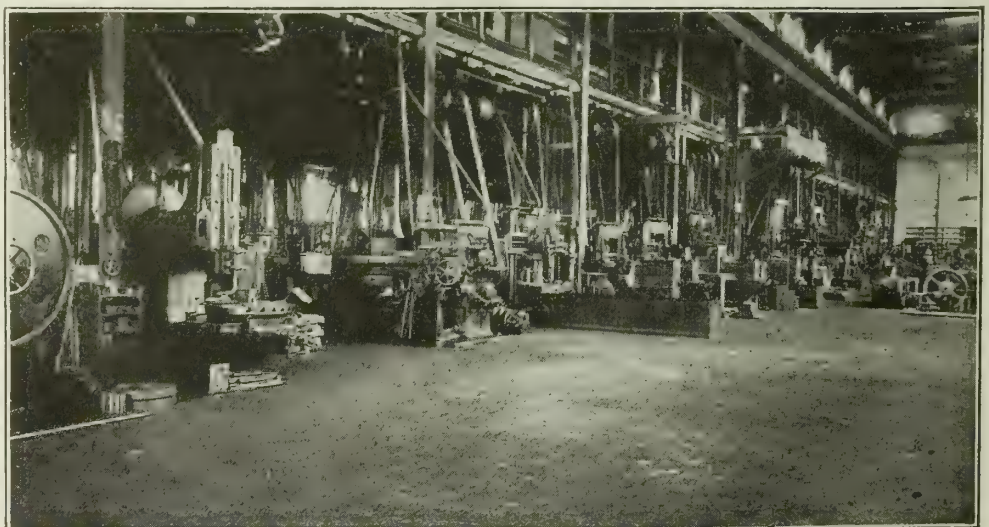
Up to 210° Centigrade, less than 5%.

Up to 235° Centigrade, 25%.

The distillation of the oil shall be carried to 355° Centigrade and the residue shall be less than 35%.

The distillate between 210° and 235° shall, on cooling to room temperature (77° Fahr.), yield solids.

The oil shall not contain more than 3% of water.



A AND L "INTERIOR" WOOD BLOCK FLOOR IN AMERICAN CAN COMPANY PLANT, MAYWOOD, ILL.



# CENTRAL CREOSOTING COMPANY

111 West Washington Street  
CHICAGO, ILL.

PLANTS

CINCINNATI, OHIO

TERRE HAUTE, IND.

## Products.

CREOSOTED INTERIOR WOOD BLOCKS for floors in machinshops, foundries, warehouses, barns, tanneries, automobile plants, freight-houses, rolling mills and roundhouses.

Creosoted Exterior Blocks for street paving, driveways, bridge floors, docks, loading platforms; Creosoted Ties, Lumber, Piling, Conduits, Fence Posts, etc.

## Interior Blocks for Floors.

Creosoted wood blocks are being more and more recognized as making the most perfect floor for industrial purposes. In fact, at the present time nearly as many blocks are used for floors as for paving.

## Advantages.

Contentment of workmen promotes efficiency. Wood block floors are easy on the feet, being resilient and doing away with that eternal vibration which is so tiring.

No maintenance, due to the fact that blocks are thoroughly creosoted to prevent decay and are laid vertical with the fiber of the wood, thus making floor practically wearproof.

Tools and castings dropped on floor are not broken.

In moving machinery or making alterations, small pieces of the floor are easily taken up and relaid.

The floor is nearly fireproof as is shown by its use in foundries, etc.

The floor does not originate dust. This means added comfort to men and saving in machine bearings.

It provides a good foothold and is smooth, making easy trucking.

It does away with a large share of the noise which is always a nervous strain.

## Construction.

Every floor should be designed to fit conditions under which it is to be used. Our Technical Department will be



TRADE-MARK

pleased to co-operate with engineers who are interested in wood block floors.

In general, for machinshop or similar floors it is recommended that the blocks be laid on concrete, foundation swabbed with pitch. The concrete to be thick enough to sustain the proposed floor loads and given a wooden float finish. The pitch to be swabbed on concrete and then the blocks laid closely at right angles to the length of the floor. The pitch cushion pins each block to the concrete.

## Materials Used.

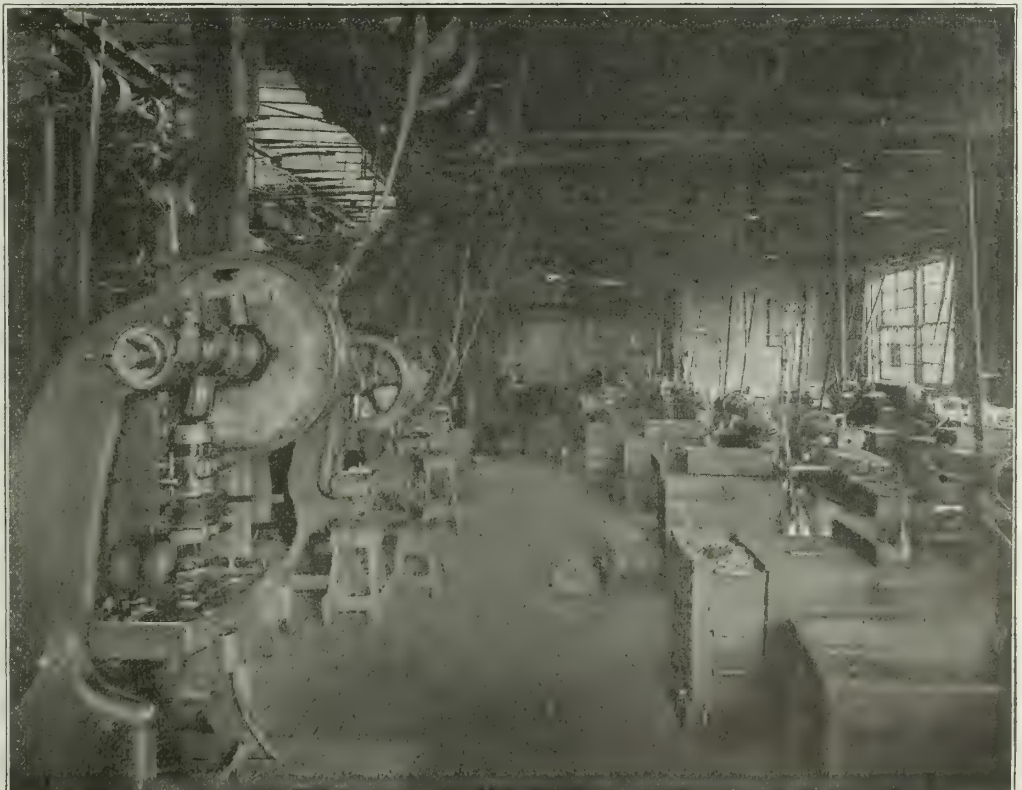
Blocks for interior floors are manufactured from air seasoned close grained, sound long leaf yellow pine. The blocks are impregnated by best modern practices with pure distillate creosote oil.

## Specification.

On request, complete specification covering timber, size of blocks, treatment, oil specifications and construction for any particular floor will be submitted.

## Cost.

Prices gladly furnished on application. Everything considered, creosoted block floors are the most economical.



SECTION OF FLOOR, PLANT OF NORTHERN BRASS CO., WAUKEGAN, ILL.

# THE JENNISON-WRIGHT COMPANY

Manufacturers of Wood Block Floors

2480 Broadway  
TOLEDO, OHIO

BRANCH OFFICES  
CHICAGO, ILL. CLEVELAND, OHIO PITTSBURGH, PA. TORONTO, CAN.  
NEW YORK, N. Y., Whitehall Building PHILADELPHIA, PA., Crozer Building

## Products and Services.

KREOLITE WOOD BLOCK FLOORS.

Creosoted Piling, Structural and Special Dimension Timbers for every type of service.

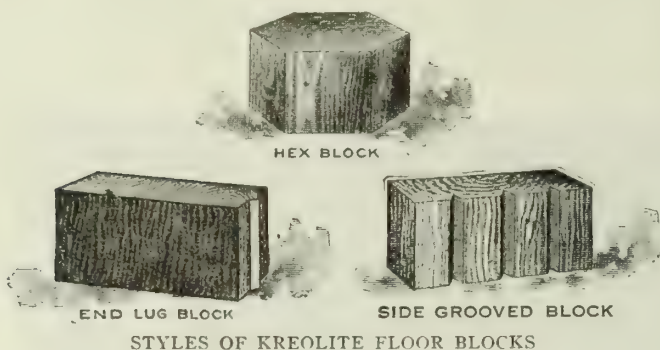
This company maintains a corps of expert superintendents who are sent out to show purchasers how to properly install Kreolite wood block floors, wherever such supervision is desired; or, if preferred, the company can arrange to have the floor installed in place.

## Use.

Kreolite wood block floors are used in machine-shops, warerooms, loading platforms, annealing rooms, foundries, pickling rooms, dye rooms, breweries, beater rooms, garages, barns and stables.

## Description.

Kreolite wood block floors present a smooth, compact surface more durable than plank or a monolithic type; efficient under either heavy or light service.



## Special Advantages.

Kreolite wood blocks are manufactured from thoroughly air seasoned long leaf yellow pine, effectively preserved against decay; and being cut to exact size, fit together in a solid, compact floor, with an exceedingly low rate of maintenance and depreciation.

Kreolite wood block floors are extremely durable; and in metal working shops, or where there is hard service, will outwear any other type of practical floor construction.

Workmen like these floors, as they are easy on the feet and far less fatiguing than most floors. They are also easy to truck over; hence, directly increase shop efficiency.

Kreolite hex blocks, because of their shape and the method of manufacture, are affected very little by heat or moisture; hence, are recommended for use under trying conditions.

Kreolite end lug blocks automatically absorb expansion, and are especially desirable for floors that are

**Kreolite Wood Block Floors**  
They outlast the factory

TRADE-MARK

subjected to water or acid solutions, or for loading platforms or driveways that are subjected to the weather. Lug blocks are ideal for stables.

Kreolite wood block floors, now seeing service in hundreds of the foremost factories throughout the country, have proved their worth, as is evidenced by the number of new buildings for which they are now being specified.

## Specifications for Kreolite Wood Block Factory Floors.

The following method of laying Kreolite blocks is recommended for the average floor. If unusual conditions are to be met, special specifications will be gladly furnished.

**KREOLITE HEX BLOCKS**—Hex blocks shall be hexagonal in shape. They shall be 3 ins. in depth (parallel to the fiber), and shall average 6 ins. in diameter. Blocks shall be well manufactured from sound air seasoned heart stock Michigan tamarack, free from injurious defects. (Treatment checks not to be considered defects.)

**KREOLITE SIDE GROOVED BLOCKS**—Kreolite side grooved blocks shall be rectangular in shape. They shall be 3 ins. in depth (parallel to the fiber), 3 ins. in width, and from 6 to 9 ins. long. On one side of each block there shall be three "V" shaped grooves  $\frac{1}{4}$  in. deep, running the full depth of the block, breaking the longest annual rings. Blocks shall be well manufactured from sound air seasoned long leaf yellow pine and free from injurious defects.

**KREOLITE END LUG BLOCKS**—End lug blocks shall be of the same dimensions as Kreolite side grooved blocks, with the following exception: at the center of one end of each block there shall be one "V" shaped rib, or lug,  $\frac{1}{8}$  in. in width at base and projecting  $\frac{1}{8}$  in., extending full depth of block in direction of the grain and being an integral part of the same.

**TREATMENT**—Blocks shall be treated by the Kreolite process standard for the type of block specified.

**CONCRETE FOUNDATION**—As a concrete foundation is desirable, after earth floor is leveled and tamped, spread a layer of concrete about 4 ins. in depth. After concrete is "set," spread a cushion  $\frac{1}{2}$  in. in depth, made up of 1 part Portland cement and 4 parts sand. This can be mixed dry and sprinkled with water just before blocks are laid.

**MANNER OF LAYING**—Blocks are to be laid directly on the cushion as prepared. After 10 rows of blocks have been laid, a piece of 2 x 4-in. plank shall be laid along edge of blocks, and blocks driven as tightly together as possible so as to fit them snugly together. The piece of 2 x 4-in. timber shall then be removed and the operation shall be repeated as fast as each 10 rows of blocks are laid, until floor is completed. The blocks in each separate row shall also be tightened, just before filler is applied, by forcing blocks together from end of row, with a lever, pick or other instrument. Hex blocks should not be forced together as indicated above, but shall be laid hand tight.

The blocks should be laid with their length at right angles to the line of traffic. Care should be taken to break joints by about 2 ins.

After the blocks have been laid in place and rolled or tamped, the surface of the floor shall be given a light swab coat of creosote oil, after which all the joints between the blocks shall be filled with Kreolite bituminous filler applied hot. Dry, sharp sand shall then be swept over the floor, completely covering the blocks, the same to be left on the floor until the blocks are well set.



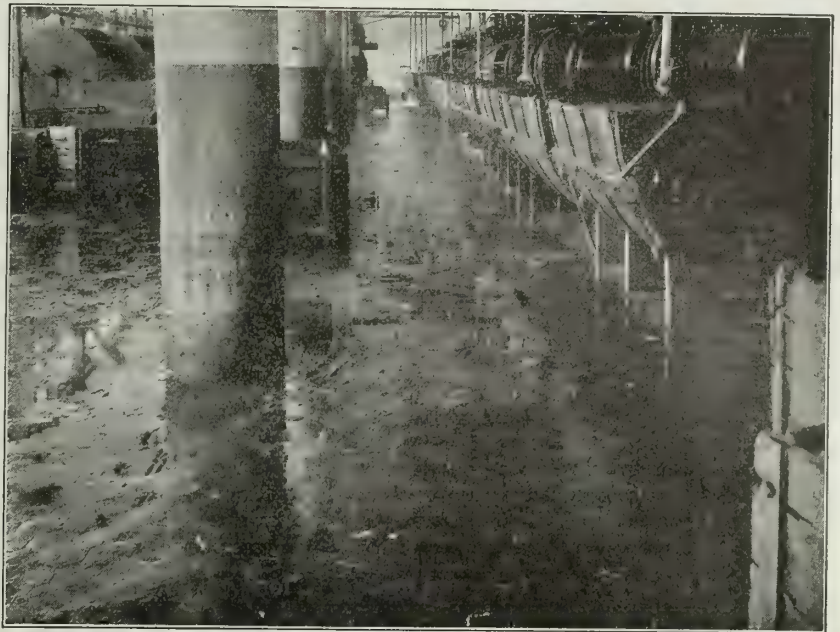
**Solution of Various Floor Problems.**

The illustrations show three different types of floor problems, and in each case a satisfactory solution was reached by installing a type of Kreolite wood block floor, which was designed to give the best results under the conditions to be met. Hundreds of metal working concerns, textile mills, paper mills and various other plants now have Kreolite wood block floors, which are withstanding service under varying conditions.

The fact that 85% of these concerns are sending in repeat orders, is the best evidence that their managers and factory engineers regard Kreolite floors as a good investment.

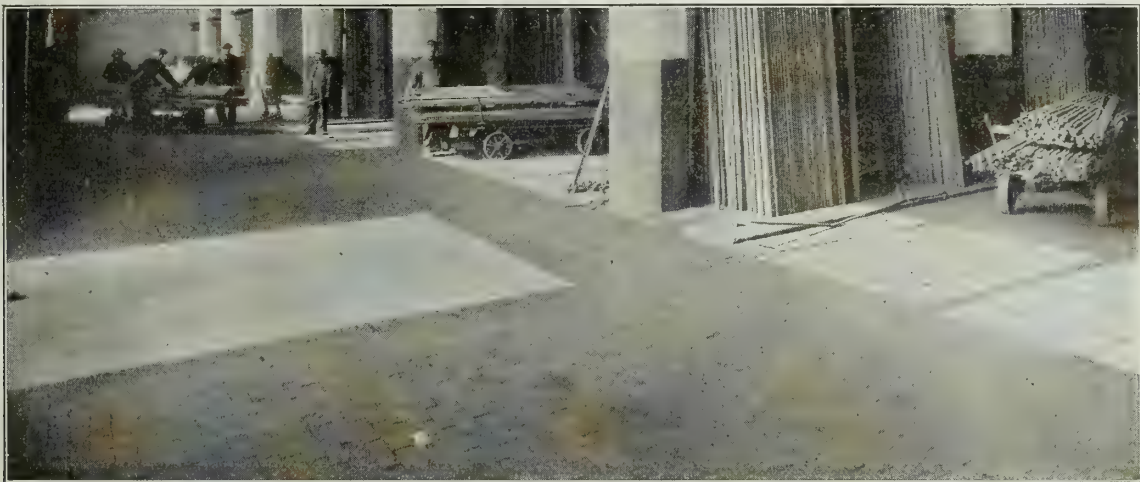
**Co-operative Service.**

Our engineering department will furnish information as to how Kreolite wood block floors can be used to advantage in the factory; how they will reduce maintenance and repair bills, increase the efficiency of workmen, and cut production costs. Inform us as to the requirements.

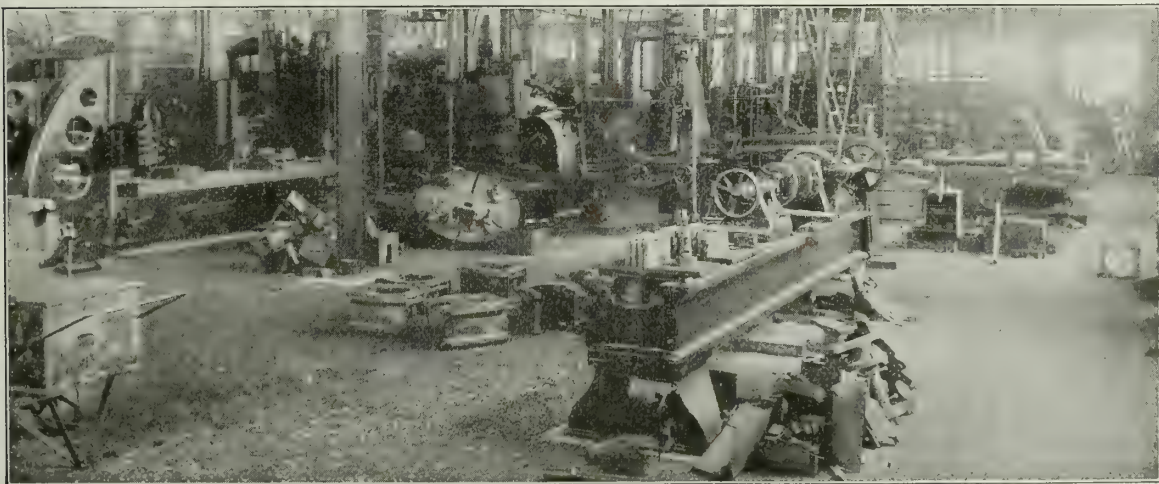


KREOLITE HEX WOOD BLOCK FLOOR IN KEYSTONE LEATHER CO. PLANT, CAMDEN, N. J.

Although floor is subjected to tanning solution and trucking, the Hex floor retains its smooth, even surface



KREOLITE END LUG BLOCK IN WAREROOM, LOADING DOCK, W. BINGHAM CO., CLEVELAND, OHIO  
Floor subjected to wear from tons of metal. End lug blocks automatically take up moisture prevailing in this basement room



KREOLITE WOOD BLOCK FLOOR IN MACHINESHOP, MICHIGAN CENTRAL RAILROAD, ST. THOMAS, ONT.  
Comfortable for workmen; permanently smooth to truck over; practically no maintenance cost



# C. J. CARTER LUMBER COMPANY

## • Wood Block Flooring

1303 R. A. Long Building  
KANSAS CITY, MO.

MILLS:  
KENSETT, ARK.

### SALES AGENTS

CHICAGO, MARSH & TRUMAN LUMBER Co., 332 South Michigan Avenue  
NEW YORK, BUILDERS MATERIAL SUPPLY Co., 8 West 40th Street

### Product.

"BLOXONEND" FLOORING, a Wood Block Flooring for heavy service.

### Description.

"Bloxonend" flooring is made of selected southern pine, in a specially constructed plant (in Arkansas, the home of yellow pine) and, unlike ordinary wood block flooring, is not merely rough wood blocks but comes in built-up sections of wood blocks dovetailed endwise onto wood bases  $3\frac{1}{2}$  ins. wide and up to 8 ft. long. The edges are grooved to receive slip tongues which come with the flooring, so that, when laid, every block is doubly secured in the floor.

The standard section (Fig. 1) recommended for general use, designated as  $\frac{2\text{ in.}}{1\text{ in.}}$ , consists of 2-in. blocks dovetailed to a 1-in. base, finished thickness over all,  $2\frac{1}{2}$  ins. by  $3\frac{1}{2}$  ins. face. Special sizes can be made for any special use.

### Advantages.

"Bloxonend" makes a smooth, durable, resilient floor, clean and quiet, minimizing noise and vibration.

Provides a safe working surface, adds materially to comfort and efficiency of workers, and saves breakage of falling articles.

Maximum loads move over "Bloxonend" flooring with minimum effort and damage to trucks, goods or men.

Makes the best flooring for shops, freight houses; baggage, mail and express rooms; factories, warehouses, stores and any public or manufacturing building.

### Application.

"Bloxonend" can be laid in new work or renewals, on screeds embedded in concrete, wood underfloor or on close-set joists or sleepers, with firm level support arranged according to loads contemplated (Fig. 2).

A simple and economical method has been devised for installing "Bloxonend," with minimum cost and change in levels, over old concrete floors that have worn rough (Fig. 3).

"Bloxonend" is laid like ordinary flooring, rapidly and easily, and never gets rough. Each block is firmly secured and reinforced by the wood base and therefore withstands even greater shearing stress than loose blocks. No cushion is required.

"Bloxonend" is intended especially for dry use inside, but may be treated where necessary to protect from dampness or accidental exposure.

### Information.

"Bloxonend" has been used in a great many plants where the highest American manufacturing standards

are maintained. A list of these installations and complete details will be furnished on request. Write for details desired, and give area to be covered, use of floors, and type of surrounding construction.



FIG. 1. SHORT SECTION OF "BLOXONEND"

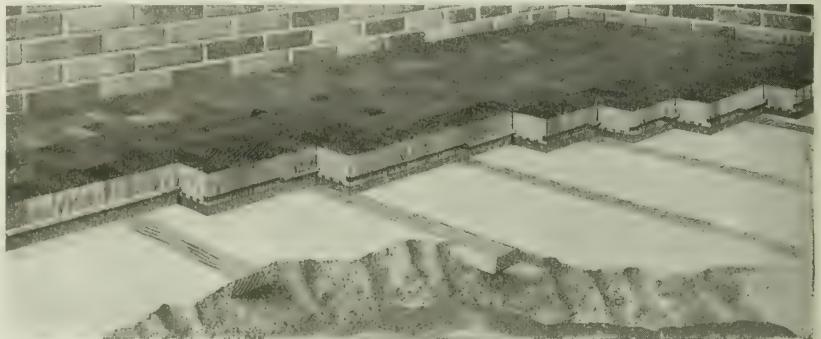


FIG. 2. SHOWING INSTALLATION OF "BLOXONEND" OVER BEVELED SCREEDS EMBEDDED IN CONCRETE

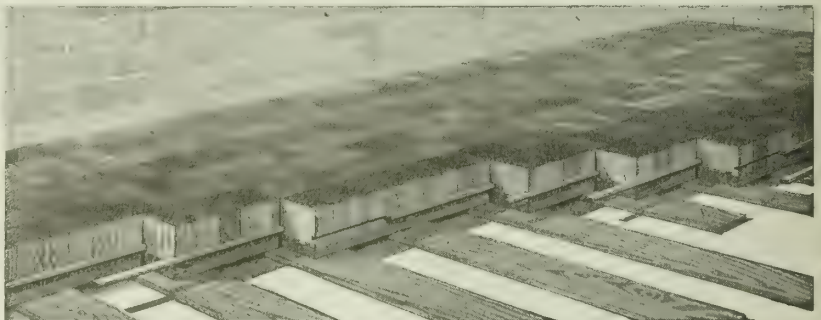


FIG. 3. SHOWING INSTALLATION OF "BLOXONEND" ON FLAT STRIPS OVER NEAT CONCRETE



FIG. 4. MOTOR ASSEMBLY FLOOR IN FORD MOTOR PLANT



ESTABLISHED 1899

# HASBROUCK FLOORING CO.

## Parquetry and Wood Block Flooring, Cork Tiling

501-509 East 70th Street

NEW YORK, N. Y.

### Products.

WOOD BLOCK FLOORING; CORK TILING.  
Parquetry, Plank Floors, Wood Carpet.

### Wood Block Flooring.

Composed of blocks with ends and sides interlocking, set in an asphaltic composition on a cement foundation. Patent No. 768852.

**ADVANTAGES—Fireproof**—There are no air spaces under this flooring to feed flames.

**Sanitary**—No cracks or unevenness to hold filth or germs.

**Durable**—It will outwear marble.

**Dampproof**—Asphaltic composition effectually prevents all passage of moisture and prevents *dry rot*.

**Noiseless**—The composition fills up all hollow spaces and acts as a cushion, making floor soft and easy to the feet, unlike tile, marble, terrazzo or cement.

**Saves Floor Height**—Cement foundation may be carried just high enough to cover conduits, pipes, etc., saving the thickness of sleepers and underfloor.

**WOOD USED**—The principal woods used are plain and quartered oak, Georgia comb grained pine, maple and birch. Quartered oak is recommended for the better classes of work, and Georgia pine or maple for institutions and public buildings.

**THICKNESS AND DESIGN**—Made in 2 thicknesses,  $\frac{7}{8}$  in. and  $1\frac{1}{8}$  in. It can be laid in any of the simpler parquetry designs.



47,000 SQUARE FEET HASBROUCK WOOD BLOCK FLOORING  
LAID IN 1906

Area covered was free from posts, pillars or obstructions of any kind.  
After severe wear in good condition in 1918.

### Cork Tiling.

Cork tiling is sanitary, noiseless and durable. It will not crack or disintegrate and requires no expensive finish or refinishing.

Made of pure cork, compressed to almost the density of hardwood, still retaining the elastic qualities of the cork. Particularly suitable for use where a noiseless floor is desired. Can be used in any room and worked into marble, parquetry or other designs to harmonize with decorations, as the process of manufacture brings out several shades, from light brown to the rich color of old teak. Delicate shading of colors in the different pieces forms a very pleasing and artistic effect.

This floor may be laid on a wood or cement foundation. In either case, the blocks are set in a special composition or cement which, besides holding the block firmly and permanently to its bed, seals the joints between blocks, making the floor waterproof and acid-proof.

Made with sanitary cove and base. Cork wainscoting with moulded wood cap also furnished.

**SIZES**—Stock sizes are  $\frac{1}{2}$  in. thick by  $4\frac{1}{2}$  by  $4\frac{1}{2}$ , 6 by 6, 9 by 9, 12 by 12, 3 by 6,  $4\frac{1}{2}$  by 9, 6 by 12, 9 by 12, 9 by 18, 12 by 18 and 12 by 24 ins., but any intermediate size can be cut to order at small additional cost.

### Samples and Estimates.

Samples of this company's products will be sent to interested persons on request. Send measurements and obtain estimates for work complete.

### Prominent Installations.

A partial list of buildings where wood block flooring and cork tiling have been installed, also name of architect, is given below.

#### WOOD BLOCK FLOORING

The Capitol, Albany, N. Y., State Architect  
Metropolitan Museum of Art, New York, N. Y., McKim, Mead & White

Museum of Art, Cleveland, Ohio, Hubbell & Benes  
Ritz Carlton Hotel, New York, N. Y., Warren & Wetmore  
Vanderbilt Hotel, New York, N. Y., Warren & Wetmore  
Biltmore Hotel, New York, N. Y., Warren & Wetmore  
Hotel McAlpin, New York, N. Y., Chief Engineer  
Provident Loan Society, 6 Buildings, New York, N. Y., Renwick, Aspinwall & Tucker  
Willard Parker Hospital, New York, N. Y., Renwick, Aspinwall & Tucker  
French Hospital, New York, N. Y., George Provot  
Guarantee Trust Co., New York, N. Y., Cross & Cross  
Bank of Montreal, Winnipeg Can., McKim, Mead & White  
Freer Collection, Smithsonian Institute, Washington, D. C., Chas. A. Platt

#### CORK TILING

Vanderbilt Hotel, New York, N. Y., Warren & Wetmore  
Plaza Hotel, New York, N. Y., Henry J. Hardenbergh  
City Hall, Cleveland, Ohio, J. Milton Dyer  
Federal Reserve Bank, New York, N. Y., Trowbridge & Livingston  
National Park Bank, New York, N. Y., Donn Barber  
Albany County Courthouse, Albany, N. Y., Hoppin & Koen  
Central Library, Indianapolis, Ind., Zantzinger, Borie & Medary  
Union National Bank, Scranton, Pa., E. H. Davis  
General Hospital, Buffalo, N. Y., Edward F. Stevens  
U. S. Post Office Building, Denver, Colo., Tracy & Swartwout  
Ford Motor Co., Cleveland, Ohio, John Graham  
Sea View Hospital, New Dorp, N. Y., R. F. Almirall  
New Rochelle Library, New Rochelle, N. Y., A. R. Ross  
Brooklyn Hospital, Brooklyn, N. Y., Lord, Hewlett & Tallant  
Middlesex County Courthouse, New Brunswick, N. J., W. H. Boylan  
Johns Hopkins Hospital, Baltimore, Md., G. Atterbury  
Ohio University Library, Athens, Ohio, F. L. Packard  
St. Patrick's Church, Troy, N. Y., M. F. Cummings & Son  
Church of St. Martin of Tours, Brooklyn, N. Y., John Bagley Day  
U. S. Post Office, New Haven, Conn., James Gamble Rogers  
Middlesex General Hospital, New Brunswick, N. J., Owner  
Mechanics & Metals Bank, New York, N. Y., Delano & Aldrich  
American Exchange National Bank, New York, N. Y., Clinton & Russell  
Citizens Trust Co., Utica, N. Y., Mowbray & Uffinger

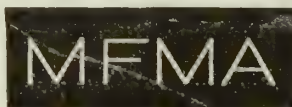
# MAPLE FLOORING MANUFACTURERS' ASS'N

## Maple, Beech and Birch Flooring

Stock Exchange Building  
CHICAGO, ILL.

### Products.

MAPLE, BEECH and BIRCH FLOORING, of which over 200,000,000 ft. are used annually in the United States.



TRADE-MARK

### Grades and Sizes.

Three standard qualities of flooring are manufactured from maple, beech and birch. They are Clear, No. 1, and Factory, and are produced in a variety of widths and thicknesses. The Association standards are:

Thicknesses, ins.	Faces, ins.	Grades.
$\frac{25}{16}$ .....	1½, 2, 2¼, 3¼.....	Clear, No. 1 and Factory
$\frac{17}{16}$ .....	2, 2¼, 3¼.....	Clear, No. 1 and Factory
$\frac{3}{8}$ .....	1½, 2, 2¼.....	Clear, and No. 1 only

Certain special sizes are manufactured in limited quantities by some manufacturers.

### Grades Defined.

The Clear grade combines appearance and service

very slowly and with the utmost uniformity. It does not splinter or become rough from wear.

For these reasons maple flooring is the preferred material with which to floor office buildings, stores, passenger and freight elevators, passenger cars, street cars, factories, machinshops, schools, churches, gymnasiums, dance halls, bowling alleys, apartment buildings, armories, city and country homes.

### Maple Wearing Qualities.

Maple makes the most durable interior floor within reach of the builder. Maple floors are not new or untried. They have been subjected to and have withstood every test of usage. Maple's great claim to recognition is its wonderful durability even when employed under adverse conditions.

The wearing qualities of maple floors are derived from the cohesive structure of the wood. Maple trees



EXTERIOR AND INTERIOR OF A CALIFORNIA RESIDENCE IN WHICH ASSOCIATION FLOORING IS IN USE

of the highest degree, and is suitable for the better classes of buildings.

The grade of No. 1 is made for service rather than for "looks" to make this grade desirable and satisfactory for use in stores, schoolhouses, and similar structures.

The Factory grade is suitable for factories, warehouses, machinshops and other buildings of like character, where a low priced floor is wanted; and, for wear, nothing better or cheaper can be obtained.

### Special Grades.

White Clear in maple and Red Clear in beech and birch are manufactured from stock selected for color, but otherwise the quality is the same as that of the standard Clear.

### Maple Floors.

Because of the service maple gives, it should be used when durable floors are wanted. Maple wears

grow slowly, the wood is firmly put together, and the structure is uniform. It bears the same relation to other woods that wrought iron does to other metals. It is universally esteemed for its toughness and strength, with which is combined the highest degree of abrasive resistance.

### Maple Floor Finishes.

Maple floors are not colorless or characterless. The wood is fine grained, of close, even texture, and should be treated with a filler only when a wax finish is to be applied.

A paste filler made of silex crystals, pure linseed oil and the best japan dryer is recommended. For a varnished floor a filler is not necessary.

### Beech and Birch Floors.

In some respects beech and birch are preferred to maple for living apartment floors. Both woods possess good color, and both may be stained and waxed or

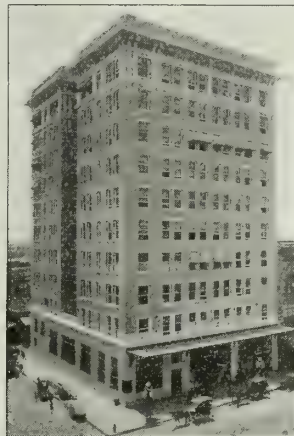




Appropriate Flooring for a Building of this Type was Found in Association Maple Flooring



For the Gymnasium



The Office Building



The Modest but Modern Apartment



A College Building



Rooms of this Character



City Apartment Building



Modern Homes of Moderate Cost



A Village School

A FEW TYPES OF BUILDINGS IN WHICH ASSOCIATION FLOORING IS GIVING SATISFACTORY SERVICE



varnished with good results. Red Clear beech and birch are unsurpassed for residence floors where warm, soft tones are desired. Paste silex fillers should be used, tinted, to give a uniform tone.

#### Beech and Birch Wearing Qualities.

The wearing qualities of beech and birch flooring are second only to those of maple. In practice, beech is being used where it is subjected to heavy traffic, and is giving satisfaction. Maple excepted, no other flooring will wear so long.

#### Installation.

When floor lining is used the hardwood flooring should be laid crosswise or diagonal to the subfloor, which should be smooth, clean, and dressed to even thickness. A subfloor, however, is not necessary under  $\frac{3}{16}$ -in. and thicker hardwood flooring, as it can be laid on joists or deafening strips without reference to breaking joints on the joists, because it is all side-matched and end-matched, the end-matching practically making one continuous strip of flooring from wall to wall.

The flooring is furnished in mixed lengths, which facilitates rapid laying, as it enables the workmen to combine the lengths economically and avoids unnecessary waste in cutting.

#### Floor Values.

On a service basis, maple, beech or birch floors are the cheapest that can be secured. They are maximum value floors. They are sanitary, warm, dry, and a source of comfort and satisfaction to all who use them.

#### A Finished Product.

Maple, beech and birch flooring, in the form now offered the building trade by members of the MAPLE FLOORING MANUFACTURERS' ASS'N, is a finished product. The process of manufacture has been completed. The floor is ready to assemble.

Through co-operative and individual effort the modern one-piece hardwood floor has been placed within reach of every builder.



PARTIAL VIEW OF MAPLE FLOOR IN CONTINENTAL MOTOR WORKS, DETROIT, MICH.

#### High Official Standard.

A uniform standard of quality is maintained by Association members through the efforts of an official inspector, who visits the various Association factories from time to time and oversees the grading.

It is to the architect's advantage to specify Association flooring, because there is no other "just as good."

#### Association Trade-mark.

The trade-mark, shown on page 316, is a guarantee of quality. It has been adopted as a means of identifying the flooring made by members of the MAPLE FLOORING MANUFACTURERS' ASS'N.

Architects can hereafter be sure of getting what they want when they specify Association flooring. The individual factory is indicated by a number following the trade-mark.

#### Literature for Free Distribution.

"Your Flooring Problem Solved."

"How to Lay and Finish Maple Floors."

"Schoolroom Floors."

"Individuality in the Home—A Woman's Dream."



AN EXAMPLE OF THE RELATIVE WEARING QUALITIES OF SOFT WOOD AND MAPLE FLOORS SUBJECTED TO THE SAME TRAFFIC



# OAK FLOORING MANUFACTURERS ASSOCIATION

W. L. CLAFFEY, SECRETARY

1603 Union Trust Building  
CINCINNATI, OHIO

## Products.

OAK FLOORING, Plain Sawed and Quarter Sawed, White or Red; scientifically and thoroughly Kiln Dried, properly Milled and Graded.

## Slogan.

*America's Best Flooring.*

## Advantages.

The natural characteristics of oak are too well known to require any eulogy. When made into flooring the diversified figure of oak is exhibited to perfection. It is a wood that will harmonize with any kind of interior trim, and will do more to give distinction to a home than any other part of the interior construction. Oak flooring is demanded, because it is rich and cheerful in color and blends harmoniously with any type of furniture and color decoration. It combines beauty, distinctiveness and durability.

Oak is a sanitary wood, and requires but little care to keep it in good condition. Real estate dealers and owners know the value of oak flooring, and emphasize oak flooring when advertising their property. It assures better renting and selling values and attracts a better class of tenants.

For economy,  $\frac{3}{8}$ -in. thickness may be laid at a very low cost over old floors in old homes, or in new buildings over cheap subfloors. It is matched and end matched so that it can be blind nailed. When laid, it has in every respect the appearance of heavy flooring.

## Durability.

In numerous public buildings and houses throughout the country in which oak flooring was laid from 25 to 40 years ago, these floors are in good condition today. The word "Oak" has long been a synonym for strength and endurance.

## Standard Thicknesses and Widths.

$\frac{1}{2}$ -in. thickness; widths,  $1\frac{1}{2}$ -in. face, 2-in. face and  $2\frac{1}{4}$ -in. face.

$\frac{3}{8}$ -in. thickness; widths,  $1\frac{1}{2}$ -in. face and 2-in. face.

## Oak Flooring Grades.

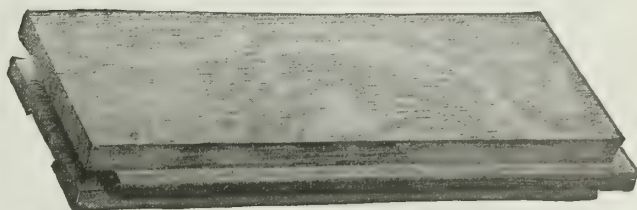
The grades of oak flooring are known as Clear, Sap Clear, Select, No. 1 Common, and No. 2 Common.

### Quarter Sawed.

**CLEAR**—Shall have one face practically free from defects, except  $\frac{3}{8}$  in. of bright sap; the question of color shall not be considered; lengths in this grade to be 2 ft. and up, not to exceed 15% under 4 ft.

**SAP CLEAR**—Shall have one face practically free of defects, but will admit unlimited bright sap; the question of color shall not be considered; lengths in this grade to be 1 ft. and up.

**SELECT**—May contain bright sap, and will admit pinworm holes, slight imperfections in dressing or a



QUARTER SAWED, TONGUED AND GROOVED, END MATCHED  
OAK FLOORING

small, tight knot, not to exceed one to every 3 ft. in length; lengths to be 1 ft. and up.

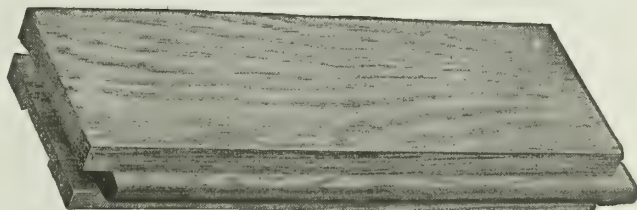
### Plain Sawed.

**CLEAR**—Shall have one face practically free from defects, except  $\frac{3}{8}$  in. of bright sap; the question of color shall not be considered; lengths in this grade to be 2 ft. and up, not to exceed 15% under 4 ft.

**SELECT**—May contain bright sap, and will admit pinworm holes, slight imperfections in dressing, or a small, tight knot, not to exceed one to every 3 ft. in length; lengths to be 1 ft. and up.

**No. 1 COMMON**—Shall be of such nature as will make and lay a sound floor without cutting; lengths 1 ft. and up.

**No. 2 COMMON**—May contain every character of defects, but will lay a serviceable floor with some cutting; lengths 1 ft. and up.



PLAIN SAWED, TONGUED AND GROOVED, END MATCHED  
OAK FLOORING

## The Use of the Different Grades.

**CLEAR, QUARTER SAWED—Red or White**—High class residences, hotels, apartment houses and club houses.

**SAP CLEAR or SELECT—Quartered, Red or White**—An economical substitute for clear quartered where a dark finish is desired. These grades make a flooring equally as durable as the first grade.

**CLEAR, PLAIN SAWED—Red or White**—High class residences, hotels, apartment houses, churches and club houses.

**SELECT, PLAIN SAWED—Red or White**—Medium priced residences, hotels and apartments, schools, office buildings and stores.

**No. 1 COMMON**—Cheap dwellings, tenements, stores, high class factories and manufacturers' buildings.

**No. 2 COMMON**—Warehouses, factories and cheap tenements.

Correspondence solicited.

# FLEXNER-TAYLOR CO.

Manufacturers of Fireproofing Materials

786 East Broadway  
SOUTH BOSTON, MASS.

## Products.

FLEX-OR-CRETE; F. & T. CUSHION; F. & T. NAILING BLOCKS or BRICKS; F. & T. "HYDRO-LYTIC" WATERPROOFING; FLEX-OR-CRETE PARTITIONS.

## Flex-or-Crete.

Flex-or-Crete is a nailing composition, a plastic, resilient, enduring material that solves builders' problems in flooring and roofing, and is also a fire stop in ceilings. For nailing wood floors it takes the place of cinder concrete and screeds. It entirely obviates the common danger of disintegration from sulphuric acid when cinders not properly burned are used.

It weighs 6 lbs. per sq. ft., 1 in. thick.

**FLOORS**—In floor work Flex-or-Crete gives a resiliency not obtainable in any other kind of floor construction. The top floor can be nailed directly to the nail course. It is recommended that 1-ply dry sheathing paper be used under all wood floors over the nail course. Flex-or-Crete can also be used for revamping old wood floors.

**ROOFS**—Slate can be nailed directly to this material; therefore wood is not needed for roofing. (See illustrations.)

**FIRE STOP**—Flex-or-Crete can be made in slab form and nailed to ceiling as a fire stop.

## Flex-or-Crete Partitions.

In these fireproof, built-up partitions Flex-or-Crete is the most important part, and eliminates all grounds. All trim can be nailed directly to the finished partitions. Details are furnished to meet existing conditions.

## F. & T. Cushion.

This plastic composition can be used as a foundation for setting any kind of tile, and when so used it eliminates noise. Linoleum, cork tile or carpet can be nailed or cemented on it. Resiliency and toughness are among the chief characteristics of the materials that compose it.

## F. & T. Nailing Blocks or Bricks.

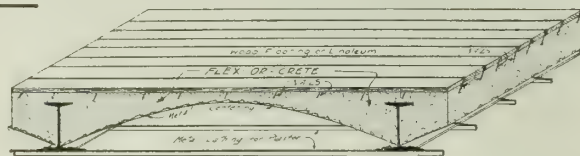
Used in place of wood nailing blocks in brick and terra cotta walls for nailing base, chair rail, picture moulding, bathroom fixtures, etc., as a border for concrete floors, and as a nailing surface for carpets, linoleum, etc.

## F. & T. "Hydro-Lytic" Waterproofing.

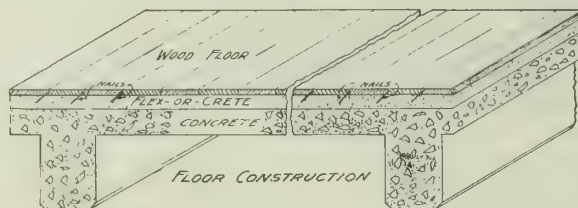
"Hydro-Lytic" is a cement mortar and contains an ingredient that makes dry and impervious to water, and even to dampness, any surface to which the mixture is applied. It is applied to concrete, brick or stone surfaces, and has the appearance of concrete itself. This product can be used on cellar walls, basement floors, concrete roofs, tanks, or in any place where the presence of water is injurious.

## Installation.

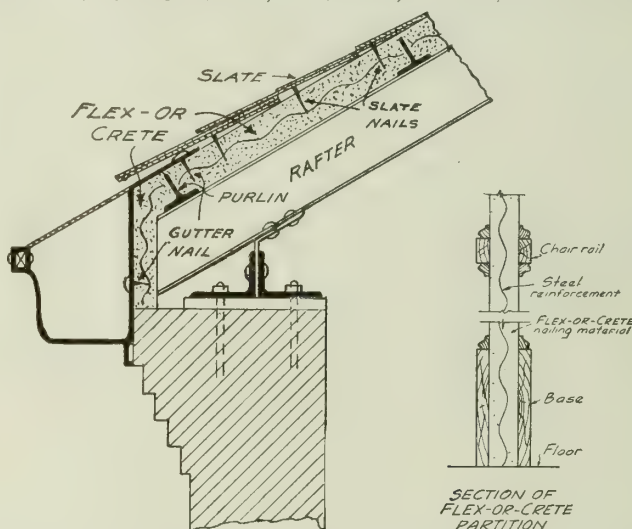
FLEXNER-TAYLOR Co. products are installed under the company's supervision.



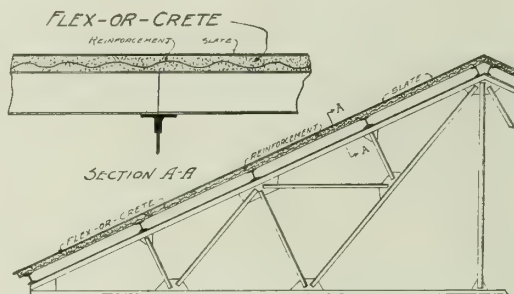
FIREPROOF FLOOR CONSTRUCTION



DETAILS OF FLEX-OR-CRETE CONSTRUCTION AND NAILING BASE FOR WOOD, LINOLEUM, CARPET, ETC.



SECTION OF FLEX-OR-CRETE PARTITION



DETAIL OF ROOF CONSTRUCTION

DETAILS OF FLEX-OR-CRETE ROOF AND PARTITION CONSTRUCTION

## Some Important Installations.

Rockefeller Institute for Medical Research, New York, N. Y.; Coolidge & Shattuck, Architects  
Wellesley College Dormitory, Wellesley, Mass.; Coolidge & Carlson, Architects  
Massachusetts Institute of Technology, Cambridge, Mass.; Wm. W. Bosworth, Architect  
Munsell House, Brookline, Mass.; Putnam & Cox, Architects  
Wm. H. Coolidge House, Magnolia, Mass.; Charles M. Baker, Architect  
Alexander Porter House, Brookline, Me.; Kilham & Hopkins, Architects  
Parliament Building, Ottawa, Ont., John Pearson, Architect



# PAUL MENDE

Inventor and Manufacturer of Nalecode Nailing Concrete

405 Lexington Avenue  
NEW YORK, N. Y.

## Product.

Inventor and manufacturer of MENDE'S NALECODE, a Nailing Concrete made of indestructible minerals

## Description of Nalecode.

Nalecode is a compound of powdered and fibrous minerals, which, when mixed with Portland cement, sand and water, makes a plastic mortar that sets and forms a tough, elastic mass filled with air cells, into which nails or screws can be driven as readily as into wood.

It is made entirely of minerals, and contains no cinders, which generate destructive sulphuric acid fumes. It contains no sawdust, wood chips, vegetable matter, gypsum, lime or other chemically active matter. It will not disintegrate nor lose its nailing properties, and is absolutely verminproof. It prevents condensation, because it is a poor conductor of heat.

Nalecode weighs and costs less than concrete.

It eliminates the short-lived wooden sleepers, fill and underflooring, thus it affects a considerable saving in cost.

## Mixing and Placing.

Nalecode is mixed on the job with Portland cement, sand and water in accordance with directions furnished by the manufacturer. There is no interference with the general work.

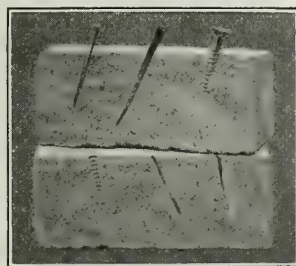
Initial set is obtained in about 2 days, after which time it can be walked upon. Freezing retards setting, but does not harm it.

## Installation Data.

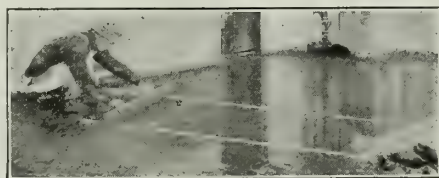
**FOR FLOORS**—A 2-in. layer of Nalecode is laid on the structural slab or arch of floors to form a nailing base. Where a wood finish flooring is specified, Nalecode takes the place of underflooring, wooden sleepers and cinder fill.

**FOR LINOLEUM**—Linoleum can be either glued or nailed to Nalecode. Glue forms a very strong bond between the two materials, thus the edges of linoleum can not roll up or become loose. Linoleum will wear longer due to the elastic properties of Nalecode.

**FOR CARPETS**—If carpets are to be used, it will be found most economical to lay Nalecode over the entire floor area. This is cheaper than laying wood nailing strips around the edges of the room and filling center with cement finish. If desired, carpets can be removed, and wood or other finish flooring laid directly on the Nalecode.



SECTION THROUGH  
NALECODE



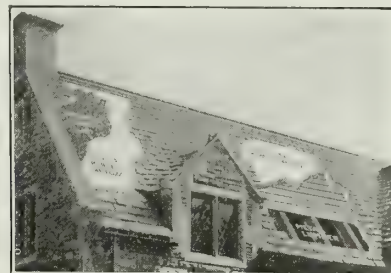
NALECODE BEING APPLIED AS A NAILING  
BASE FOR FINISH FLOORING

**FOR TERAZZO AND COMPOSITION FINISHES**—These finishes will not crack when laid on Nalecode, which is not the case when laid on a concrete base.

**FOR ROOFS**—A 1½-in. layer of Nalecode on the reinforced concrete, hollow tile or other structural slab, makes a perfect and permanent base for nailing finish roofings, thus eliminating wood sleepers, fill and sheathing.

**FOR STRUCTURAL ROOF SLABS**—A 3-in. slab of Nalecode, laid on a reinforced expanded metal plate carried on lumber rafters spaced about 24 ins. on centers, makes a structural slab which is at the same time a nailing base for attaching the finish roofing.

**FOR REINFORCED SOLID PARTITIONS**—A 1-in. coat of Nalecode, applied to either side of reinforced metal, makes a 2-in. solid partition to which all trim can be readily nailed without furring strips. A Nalecode partition deadens sound and is fireproof.



SHOWING NALECODE APPLIED AS A  
NAILING BASE FOR FINISH  
ROOFING

## Specifications.

**FOR CONCRETE WORK, MASONRY SPECIFICATIONS**—For all floor areas specified to be finished with wood, linoleum or other finish flooring, and for roof areas specified to be finished with tile, slate or other roofing materials, the contractor shall lay a base of Nalecode at least 2 ins. thick to receive flooring, and 1½ ins. thick to receive roofing. By the use of leveling strips and straightedge, this base shall be finished to a perfectly true level up to the level required by the thickness of the finished flooring or roofing specified.

Nalecode floor base shall be installed immediately after the partitions are erected, and in no case shall the surface be walked over until it has had at least 2 days to get its initial set. Nalecode shall never be tamped.

The mixture of Nalecode shall be such that it will receive and securely hold nails after it obtains its final set. It shall contain no cinders, gypsum, lime, wood sawdust, wood chips or other organic or chemically active matter. It shall be composed of neat Nalecode, Portland cement and sharp, screened building sand and water—mixed, installed and finished in strict accordance with the instructions of the inventor and manufacturer, PAUL MENDE, 405 Lexington Avenue, New York, N. Y. The sand shall be screened through ¼-in. mesh. No gravel shall be used, as this would interfere with the proper penetration of nails.

**FOR FLOOR WORK, CARPENTER'S SPECIFICATIONS**—All wood floors are to be securely nailed to the Nalecode base specified in the Masonry Specifications, using the same size, style, thickness and quantity of nails as usual.

## References.

New York, N. Y.—Cass Gilbert; Donn Barber; Ernest Flagg; Ludowici-Celadon Co.; Board of Education  
Albany, N. Y.—Alexander Selkirk; Public Works Commissioner  
Philadelphia, Pa.—Brockie & Hastings  
Springfield, Mass.—McClintock & Craig  
Trenton, N. J.—Board of Education  
Newark, N. J.—Board of Education  
Boston, Mass.—Massachusetts State Architect  
Kansas City, Mo.—Wight & Wight  
Names of many others on request.

# NEW YORK BELTING & PACKING CO.

Original Manufacturers of Interlocking Rubber Tiling

NEW YORK, N. Y., 91-93 Chambers Street  
TELEPHONE: WORTH 2400  
CHICAGO, ILL., 130 West Lake Street  
PHILADELPHIA, PA., 821-823 Arch Street  
ST. LOUIS, MO., 218-220 Chestnut Street

SAN FRANCISCO, CAL., 519 Mission Street  
BOSTON, MASS., 65 Pearl Street  
PITTSBURGH, PA., 420 First Avenue  
MINNEAPOLIS, MINN., W. S. Nott Co., Second  
Avenue and Third Street

## Products.

INTERLOCKING RUBBER TILING, SANITARY RUBBER BASE, RUBBER STAIR TREADS and RISERS, and RUBBER and BRASS STAIR NOSINGS.

### Interlocking Rubber Tiling.

Interlocking rubber tiling is manufactured of high grade, wear resisting rubber in two skilfully designed tiles which interlock perfectly (Fig. 1).

The impervious liquid cement employed in the laying hermetically seals the joints, rendering the floor absolutely waterproof and germproof, and making it impossible for the tiles to become separated or loosened from the underfloor.

**ADAPTABILITY**—The increasing use of interlocking rubber tiling, as *originated by us over 25 years ago*, demonstrates that the merits of our products are well established.

Universally recognized as the ideal floor for residences, churches, banks, office buildings, theaters, courthouses, clubs, hospitals, libraries, railroad cars, steamships, etc.

**WEARING QUALITY**—Floors of interlocking rubber tiling are wonderfully durable. Will last a lifetime under the most severe traffic conditions.

The resiliency of the rubber prevents wear resulting from the effects of abrasion and friction. The elas-

ticity of the rubber saves it from cracking and becoming unsightly, as is sometimes the case with mosaic and marble floors.

**OTHER ADVANTAGES**—Interlocking rubber tiling is odorless, non-slippery, sanitary, non-absorbent, waterproof, fire resisting and noiseless.

**COLORS AND DESIGNS**—Many artistic effects can be produced by combining any of the following colors: red, white, light and dark green, buff, salmon, black, light and dark gray, blue, light and dark brown.

Uniform price for all designs.

### Interlocking Rubber Nosing.

Used in connection with rubber tiling, it forms a safe, non-slippery stair tread. Made in 5 sizes for iron, wood or marble steps, and in any color.

### Sanitary Rubber Base.

Protects woodwork and walls against discoloration when cleaning floors. Made from the same high grade rubber as the tiling, in any color and in continuous lengths without joints.

Furnished with cap moulding in any height up to  $7\frac{3}{4}$  ins., or without moulding in any height up to 7 ins. Suitable for stair risers.

### Polished Brass Nosing.

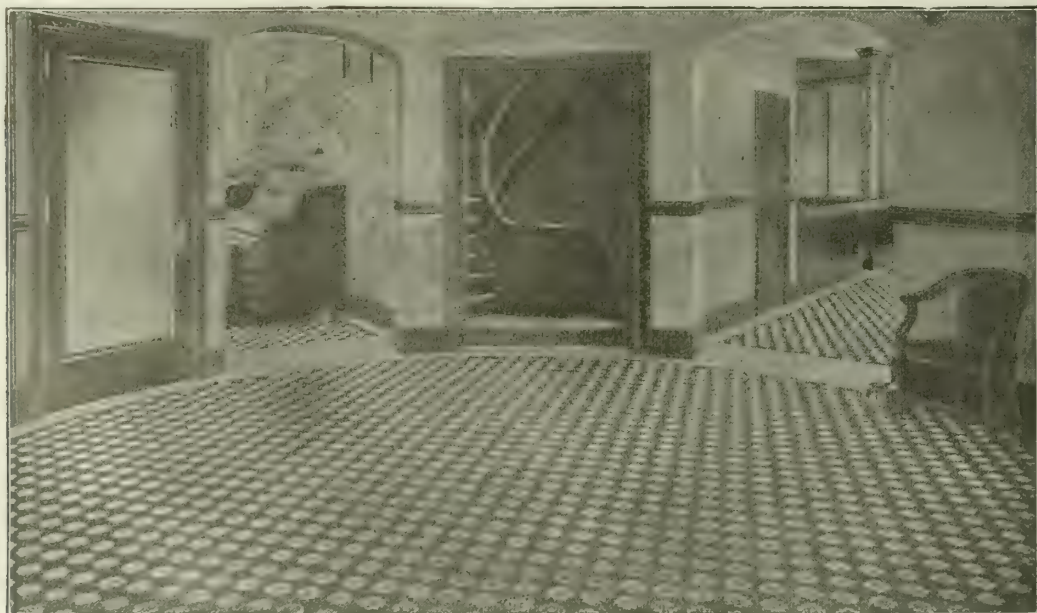
Especially recommended for public buildings, steamships and places where the traffic is excessive.  $1\frac{1}{2}$  ins. wide by  $\frac{3}{16}$  in. thick.

### Catalogues and Samples.

Full information, samples, and illustrated catalogue in colors will be sent on request.



FIG. 1. INTERLOCKING RUBBER TILES



UNITED STATES RUBBER CO. BUILDING, BROADWAY AND 58TH STREET, NEW YORK, N. Y.  
CARRERE & HASTINGS, Architects

Halls, elevators, and U. S. Tire Co. store floored with interlocking rubber tiling



# ARMSTRONG CORK & INSULATION COMPANY

Manufacturers of and Contractors for Linotile and Cork Brick Floors

135 Twenty-fourth Street  
PITTSBURGH, PA.

BRANCH OFFICES IN THE LARGER CITIES

## Products.

LINOTILE FLOORING, STAIR TREADS, SANITARY COVE and BASE.

CIRCLE A CORK BRICK for Cow Stalls, Horse Stalls, Sheep Pens, Piggeries, Kennels, Shipping Platforms, etc.

For Nonpareil Insulating Materials, see pages 349-51.

## Linotile.

Linotile is a composition of clean, powdered cork, wood flour, pure linseed oil, various gums and suitable color pigments, compressed into sheets  $\frac{1}{4}$ -in. thick and thoroughly cured or seasoned.

ADVANTAGES—Linotile can be readily laid over any smooth base—wood, concrete or metal. Due to its composition and the method of manufacture, it has all the requirements of an ideal floor. It is easy under foot, and not slippery. Being nonabsorbent, it is perfectly sanitary and is easy to clean and keep clean. It is a non-conductor of heat and, hence, a warm, comfortable floor to work on. It does not "draw" the soles of the feet,



LINOTILE FLOOR IN THE RESIDENCE OF JOHN CLEMSON, PORTLAND, ORE.

however, or make them hot and feverish. Linotile is practically noiseless, entirely free from objectionable odor, distinctly artistic in appearance, and lends itself readily to harmonious treatment, both in design and color.

DURABILITY—The inherent wearing quality of Linotile is beyond question. The material has no grain like wood and, hence, will not splinter. It is not brittle or rigid like concrete and, therefore, does not crumble. It stays "put." Even under the heaviest sort of foot traffic Linotile will wear for years, if properly installed and cared for.

FIELD OF USEFULNESS—Linotile successfully solves the floor problem in offices, banks, stores, churches, lobbies, libraries, court rooms, restaurants, hospitals,

museums, theaters, schools, etc., as well as in billiard rooms, kitchens, pantries, laundries, bathrooms, etc.

While not a cheap floor, Linotile is not expensive, when its long life in service and other merits are taken into consideration.

SHAPES, SIZES AND COLORS—Linotile is manufactured in squares and oblongs of various sizes and in the following eleven colors:

Light gray	Dark brown	Light green	White
Dark gray	Light blue	Dark green	Black
Light brown	Dark blue	Red	

SAMPLES, CATALOGUE AND DESIGNS—Samples, catalogue, and designs suitable for any room or building will be furnished on request.

## Circle A Cork Brick.

Circle A Cork Brick are composed of 70% of finely granulated cork and 30% of asphalt by volume, thoroughly mixed and moulded under heavy pressure. They measure 9 by 4 by 2 ins., and are laid flat. Four cover exactly 1 sq. ft. of surface.

MERITS OF CORK BRICK—For horse and cow stalls, hog and sheep pens, machine shops, factories, warehouses, shipping platforms, cold storage rooms, etc., Circle A Cork Brick solve the floor problem. They make a floor that is warm, resilient, and practically noiseless; never slippery when wet or dry; thoroughly sanitary, and remarkably durable in service. They have been tested out under various conditions for more than six years and have given perfect satisfaction.

APPLICATION—Circle A Cork Brick are readily installed in either old or new buildings. The best results are obtained when laid over a concrete base, but they may be put down successfully over wood floors. Full directions for installing on application.

SAMPLES AND LITERATURE—Further information, literature, samples, list of installations of Circle A Cork Brick, will be gladly forwarded on application.



CIRCLE A CORK BRICK FLOORS IN COW STALLS AT THE BAILEY FALLS FARM, OGLESBY, ILL.

# BEAVER TILE & SPECIALTY CO., INC.

## Cork Tile Flooring

44 Cliff Street  
NEW YORK, N. Y.

### Products.

Manufacturers of and contractors for "BE-VER" NATURAL CORK TILE, "BE-VER" COLORED CORK and RUBBER COMPOSITION TILING.

#### "Be-ver" Natural Cork Tile.

These tile are made  $\frac{1}{2}$  in. thick from pure cork shavings throughout. The bottom of each tile is as clean and smooth as the top. Tiles are made under 500 tons hydraulic pressure.

All tiles delivered for installations are equal to samples submitted.

**GUARANTEE**—We guarantee this tile to weigh one and one-quarter pounds per square foot.

**COLORS**—Light, medium and dark.

**SIZES**—3 by 3 ins., 6 by 6 ins., 9 by 9 ins., 12 by 12 ins., 18 by 18 ins., and oblongs.

**INSTALLATION**—Installed with a liquid waterproof cement on any smooth surface.

#### "Be-ver" Colored Cork and Rubber Composition Tiling.

These tile are made  $\frac{1}{4}$  in. thick of pure granulated cork, rubber substitute gum, and coloring matter.

**COLORS**—Black, white, brown, buff, red, green, blue and gray.

**STYLES**—Interlocking, squares and squares with feature joints.

**SIZES**—Squares—3 by 3 ins. up to 18 by 18 ins., and oblongs, with joints of any width required and borders of any width or style.

**Interlocking**—3-in. unit in any color and design to correspond with all interior decorations.

**INSTALLATION**—Installed with a liquid waterproof cement on any smooth floor.

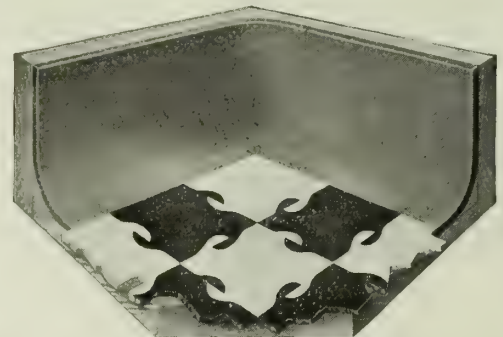
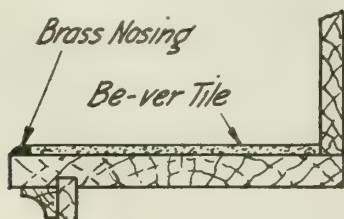
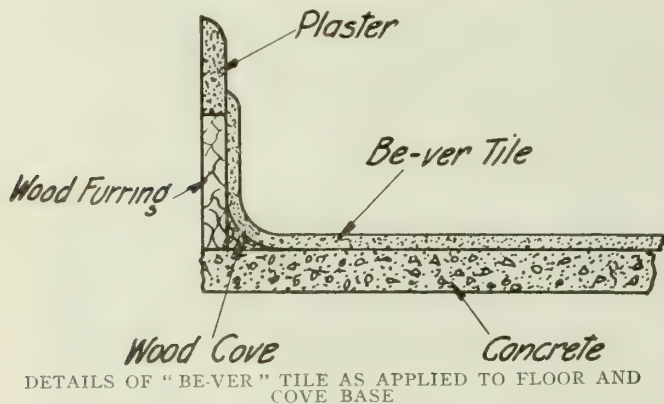
### Advantages.

A sanitary, resilient, non-absorbent floor covering. Used where wearing qualities, comfort, durability and attractive design are required.

For public or private buildings and also for private residences.

### Samples.

Samples submitted on request.



"BE-VER" TILE AS APPLIED TO FLOOR AND COVE BASE



"BE-VER" TILE AS APPLIED TO STAIR TREAD



# DREADNOUGHT FLOORING COMPANY

154 West 18th Street  
NEW YORK, N. Y.

## AGENCIES

PHILADELPHIA, PA., HEATON & WOOD, 1802 Chestnut Street  
BOSTON, MASS., BOSTON FLOOR COMPANY, 22 Kingston Street  
TOLEDO, OHIO, CHARLES F. HEINE, 1010 Monroe Street  
DENVER, COLO., GEORGE W. SUMMERS & Co., 420 Century Building  
CHICAGO, ILL., E. R. NEWCOMB, 730 South Wabash Avenue  
BALTIMORE, MD., J. M. ADAMS, 330 North Charles Street  
KANSAS CITY, MO., JOHN B. RICKETTS, 604 Ridge Building  
LOS ANGELES, CAL., B. V. COLLINS, 945 South Los Angeles Street  
ATLANTA, GA., JOS. F. GARDNER  
HOUSTON, TEX., HARDESTY FLOORING Co., 210½ Main Street  
SAN FRANCISCO, CAL., JAMES P. DWAN, INC., 1113 Hearst Building

MINNEAPOLIS, MINN., GENERAL EQUIPMENT Co., 4th floor, First National-Soo Line Building  
ST. LOUIS, MO., W. A. WHEELAND, 1215 Syndicate Trust Building  
MEMPHIS, TENN., CHEARS FLOOR & SCREEN Co., 217 Court Avenue  
PITTSBURGH, PA., PITTSBURGH HARDWOOD FLOOR COMPANY, 923 Park Building  
DETROIT, MICH., GEORGE R. MEHLING, 106 Henry Street  
SEATTLE, WASH., S. W. R. DALLY, 435 Globe Building  
BUFFALO, N. Y., STEVENS FLOOR Co., 41 Elmwood Avenue  
WASHINGTON, D. C., J. M. ADAMS, 1216 Connecticut Avenue  
MILWAUKEE, WIS., J. DOUBRAWA & SON, 482 Market Street

## Product.

Manufacturers of "DREADNOUGHT ELASTIC TILE."

## Dreadnought Flooring.

UTILITY—"Dreadnought" is an ideal flooring for public buildings, such as hospitals, churches, libraries, court houses, office buildings, banking institutions, hotels, etc. It has no equal in private houses for kitchens, laundries, hallways, pantries, bathrooms, bedrooms, billiard rooms and nurseries. "Dreadnought" is light in weight, only 1 lb. to the sq. ft., and is, therefore, especially suitable for elevator cars, yachts and steamships, where weight is an important factor.

ADVANTAGES—"Dreadnought," a compound of cork, embodies the most modern idea of floor covering, on account of its resilient and noiseless surface and attractive appearance. It is non-absorbent, has no objectionable odor, is easily cleaned and not slippery when wet. Liquids such as ink, grease, oil, etc., can be removed without leaving a stain.

DURABILITY—"Dreadnought" flooring has been thoroughly tested for durability, and evidence can be furnished showing how the flooring has worn under the severest use.

DESCRIPTION—"Dreadnought" is furnished in interlocking units (3 ins. from center to center) and in squares and rectangles of any desired size. The two latter can be outlined with inserted "Dreadnought" seams (¼ in. wide and up) of any color, such as black, white, etc., producing the effect of Dutch or stone tile.

"Dreadnought" is laid in an elastic cement which adheres equally well to wood, concrete or steel.

COLORS AND DESIGNS—"Dreadnought" is made in 10 colors: Dark and light blue, dark and light green, buff, French gray, brown, black, red and cream white.

## Stair Tread and Brass Nosing.

"Dreadnought" is especially suitable for stair treads, on account of its being non-slippery and noiseless, and, when edged with our special brass nosing, presents a neat and attractive appearance.

## Specifications.

"Dreadnought" Flooring is uniformly ¼ in. thick; and the under floor, if of concrete, must be troweled to a smooth and level surface, to within ¼ in. of the finished floor level desired; and if of wood it must be "tongue and groove" boards not over 4 ins. wide, free from knots, well seasoned, nailed and planed.

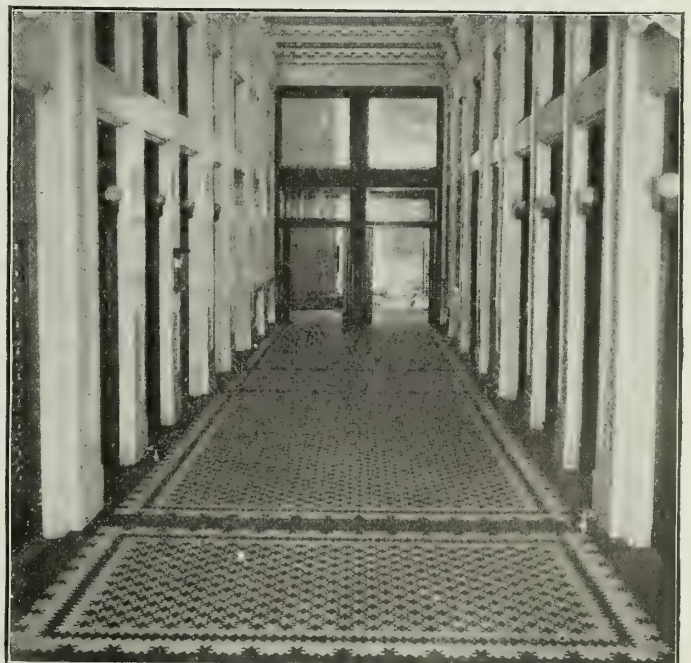
## Samples and Catalogues.

Designs, samples and our new catalogue, giving further information, will be furnished on request.

## "Dreadnought Elastic Tile" in Use.

The following list shows some of the buildings in which "Dreadnought" is installed:

The International Bank Corporation Building, 60 Wall Street, New York, N. Y.  
Central Trust Co., New York, N. Y.  
National State Bank, Newark, N. J.  
Mechanics Bank, Brooklyn, N. Y.  
Citizens Savings Bank, Stamford, Conn.  
Fulton Trust Co., New York, N. Y.  
Grand Central Station, New York, N. Y.  
New Municipal Building, New York, N. Y.  
American Museum of Natural History, New York, N. Y.  
First Baptist Church, Plainfield, N. J.  
Chapel, St. Mary's Hospital, Orange, N. J.  
Congregational Church, New Canaan, Conn.  
First Baptist Church, Montclair, N. J.  
The Biltmore Hotel, New York, N. Y.  
The Copley Plaza Hotel, Boston, Mass.  
The Waldorf-Astoria, New York, N. Y.  
The Plaza Hotel, New York, N. Y.  
Columbia Theater, New York, N. Y.  
Proctor's Theater, 125th Street, New York, N. Y.  
Childs Company, 200 Fifth Avenue, New York, N. Y.  
Chas. Scribner's Sons, 597 Fifth Avenue, New York, N. Y.  
F. W. Woolworth Residence, New York, N. Y.  
S. M. Colgate Residence, Orange, N. J.  
Jacob H. Schiff Residence, New York, N. Y.



HALLWAY, 43 EXCHANGE PLACE, NEW YORK, N. Y.



# DAVID E. KENNEDY, INC.

## Nonpareil Cork Tile, Wood Block, Parquet and Strip Floors

55 Fifth Avenue  
NEW YORK, N. Y.

### BRANCH OFFICES

CHICAGO, ILL.  
BOSTON, MASS.

MONTREAL, CAN.  
PHILADELPHIA, PA.

SAN FRANCISCO, CAL.  
WASHINGTON, D. C.

### Products.

NONPAREIL CORK FLOOR TILE and SANITARY COVE BASE; STAIR TREADS and RISERS; DESK and COUNTER TOPS; BULLETIN BOARDS.

Wood Block, Parquet and Strip Flooring.

### Nonpareil Cork Tile.

The wide use of Nonpareil Cork floor tile ranges from the highest class of architectural work, where appearance is the chief consideration, to places where service only is essential. It is the ideal floor for court-houses, hospitals, libraries, churches, banks, museums, galleries, gymnasiums, running tracks, billiard rooms, dining rooms, restaurants, kitchens, laundries, pantries, bathrooms, offices, stores, halls, stair treads and steamship work.

### Colors and Appearance, Nonpareil Cork Tile.

Nonpareil Cork tile is obtained in three shades of brown. While its soft brown shades harmonize perfectly with any color scheme, it does not lack character. Each tile is laid separately and individually. The construction of the floor is obvious, and therefore distinctly architectural in appearance.

### Sizes, Cork Tile.

#### STANDARD SIZES

Squares—9 x 9 and 12 x 12 ins.  
Oblongs—9 x 18, 12 x 18, 12 x 24 ins.  
Border Strips—3 x 18, 4 x 18, 4½ x 18, 6 x 18, 3 x 36, 4 x 36, 4½ x 36, 6 x 36, 9 x 36, 12 x 36 ins.

#### SPECIAL SIZES

Can be furnished at a somewhat higher price:  
Squares—3 x 3, 4 x 4, 4½ x 4½, 6 x 6, 8 x 8 ins.  
Oblongs—6 x 12, 8 x 16 ins.

### Nonpareil Cork Sanitary Cove Base.

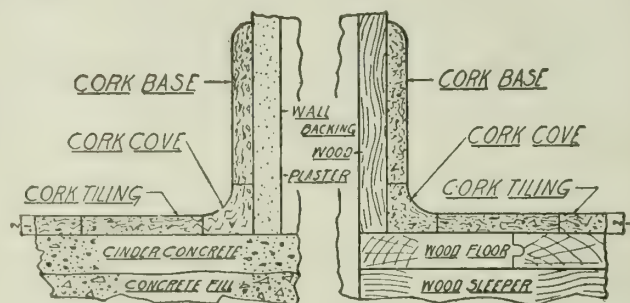
Nonpareil Cork cove base can be furnished to any height desired. Being elastic, it can not crack or open. This base can be set against any smooth backing: wood, plaster, concrete, metal, etc.

### Nonpareil Cork Tile Stair Treads.

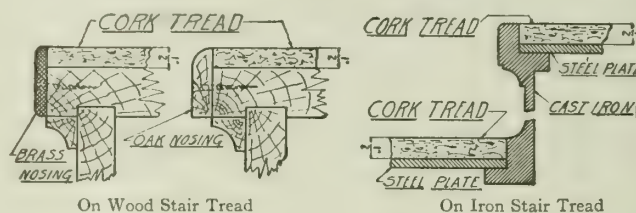
Nonpareil Cork tile makes a more durable stair tread than stone or metal, and a more agreeable and non-slippery tread (wet or dry) than rubber or carpet. It presents a plain, flat surface. There are no grooves for the retention of filth and disease germs, consequently dirt can be easily brushed off, which is impossible with grooved metal treads.

### Standard Specifications for Cork Tile.

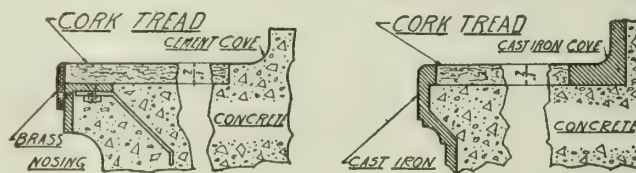
Floors [or stair treads, etc.] shall be of Nonpareil Cork Tile ½ in. thick. All cork tile shall be of American manufacture and made only of clean cork shavings throughout, compressed solid in closed moulds and thoroughly baked. It shall be homogeneous from face to back and free from all foreign substances and cement of any kind, other than the natural gum of the cork. All cork tile shall be manufactured by a company engaged in the satisfactory manufacture of this material for at least 6 years prior to the taking of bids, and shall be laid by a contractor who has made installations of cork tile floors in large areas for a similar period, which floors must have withstood satis-



On Concrete Floor On Wood Floor  
NOTE—The tile is laid with a waterproof cement applied with a brush



On Wood Stair Tread On Iron Stair Tread



On Concrete Tread—A On Concrete Tread—B  
DETAILS OF CORK TILE, COVE BASE AND STAIR TREADS

factorily wear and tear under similar conditions to those which will obtain in connection with the floors in this building. All bidders must state in their proposals the names of 3 buildings in which they have installed cork tile floors, of the manufacture and quality required, that have been in use for at least 6 years, stating the areas of these floors and the dates they were completed.

If cove base is desired, state height required.

NOTE—Our name may be mentioned if desired.

### Specification for Backing for Nonpareil Cork Tile.

Any smooth backing that exists or is most convenient to provide—wood, concrete, metal, stone or tile. In new work, the backing should be finished ½ in. below the finished floor level. Plaster, wood or any smooth material makes a suitable backing for sanitary base and wainscoting. Whether of plaster or other material the wall backing should be carried down and finished square with the floor backing, making a clean corner.

SPECIFICATIONS FOR CONCRETE BACKING (FOR NEW WORK)—All surfaces to receive cork tile shall have a top layer or finish 1 in. thick, composed of 1 part Atlas Portland cement [or equal] and 5 parts screened sand. This top layer shall be trowelled to a smooth and even finish exactly ½ in. below the required finished floor level. No lines shall be struck in the surface.

### Wood Block Flooring.

Wood blocks (ends and sides interlocking) are laid directly on concrete or steel in asphalt mastic. Fire-proof, sanitary, dampproof and noiseless. Particularly adaptable for buildings containing finished concrete floors, the covering of which is always a problem. Made ⅞-in. or 1½-in. thick.



# DAVID E. KENNEDY, INC.

## Everlastic Tile and Kencor Bulletin Boards

55 Fifth Avenue  
NEW YORK, N. Y.

CHICAGO, ILL.  
BOSTON, MASS.

BRANCH OFFICES  
MONTREAL, CAN.  
PHILADELPHIA, PA.

SAN FRANCISCO, CAL.  
WASHINGTON, D. C.

### Products.

EVERLASTIC FLOOR TILE and STAIR TREADS, SANITARY COVE BASE; KENCOR BULLETIN and CHART BOARDS.

### Everlastic Tile.

**DESCRIPTION**—An elastic flooring material capable of architectural construction and artistic color treatment. A utility floor as distinctly structural as ceramic tile, marble or mosaic.

**ADVANTAGES**—Everlastic tiles are a composition of which cork is the basic ingredient. Cork is recognized as a wonderfully durable and elastic flooring material, and it is the cork of which they are mainly composed that gives to Everlastic tiles their great wear resisting quality and their soft, pleasant and secure foothold. Under foot these tiles are as soft and quiet as carpet, yet they are as sanitary and non-absorbent as glazed tile.

These tiles are odorless and more durable and sanitary than rubber tile. The interlocking tiles are identical in appearance with rubber tile, and cost about one-third the price.

**UTILITY**—Everlastic tile is desirable wherever a durable, soft, serviceable, non-absorbent, artistic and inexpensive floor is required. For kitchens, laundries, pantries, bathrooms, halls, corridors, vestibules, elevators, stair treads, restaurants, libraries, banks, court-rooms, offices, stores, aisles and vestibules of theaters, and steamship work.

**COLORS AND SHAPES**—Everlastic tiles are made square, oblong and interlocking. The square and oblong tiles can be laid with a featured joint, thus emphasizing the tile construction. They can be made in any color, the following being the standard colors usually carried in stock:

White	Light Brown	Medium Brown	Dark Green	Red
Gray	Dark Brown	Light Green	Blue	Black

**SIZES**—The tiles are made  $\frac{1}{4}$  in. thick in the following standard sizes:

*Interlocking*— $2\frac{3}{8} \times 2\frac{3}{8}$  ins.

*Square*— $6 \times 6$ ,  $8 \times 8$ ,  $10 \times 10$ ,  $12 \times 12$ ,  $16 \times 16$ ,  $20 \times 20$  ins.

Smaller squares furnished at a slightly higher cost.

*Oblong*— $6 \times 12$ ,  $8 \times 16$ ,  $10 \times 20$ ,  $12 \times 24$  ins.

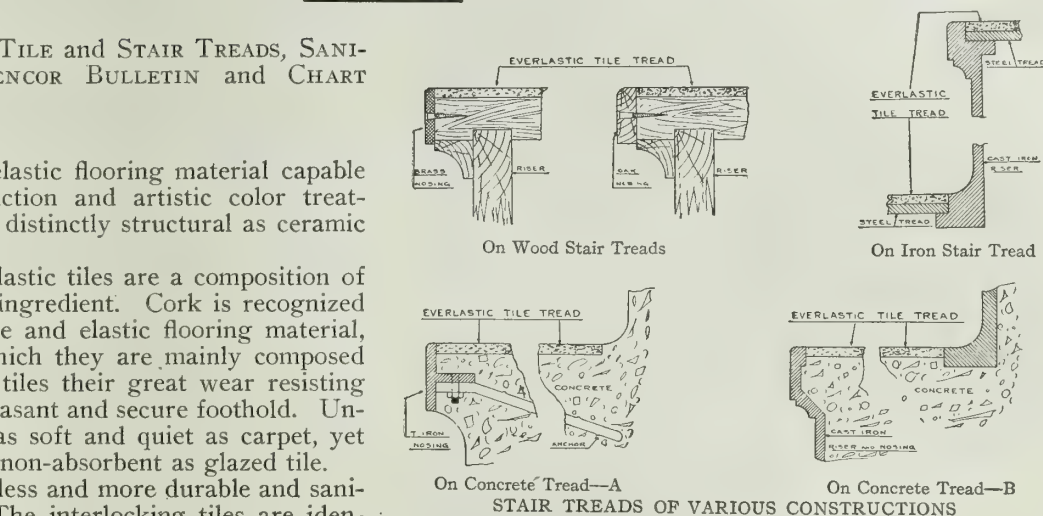
### SANITARY COVE

**BASE**—Everlastic cove base is made any height desired.

Being elastic, it can not crack nor open.

This base can be set against any smooth backing: wood, plaster, concrete, metal, etc.

**STAIR TREADS**—Everlastic tile makes a stair tread as durable as the metal treads, and provides a non-slip foothold (wet or dry). It presents a plain, flat surface; no grooves for the retention of filth.



### Standard Specifications for Everlastic Tile.

Floors [or stair treads, etc.] shall be of Everlastic Tile. All material from which this tiling is fabricated must be made of clean powdered cork, wood flour, pure linseed oil, gums and pigments, thoroughly mixed in the most approved manner; rolled, cut into sheets and seasoned in the sheet in drying rooms for a period of at least 3 months before the tiles are cut. Proof of the period of seasoning will be required. Tile must be homogeneous throughout. No material with a top surface or crust that is any harder or denser than the inside or core will be accepted. Tiling shall be  $\frac{1}{4}$  in. thick, cut true to size and shape with absolutely square clean cut edges. No tile with edges at all beveled will be accepted. [State color and whether Square, Interlocking or Oblong tile is required.] Tile shall be set with Everlastic Waterproof Cement; on concrete backing, directly on concrete; on wood backing, canvas shall be thoroughly tacked to the wood and tiling cemented to the canvas. All joints must be absolutely watertight. Tile furnished under this specification shall be of American manufacture, manufactured and installed by a firm experienced in the manufacture and installation of this material that has made installations of this tile in large areas at a period of not less than 4 years prior to taking of bids on this work, which floors must have satisfactorily withstood wear and tear under similar conditions to those which will obtain in connection with floors in this building. Bidders must name in their bids 2 buildings in which they have laid tile floors, of the manufacture and quality required, that have been in use for the period required by these specifications, stating the dates these floors were completed.

State color and size of tile desired.

If cove base is specified, state height required.

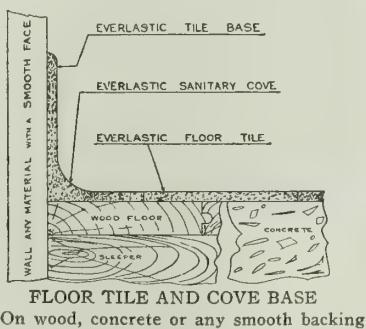
**NOTE**—Our name may be mentioned if desired.

**BACKING FOR EVERLASTIC TILE**—Any smooth backing that exists or is most convenient to provide: wood, concrete, metal, stone or tile. In new work the backing should be finished  $\frac{1}{4}$  in. below the finished floor level. Plaster, wood or any smooth material makes a suitable backing for sanitary base and wainscoting. Whether of plaster or other material the wall backing should be carried down and finished square with the floor backing, making a clean corner.

**NOTE**—The tile is laid with a waterproof cement applied with a brush.

### Kencor Bulletin and Chart Boards.

Kencor bulletin boards are  $\frac{1}{2}$  in. thick, consisting of sheet cork  $\frac{1}{4}$  in. thick, cemented to special composition board backing  $\frac{1}{4}$  in. thick.





# UNITED CORK FLOORING COMPANY

DEPARTMENT OF UNITED CORK COMPANIES

50 Church Street  
NEW YORK, N. Y.

BRANCHES AND AGENCIES IN ALL LARGE CITIES  
FACTORY AND MAIN OFFICE, LYNDHURST, N. J.

## Products.

**CRESCENT CORK TILE** and **SANITARY COVE BASE**, for floors, stair treads, desk tops, table tops and bulletin boards.

**UNICO ELASTIC TILE** and **SANITARY COVE BASE**, for floors, stair treads, elevator cars, ship and yacht decks, wainscoting and drainboards.

**STAR CORK BRICK**, for paving cow barns, horse stalls, bull, calf, hog and sheep pens and for heavy duty service in factories, fire stations, machinshops, packing houses, shipping platforms, etc.

**UNICO MASTIC FLOORING** for floors, stair treads and cove base.

## Crescent Cork Tile.

The best cork tile that it is possible to produce. Manufactured from the finest quality of carefully selected pure cork shavings, under the most approved process, produced in a variety of pleasing shades of brown, adaptable to artistic combinations and a wide range of service.

It can be laid on any smooth level backing. Is adhered with a specially prepared waterproof cement so applied as to hermetically seal all joints. Requires no care but ordinary washing.

A brochure enumerating a few of the bank, office, public buildings and residences in which it has been installed, supplied on request.



CRESCENT CORK TILE IN CHURCH OF ST. MARTIN OF TOURS, BROOKLYN, N. Y.

Sizes—Standard sizes as follows:

Square: 3 x 3, 4 x 4, 6 x 6, 12 x 12 ins.

Oblong: 6 x 12, 9 x 18, 12 x 24 ins.

Border: 3 x 18, 3 x 36, 4 x 18, 4 x 36, 6 x 18, 6 x 36 ins.

## Unico Elastic Tile.

A composition of cork, pigment and binder thoroughly compressed and seasoned. Essentially a service and utility floor which offers remarkable resistance to wear. Peculiarly adapted to areas where artistic appearance, durability and security of foothold are essential. Manufactured in 10 true colors: black, red, light brown, light blue, light green, white, gray, dark brown, dark blue, dark green. Can be laid on any



UNICO ELASTIC TILE INSTALLED ON SUN PORCH OF BROOKLYN RESIDENCE

smooth level backing. Is set in waterproof adhesive cement.

SIZES—Uniformly  $\frac{1}{4}$  in. thick, fabricated in the following stock sizes:

Interlocking: 3 x 3 ins.

Squares: 6 x 6, 8 x 8, 10 x 10, 12 x 12, 16 x 16, 20 x 20 ins.

Oblongs: 6 x 12, 8 x 16, 10 x 20, 12 x 24 ins.

Dividing Strips: Any width desired.

Cove Base: To any height desired.

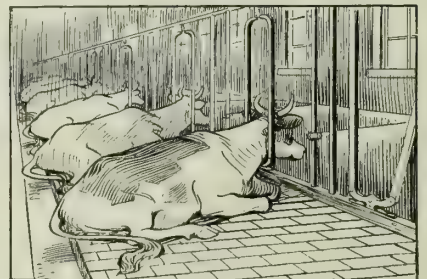
Stair Treads: Individual tile or tile cut to size of tread.

## Star Cork Brick.

Made from finely granulated cork and superior quality binder, thoroughly mixed in standard proportions by weight, and moulded under hydraulic pressure into bricks 2 by 4 by 9 ins. and  $1\frac{3}{4}$  by 4 by 9 ins., weighing about  $2\frac{1}{2}$  lbs. each; 4 bricks laid flat covering 1 sq. ft. of ground area.

Resilient, noiseless, non-slippery (wet or dry); thoroughly sanitary, non-absorbent; unaffected by climatic conditions, urine or liquid manure, they will not rot; are always warm and comfortable, and eliminate the necessity of large quantities of unsanitary bedding and the possibility of disease to which animals are liable from standing or lying on cold, wet, hard, slippery cement floors.

For heavy duty service, Star cork bricks are unequalled. Their ingredients and process of manufacture make them so tough and durable that they will not chip, splinter or disintegrate under the most severe service. These bricks can be applied to any foundation, but concrete is recommended for best results. The concrete foundation should be finished  $2\frac{1}{2}$  ins. below finished floor level. Brick should be laid flat and tamped to an even surface. All joints should be broken and filled with a Portland cement grout. Laying instructions furnished with each order.



STAR CORK BRICK

Samples and literature on request.

## Unico Mastic Flooring.

A compound of hydro-carbons, mineral caoutchouc and asbestos fiber, combined with mineral oil and color pigments. It is non-absorbent, therefore sanitary; because of its resiliency it will not crack and is non-slippery and semi-noiseless to the tread.

It is waterproof, fireproof and dustless. Contains no sand, cement, slag or sawdust. Unico Mastic is devised for hard usage and its marked durability makes it especially adapted to the floors of factories, hospitals, schools, loft buildings, stair treads, ships, etc. It is strictly a floor covering, being an economical substitute for linoleum; it is in fact a *mastic linoleum*. It is best applied on a finished concrete floor. Unico Mastic is applied in plastic form directly to the concrete with a trowel in 5 coats and when finished, is  $\frac{1}{8}$  in. thick. Sanitary cove base also furnished.



# CHENEY & COMPANY, INC.

Sole Owners and Manufacturers of "Troegerlith Composition"

TELEPHONE:  
FARRAGUT 4527

519 West 21st Street  
NEW YORK, N. Y.

## Products.

"TROEGERLITH COMPOSITION" and PLASTIC TILE for Flooring, Wainscoting, Base, Stair Treads, Risers. Pollo Oil for the care of "Troegerlith" floors.

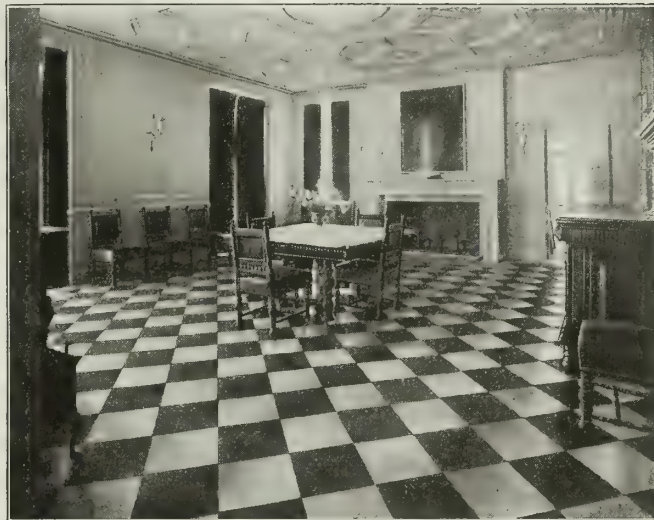
## "Troegerlith Composition".

This material is a magnesium chloride cement. Commercial magnesium oxide ( $MgO$ ) is mixed with a strong solution of magnesium chloride ( $MgCl_2$ ), together with certain inert and semi-inert fillers—one of the chief of which is asbestos, which adds greatly to the strength, warmth, resiliency and fire resistance of the floor. The composition contains neither Portland cement nor sand and will not dust. It is absolutely sanitary. This material forms a light weight, fireproof, resilient, jointless and seamless covering. Laid in a plastic state,  $\frac{1}{2}$  in. in thickness and in a solid single layer, it bonds directly and securely to wood, cement or metal. The material is finished by troweling to a perfectly smooth, close grained even surface; takes initial set in a few hours, and may be used after 24 or 36 hours.

"TROEGERLITH" FLOORING—Many companies install two or more layers and use expanded metal lath. "Troegerlith" discarded both of these features several years ago, because two layers are apt to split and not perfectly bond together, leaving hollows, and also because the under layer is usually a cheap sand and sawdust filler. Wire lath tends to break the bond rather than increase it, and after a time will go to pieces or rot out, leaving the floor only bonded in spots.

The special feature in the "Troegerlith" formula is the ingredient, which excludes the element of expansion between the composition floor covering and the foundation floor, and reduces to a minimum the possibility of cracking or buckling.

ADAPTABILITY—These floors are giving eminently



"TROEGERLITH" PLASTIC TILE, MARBLE EFFECT

satisfactory service under varied conditions; are appropriate for all classes of buildings, and are especially suitable where a clean, dustless and warm flooring of pleasing appearance is desired, such as private homes, offices, laboratories, billiard rooms, schools, courthouses, hospitals, apartment houses, bedrooms, bathrooms, kitchens, hallways and stairways. This material is also an important factor in factory construction. It may be laid over new or old wooden or cement floors with an equal degree of satisfaction.

ATTRACTIVENESS AND DURABILITY—In this, "Troegerlith" is equalled by few flooring materials. It may be installed in almost any color or combination of colors; the most popular being red, buff and light gray. Borders or panel effects may be used, or "Troegerlith" may be employed in conjunction with ceramics. A floor may be scored to represent tiles, or produced to effect a marble or quarry tile floor. "Troegerlith Composition" floors, after six to ten years of service, are now as sound, attractive and perfect as when installed.

## Costs.

"Troegerlith Composition" costs between 20¢ and 30¢ per sq. ft. laid; or more, according to area, location, design and conditions, a price comparable with good linoleum or wooden floors, and less than tile, terrazzo or marble.

## Specification Data.

Complete and necessary specification data to insure perfect installation will be sent on request.

## Guarantee.

CHENEY & COMPANY, INC., squarely and fully guarantee its products.

## References.

A representative list of "Troegerlith" installations for the more prominent architects and builders, and covering all classes of service, will be submitted on request.



"TROEGERLITH COMPOSITION" FOR OFFICES

## GENERAL KOMPOLITE CO.

Manufacturers of Composition Floors and Wainscots, Mastic and Magnesite  
Floor Compounds  
Calciners and Grinders of Magnesite

TELEPHONE:  
HUNTER'S POINT 5361

325-327 Borden Avenue  
LONG ISLAND CITY, N. Y.

### Products.

"KOMPOLITE," a MONOPLASTIC, SANITARY, SEAMLESS COMPOSITION FLOOR and WAINSCOT.

"MASTOLITH," a MASTIC, PLASTIC FLOORING.

### "Kompolite."

"Kompolite" is a magnesium asbestos composition and comes in many attractive colors.

"Kompolite" has proved wonderfully durable under the severest conditions. A floor now in use nearly 12 years (where other forms of floors failed) over which loads of 2 or 4 tons are drawn and sharp shod horses are driven, shows hardly any signs of wear.

Another floor, over which approximately 60,000 to 80,000 people have passed each day for the last 8 years, is in good condition.

Nearly 250,000 ft. have been installed in a public institution, and after almost 6 years of use not a single foot was removed, repaired or relaid because of defective or unsatisfactory material or workmanship.

After 2 years of test and service and in comparison with many other composition floors, "Kompolite" was the one accepted by the architects of the Grand Central Terminal, New York, and is the only composition floor laid in that great railroad station.

After careful scientific tests and numerous experiments by the Bureau of Standards, Washington, D. C., "Kompolite" was installed in many United States Post Offices, Government Printing Offices, the Capitol of the United States and other buildings.

"Kompolite" has been laid in the palaces of the rich, and in the tenements for the poor; in hotels, restaurants, factories, stores, railroad stations, hospitals, schools, churches, office and loft buildings, theaters, clubs, etc. In all, it has been satisfactory.

"Kompolite" is the solution of many floor troubles.

**ADVANTAGES**—Sanitary, fireproof, durable, sound deadening, water repelling, easy under foot, germproof and dustproof. For heavy service and hard wear; applied in plastic form on concrete, wood or iron, in new or old buildings.

Light weight, so that it can be used on weak structures where heavier materials can not be employed. It is in daily use in places where wood, cement, asphalt, concrete, slate, marble, etc., had not been satisfactory.

It is requested not to compare "Kompolite" with any of the many disappointing composition floors, and

not to class it with, or condemn it because of past failures, with sand, sawdust, or old magnesium cement floor mixtures.

As this company is the only composition flooring concern in the United States which calcines magnesite, it can guarantee the absolute freshness of these most important materials in every "Kompolite" installation.

### "Mastolith."

"Mastolith" is a plastic battleship linoleum, made from mineral gum with vulcanized oil and asbestos fiber.

It is furnished in a medium red, chocolate brown and dark gray. It is applied with a trowel, and when used for flooring, is laid  $\frac{1}{8}$  to  $\frac{3}{16}$  in. thick. It sets rapidly and may be used for foot traffic within 24 hours after being laid.

It is practically wearproof and is not affected by foot usage or truck in warehouses.

It deadens noise and is agreeable to the tread.

It is absolutely sanitary, being non-absorbent.

It is not affected by change of temperature.

It bonds to a base of wood, concrete or brick, and will not crack nor loosen under usage.

When fully set, it is practically fireproof.

It can be repaired perfectly with little trouble.

It retains its elasticity and always presents an attractive appearance.

"Mastolith" is used as a covering for concrete or wood floors, either old or new, concrete roofs, roof gardens, porches, walks, stair treads, and wherever it is desired to protect concrete floors from dusting or wear of trucking, or to provide an elastic, sanitary floor having the advantage of high-grade linoleum.

It forms an ideal floor for schools, churches, hospitals, asylums, jails, and for theaters, restaurants and all public or private buildings where sanitary considerations are of high importance.

### References.

"Kompolite" and "Mastolith" have been subjected to most severe tests in practical use. References will be given to architects, engineers, or contractors to prove that "Kompolite" and "Mastolith" are the most reliable and, quality considered, the most moderate priced monoplasic floors and wainscots now made.

"Kompolite" is specified by leading architects, indorsed by noted contractors, and approved by property owners.



# H. W. JOHNS-MANVILLE CO.

## Asphalt Mastic Flooring

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910

### Products.

JOHNS-MANVILLE ASPHALT MASTIC FLOORING.

For Acoustical Service and Waterproofing Materials, see page 36; for Roofing Materials, see pages 402-05; for Asbestos Shingles, see pages 386-87; for Radiator and Steam Traps, see page 930; for Underground System of Pipe Insulation, see page 910; for Pipe and Boiler Insulation, see pages 1076-77.

### Johns-Manville Asphalt Mastic Flooring.

This flooring is in the nature of an asphaltic concrete, and consists of a binder or cement made up of a combination of natural asphalts and a well graded mineral aggregate of torpedo gravel, crushed stone and sand with particles ranging in size from those passing a  $\frac{3}{8}$ -in. mesh screen down to those which pass a 200-mesh screen.

Success with this type of flooring demands a careful grading of the aggregate particles and their intimate mixture with the cementing materials in a manner that will insure the densest possible product, in which even the finest particles are thoroughly coated with the asphaltic cement.

To insure this essential result in Johns-Manville Mastic Flooring, the aggregates passing an 80-screen are combined with the asphalt at the plant rather than at the site of the work by heat and mechanical agitation for a period of 6 to 7 hours, and are then moulded into blocks of convenient size for shipment. These blocks are broken up on the work and reheated to a temperature of 450° Fahr., and mixed with the coarser aggregate, using a pure asphaltic flux to break down the blocks in the kettle.

The resulting softened and plastic mass is transported to the work in oak buckets, and is then laid down in one or two courses, depending upon the required thickness, and given a comparatively smooth finish by rubbing with wood floats.

### Adaptability of Johns-Manville Asphalt Mastic Flooring.

By reason of its remarkable ductility, toughness, strength and enduring qualities, Johns-Manville Mastic Flooring is peculiarly adapted for the work it is called upon to perform in floor use under various conditions. It provides a surface that is waterproof and at the same time practically wearproof. It is also highly resistant to the effect of acid, alkali and brine.

These characteristics should appeal to architects and owners of breweries, distilleries, canning factories, packing houses, ice cream factories, creameries, cold storage plants, warehouses, freight houses, railroad shops, machineries, schoolhouses, institutions, platforms, loading docks, plating establishments, battery houses, chemical laboratories, pickling tanks and tank rooms in smelters.

Another point of vital importance, in establishments where light or accurate machinery is in operation or where merchandise is stored, is that Johns-Manville Mastic Floors do not originate or hold dust.

This flooring is unequalled for factory and warehouse use, even under the heaviest trucking conditions;



TRADE-MARK

and on account of its noiseless character, is a boon to plants where there is considerable trucking. It also has a peculiar holding quality which has a tendency to prevent slipping.

### Advantages of Johns-Manville Asphalt Mastic Flooring.

Johns-Manville Mastic can be laid in any consistency between extreme hardness and softness and, while always dense, possesses a certain amount of resiliency. It does not cause foot-soreness and fatigue, like concrete and other non-yielding floor surfaces; and where employees of machineries, factories and other industries are compelled to stand while at work, it adds greatly to their comfort and efficiency. Furthermore, being dampproof, it is a protection against rheumatism and other ailments common to damp conditions.

### Application of Johns-Manville Asphalt Mastic Flooring.

This flooring is easily laid and easily repaired if changes in the floor surface are made necessary at any time. It adds very little to the dead load, as the standard thickness of  $1\frac{1}{2}$  ins. weighs only 18 lbs. to the sq. ft. in place. This thickness is sufficient for ordinary trucking requirements, but can be varied to meet conditions, ranging from 1 in. for foot traffic, where the requirements are very light, to 2 ins. in thickness for loading docks, where the requirements are correspondingly severe.

It can be laid over any foundation which is firm and stable and can be applied over wood, brick, concrete or tile already in place. If these surfaces are badly worn it is preferable to level up the inequalities by the use of cement grout.

The finished surface is monolithic, without construction joints or cracks to collect or hold dirt or moisture. The installation of this floor does not necessarily occasion any delay in the operation of a plant.

### Specifications.

This is essentially a flooring that is "made to fit," therefore each subject should be treated as an individual problem; a specification written to meet the exact requirements. A brief description of conditions sent to any of our branch engineering departments will bring immediate response.



LAYING JOHNS-MANVILLE MASTIC ASPHALT FLOORING IN SOUTHERN RAILWAY FREIGHT HOUSE AT MOBILE, ALA.



# THE MARBLELOID COMPANY

Manufacturers of and Contractors for Fireproof Plastic Flooring

Broadway and Thirty-fourth Street

NEW YORK, N. Y.

FACTORY

NEW DURHAM, N. J.

## BRANCH OFFICES

PITTSBURGH, PA., 602 Commonwealth Building  
CINCINNATI, OHIO, 507 Mercantile Library Building  
CLEVELAND, OHIO, 528 Erie Building  
DETROIT, MICH., 1333 Dime Bank Building  
CHICAGO, ILL., 11 So. La Salle Street

KNOXVILLE, TENN., 407

MINNEAPOLIS, MINN., 714 Metropolitan Life Building  
BOSTON, MASS., 200 Devonshire Street  
PHILADELPHIA, PA., 911 Pennsylvania Building  
BALTIMORE, MD., Builders' Exchange  
NORFOLK, VA., 905 National Bank of Commerce  
Bank and Trust Building

## Products.

"MARBLELOID" FIREPROOF FLOORING, a Plastic Magnesia-asbestos Composition for Floors, Coved Sanitary Base, Wainscot, Trim, Treads, etc.

Tredlite Tiling, an elastic ground cork and linseed oil compound, resembling but superior to and cheaper than rubber tiling.

## Physical Characteristics, Properties and Advantages.

Marbleloid is a sanitary, standardized, permanent, light weight, fireproof and resilient composition for floors, coved base, wainscot, trim, treads, etc. It is installed in a plastic state, usually  $\frac{1}{2}$  in. thick, and sets in a few hours into a seamless, tough, elastic body presenting a fine grained, smooth surface.

The fact that it is jointless, remarkably free from the tendency to crack and practically non-absorbent give it unusual sanitary value. It is easily kept clean; it is quiet under the tread; it is non-dusting, offering high resistance to abrasion; it is not slippery; it is waterproof; owing to its elasticity, it is not fatiguing; it is a non-conductor of heat, and therefore, never cold; it has great crushing and structural strength and does not contract nor expand to any appreciable degree.

Marbleloid adheres firmly to wood, concrete or iron, and may be installed over old flooring, base or wainscot, as well as upon new construction. It is made in all colors, offering possibilities in the working out of any desired color scheme. Only inert mineral colors are used.

## Wide Range of Adaptability.

Over 5000 Marbleloid installations of large area have been made for the most varied types of flooring service. Its sanitary qualities, resilience, warmth and pleasing appearance give it consideration for offices, hospitals, residences, etc., where these features are of prime importance. Being non-slippery, it is used with satisfaction for stair treads, corridors, etc. Its cheapness, great durability, high resistance to fire and heat together with its foot comfort make it desirable for industrial plants, factories, powerhouses, etc. Its remarkable fire and heat resisting properties give Marbleloid favorable consideration for all classes of work where fire protection is of prime importance. Many instances are recorded where Marbleloid, installed in non-fireproof structures, has actually served as a fire stop, preventing the spread of the fire throughout the building.

Approximately 2,000,000 sq. ft. of Marbleloid are annually installed in the United States and Canada.

## Physical Tests.

Marbleloid weighs approximately 3 lbs. to the sq. ft.; it has a very low percentage of absorption; its com-

pressive strength is over 5000 lbs. per sq. in.; it has high tensile strength; it will withstand a heat of 1700° Fahr. without cracking or disintegrating.

Marbleloid has been tested and approved by the Bureau of Buildings, Borough of Manhattan, New York City, as fireproof material. Copies of this report and other physical tests made by Prof. Woolson at Columbia University may be had on request.

## Marbleloid Service.

THE MARBLELOID COMPANY maintains skilled workmen at the principal building centers of the country, and is, therefore, unusually well equipped to perform work in any section with its usual high standard of excellence.

Owing to the fact that installations are not always successful when made by local cement masons, inexperienced in the handling of material of this nature, Marbleloid is not sold in bulk. All installations are made by our own trained mechanics, long experienced in the working of this material, with the result that the highest standard of workmanship is always assured. All work installed by the Marbleloid organization is rigidly guaranteed.

A printed foundation specification giving full directions as to the proper preparation of all foundation work is provided, and before actually beginning the installation of the Marbleloid material, a preliminary inspection is made by an engineer thoroughly familiar with all phases of building construction.

At the plant and in the field, Marbleloid facilities are such that the company is always prepared to handle



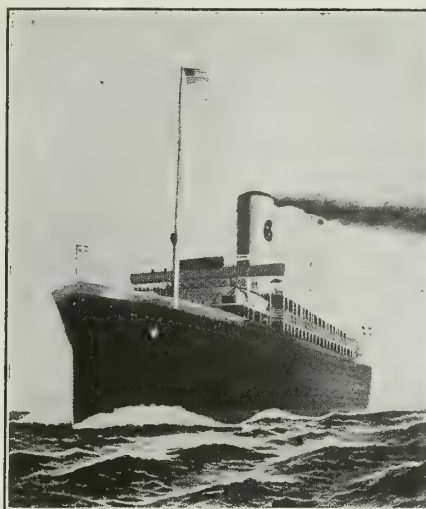
MARBLELOID INSTALLED IN OFFICE OF AMERICAN PULLEY COMPANY, PHILADELPHIA, PA.  
HEACOCK & HOKANSON, Architects





FLOOR AND SANITARY BASE IN HOSPITAL CORRIDOR

One of the many Marbleoid hospital installations



S.S. "STOCKHOLM," SWEDISH AMERICAN LINE

14,000 sq. ft. of Marbleoid installed in various parts of this vessel

all work, no matter of how vast an extent, with the utmost dispatch and efficiency.

The draughting department is prepared at all times to submit details covering any special construction, sketches showing proposed color schemes, etc.

In order to maintain the superior merit of its product, THE MARBLEOID COMPANY has in its employ a graduate chemist who has specialized in this line for the past fourteen years. The laboratory is constantly engaged in research work and all raw materials entering into the Marbleoid composition are carefully tested or analyzed.

### Marbleoid Specifications.

Before drawing up specifications covering the use of Marbleoid, the company suggests that architects secure a copy of the printed specification sheet, detail for sanitary base, iron stair construction, etc. The specification sheet contains much information of value covering fully the preparation and requirements necessary in the way of a wood, concrete, iron or steel foundation for floor, coved base and wainscot; the best treatment for pipes passing under or through the material; the proper conditions under which Marbleoid should be installed; the protection of finished work and other essential data.

The detail for the iron stair construction shows a practical way of constructing the iron foundation to most efficiently receive the Marbleoid treads, risers and strings.

### Relative Low Cost.

Marbleoid is a permanent flooring which requires no unusual or expensive foundation. It may be put into service within 36 hours after it has been installed. It may be applied over an old finished floor, thus avoiding the expense and annoyance of ripping out the old flooring and preparing a special foundation. It can be used just as readily over wood (top or under) flooring as it can over concrete fill or finished cement floor.

In the larger areas it costs but a trifle more than the best grade of linoleum and will outwear many applications of the latter.

The price of Marbleoid flooring, sanitary coved base, wainscoting, stair work, etc., varies, naturally, with the area involved, nature of the foundation (wood, concrete or iron) and location.

With crews constantly in the field, THE MARBLEOID COMPANY is enabled to figure an installation by its

own workmen, at a considerable distance from headquarters, to much better advantage than would be the case were it necessary to transport workmen in each instance from New York City.

Upon receipt of data giving information regarding nature of foundation, the area of floor and wainscot, lineal extent of sanitary base, treads, etc., a definite proposal for the work completely installed will be furnished.

### Guarantee.

THE MARBLEOID COMPANY rigidly guarantees the quality of its material and all work performed by its own workmen, and will repair, free of charge, all defects due to the use of improper materials or workmanship.

### Samples, etc.

Samples and color card, together with full literature including booklet, foundation sheet, etc., will be gladly mailed on request.

### References.

Marbleoid flooring is standard of specification and is used extensively by the following corporations:

General Electric Co.	United Gas Improvement Co.
Standard Oil Co.	National Tube Co.
American Can Co.	L. E. Waterman Co.
Bethlehem Steel Co.	F. W. Woolworth Co.
Pennsylvania Railroad Co.	Willys-Overland Co.
Crucible Steel Co. of America.	Beechnut Packing Co.
American Sheet & Tin Plate Co.	Procter & Gamble Co.
General Chemical Co.	R. Wallace & Sons Mfg. Co.
American Bridge Co.	Continental Gin Co.
Carnegie Steel Co.	Standard Welding Co.
Armour & Co.	Western Electric Co.
Swift and Co.	Packard Motor Car Co.
Remington Arms U-M-C Co.	Reo Motor Car Co.
Singer Sewing Machine Co.	Hudson Motor Car Co.
White Sewing Machine Co.	Firestone Tire & Rubber Co.
Bridgeport Brass Co.	The Gorham Co.
Standard Steel Car Co.	American Platinum Co.
American Rubber Co.	Aluminum Co. of America
New York Central Railroad Co.	Westinghouse Electric Co.
Atlas Powder Co.	American Pulley Co.
Yale & Towne Mfg. Co.	Edison Mfg. Co.

GOVERNMENT WORK—THE MARBLEOID COMPANY has installed work for the following departments of the Federal Government:

Department of Commerce and Labor	Lighthouse Service
War Department	Bureau of Standards and Weights
Navy Department	Panama Canal Department
Department of the Interior	Bureau of Printing and Engraving
Treasury Department	

# MAS-OLEUM FLOOR MFG. CO.

## Mastic Linoleum

11 South La Salle Street  
CHICAGO, ILL.

### Products.

MAS-OLEUM (Mastic Linoleum) SANITARY FLOORING: Fiber Mastic Floor Covering; Composition Flooring; Rubber Flooring, and Asphalt Mastic Flooring.

### Description.

Mas-Oleum (mastic linoleum) is an asphaltic mastic linoleum, a combination of hydrocarbons with mineral caoutchouc and asbestos fiber, to which has been added color pigments, and then sufficiently fluxed with mineral oil, permitting its use on weak and unsupported floors, where a heavy material would be prohibited. Mas-Oleum (mastic linoleum) can be nailed, sawed or drilled like wood. It contains no sand, slag, cement or sawdust and is fireproof, waterproof and dustless.

### Advantages.

Mas-Oleum (mastic linoleum) can be laid indoors or out, and contains no substance soluble in water. It is laid monolithic, without seam or point, and when installed in connection with a sanitary cove, base or wainscot, forms a hermetically sealed, perfectly sanitary, verminproof and waterproof flooring, without cracks or crevices, and is noise resisting.

Can be cleaned with hot or cold water, or disinfectants, and dries rapidly.

Is absolutely non-absorbent and its elasticity prevents cracking or disintegration.

Mas-Oleum (mastic linoleum) will withstand the most severe usage. Heavy blows may bruise or dent the surface, but no cracks will occur.

### Application.

Mas-Oleum (mastic linoleum) is laid directly on any floor surface—wood, concrete, steel, tile, brick, asphalt or fabric surfaces. It is laid in 5 or more thin coats trowelled or rolled and the 5 coats when completed should be  $\frac{1}{8}$  in. in thickness. The first or primer coat is followed by 3 or more filler or body coats, with a finishing coat trowelled hard, which may be waxed, if desired.

Any ordinary workman, by following printed instructions furnished, can lay Mas-Oleum (mastic linoleum).

### Scope of Use.

Mas-Oleum (mastic linoleum) may be used for floors, walls, tanks, swimming pools, vaults, silos, etc., on either interior or exterior surfaces, and for bridges, tunnels, subways, track elevations, pent houses, washrooms, battery rooms, sidewalks, aisles, etc.

### Economy.

Mas-Oleum (mastic linoleum) is the cheapest permanent floor covering offered today; costs less than battleship linoleum, composition, and, in many cases, less than wood flooring.

### Guarantee.

This company guarantees every Mas-Oleum (mastic linoleum) floor laid by them for a period of 2 years and will repair, without charge, any and all defects due to defective material or imperfect workmanship. Surety bond furnished when desired.

### References.

CHICAGO, ILL.

Municipal Pier  
Marshall Boulevard Administration Building, Municipal Plant  
Municipal Bath Houses, 24th Street and Kedzie Avenue  
Chicago Public Library, Woodlawn Branch  
Y. M. C. A. North Side Boys' Club, 1508 N. Larrabee Street  
Chicago Arena, Ice Skating Rink, 5875 Broadway  
Builders & Traders Exchange, Chamber of Commerce Building  
Elks' New Club House, 179 West Washington Street  
Resurrection Fathers Home, Larramie and Belden Streets  
Mid City Trust & Savings Bank, Madison and Halstead Streets  
Wm. G. Carnegie, Architect, Reception, Drafting and General Offices  
Trinity Lutheran Church, Oak Park  
Jepsen & Murmann, Commission, 222 West South Water Street  
Mercy Hospital, 26th and Calumet Streets  
Iris Theater, 5747 West Chicago Avenue  
Hamlin Theater, Madison and Hamlin Streets  
Sherwin-Williams Co., Washrooms, Kensington  
John Bader Lumber Co., General Offices, 2020 Clybourn Avenue  
Gutman Tannery, Washrooms, Toilets, etc., Webster and Dominick Streets  
Mikesell Brothers, General Offices, 178 North La Salle Street  
South Park Commissioners, Drafting Rooms, 57th Street and Cottage Grove Avenue

### OTHER LOCALITIES

City Hall, Evanston, Ill.  
American Can Company, Maywood, Ill.  
Masonic Temple, Maywood, Ill.  
State Penitentiary, Cells, Halls, Verandas, etc., Peoria, Ill.  
United States Government Buildings, Fort Worth, Tex.  
Sanitarium of Paris, Paris, Tex.  
S. W. Nichols, Dallas, Tex.  
Albert Kahn, General Offices, Marquette Building, Detroit, Mich.  
Dalton Hotel Annex, Jackson, Mich.  
Friederich Music House, Grand Rapids, Mich.  
Elks' Home Building, Dubuque, Iowa  
St. Francis Hospital, Carroll, Iowa  
Successful Farming Publishing Co., Des Moines, Iowa  
Napanee High School, Napanee, Ind.  
Gary Public Schools, Gary, Ind.  
Hospital Association of City of Schenectady, Schenectady, N. Y.  
Standard Aniline Products, Wappingers Falls, N. Y.  
Wm. Wirt, Lake George, N. Y.  
Waukesha Moor Bath, Waukesha, Wis.  
Town Club, Milwaukee, Wis.  
Builders' Exchange, Milwaukee, Wis.  
Memorial Hospital, Richmond, Va.  
Virginia Railway Power Co., Richmond, Va.  
Miller & Rhoades Department Stores, Richmond, Va.  
Central Y. M. C. A., Cincinnati, Ohio  
St. Joseph Hospital, Lorain, Ohio  
Worcester Hahnemann Hospital, Worcester, Mass.  
Boston Elevated Railway Co., Boston, Mass.  
Van Felleet-Freear Co., San Francisco, Cal.  
Dooly Block, Salt Lake City, Utah  
Chas. W. Rodgers, Seattle, Wash.  
Standard Oil Company, Louisville, Ky.  
Hackensack Hospital, Hackensack, N. J.



Y. M. C. A. NORTH SIDE BOYS' CLUB, CHICAGO



# FRANKLYN R. MULLER & COMPANY

Manufacturers of Composition Flooring

800 Madison Street

WAUKEGAN, ILL.

CHICAGO OFFICE, 1204-8 So. Dearborn Street—Telephone, Randolph 708

## Product.

MULLER ASBESTONE COMPOSITION FLOORING.

## Description.

Muller Asbestone composition flooring makes a floor that is fireproof as its name implies. It is resilient and agreeable to walk on, not hard and ringing like tile, more like a floor of hard, smooth rubber. But it is firm and blow resisting, not spongy like linoleum. It is perfectly smooth and sanitary, no crevices as in tile or wood. It is manufactured in a variety of soft, warm colors that will harmonize with any color scheme and impart a cheerful and homelike atmosphere to any interior.

Muller Asbestone composition flooring is prepared by us as ordered for the individual job. The composition is a scientifically compounded mixture of calcined magnesite, magnesium chloride and other proper ingredients to assure a uniform material to be used for sanitary and fireproof floors that will give satisfaction as to wear, appearance and easiness to the tread—one that is easy to keep clean and of moderate cost.

All ingredients are scientifically tested as to their chemical and physical properties by a graduate chemist in our completely equipped laboratory. They are then carefully compounded by competent workmen under the supervision of an expert. A thoroughly equipped plant capable of producing 20,000 sq. ft. per day, and unequaled transportation facilities assure prompt delivery.

## Information Required for Estimating.

State character and location of building. Give number of square feet of floor, and number of lineal feet of sanitary base. State whether underfloor is to be of wood or concrete.

## Specification.

**CONCRETE UNDERFLOORS**—Must be composed of 1 part of a good standard Portland cement, 2 parts of clean, sharp sand, and 4 parts of clean gravel or crushed limestone.

Same must be thoroughly tamped and leveled with wood float, and brought up to within  $\frac{1}{2}$  in. of desired finished floor line to a true, even surface, free from holes or projections.

All pitches to drains, slopes and levels must be provided for within  $\frac{1}{2}$  in. of desired finished floor line in underfloors.

Wherever pipes that are subject to expansion and contraction pass through concrete underfloors they shall be surrounded by sleeves large enough to allow for necessary expansion. All pipes imbedded in concrete, and subject to expansion and contraction, shall be covered with asbestos pipe covering, over the top of which there shall be not less than 2 ins. of concrete. This work to be included in masonry contract.

**BACKINGS FOR BASE AND WAINSCOT**—All plaster shall be brought down to a ground, preferably of metal, at a point where composition shall terminate. The desired backings for composition, if of brick, terra cotta, stone or metal lath, shall be



covered with a coating of Portland cement free from lime and brought up to within  $\frac{3}{8}$  in. of desired finished surface. This cement shall be not less than 1 in. thick and be of 1:2:4 mix.

**WOOD BACKING**—This applies to floor, base and wainscoting over wood. Wood backing shall be of soft wood, rough stock not over 8-in. face, securely face nailed to joists or studding, and made as rigid as possible. The same shall be brought up for floors to within  $\frac{1}{2}$  in. of desired finished surface and within  $\frac{3}{8}$  in. for sanitary base and wainscoting. If lumber is faced one side, have rough side up or out, as composition can then get a better hold. This work to be included in carpenter's contract.

**REINFORCING OVER WOOD FLOOR**—Where composition is to be laid over wood floors, it shall be reinforced with expanded metal binder, laid across the boards, and nailed with  $\frac{7}{8}$ -in. large headed roofing nails every 6 ins., alternate nailing.

**COMPOSITION FLOORS, WAINSCOTING AND BASE**—Composition floor shall be laid  $\frac{1}{2}$  in. thick over underfloor as specified. Composition wainscoting shall be laid  $\frac{3}{8}$  in. thick over backings as specified. Installation of composition shall not take place until after trim is set, all glass in, and plastering done; in fact, all construction work, as nearly as possible, to be completed.

Temperature where installation is made to be not less than 45° Fahr.

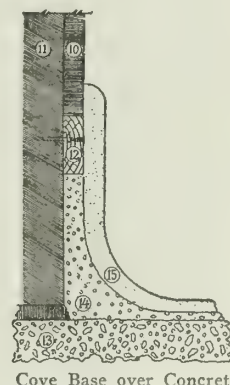
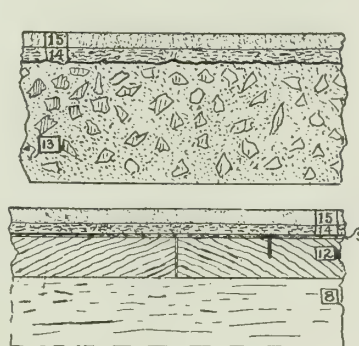
Surfacing of composition floors shall be done in first-class, workmanlike manner with a trowel, and any composition surfaced by grinding, honing or scraping shall be removed and replaced by new material finished with a trowel. The surface of composition shall be true and even, and of a permanent color throughout.

**TO SECURE TILE EFFECTS**—The finished floor shall be surface scored to represent tile or marble slab in such sizes as may be specified by the architect.

Inlaid border or base and border may be made of different color from the field. Plans for the same will be submitted by the architect.

**FINAL SURFACING**—After floor has had its initial set, it shall be properly and thoroughly oiled and waxed.

**NOTE**—A neatly arranged specification in regular filing size, according to standard of American Institute of Architects, furnished on request.



Cove Base over Concrete

**METHOD OF INSTALLING FLOOR OVER CONCRETE OR WOOD**  
(8) Joist, (9) Metal Binder, (10) Plaster, (11) Wall, (12) Wood Floor or Bead, (13) Concrete Subfloor, (14) Cushion Coat, (15) Top Coat

RELATIVE VALUES OF COMPOSITION FLOOR AND FIVE OTHER MATERIALS MOST COMMONLY USED

Kind of floor	Sanitary properties	Quietness	Resiliency	Non-slipperiness	Appearance	Waterproof	Durability	Resistance to fire	Relative weight	General average	Percentage of cost
Composition.....	100	75	90	100	90	96	70	100	60	86	50
Tile.....	75	05	04	00	95	90	100	100	47	57	100
Terrazzo.....	90	03	03	00	90	100	95	100	47	53	65
Linoleum.....	70	100	100	100	85	50	05	00	87	66	25
Wood.....	35	90	90	50	100	25	50	00	100	60	45
Cement.....	90	01	01	70	55	100	90	100	49	62	10

# SPECIAL SERVICE FLOORING CORPORATION

Engineers, Contractors and Manufacturers of Composition, Asphalt and Industrial Floors

Grand Central Terminal  
NEW YORK, N. Y.

BRANCH OFFICES IN PRINCIPAL CITIES  
FACTORY AT MAMARONECK, N. Y.

## Products and Services.

SPECIAL SERVICE MAGNESITE COMPOSITION FLOORING.

SPECIAL SERVICE MASTIC FLOORING.

SPECIAL SERVICE ASPHALT COMPOSITION FLOORING and DECKING.

SPECIAL SERVICE CONCRETE HARDENER.

SPECIAL SERVICE FLOORING, for Special Conditions. FLOORING ENGINEERS and CONTRACTORS.

## Special Service Floors.

Sanitary, durable, dustproof, resilient, fireproof, verminproof and germproof; they are sound deadening, quickly installed, and never become slippery even when wet.

Designed to meet the various service requirements. The entire floor problem is assumed by the corporation, one of whose engineers interviews the customer to ascertain what may be *particularly required of the new floors*; after these specific data shall have been obtained, the flooring materials will be manufactured at the company's factory expressly for the special service to which the new floor is to be subjected. The best materials and treatments are used to take care of the individual floor in question, the traffic to be met, etc.

## Adaptability.

Special service floors can be laid over wood, concrete or steel and are extensively used in industrial buildings, public buildings, hospitals, schools, residences and naval vessels.

## Installation.

Floors are installed by the experienced mechanics of this corporation anywhere in the United States or Canada. These materials can be used over all kinds of construction and are suitable for floor, base, wainscot and stair work, in both new construction and in existing buildings. Prompt installation is warranted.

The formulæ and methods of installation are based on 10 years' actual experience in various installations of special service floors in all kinds of buildings in all parts of the country, the results of different formulæ and methods being carefully noted in all cases; this policy, therefore, well enables the corporation to give the proper floor for each particular requirement.

## Special Service Magnesite Composition Flooring.

Special Service magnesite composition flooring is generally laid  $\frac{1}{2}$  in. thick over wood, concrete or steel; can be installed at any temperature down to  $18^{\circ}$  below zero; is not affected by changes of temperature or humidity; is fireproof; does not dust; having the quality of springiness, it does not tire a person who stands on it; is smooth, sanitary and adapted for use where absence of dust is necessary.

COLORS—Made in all colors.

## Special Service Mastic Flooring.

It is installed by cold process and is built up in four layers. Is very resilient and presents a pleasing appearance; is flashproof and a good thermal insulator; is usually laid  $\frac{1}{8}$  in. over concrete, composition, steel or wood.

COLORS—Brown, black, red and green.

## Special Service Asphalt Flooring and Decking.

Is laid usually from  $\frac{5}{8}$  to  $1\frac{1}{2}$  ins. thick over wood, concrete or steel; is *guaranteed* not to creep; has been successfully used in factories, naval vessels, recreation roofs and other places where a floor or decking is required to be extremely resilient, waterproof and durable.

COLOR—Laid in black only.

## Special Service Concrete Hardener.

Is a colorless liquid for hardening and dustproofing concrete surfaces. The treatment does not interfere with the use of the floor at all.

## Special Flooring for Special Conditions.

Special floors are installed by this company to resist action of corrosive acids, such as hydrofluoric acid, for use in coal bunkers and under other difficult conditions.

## Manufacture of Products.

Raw materials, magnesite, asphalt, color, and all other ingredients of very highest grade and test, are carefully selected; first, analyzed by means of chemical tests conducted by the company's chemical engineers at time of purchase; second, a re-analysis before the manufacture of same; third, a check analysis before shipment.

## Supervision.

A corps of skilled mechanics, trained during 10 years, work under the direction of the company's president, assuring uniformly successful installations. These men have had long experience in floor operations under all conditions in all parts of North America.

## Guarantee.

All products installed by the corporation are *guaranteed* by it against all defects of materials and workmanship.

## Quick Shipments.

Large stocks of raw materials are kept on hand at all times. A siding of the New York, New Haven & Hartford R.R. Co. permits loading direct from the factory at Mamaroneck, N. Y., into cars, facilitating quick shipment of materials. Manufacture and shipment of products are carried out on short notice.

## Estimates, Samples, Literature.

Gladly supplied upon application.

## References.

This corporation has installed work for many of the leading architects and engineers in the United States and Canada, names of whom will be gladly given on request.

Among the installations made are the following:

Aeolian Co.	R. H. Macy & Co.
American Can Co.	New York Edison Co.
Botony Worsted Mills	New York City Sea View
Curtis Engineering Co.	Hospital
Electro Dynamic Co.	New York Telephone Co.
Elyria Iron & Steel Co.	Our Lady of Victory Hospital
General Chemical Co.	and Orphanages, Lackawanna, N. Y.
General Electric Co.	Portchester Memorial Hospital
Johnson & Johnson	Turner Falls Power & Electric
Linde Air Products Co.	Co.
Mamaroneck Republican Club	West Point Military Academy



# P. M. BRUNER GRANITOID CO.

Frisco Building  
ST. LOUIS, MO.

## ALBERT GRAUER & COMPANY

216 Columbia Street, East  
DETROIT, MICH.

## Manufacturers of Cement Floor Finish

### BRANCH OFFICES AND AGENCIES

AKRON, OHIO, FLOWER MANTEL Co.  
ATLANTA, GA., STRAFFORD R. HEWITT  
BUFFALO, N. Y., ALBERT GRAUER & COMPANY  
CLEVELAND, OHIO, ALBERT GRAUER & COMPANY  
DAYTON, OHIO, JOHN G. POOL Co.  
FORT WAYNE, IND., JOCQUEL-SCHULZ Co.  
KANSAS CITY, MO., J. P. SPRAGUE Co.

LANSING, MICH., W. T. BRITTEN  
MONTREAL, CAN., WINDOW STRIP & SUPPLY Co., LTD.  
PITTSBURGH, PA., J. B. BOOTH & Co.  
ROCHESTER, N. Y., AMERICAN CLAY & CEMENT CORPORATION  
ST. PAUL, MINN., PAUL J. KALMAN Co.  
TOLEDO, OHIO, THE BUILDING PRODUCTS Co.  
WASHINGTON, D. C., SOUTHERN BUILDING SUPPLY Co., INC.

### Products.

#### DUSTLESS CEMENT FLOOR FINISH.

For the "BRUNER" System of Reinforced Concrete Sidewalk Lights, Skylights and Floor Lights, see pages 824-26.

### Dustless Cement Floor Finish.

This company has introduced a new product for the finishing of reinforced concrete floors in office buildings, apartments, hotels and warehouses; in short, for any location where a smooth, durable, dustless floor is desired.

### Process.

Cement sidewalks are the standard paving in all cities, and cement, by this process, will become the standard material for floors in public buildings.

This company guarantees to lay on reinforced concrete a topping coat or wearing coat,  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. thick, that will become monolithic or integral with the foundation, so as to be solid, even, durable and agreeable.

### Colors and Finishes.

These floors can be laid in plain cement color, or in different shades, of black, green, red or other colors. They can be ground and polished to produce variegated color effects.

### Hardening.

Hardening method patented by P. M. Bruner.

### Thinner and Lighter Than Wood Floors.

Dustless cement floors add but  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. thickness, and only 5 to 8 lbs. per sq. ft. in weight to

the floor load, while a wooden floor would add  $2\frac{1}{2}$  ins. to the thickness of floor and from 20 to 25 lbs. per sq. ft. to the floor load of each story.

### Preparation of Subfloors.

The subfloor should be laid so that not over  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. of topping is necessary in order to meet all grades. This must be done by the use of straightedge or grade sticks. This subfloor should also be laid with a view to having as little laitance as possible.

### Specification.

Specify, "Cement finish to be laid according to the 'Bruner Process,' and to be guaranteed not to turn sandy or dusty, nor to break up or become uneven."

### Cost.

The cost of dustless cement floors is but one-half as much as wooden floors on concrete and less than half as much as other kinds of floors.

Circulars, terms and prices gladly supplied on request.

### References.

Chicago Bell Telephone Co., Wisconsin Bell Telephone Co., and many private owners; Holabird & Roche, Marshall & Fox, and E. E. Roberts, all architects of Chicago, Ill.; A. B. Groves, William Levy, Theodore C. Link, and Ittner & Brueggeman, all architects of St. Louis, Mo., also the following general contractors: James Black Masonry & Contracting Co., St. Louis, Chicago, Omaha, Detroit, Cleveland, Boston; James H. Bright Contracting & Building Co. and W. M. Sutherland Building & Construction Co., both of St. Louis, Mo.; Michigan State Telephone Co., and Smith, Hinchman & Grylls, architects; Real Estate Exchange Building, Detroit, Mich., Louis Kamper, architect.

# CONCRETE HARDENING CO., INC.

220 Fifth Avenue  
NEW YORK, N. Y.

## Products.

Manufacturers of EVERLAST, a HARDENER and DENSIFIER of Cement and Concrete Floors.

### Everlast Concrete Hardener.

A colorless, liquid, chemical concrete hardener which permanently makes concrete wear resisting and, therefore, dustproof. Everlast actually changes the component parts of cement into a granitelike and insoluble mineral; it protects concrete against the action of water, oil, acids or other chemicals; it *penetrates old or new concrete* and hardens it to the density and solidity of granite.

**CHEMICAL ACTION OF EVERLAST**—The chemical action resulting from the combination of the liquid Everlast and the concrete renders the latter unaffected by wear and tear, as well as proof against powdered dust, while at the same time contributing to the waterproofing features of the installation.

**ADVANTAGES OF EVERLAST**—The immediate effects, therefore, of proper applications of Everlast include the following economic and advantageous characteristics of first class concrete floors: (1) Prevents cracking. (2) After Everlast is applied, no dust can arise to impair health of workmen or cause injury to fine and vital parts of machinery, etc. (3) Crumbling or pulverized concrete (signs of incipient disintegration) will not appear in a concrete floor treated with Everlast. (4) The floor as treated becomes immediately impervious to action of acids or other chemicals, fumes, oils, water and all deleterious substances. (5) Health of employees is improved. (6) Cost of application is nominal.

### Tests on Everlast.

(1) Two concrete blocks, weighing 870 grammes each, after 300 revolutions in a carborundum disk, lost weight as follows: the untreated block, 425 grammes; the treated block, only 124 grammes.

(2) A weight dropped 6 times on concrete treated with Everlast produced same results as were obtained by dropping it *once* on untreated concrete.

(3) A saw blade drawn 8 times across concrete treated with Everlast produced same results as when drawn across untreated concrete *once*.

These scientific and practical tests show that Everlast makes concrete wear resisting, dustproof and impermeable to acids and water.

### General Information.

To get maximum efficiency Everlast must be properly absorbed by the concrete. Dense concrete will absorb slowly; therefore, under this condition applications should be of less concentration. A worn floor will absorb more rapidly, requiring a more concentrated solution of Everlast, together with more numerous applications. Concrete floors can be used immediately after application; but it is recommended that floors be allowed to dry for about 2 hours before being used. Everlast will not act chemically on painted floors.

### Instructions for Application of Everlast.

**ON CONCRETE FLOORS**—All concrete floors (new and old) should be dry, clean and free from dust, dirt

or oil before application of Everlast thereto. Application may be made by unskilled labor.

**PROPORTIONS OF EVERLAST, WHEN DILUTED**—For average floors, the first application to be 1 part Everlast to 1 part water; second application, Everlast to be undiluted. Apply the mixture liberally until floor is thoroughly saturated; 2 applications should be sufficient to harden any well-laid dense floor.

**On Old Floors of Uneven Construction**—If floor is old and very porous, a third application of Everlast, *undiluted*, should be given until floor acquires the desired hardness; this will be necessary in exceptional cases only.

**TIME FOR APPLICATION**—These applications should be made at intervals long enough to allow the concrete to dry thoroughly; in factories, it is convenient to make applications 24 hours apart; in any case, however, applications may follow at intervals of a few hours, day or week.

**MANNER OF APPLICATION**—Flush Everlast from a pail and distribute on floor with a brush or broom having a long handle.

**On New Concrete Floors**—New concrete floors must be allowed to harden before treating same, and be free from dirt, oil, etc.

**COVERING CAPACITY**—A gallon of Everlast will cover an area of 100 sq. ft., *twice applied*. Any unskilled laborer can apply Everlast; an average man should be able to cover from 10,000 to 15,000 sq. ft. per day, one application.

### Samples and Prices.

A sample concrete block, one-half of which is treated with Everlast, will be mailed on request; the wonderful chemical action of Everlast is clearly observed by scratching the treated and untreated parts with a hard instrument. Prices sent on application.

### References.

Limited space permits mention of a few satisfied users:

Thomas A. Edison Works, Orange, N. J.  
Metropolitan Life Insurance Co., New York, N. Y.  
National District Telegraph Co., New York, N. Y.  
Department of Parks and Public Properties, Newark, N. J.  
Bethlehem Motor Truck Co., Allentown, Pa.  
Board of Education, Bridgeport, Conn.  
Department of Docks and Ferries, New York, N. Y.  
Fire Department, New York, N. Y.  
Guarantee Securities Corporation, New York, N. Y.  
Eastman Kodak Co., Rochester, N. Y.  
Lynch & Larkin, Yonkers, N. Y.  
Burke Bros. Construction Co., New York, N. Y.  
Max Rubel & Co., New York, N. Y.  
General Typewriter Exchange Co., Brooklyn, N. Y.  
Adolph Gobel Provision Co., Brooklyn, N. Y.  
Steel Sales Corporation, Chicago, Ill.  
Moore Steam Turbine Corporation, Welleville, N. Y.  
Henry Disston & Co., Philadelphia, Pa.  
Union Stockyards & Transit Co., Chicago, Ill.  
American Steel & Wire Co., Waukegan, Ill.  
National Printing & Engraving Co., New York, N. Y.  
Dancy Davis Press, New York, N. Y.  
Shubert Piano Co., New York, N. Y.  
Sweet Bros., Paper Manufacturers, Phoenix, N. Y.



# THE MASTER BUILDERS COMPANY

## Metallic and Liquid Concrete Floor Hardeners

### CLEVELAND, OHIO

SALES OFFICES

NEW YORK

CHICAGO  
LONDON, ENG.PHILADELPHIA  
AMSTERDAM, HOLLAND

DETROIT

INDIANAPOLIS  
CHRISTIANIA, NORWAY

MONTREAL

TORONTO  
SYDNEY, N. S. W.

#### Product.

MASTER BUILDERS CONCRETE HARDNER, used in accordance with the MASTER BUILDERS METHOD for making concrete floors dustproof, wearproof and waterproof.

MASTER BUILDERS SANISEAL, a liquid preparation for hardening and dustproofing cement floors.

#### Patents.

Licensed for use under Patent No. 830,003. Also, owners of Patents Nos. 1,113,112; 1,012,832 and 13,598.

#### Description and Advantages of Master Builders Method.

Ordinary concrete floors dust and wear into ruts and holes. The reason for this is their porous structure and lack of proper wearing aggregate. Master Builders Method is a formula for building concrete floor surfaces according to definite, standardized principles which eliminate the defects of ordinary concrete floor construction and produce wearproof, dustproof and waterproof concrete floors.

To accomplish this result, Master Builders Method employs Master Builders Concrete Hardner, a perfectly graded, scientifically treated metallic aggregate, which, when added to the sand and cement when the topping of the floor is installed, eliminates all pores and supplies a hard wearing, permanent, non-abrasive element that withstands the wear and tear under which ordinary concrete floors break down and wear out.

Master Builders Method is the original and standard method for producing concrete floors that will not dust or absorb moisture and that will resist the hardest kind of wear. Over 25,000 users have more than 80,000,000 sq. ft. of surface in use to date.

#### Master Builders "Standard" Specification.

Recommended for making wearproof, dustproof and waterproof concrete floors in every type of building.

Wherever practicable, topping to be laid before base has set.

PROPORTIONS OF TOPPING—Topping (thickness at least full  $\frac{3}{4}$  in.) shall consist of the following proportions: 1 part tested Portland cement; 2 parts coarse, gritty, clean sand.

If rock or grit is used in addition to sand, specify as follows, instead of above: 1 part tested Portland cement; 1 part crushed rock or grit (not over  $\frac{3}{8}$  in. in size), free of dust; 1 part clean, coarse, gritty sand.

MEASURING VOLUMES—These proportions shall be accurately measured by volume, in suitable size boxes. No counting by shovels, or measuring by wheelbarrows or other approximation will be permitted. To determine proper proportions, 1 bag of cement shall equal 1 cu. ft. of sand or grits.

ADDITION OF WATER—Mix thoroughly dry until uniform in color, showing no streaks or patches of the constituents; if mixed by hand, topping aggregate shall be turned over dry three times. Add sufficient water to saturate mixture and mix thoroughly again. Topping shall at no time be made sloppy.

APPLICATION OF TOPPING—Lay and straight-edge the topping to a true and even surface; float the surface well with wooden floats to close all voids and hollows.

THE WEARPROOF FINISH—A dry mixture of 1 part Master Builders Concrete Hardner to 1 part tested Portland cement (by weight), mixed to an even color, shall be sprinkled evenly over surface. Not less than 20 lbs. of Master Builders Concrete Hardner and 20 lbs. of Portland cement shall be distributed in this manner over each 100 sq. ft. This shall be



Master Builders Method

TRADE-MARKS

Registered United States  
Patent Office

floated in thoroughly and troweled. A second troweling shall be given surface when it has set sufficiently to finish hard and smooth.

Under no circumstances shall the wearproof finish be applied when there is any surplus water on the floated surface.

SAFEGUARDING THE FLOOR—After topping has set up, contractor shall cover it with a uniform layer of soft wood sawdust, shavings, or other suitable covering. This covering must not be applied until experiment shows surface hard enough to prevent covering from scratching or injuring the finish. Surface shall be kept wet for at least 5 days. Floors, if protected as above, will be ready for light traffic in 1 week, and for heavy traffic in 3

weeks, under favorable weather conditions.

EXCEPTIONS—The foregoing "Standard Specification" is the standard method of procedure for the average building. The 20 lbs. of Master Builders Concrete Hardner recommended per 100 sq. ft. will give a surface which will withstand any average service. However, there are some cases where the quantities should be varied. These exceptions follow:

In buildings where floors are subjected only to light foot traffic, specify 15 lbs. of Master Builders Concrete Hardner to every 100 sq. ft. for the wearproof finish. For floors, piers and loading platforms, etc., which receive extremely heavy wear, specify 25 lbs. of Master Builders Concrete Hardner to every 100 sq. ft. for the wearproof finish. For railroad repair shops, forge shops, etc., specify 30 lbs. of Master Builders Concrete Hardner to every 100 sq. ft. for the wearproof finish.

#### Master Builders Red or Black Concrete Hardner.

Either of these colors may be obtained, combined with the hardening elements found in the regular Hardner, and are particularly desirable to use where the decorative fitness of the floor is as important as its wearing qualities.

#### Master Builders Saniseal.

On concrete floors, already laid and not giving satisfactory service, or where it is impossible or impracticable to use a metallic hardner in laying the floor, Saniseal is the ideal material to use. It combines with the lime in the cement, forming a new crystal that is exceedingly hard and wear resisting. It changes the soft, porous surface to a flintlike hardness.

Saniseal is easy to use. No involved mixture or dilutions are required. An ordinary workman can apply it. One or 2 applications are all the average floor requires, and are equal in accomplishment to 3 of any other material on the market for a similar purpose. Except where a floor is exceptionally porous, 1 gal. of Saniseal will cover approximately 100 sq. ft. It does its work quickly, overnight in most cases, and costs so little there is no excuse or reason for longer putting up with the intolerable conditions that dusting, crumbling, scaling concrete floors bring about.

#### Contractor's Guarantee Service.

Throughout the country, many contractors are specializing in Master Builders Method floors, giving a positive guarantee of results. Architects or owners who are interested in securing a floor that is *guaranteed* dustproof, wearproof and waterproof, should write this company for further details. Where the floor surface to be treated with Saniseal is 25,000 sq. ft. or over, Master Builders service department will take over the work, if desired, and give a *guarantee* of results.

## L. SONNEBORN SONS, INC.

Manufacturers of Concrete Floor Hardeners, Special and Technical Paints

262 Pearl Street  
NEW YORK, N. Y.

FACTORY, AVONDALE, N. J.

### Products.

LAPIDOLITH, a HARDENER for Concrete Floors and a permanent WATERPROOFER for Concrete and Stucco Walls; CEMCOAT, a WALL and FLOOR COATING for Concrete, Brick, Wood, Metal, etc.

Hydrocide, for dampproofing foundations and walls; Structural Steel Paints.

### Lapidolith.

Lapidolith is a liquid chemical which renders concrete floors hard, dust-proof, wearproof and watertight. When applied to old concrete floors, Lapidolith will prevent further dusting and disintegration.

**LAPIDOLITH**  
TRADE MARK

### Advantages of Lapidolith.

Prevents dusting and wear of floors, because the texture of the floor, after this chemical has permeated it, is as hard as granite.

Lapidolized floors take on a fine surface finish under service.

After Lapidolith is used floors will not crumble or dust, thus saving cost of expensive repairs to machinery and injury to merchandise.

The labor cost of applying Lapidolith is negligible. Only unskilled labor is required, and an average man should be able to cover from 10,000 to 15,000 sq. ft. per day with one application.

### Covering Capacity of Lapidolith.

With 3 applications 1 gal. will cover 70 to 100 sq. ft.

This will vary according to porosity of the cement.

To harden the ordinary floor 3 applications are sufficient.

### Tests of Lapidolith.

ABRASION TEST ON BAUSCHINGER APPARATUS—Cubes, 2 weeks old, treated with Lapidolith and untreated, showed the following results after 200 revolutions of the abrasion disk:

Untreated sample weighed before the test.....	750 grams
After the test.....	429 "
Loss 43% or.....	321 grams
Treated sample weighed before the test.....	770 grams
After the test.....	742 "
Loss only 3½% or.....	28 grams

PERMEABILITY TEST—Water was forced under 30-lbs. pressure, through sections of pipe, 1 in. deep and 6 ins. in diameter, filled with concrete treated with Lapidolith and untreated concrete. Concrete used was composed of 1 part of Portland cement and 3 parts of 20-30 Ottawa sand.

Figures below express in cubic centimeters the water which permeated the bodies of concrete in given times:

Time	Water permeated the untreated concrete	Water permeated the Lapidolized concrete
1 minute	1.132 cu. cm.	0.135 cu. cm.
30 minutes	0.186 cu. cm.	0.074 cu. cm.
60 minutes	0.174 cu. cm.	0.046 cu. cm.

### Guarantee of Lapidolith.

The chemical change effected by Lapidolith is guaranteed to be permanent.

### Specifications for Concrete Floors.

Harden and dustproof with Lapidolith, manufactured by L. SONNEBORN SONS, INC., New York, as per the following directions:

HOW TO APPLY—Clean floor of all dust, dirt and oil. Flush on and distribute Lapidolith evenly with a long handled stiff brush.

Allow concrete to dry thoroughly between applications, i. e., allow several hours or longer for drying.

Dilute Lapidolith with water as follows:

First application, 1 part Lapidolith to 2 parts water.

Second application, 1 part Lapidolith to 1 part water.

Third application, 2 parts Lapidolith to 1 part water.

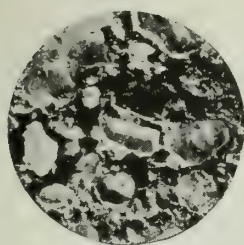
### An Investigation of the Action of Lapidolith on Concrete.

Prof. R. J. Colony, the Petrographer of Cooper Union, New York, a leading consulting authority on concrete, made an examination of treated and untreated concrete under the microscope, and the following is quoted from his official report:

"The external application of Lapidolith to concrete surfaces results in (a) the formation of an optically isotropic but crystalline substance, derived by a reaction between components of the Lapidolith and the 'cement' matrix of the concrete which (b) has a tendency to fill in voids and cavities and act as a binding agent, thus rendering the surface smoother and more uniform."

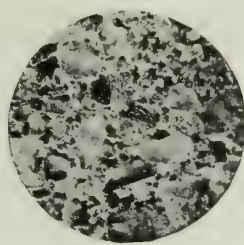
Lapidolith actually forms a new crystalline component, which reduces the pores of the concrete.





Untreated Concrete

Note large numerous voids (black spots) and roughness of surface



Lapidolized Concrete

Note roughness is reduced and voids filled with network of newly formed hard crystalline substance

MICROPHOTOGRAPHS OF SPECIMENS OF CONCRETE  
Magnified 50 diameters

### Testimonials from Users of Lapidolith.

OFFICE OF SUPERINTENDENT OF PUBLIC BUILDINGS, HARTFORD, CONN.—

"We are entirely satisfied with the results obtained by using 'Lapidolith' on our concrete floors. Our only regret is that this material was not put on the floors at an earlier date, as much of the difficulty which we have experienced would have been obviated."

(Signed) PHILIP A. MASON.

UNITED SMELTING & ALUMINUM COMPANY, INC., NEW HAVEN, CONN.—

"Our President has just come back from the Hamden Plant, where you treated about 30,000 square feet of concrete with Lapidolith. He has requested the writer to inform you that the results are very gratifying.

"He wishes to call the attention to one spot where Lapidolith was not used, owing to a heap of Aluminum which could not be moved at the time of treatment. This spot is very soft and crumbling, but next to it, where your material has been applied, the floor is harder than granite.

"I will also remark that the barrel which we purchased from you last year and applied at the New Haven Plant is giving excellent service, and the floor shows no signs of wear.

"We are putting up a large office building in Bridgeport, and will communicate with the architect to be sure that Lapidolith will be used, for we shall not stand for substitutes which we have already experimented with."

### Some Present Users of Lapidolith.

Aetna Life Insurance Co.

Bethlehem Steel Co.

(several plants)

Carborundum Co.

Carnegie Steel Co.

(several plants)

Crane Co.

(several plants)

Crown Cork & Seal Co.

Ford Motor Co.

(several plants)

B. F. Goodrich Tire & Rubber Co.

Goodyear India Rubber Glove Mfg. Co.

Libby, McNeil & Libby

National Lamp Works

New England Westinghouse Co.

Wm. Wrigley Jr. Co.

(several plants)

Aluminum Co. of America

Chalmers Knitting Co.

General Chemical Co.

National Can Co.

Nordyke & Marmon Co.

### Cemcoat for Interior and Exterior Use.

Cemcoat is an ideal enamellike wall and floor coating, in white and colors.

Absolutely free from all poisonous ingredients. It forms an even, non-porous surface which affords no lodgment for dust and can not be injured by soap and water or even water applied by a hose.

The pigment and vehicle used in Cemcoat produce a tough wear resistant and smooth surface, to which

**Cemcoat**

TRADE-MARK

dust and smoke will not adhere and which can easily be maintained in a perfect, sanitary condition.

**CEMCOAT FOR INTERIOR WALLS**—Not affected by extreme heat or extreme cold, steam or water; prevents oil, water, and lime stains, and will not crack, crumble or wear off.

**WHITE GLOSS CEMCOAT**—Reflects all the light and disseminates it equally throughout the room. It does not turn yellow. Unlike enamel, it needs no undercoat, thus lessening the cost.

**COVERING CAPACITY**—1 gal. of Cemcoat will cover 200 to 250 sq. ft. of surface with 2 coats and requires no filler or primer.

**COLORS**—Made in any desired shade. The following standard colors are always in stock:

Gray, red, green, stone, brown, terra cotta, cream, white, concrete, moss green, maroon and black.

**CEMCOAT FOR EXTERIOR WALLS**—Used effectively on brick, tile, slate, stone, wood shingles, canvas or felt and on plaster or concrete. It seals the pores and minute cracks on the surface; and on account of high degree of elasticity and intense adhesion to surfaces, is not affected by expansion or contraction of building material and will not peel off or crack. Lasts indefinitely and will remain waterproof under the most trying conditions.

For walls where moisture must not be allowed to penetrate, Cemcoat is the logical coating.

**CEMCOAT FOR FLOORING**—When a decorative effect is desired, concrete floors may be treated with Cemcoat. It renders them not only attractive, but also free from dust and dampness.

### Specifications for Cemcoat.

For exterior and interior walls or for floors apply 2 coats. Allow 2 days before floors are subjected to heavy wear.

**HOW TO APPLY**—Clean the surface to be coated of all dirt and grease. Thoroughly stir the Cemcoat with a broad paddle, before using, so as to mix the pigment and vehicle, and do not allow any sediment to remain at the bottom of the container.

Apply the Cemcoat with a flat wall brush, working it well into the pores so as to secure an even and well bonded coat.

If any thinning is necessary, use only a little turpentine.

### Further Information.

The following printed matter on Sonneborn products will be sent on request:

Booklets, "Concrete and Lapidolith," and "Report of a Committee of New York Architects."

Samples, flask of Lapidolith and hardened block of concrete.

Specification Booklet covering Lapidolith, also Cemcoat and other products.

# THE MINWAX COMPANY, INC.

## Floor Treating Materials

18 East 41st Street  
NEW YORK, N. Y.

BRANCH OFFICES

CHICAGO, 327 South La Salle Street

PITTSBURGH, Frick Building

BALTIMORE, 546 Equitable Building

BRANCHES IN ALL PRINCIPAL CITIES OF THE UNITED STATES

### Products.

MINWAX FLOOR FILLER and FLOOR FINISH and MINWAX WOOD FILLER and FINISH.

### Materials for Treating Floors.

**MINWAX FLOOR FILLER AND FINISH**—For cement, composition, terrazzo, tile and marble floors. A light amber colored, almost transparent liquid applied cold with a brush. It is a solution of a heavy hydrocarbon wax in a volatile hydrocarbon oil which penetrates the pores and crevices of the floor and gives a thorough subsurface impregnation. The oil quickly evaporates, leaving the wax to hermetically seal the pores and to lend support to the particles. Being acidproof and alkali-proof, it is not subject to subsurface disintegration and lasts as long as the floor. It does not alter the color of the material—except in the case of marble which is given an alabasterlike translucence. It makes a floor non-absorbent, stainproof, and as dustless as a floor can be made.

**MINWAX WOOD FINISH**—Acts upon wood much as Minwax Floor Filler acts upon composition floors, penetrates beneath the surface and fills the pores with a mineral wax. Minwax Finish is in, not on, the wood, therefore outwears and outlasts any surface application. It accentuates and enriches the grain and gives a soft wax finish that can be maintained indefinitely by rubbing with a cloth or brush. Used as a vehicle for stains, it carries them deep into the wood, waxing and staining at one operation. The surface can, if desired, be waxed over Minwax Finish. But the Minwax treatment can not be applied on waxed, varnished or shellacked wood without removal of the latter finish.

### Covering Capacity.

**MINWAX FLOOR FILLER**—The covering capacity is from 100 to 300 sq. ft. per gal., depending on the porosity and finish of the floor.

**MINWAX WOOD FINISH**—The covering capacity is from 250 to 600 sq. ft. per gal., depending on the density of the wood.

### Specifications.

**MINWAX FLOOR FILLER**—Floors shall be turned over to contractor thoroughly dry, broom-clean, and free from all dirt, plaster or other stains. The inside temperature at the time of application shall not be below 60° Fahr.

Floors shall be given 1 brush coat of Minwax Floor Finish and allowed to stand for at least 24 hours without being walked upon. A second coat of Minwax Floor Filler shall then be applied and the floor again left unused for 24 hours.

**MINWAX WOOD FINISH**—Floors (and trim) shall be turned over to contractor dry, clean and free from dust and stains of any kind. Surface shall be well sanded. Inside temperature at time of application of the Minwax Finish shall not be below 60° Fahr.

Wood shall be given 1 thorough brush coat of Minwax Wood Finish and left untouched for at least 24 hours. It is desirable—though not essential—that surface then be thoroughly rubbed down, to remove surplus material. A second coat of Minwax Finish shall then be applied and another 24-hour interval allowed before touching. At the end of that period, the wood shall be thoroughly rubbed off with a clean, dry cloth—preferably cheesecloth.

### Service.

The Minwax system of hardening concrete floors is permanent. Many of the floors treated by us (the Bush Terminal group is a striking example) have been in continuous use, under varying conditions, for over 5 years and are still giving satisfactory service.

### References.

BUILDINGS AND LOCATION	ARCHITECTS
U. S. Post Office, New York, N. Y.	McKim, Meade & White
Pennsylvania R. R. Terminal, New York, N. Y.	McKim, Meade & White
Robert Gair Building, No. 5, Brooklyn, N. Y.	William Higginson Sheldon & Son
Gardner Building, Providence, R. I.	
Bush Terminal Building, Brooklyn, N. Y.	
Edison Plant, West Orange, N. J.	
Warehouse of Deering Milliken & Co., New York, N. Y.	C. H. P. Gilbert
Loose-Wiles Biscuit Co., Long Island City, N. Y.	William Higginson
Studebaker Corporation and Brett Litho. Co. Building, Long Island City, N. Y.	William Higginson
71st Regiment Armory, New York, N. Y.	



BUILDINGS OF BUSH TERMINAL COMPANY, BROOKLYN, N. Y.

There are fourteen of these great buildings and the floors of each one are treated with Minwax



# THE VITRIFYX COMPANY

Manufacturers of Portland Cement, Hydrolithic and Colored; and  
Cement Chemicals

GENERAL OFFICES

Chamber of Commerce Building, 133 West Washington Street  
CHICAGO, ILL.

TELEPHONE, MAIN 1065

## Product.

VITRIFYX, a Liquid Chemical Concrete Hardener.

Makes concrete as hard as granite; is acidproof, dustproof, oilproof, waterproof, and wearproof. As effective on old as on new concrete floors, walls or stucco. Makes concrete wear indefinitely.

## Advantages.

Absolutely no upkeep cost involved, as results are guaranteed to be permanent. The application of this product actually changes the nature of the concrete by acting chemically on the concrete's elements, producing a new component, which is practically wearproof. By acting principally on the weakest part of any concrete floor, namely, the cement matrix, Vitri-fyx imparts strength where it is most needed, and really makes the surfaces undergoing treatment 100% serviceable, as compared to the practice of adding or substituting metal, granite, or other hard substances in the usual cement and sand topping, which obviously does not harden the cement used, the latter remaining unchanged and comparatively soft.

Satisfactory results insured, because it is only necessary to flow the material over the surface to be treated—Vitri-fyx will do the rest.

## How to Use.

Every new concrete floor should be treated with Vitri-fyx before the skin coat on the surface is badly abraded, thereby preserving the original finish. Vitri-fyx may, however, be used successfully on any concrete floor, provided part of topping is still left.

Vitri-fyx is not mixed into the concrete before the concrete is laid, but is applied after the concrete has set and dried. The only requirement for a perfect job is that the work to be treated be of ordinarily good construction, properly finished.

## Cost.

Depends on the area to be treated, and the conditions that the treated work must endure. The cost for all labor and all material varies from 2¢ to 5¢ per sq. ft.

## Territory.

No point too distant.

## How to Specify.

All concrete floors, stair treads, landings, etc.,



TRADE-MARK  
(Reg. U. S. Pat. Off.)

throughout the building, shall be treated with Vitri-fyx, as manufactured by THE VITRIFYX COMPANY, Chamber of Commerce Building, Chicago, in strict accordance with their instructions to render these concrete surfaces [state what is desired—i. e., dustproof; wearproof against heavy trucking; wearproof against foot traffic; acidproof; oilproof; waterproof, etc.].

Detailed information promptly furnished regarding suitability of our product for any special work.

## References.

A few professional references are given below:

Stewart-Warner Speedometer Corporation, Chicago, Ill., L. G. Hallberg & Co., Architects  
Smith Motor Truck Corporation, Chicago, Ill., S. N. Crowen, Architect  
Berhalter Health Foods Company, Chicago, Ill., Richard Greisser, Architect  
William D. Gibson Company, Chicago, Ill., Harold Holmes, Architect  
Central Manufacturing District, Chicago, Ill., S. Scott Joy, Architect  
Louis Geyler Company, Hudson Motor Car Service Stations, Chicago, Ill., C. W. & G. L. Rapp, Architects  
Consolidated Engineering Company, Chicago, Ill., Chatten & Hammond, Architects  
Chicago Mill & Lumber Company, Paper Mill, Chicago, Ill., Louis Guenzel, Architect  
Apartment Buildings (Jackson Highlands), Chicago, Ill., John R. Stone, Architect  
MacMillan Company, Chicago, Ill., H. R. Wilson & Company, Architects  
Dr. Peter Fahrney & Sons Company, Chicago, Ill., N. Max Dunning, Architect  
Saginaw Malleable Iron Company, Saginaw, Mich., Frank D. Chase, Architect  
Western United Gas & Electric Company, Joliet, Ill., Zimmerman, Saxe & Zimmerman, Architects  
Illinois Central Railroad Suburban Stations, Chicago, Ill., O. F. McLaughlin, Architect  
International Harvester Company, Toledo, Ohio, W. D. Price, Architect  
Youngstown Sheet & Tube Company, Youngstown, Ohio  
Stone & Webster, Youngstown, Ohio  
Excelsior Shoe Company, Portsmouth, Ohio  
Central Ohio Paper Company, Columbus and Toledo, Ohio  
Selby Shoe Company, Portsmouth, Ohio  
La Belle Iron Works, Steubenville, Ohio  
Owens Bottle Machine Company, Toledo, Ohio; Clarksburg and Fairmont, W. Va.  
Grand Rapids Blow Pipe Company, Detroit, Mich.  
Gisholt Machine Company, Madison, Wis.  
Felt & Tarrant Company, Chicago, Ill.  
The Seng Company, Chicago, Ill.  
Pheoll Manufacturing Company, Chicago, Ill.  
Wisconsin Pearl Button Company, La Crosse, Wis.  
Vassar-Swiss Underwear Company, Chicago, Ill.  
John V. Farwell Company, Chicago, Ill.  
Hibbard-Spencer-Bartlett Company, Chicago, Ill.

# AMERICAN MASON SAFETY TREAD CO.

LOWELL, MASS.

## BRANCH OFFICES

BOSTON, MASS., 813 Old South Building  
NEW YORK, N. Y., 1565 Fulton Building, 50 Church Street

KANSAS CITY, MO., 604 Ridge Building  
PHILADELPHIA, PA., 900 Widener Building  
WASHINGTON, D. C., 1635 Hobart Street

GENERAL WESTERN DISTRIBUTERS, JOSEPH T. RYERSON & SON, CHICAGO, ILL., and ST. LOUIS, MO.

## Products.

"MASON" SAFETY TREAD (lead or carborundum filled); "MASON" BLACK DIAMOND SAFETY TREAD; "MASON" SAFETY TREAD and CORK COMPOSITION; BRASS and DENTIL NOSING; "STANWOOD" TREAD; KARBOLITH FLOORING.

"Mason" Safety Sidewalk Vault Lights; "Mason" Safety Coalhole and Ash Lift Covers; "Mason" Non-slip Ladder Shoes.

## Uses of "Mason" Safety Tread.

It is adapted for any situation where a safety tread is needed, such as stairways, thresholds of doors and elevators, fire doors, inclined passageways, vestibules of cars, around machinery where the presence of oil is dangerous, etc.

## Description of "Mason" Safety Tread.

"Mason" safety tread prevents accidents caused

## Standard Sizes of "Mason" Safety Tread.

STEEL BASE—Manufactured in widths of  $2\frac{1}{2}$ ,  $3\frac{3}{4}$ , 4,  $4\frac{3}{4}$  and 6 ins. flat; 3 ins. with nosing or overhang and square back, and  $3\frac{1}{2}$  ins. with nosing and beveled back. Combinations of these sizes will give any desired width. It is cut to order, with necessary countersunk holes, and with anchors if for cement work.

HARD BRASS BASE—Manufactured in widths of 2,  $2\frac{1}{4}$ ,  $2\frac{1}{2}$ ,  $2\frac{3}{4}$ , 3,  $3\frac{1}{2}$ , 4 and 6 ins. flat; and with nosing in widths of  $2\frac{1}{8}$  and  $3\frac{1}{2}$  ins. with nosing similar to that with steel base, 2 and  $2\frac{3}{4}$  ins. wide with deep nosing. The 2-in. width, with deep nosing, is undercut at the back and not available for combinations.

## Repair Work.

The best known material for repair work, being applicable upon outer or inner stairs of iron, granite, marble, slate, cement or wood. Used on concrete stairs it saves the edges from chipping.

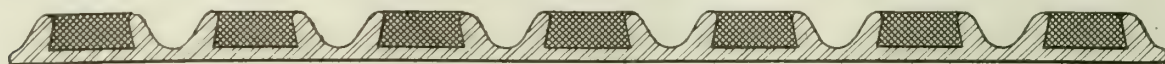


FIG. 1. 6-inch Section, Flat

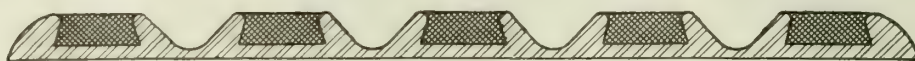


FIG. 2. 4 3/4-inch Section, Flat



FIG. 3. 4-inch Section, Flat



FIG. 6. 2 1/2-inch Section, Flat

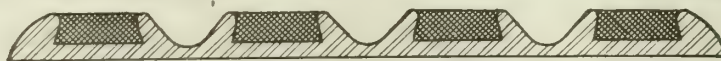


FIG. 3A. 3 3/4-inch Section, Flat

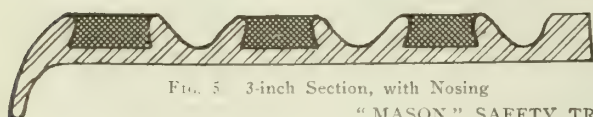


FIG. 5. 3-inch Section, with Nosing



FIG. 4. 3 1/2-inch Section, with Nosing

## "MASON" SAFETY TREAD FULL SIZE CROSS SECTIONS

Steel base, lead or carborundum filled

by persons slipping. Is unaffected by moisture or frost, and is fireproof; materially adds to the structural strength of the tread, and gives an absolutely secure footing. It is recognized by leading architects and engineers as the best, most reliable and most durable safety tread manufactured. It has been in constant use for many years and every year has shown an increased sale. Over 90% of the safety tread in use is "Mason."

Made of rolled steel or extruded hard brass base of substantial thickness ( $\frac{1}{4}$  in.), with dove-tailed grooves filled with lead or carborundum. Open grooves occupy alternate spaces, hence filling and continuous supports wear evenly; there is no filling of open grooves with mushrooming or creeping lead, no jagged edge for the retention of filth and germs, and dirt can be readily swept and washed out. No top dressing to wear off and leave a polished, dangerous surface, as its non-slippery parts remain intact during the whole life of the tread.

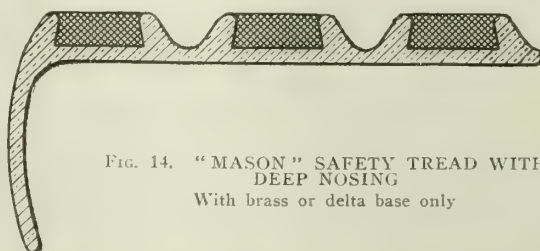
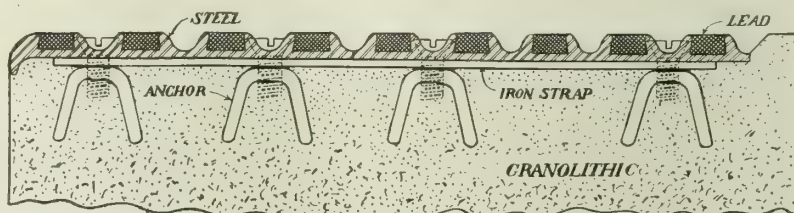


FIG. 14. "MASON" SAFETY TREAD WITH DEEP NOSING  
With brass or delta base only

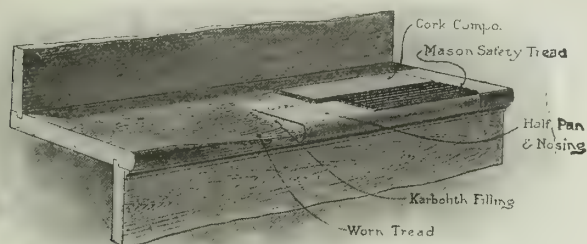


## CROSS SECTION ON GRANOLITHIC STEP

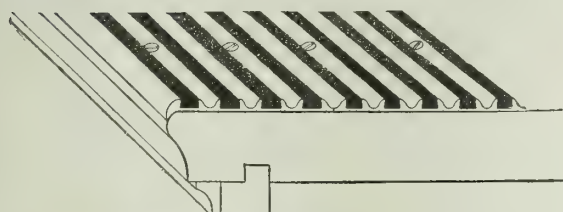
Showing "Mason" safety tread  $3\frac{1}{2}$  ins. wide, with nosing on outer edge backed by 4 ins. width, connected by iron strap to iron anchors.  
Scale,  $\frac{1}{2}$  full size



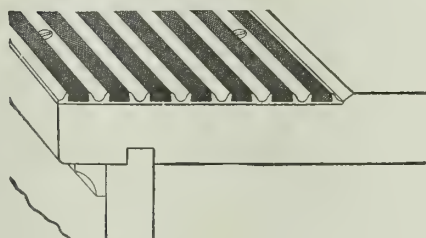
The illustration shows repairing of worn stairs by use of "Mason" safety tread in a half pan; the worn places being filled with Karbolith and tread backed with cork composition.



REPAIRING WORN STAIRS

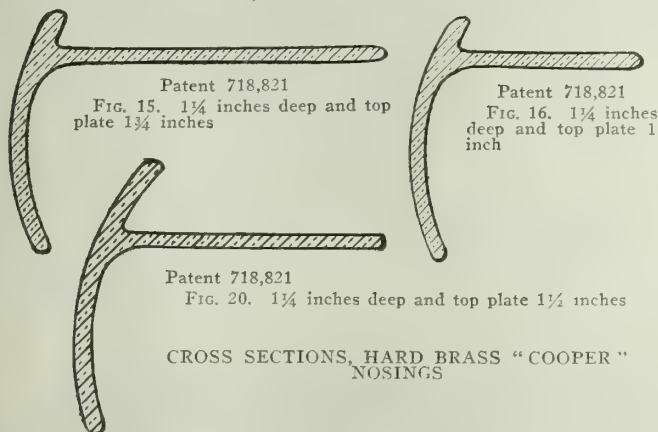


With Nosing placed on Top of Stair

Without Nosing (Flat) Showing Rebate  
"MASON" SAFETY TREADS

### "Cooper" Brass Nosings.

For stair treads; made of hard brass.



### "Mason" Black Diamond Safety Tread.

The "Mason" Black Diamond safety tread (Fig. 25) consists of a non-slip stair tread, of a deformed surface for the catching of foreign substances, and the

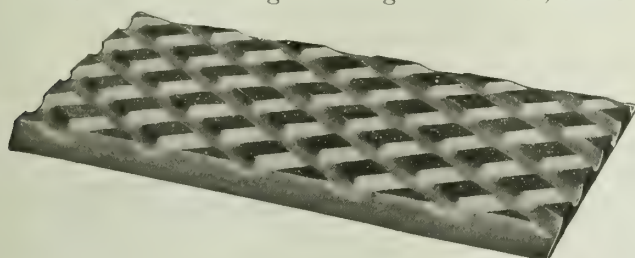


FIG. 25. "MASON" BLACK DIAMOND SAFETY TREAD

necessary open end grooves for drainage. The non-slip diamond shaped units are of an abrasive mixture, containing carborundum, surrounded by a frame of metal on edge, assuring durability. This form is particularly useful for door thresholds and elevator sills. Its neat appearance and its beveled edges make it especially adapted for this purpose. It is furnished in steel or brass.

### "Mason" Safety Tread and Cork Composition.

For interior stairways, landings and passageways this composition gives excellent satisfaction and is more economical than a complete safety tread installation. It is in use in nearly all the large department stores in New York, Boston, Philadelphia, Chicago, and numerous other cities.

### Dentil Nosings.

It is often desirable to have the nosing and safety tread in one piece. This is furnished in the combination "Mason" Tread and Nosing (Fig. 26) and the "Mason" Non-slip Dentil Nosing (Fig. 27). The latter prevents the foot from slipping forward over the extreme edge of the nosing, and sidewise as well. Both types are especially suited for use with concrete, asphalt, or composition filling.

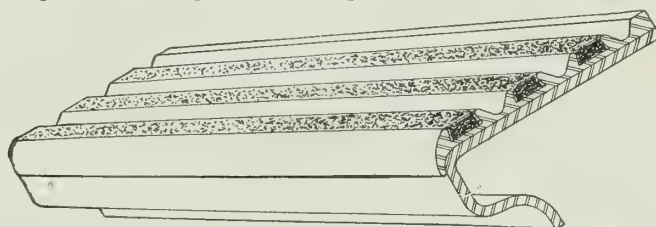


FIG. 26. "MASON" SAFETY TREAD AND NOSING

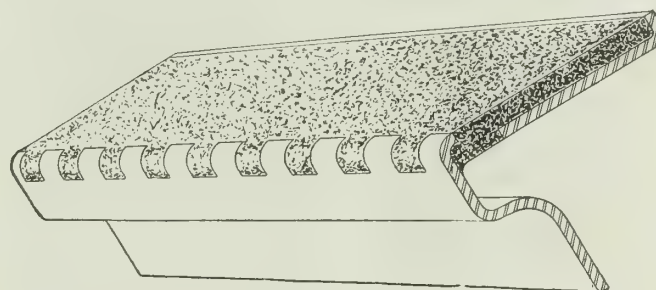


FIG. 27. "MASON" NON-SLIP DENTIL NOSING

### "Stanwood" Tread.

This tread is made up of a number of thin strips of high carbon steel, bent so as to form a series of openings in its surface. This is an exceedingly strong and serviceable step. It is especially adapted where a non-slipping self-cleaning tread would be of advantage, such as on stairways to engine rooms, areaways, etc. It is made to order in any size or shape.

The "Stanwood" tread has been used for years by the U. S. Government on its war vessels; as well as on the cars of the leading railroad companies, and by automobile makers.

### Karbolith Flooring.

Made of a composition of materials, largely of magnesium base, that produces a hard, durable surface. It is fireproof, ratproof and germproof; and is adapted to all interior floors, especially car floors, sanitary base and wainscoting. It is impervious to heat, cold and dampness; and will not chip, crack, tear loose from its base, nor disintegrate. Its surface is smooth, fine grained, but not slippery. It can be laid over cement, granolithic, iron or wood, and binds firmly to its base.

# AMERICAN ABRASIVE METALS CO.

TELEPHONE:  
CORILAND 7444, 7445

Hudson Terminal Building, 50 Church Street  
NEW YORK, N. Y.

## Products.

Manufacturers of FERALUN ANTISLIP TREAD SURFACES.

## Needfulness.

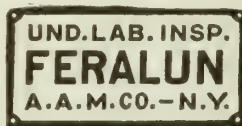
In public and industrial safety, the most serious problem is the reduction of the great number of casualties due to slipping and tripping.

In a single year, in the industrial establishments of four States, the number of workmen injured by slipping and tripping (11,099) was greater than from ladders (2480), belts and pulleys (2618), cranes (2460), gears (1864) and elevators (878), which combined totaled only 10,300. In New York City in five years 816 people have been killed by falls on stairs and sidewalks. In Chicago in 1916, while only 8 people were killed in burning buildings, 154 were killed by falls on stairs and sidewalks other than through slipping on ice or banana peels.

Such casualties are caused chiefly through the use of cast iron, steel and other unsafe materials for tread surfaces. The American Society of Safety Engineers recently passed a resolution condemning the use of cast iron or steel as a tread surface unless there was embodied in it an abrasive or other antislip material. Laws in several states and ordinances in principal cities now require the use of approved antislip treads.

## Awards and Approval.

Feralun antislip treads are the only type that have received the highest award (grand prize) at the Expositions of Safety and Sanitation, and are approved without any qualifications as a fire safe and antislip tread by the Underwriters' Laboratories, Inc.

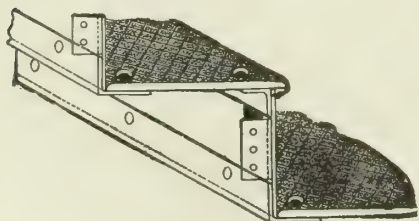


UNDERWRITERS' LABEL

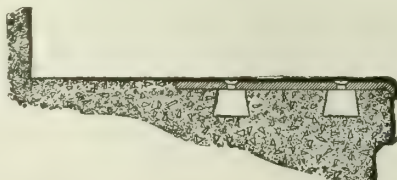
The United States Navy Department specify Feralun treads for battleships, where they withstand exposure to severest conditions without deterioration. In New York subways and elevated railroads, Feralun has been used for nearly all new work, and the company now has contracts covering the entire safety tread requirements of the Interborough Rapid Transit Co. up to October 1, 1919. Many of the principal public utility and industrial corporations have made Feralun their standard.

## Description and Adaptability.

Feralun is hard metal with abrasive grit cast into the wearing surface and protruding slightly therefrom, providing a durable and effective antislip tread for use especially in place of cast iron and steel floor plates, trench covers, drainage gratings, expansion joint cover plates, door saddles, stair treads, etc.; and also applicable in any form in which metal may be cast as a tread surface.



APPROVED METAL STAIR CONSTRUCTION, WITH STYLE L FERALUN TREAD



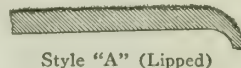
APPROVED CONCRETE STEP CONSTRUCTION, WITH STYLE A FERALUN INSERT 6 INS. WIDE



APPROVED METHOD OF REPAIRING WORN STEPS

## Safe Stair Tread.

Feralun antislip stair treads are fireproof and slip-proof, lasting much longer than iron, steel, slate or marble. They have no dangerous, slippery nosing edge or heel catching grooves. A plain or hatched abrasive metal surface, with the antislip element carried down over the nosing, makes Feralun stair treads unequalled as a preventive of stair accidents.



Style "A" (Lipped)



Style "B" (Rounded)

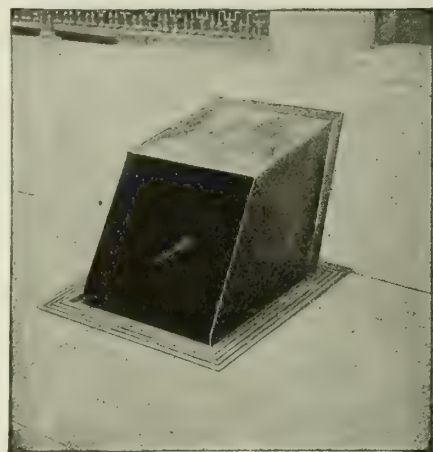


Style "C" (Ornamental)  
FERALUN TREAD  
NOSINGS

On certain railroad station stairs 141 accidents in less than two months occurred on grooved safety treads. Abrasive metal treads were substituted and there was not a single fall reported in the three months following. The Pennsylvania Railroad and Delaware, Lackawanna & Western Railroad, among others, have stair rulings requiring non-corrugated antislip treads. Feralun conforms to their specifications.

## Approved Coal Hole Cover.

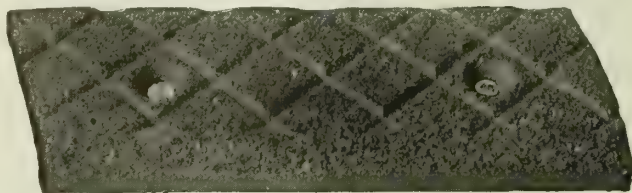
The Feralun cover, illustrated herewith, conforms to the new requirements in New York City, and is being rapidly adopted as standard by other municipalities.



FERALUN SAFETY COALHOLE COVER (OPEN)

## Other Forms.

Floor plates, door saddles, trench covers, drainage gratings, and other forms, where steel and cast iron have proved unsatisfactory and dangerous by becoming slippery, are made of Feralun. Slippery sidewalks, ramps and vault lights are made slipproof by Feralun strips, crosses or buttons.



FERALUN ANTISLIP TREAD  
Note the antislip nosing and absence of grooves parallel to it



# UNIVERSAL SAFETY TREAD COMPANY

40 Court Street  
BOSTON, MASS.

FACTORY: WALTHAM, MASS.

## BRANCH OFFICES

NEW YORK, N. Y., 120 Liberty Street  
PHILADELPHIA, PA., 417-419 Widener Building

CHICAGO, ILL., 168 North Michigan Avenue  
SAN FRANCISCO, CAL., 523 Market Street

## Products.

Manufacturers of UNIVERSAL ANTI SLIP METAL TREAD; UNIVERSAL SAFETY TREAD (Lead Filled).

### Universal Anti Slip Metal Tread.

Designed for severest wear, as on subway stairs, etc. The *alundum* is distributed throughout its entire thickness to the base.

**SAFETY FIRST**—Safety tread efficiency depends upon a *non-slip* surface and the absence of steel or other hard supporting metal which soon becomes slippery, *especially if wet*.

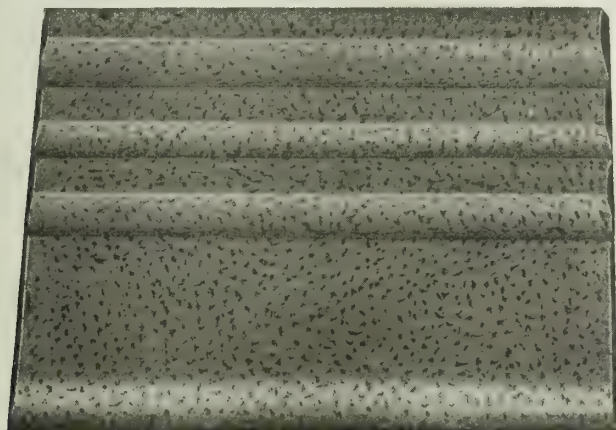


FIG. 1. Ribbed Type with Lip Nosing



FIG. 2. Section of Rib Type showing Lip



FIG. 3. Section of Flat Type showing Nosing  
"UNIVERSAL" ANTI SLIP METAL TREAD

**NO METAL RIBS**—Statistics have convinced safety experts of casualty companies that deep longitudinal grooves between steel ribs supporting the non-slip inserts offer special danger by the catching of heels, particularly where women are employed.

Universal Anti Slip Metal Tread surface contains *no steel whatever*, being composed of *alundum*, a mineral abrasive held firmly to the base by a binder of lead composition.

The *projecting points of alundum grains* give the tread the highest *non-slip* efficiency, while their extreme hardness insures durability. Hence are combined *perfect safety* and *maximum life*.

**CORRUGATIONS**—Unlike other treads having deep grooves, the depressions are shallow and rounded on

the edges, thereby rendering tripping or catching impossible.

Flat type furnished if desired, as shown in Fig. 3.

**REINFORCED NOSING**—Fig. 3 also shows a special nosing having a thick body of abrasive metal on the edge of the tread where the hardest wear occurs, especially on down-traffic stairways.

**RUSTPROOF**—The steel base to which the abrasive surface is attached is designed for a *stiffener only*, and in process of manufacture, the tread is lead coated on all sides, rendering it rustproof.

### Universal Safety Tread (Lead Filled).

**CONSTRUCTION**—It is constructed of a *steel* or *brass* base in which is punched openings to receive the non-slip lead inserts (Fig. 4).

By this construction, a *constantly increasing* non-slip lead surface is presented during its entire life. The steel teeth reinforce the softer metal, thus insuring durability.

**REASONS FOR USE**—Because it is essentially *safe* in all stages of wear, non-slip in *both* directions, as there are no hard longitudinal ribs to wear smooth.

Because the lead is firmly clinched on the under side so that it can not be removed.

Because it can be furnished in one piece up to twelve inches in width, thereby avoiding unnecessary joints.

Because it can be furnished with curved nosing any depth, especially desirable in repair work to conceal cement joints.

**NON-CORROSIVE**—This tread can be manufactured of *brass* or *alloy-coated "Armco" pure iron*, the best rust resisting iron known, and especially suitable for navy use.

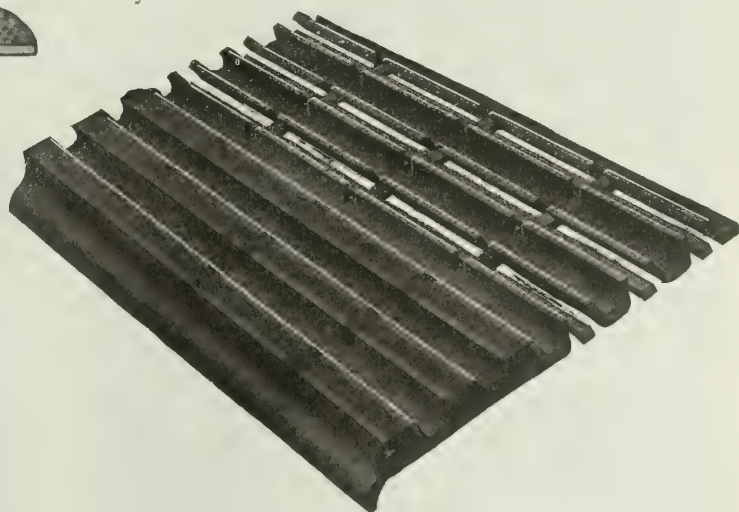


FIG. 4. "UNIVERSAL" SAFETY TREAD, SHOWING STEEL BASEPLATE BEFORE AND AFTER LEAD IS ROLLED IN

## Catalogue.

Write for catalogues, samples and prices.

# IRVING IRON WORKS COMPANY

TELEPHONE:  
HUNTERS POINT, 3342

Dutchkills Creek and Third Street  
LONG ISLAND CITY, CITY OF NEW YORK

## Products.

Sole manufacturers of IRVING PATENTED "SUBWAY," "HONEYCOMB," "EGGCRATE" and other forms of GRATING-FLOORING, and of GRATING-FLOORING PRODUCTS.

Ornamental and Structural Iron and Steel; Terra Cotta and other Building Anchors, Steel Wedges, Wall Ties, Pipe Hangers, etc.; Forgings; Metal Accessories for power-houses, dye, chemical and lighting plants, breweries, subways, pumping stations, paper, munition and cement works, etc.

## Trade-marks.

The trade-marks "Subway," "Honeycomb" and "Eggcrate" are our exclusive property and can not be legally used in connection with any other grating-flooring products.

## Scope of Use of Irving "Subway" Grating.

Irving "Subway" grating is a perfect grating-flooring adapted for use in every place where a grating-flooring is required, hence its use by engineers and architects in the following and many other places:

Powerhouse floors, galleries and walkways	Theater gridirons
Pump platforms	Window guards
Gas house floors	Register openings
Turbine pits	Sidewalk doors
Charging floors	Elevator gratings
Retort houses	Stair treads
Pipe trenches and sump covers	Drying oven floors
Replacing of water cooled plates	Shrinkage pits
Ship engine and boiler rooms	
Reinforcing top surface of concrete floors	
Storage rack floors and walkways	

Places where heretofore "bump" steel or cast iron floor plates were necessary for footing or wheeling, and ventilation reluctantly dispensed with.

## Advantages of Irving "Subway" Gratings.

Before the advent of the Irving "Subway" grating, the best known type of grating was the system of parallel bars strung on a rod—the loose and rattling kind—the kind that wheelbarrows and trucks could



A CHEMICAL PLANT INTERIOR SHOWING IRVING "SUBWAY" GRATING

Note that in spite of the sharp rib hoops, the steel barrel will roll on Irving "Subway" grating, an impossibility on the old types

**IRVING**  
TRADE  
**SUBWAY**  
MARK  
**GRATING**

PATENTED NOV. 26, 1912

cross in only one, and men slip on in any direction; the grating in which each individual bar had to stand the strain of any concentrated load which happened to come upon it—or fail. This type was nothing but a grating, used only where ventilation was an absolute necessity, and generally characterized by engineers as "an abomination."

Irving "Subway" grating, however, is more than a grating, it is a complete ventilating flooring, and can be used as such to advantage in many places which will at once suggest themselves to experienced, thinking, modern engineers and superintendents, because:

It presents a smooth working surface, is comfortable to walk upon, yet absolutely non-slipping. Vehicles can cross it in any direction without the wheels going through and spreading the bars.

The truss element, appreciated so keenly by engineers, in Irving "Subway" grating, makes for extreme rigidity and strength and insures a positive distribution of loads over the entire panel.

Ordinary holes for pipes, pilasters, etc., can be cut out of the grating, without additional framing; the loads will carry around.

For a given load and any considerable span it is lighter than any other floor of equivalent strength.

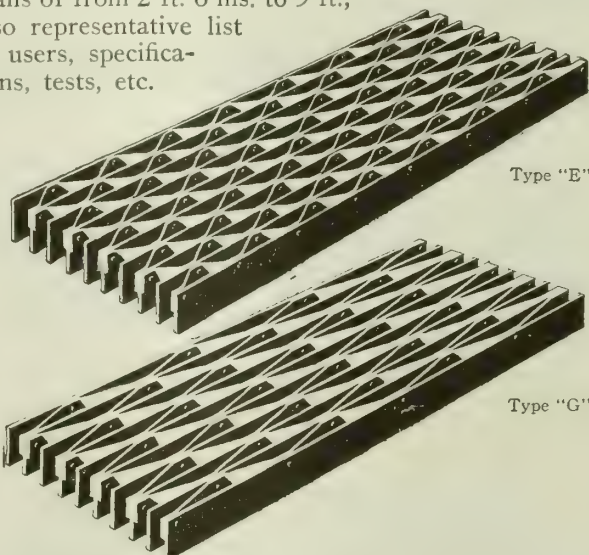
It affords a maximum of ventilation and daylight. It is modern and attractive.

## Fastening Devices.

Special fastening devices are made for any condition.

## Catalogue.

Send for Catalogue A1E. This gives loads and deflections of the six different standard sections, for spans of from 2 ft. 6 ins. to 9 ft., also representative list of users, specifications, tests, etc.



TWO TYPES OF IRVING "SUBWAY" GRATING

Made to fit any opening  
Regularly made 1, 1¼, 1½, 1¾, 2 and 2¼ ins. in depth  
Patented Nov. 26, 1912



# ARMSTRONG CORK & INSULATION COMPANY

Manufacturers of and Contractors for Cold Storage Insulation,  
Hot and Cold Pipe Covering and Heat Insulating Materials

135 Twenty-fourth Street  
PITTSBURGH, PA.

BRANCH OFFICES IN THE LARGER CITIES

## Products and Services.

NONPAREIL, ACME, and EUREKA CORKBOARD, and GRANULATED CORK, used for insulating Cold Storage Warehouses, Packing Plants, Breweries, Ice Factories, Fur Vaults, Dairies, Creameries, Ice Cream Plants, Refrigerators, Freezing and Brine Tanks, and generally wherever refrigeration is employed. Contractors for COLD STORAGE INSULATION

NONPAREIL CORK COVERING for Brine, Ammonia, Ice Water, Beer, and All Cold Lines. Contractors for COLD PIPE COVERING.

NONPAREIL INSULATING BRICK for Furnaces, Boiler Settings, Breechings, Stacks, Bake Ovens, Kilns, etc. INSULATING CEMENT.

NONPAREIL HIGH PRESSURE COVERING, BLOCKS and CEMENT for High Pressure and Superheated Steam Lines, Feed Water Heaters, Breechings, Tanks, Enameling Ovens.

NONPAREIL CORK MACHINERY ISOLATION, a Sound Deadener for Fans, Motors, Presses, Pumps, etc.

For Linotile Flooring and Cork Paving Brick, see page 323.

## Nonpareil Corkboard Insulation.

Nonpareil Corkboard Insulation consists of pure granulated cork, slightly compressed in sheets, and baked at a moderate temperature. This process brings



INSTALLING NONPAREIL CORKBOARD INSULATION IN  
CEILING FORMS, CHICAGO COLD STORAGE  
WAREHOUSE COMPANY, CHICAGO, ILL.

out the natural waterproof gum or rosin in the cork, which binds the whole mass together firmly.

**ADVANTAGES**—Containing no foreign substance, the heat conductivity of Nonpareil Corkboard is the lowest of any commercial insulator. The material will not disintegrate in the presence of moisture, if properly erected; and it is proof against rot, mould and offensive odors. It has been tested and officially approved by the National Board of Fire Underwriters.

Nonpareil Corkboard is giving excellent satisfaction in thousands of plants employing refrigeration, situated throughout the civilized world. It is also used for preventing the condensation of moisture on concrete roofs of textile and other mill buildings; in bungalows and houses for protection against heat and cold; and for insulating Turkish bathrooms, fever rooms in hospitals; dough mixing and proving rooms in bakeries, etc.

**DIMENSIONS**—Nonpareil Corkboard is made in sheets of standard size, 12 by 36 ins., of the following thicknesses: 1, 1½, 2, 3, 4 and 6 ins.

**METHODS OF CONSTRUCTION**—The ease with which Nonpareil Corkboard may be erected is one of the chief points in its favor. It can be nailed, sawed and put up just as readily as lumber in buildings of frame construction, or erected in Portland cement mortar against brick, stone, concrete, or hollow tile walls and ceilings.

Solid corkboard partitions as high as 24 ft. are constructed without the use of any studding whatsoever, saving space and the cost of lumber otherwise required.

In insulating floors, Nonpareil Corkboard is laid down in hot asphalt, a concrete or lumber finish being put down directly on top.

Wherever the material is installed in two courses, joints are broken both horizontally and vertically between the layers. Portland cement plaster finish may be readily applied directly against its surface, making a thoroughly sanitary and hygienic finish.

**CATALOGUE**—A 152-page illustrated book, entitled, "Nonpareil Corkboard Insulation," will be cheerfully sent on request.

**CO-OPERATION**—The branch offices, situated throughout the United States and Canada, will co-operate with architects and engineers in solving insulation problems, without charge or implied obligation.

**Nonpareil Cork Covering.**

Nonpareil Cork Covering is the only thoroughly satisfactory covering for brine, ammonia and ice water lines, and cold pipes of every kind. It consists of pure granulated cork, compressed and moulded in sectional form to fit the different sizes of pipe and various fittings in ordinary use. It is coated inside and out with a mineral rubber finish, and is applied with waterproof cement on the joints, rendering them impervious to moisture.

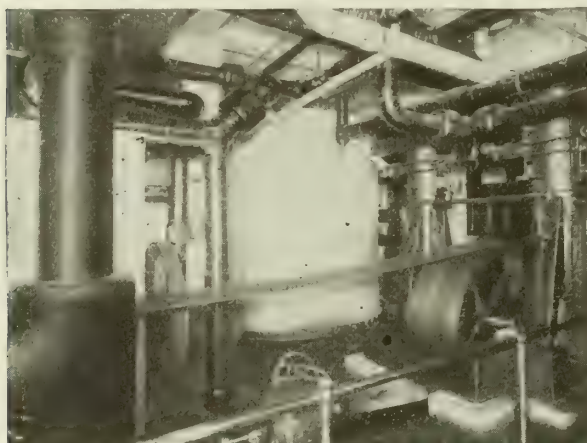
**SERVICE DETAILS**—Nonpareil Cork Covering is manufactured in three thicknesses to meet different service conditions:

(1) Standard Brine Covering, from 2 to 3 ins. thick, is designed for temperatures from 0° to 25° Fahr.

(2) Special Thick Brine Covering, from 3 to 4 ins. in thickness, for temperatures below 0° Fahr.

(3) Ice Water Covering, approximately 1½ ins. thick, for temperatures above 25° Fahr.

**ADVANTAGES**—(1) Maximum insulating efficiency, insured by the millions of sealed air cells of the natural cork. (2) Free from capillary attraction, non-absorbent of moisture and, therefore, durable in service. (3) Light, clean, and neat in appearance. (4) Easy to apply. (5) On a brine or ammonia line, under average conditions, it will pay for itself in a year or less. The book entitled, "*Nonpareil Cork Covering*," sent on request, renders it easy to figure out how much can be saved in any given case by installing it.



NONPAREIL CORK COVERING IN THE DAVENPORT HOTEL, SPOKANE, WASH.

All of the heat insulation in this building was supplied by the ARMSTRONG CORK & INSULATION COMPANY

**DRINKING WATER SYSTEMS**—Nonpareil Cork Covering is the ideal cold pipe covering for drinking water systems in mills, factories, office buildings, hotels, apartment houses, etc. Its high insulating efficiency insures water being delivered at the proper temperature, and its moisture resisting properties give it remarkable durability in service.

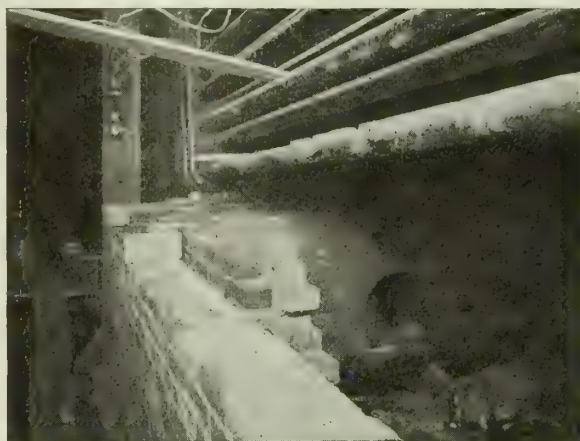
**CORK COVERING LITERATURE**—The books, "*Nonpareil Cork Covering*" and "*Drinking Water Systems*" (containing valuable data), together with price list, will be mailed on request.

**Nonpareil Insulating Brick.**

Nonpareil Insulating Brick, for boiler settings, furnaces, blast mains, ovens, stacks, etc., are composed principally of diatomaceous earth (kieselguhr). This peculiar material is practically pure silica, being composed of the skeletons or shells of microscopic plants that grew in the sea ages ago. It is estimated that there are 39 billions of these shells to the cubic inch, each one hollow and filled with air. It is this large amount of "dead" or entrapped air which gives Nonpareil Insulating Brick their high heat insulating value. They are, in fact, ten times as efficient nonconductors of heat as fire brick or common brick. In other words, one 4½-in. course of Nonpareil Brick will retain as much heat as a wall of common brick or fire brick 45 ins. thick.

**ADVANTAGES**—Nonpareil Brick will greatly reduce the amount of heat lost by radiation from boiler settings, furnaces, blast mains, ovens, etc., resulting in a material saving in fuel and making the rooms themselves much more comfortable. This last feature is of special importance in office buildings, hotels, apartments, etc., where hot boiler rooms and stacks cause inconvenience and discomfort to those in nearby rooms.

A condition of this kind was corrected in the Chamber of Commerce Building, Detroit, Mich., where the heat from the boiler room was quite noticeable in the store above. By installing one course of Nonpareil Brick, set on edge, on the tops of the boiler settings and over the drums, the temperature above the boilers was lowered 30°. In addition, enough fuel was saved in less than a year to pay for installing the brick.



A 4½-IN. COURSE OF NONPAREIL INSULATING BRICK INSTALLED IN THE WALLS OF A BOILER SETTING, BETWEEN THE FIRE BRICK AND COMMON BRICK, BONWIT TELLER COMPANY, NEW YORK, N. Y.

**ADAPTABILITY**—The convenient form of Nonpareil Brick makes them particularly well suited to the service for which they are intended. They combine low heat conductivity with sufficient structural strength to support any ordinary load when built in as an integral part of the structure to be insulated.

**SIZE, SHAPES AND WEIGHT**—The standard straight Nonpareil Brick are nominally 9 by 4½ by 2½ ins.,



and weigh approximately 1½ lbs. each. A variety of special shapes are also carried in stock.

**INFORMATION**—Complete information regarding the various applications of Nonpareil Insulating Brick is given in the following booklets:

In boiler settings: "*Saving Fuel.*"

In furnaces and ovens: "*Good Furnaces Made Better.*"

In bread baking ovens: "*Comfort and Economy in the Bakery.*"

In glass plants: "*Keeping Heat Where it Belongs.*"

Any or all of the above will be sent, free of charge, on request, together with samples.

### Insulating Cement.

To obtain the best results, Nonpareil Brick should be laid in special insulating cement, which the ARMSTRONG CORK & INSULATION COMPANY is in a position to furnish. The cement has practically the same insulating value as the brick, and, by using it, continuous walls of insulation are obtained.

### Nonpareil High Pressure Covering.

Nonpareil High Pressure Covering is also composed largely of diatomaceous earth (see description under Nonpareil Insulating Brick), combined with a small quantity of asbestos fiber as a binder. Here again the remarkable insulating value of the former material is utilized to excellent advantage.

**MERITS**—Due to the large amount of entrapped or "dead" air it contains, Nonpareil High Pressure Covering is a much more efficient nonconductor of heat than other types of pipe coverings. The only air confined in high pressure coverings heretofore in general use, is that which is caught in the voids between the minute interlacing crystals of the substances of which they are composed. In Nonpareil Covering, not only is a large amount of air entrapped between the diatoms, which are of all shapes and sizes, but the diatoms themselves are hollow and full of air to begin with.

In addition to being a superior heat insulator, Nonpareil High Pressure Covering will withstand much

higher temperatures without calcining or disintegrating. It is particularly well suited, therefore, for the insulation of superheated steam lines, retorts, breechings, etc., and has given remarkable service when used for insulating oil burning marine boilers, where the service is unusually severe.

Another valuable characteristic of Nonpareil High Pressure Covering is its ability to bear repeated wetting and drying. It may be soaked in water for weeks, and when dried out again will be found to have lost none of its insulating efficiency or structural strength. For this reason Nonpareil High Pressure Covering is the ideal insulation for underground steam lines, where moisture is present almost constantly.

**EASY TO APPLY**—Nonpareil High Pressure Covering is supplied in sectional, segmental, block and plastic cement form. The sectional covering is for small and medium size pipes; the segmental for large pipes; the blocks for feed water heaters, breechings, tanks, ovens, etc.; and the plastic cement for fittings and irregular surfaces.

**LITERATURE AND SAMPLES**—Literature, price list, samples and further information will be cheerfully furnished on request.

### Nonpareil Cork Machinery Isolation.

Nonpareil Cork Machinery Isolation is similar to Nonpareil Corkboard in composition, except that it is much denser.

**ADVANTAGES**—The natural resiliency of the cork makes Nonpareil Cork Machinery Isolation a highly efficient medium for deadening the noise of fans, motors, presses, pumps, refrigerating machines, engines, conveyors, etc., in hospitals, sanitariums, hotels, apartment houses, and industrial establishments where noise and vibrations are objectionable.

**SIZES**—Nonpareil Cork Machinery Isolation is supplied in sheets 12 by 36 ins., and in the following thicknesses: ½, ¾, 1, 1½, 2, 3, 4, 5 and 6 ins.

**SAMPLES**—Further information and samples will be supplied on request.



NONPAREIL HIGH PRESSURE COVERING INSTALLED ON STEAM LINES AND NONPAREIL HIGH PRESSURE CEMENT ON PUMP CYLINDERS AND STEAM CHESTS IN THE CHAMBER OF COMMERCE BUILDING, DETROIT, MICH.



NONPAREIL CORK MACHINERY ISOLATION INSTALLED ON THE TOP OF A MAIL CONVEYOR FOUNDATION AT THE PENNSYLVANIA RAILROAD TERMINAL, NEW YORK, N. Y.

# BANNER ROCK PRODUCTS CO.

Manufacturers of Cold Storage Insulation

ALEXANDRIA, IND.

## Products and Services.

ROCK CORK; ROCK CORK STUCCO SHEATHING; ROCK CORK LATH; ROCK WOOL.

Contractors for application of our products in all kinds of cold storage installations, or, with the insulation, a competent superintendent to direct application will be furnished for his time and traveling expenses.

## Rock Cork.

**DESCRIPTION**—A board made of rock wool, bound with waterproofing crude paraffin binder, and in volume 88% air cells. Formed in slabs 16 by 36 ins., and  $\frac{1}{2}$ , 1,  $1\frac{1}{2}$ , 2 and 3 ins. thick. Can be applied to brick or concrete walls in Portland cement mortar and to lumber surfaces in asphalt insulating cement.

Permanent walls and partitions are constructed by erecting 2 layers in Portland cement mortar, and plastering both sides. Portland cement plaster adheres tenaciously to Rock Cork. Rock Cork is non-inflammable, being a mass of minute air cells, having walls of indestructible mineral.

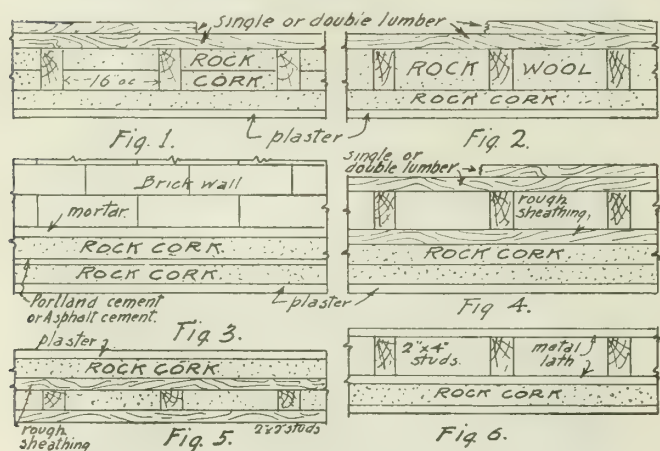
## Rock Cork Stucco Sheathing.

**DESCRIPTION**—Made from Rock Cork composition  $\frac{1}{2}$  in. thick, for application on exterior walls of dwellings or buildings receiving stucco finish. On brick, tile or concrete walls, apply in Portland cement mortar. On lumber walls, nail with 3d nails and tin or galvanized caps, allowing 3 nails per sq. ft. Cover with 2-in. chicken netting or other wire fabric. Apply stucco finish direct in 2 coats, following usual compositions. Rock Cork stucco sheathing  $\frac{1}{2}$  in. thick insulates a building from heat and cold equivalent to 8 ins. brick veneer, and protects from moisture and sound.

**DECORATIVE EFFECTS**—Use 1-,  $1\frac{1}{2}$ - or 2-in. thickness of suitable widths of Rock Cork in connection with stucco sheathing, for raised panels, pilasters, vertical or horizontal borders, and water tables.

## Rock Cork Lath.

**DESCRIPTION**—A painted metal lath embedded in



Rock Cork composition  $\frac{1}{2}$  in. thick, made in 4-in. lengths, 18 ins. wide. Can be nailed to interior or exterior studs on 16- or 12-in. centers, and receive plaster or stucco finish for partition construction for outside stucco finish. Resists heat, cold and moisture. Sound resistance is increased and weight of partition is but 60% of solid construction when granulated Rock Cork mixed with plaster composition is used. For hospitals, hotels and apartment houses.

## Roof Insulation.

For 1-in. thickness, use 16 by 36-in. sheets. This thickness conducts about one-half as much as two  $\frac{7}{8}$ -in. boards with paper between. 1-in. Rock Cork weighs 1.5 lbs. per sq. ft.

## Floor and Partition Deadening.

Lay Rock Cork on floors, or granulated Rock Cork between strips. Apply to tile, brick or metal lath partitions in Portland cement mortar, and plaster. Partitions, for any purpose that have great sound resistance, can be constructed as indicated above.

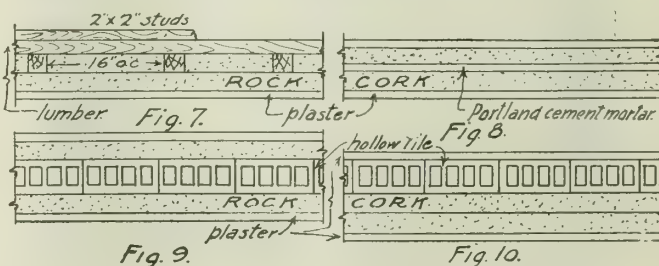
## Insulating Efficiency.

The average of many tests by different observers and by different methods shows Rock Cork 1 in. thick to conduct 6.5 B.t.u. per 24 hours per sq. ft. for  $1^\circ$  difference. Proof against water, fire and decay. The test of time for 10 years demonstrates its permanency. It is backed by a record of successful service in many leading cold storage warehouses, packing plants, ice storage rooms, ice cream plants, creameries, etc. Rock Cork is acknowledged to give more insulating efficiency per dollar expended than any other material or composition known.

## References.

Rock Cork has been installed in 32 states and in Mexico. Below are listed some of the oldest installations:

Grocers' Ice & Cold Storage Co., Louisville, Ky.  
Geo. D. Mansfield Co., Milwaukee, Wis.  
Milwaukee-Waukesha Brewing Co., Milwaukee, Wis.  
Syracuse Cold Storage Co., Syracuse, N. Y.  
Cincinnati Abattoir Co., Cincinnati, Ohio  
Miller & Hart, Union Stock Yards, Chicago, Ill.  
Burge Machine Works, Chicago, Ill.  
Indiana Ice & Dairy Co., Anderson, Ind.  
Schalk Bros. Ice Co., Anderson, Ind.  
Indianapolis Abattoir Co., Indianapolis, Ind.  
Kuhner Packing Co., Muncie, Ind.



FIGS. 1 TO 10 WALL AND PARTITION CONSTRUCTION

Figs. 1, 2, and 7 are designs for vestibules and passageways faced with lumber finish. Figs. 6 and 8 are partitions between rooms requiring plaster finish on both sides. Fig. 5 reduces lumber to minimum, is more substantial and as cheap to erect, as laying up insulation in Portland cement mortar with plaster on both sides, as Fig. 8. Figs. 3 and 4 are wall insulations.



# JUNIUS H. STONE

## Pure Compressed Corkboard

461 Eighth Avenue  
NEW YORK, N. Y.

### BRANCH OFFICES

CHICAGO, ILL., 1742 Monadnock Block

PHILADELPHIA, PA., 427 Weightman Building

### Product.

"NON-PLUS ULTRA" PURE COMPRESSED CORKBOARD for cold storage insulation.

### Policy and Services.

My policy is that of working with and through engineers and contractors as far as possible, preferring to sell Corkboard at a close price to contractors and to assist them in all ways; in short, instead of endeavoring to obtain contracts for erection of insulation, to have the work done by the building or other contractors. However, when owners prefer to deal direct, I am prepared to handle contract work, and have a well equipped and thoroughly efficient staff for that purpose.

### Experience.

I have been identified with the Corkboard industry for over 20 years, having introduced it as an insulating material as senior member of Stone & Duryee.

### Source of Supply and Stock.

Manufacturas de Corcho, of Palafrugell, Spain, whom I represent in the United States and Canada, are the largest manufacturers of cork products in Spain. The volume of their business is so large that it furnishes more cork waste than is required for even their large output of Corkboard. This renders them independent of the market supply of cork waste.

A stock of 500,000 sq. ft. board measure is maintained in my Jersey City warehouse, insuring spot deliveries.

### Quality.

The main business of Manufacturas de Corcho is the making of cork discs for crown caps, fine wine corks, cork lined summer helmets and cork paper for cigarette tips. Therefore, as all these products require the best grade of cork, the waste from their manufacture is necessarily fine, and is kept clean and dry. Clean and dry stock means easy and uniform baking, strong, firm sheets, no "green" centers, and few broken corners.

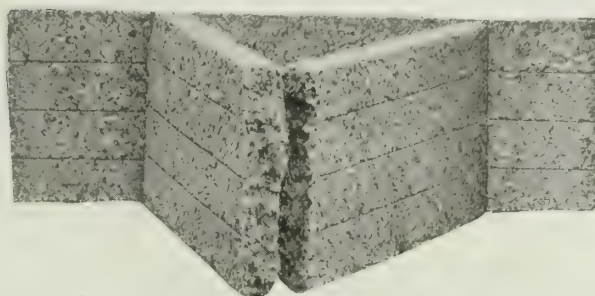
### Weight.

The weight of Pure Corkboard, provided it is *thoroughly baked*, determines its quality. It should be approximately 14 oz. (.875 lb.) per sq. ft., board measure (per inch of thickness), in order to possess proper structural strength and the *close grained internal texture* that resists moisture and time. As limits, 13 to 16 oz. per sq. ft. board measure are suitable, but the low limit should not be less.

The average weight of all Corkboard shipped during 1917 by Manufacturas de Corcho was almost exactly .87 lb. board measure; low shipment averaged .83 lb. and high shipment .90 lb.

### Processing.

Proper processing is another requisite for good, Pure Corkboard. It includes, first, correct granulation of cork waste, which should be about the size of a large



"NON-PLUS ULTRA" PURE COMPRESSED CORKBOARD

Thickness of sheets, ins.	No. sheets in crate	Measurement of sheets		Size crate		Gross weight, lbs.
		Dimensions, ins.	Board measure, sq. ft.	Dimensions, ins.	Contents, cu. ft.	
2	28	36x12x2	168	39x31x26	18	183
3	20	36x12x3	180	39x33x26	19½	195
4	16	36x12x4	192	39x35x26	21	207

1 and 1½ sizes proportionate

pea, except on the surfaces which are coarser grained, to give a good grip for the cement used in erecting and finishing.

Next, it includes the proper quantity of ground cork, which should be sufficient to give a strong, solid sheet, weighing (after being properly baked) within the limits stated above.

Finally, there must be *proper baking*, which means that the finished product shall have a *medium chocolate color* throughout, with no "green" centers or burnt corners. "Green" centers occur principally in 3-in. and 4-in. sheets and are due either to wet cork or too hot an oven that bakes the surface too quickly, thereby *insulating* the center of the sheet from the oven heat and preventing proper baking. There is no stable cohesion between the cork particles in an underbaked or "green" sheet, and, if moisture enters, they will disintegrate in time. For this same reason very light colored sheets are not durable.

### Serviceability.

In 1894 and 1895 the cold storage rooms of the steamships St. Louis and St. Paul were insulated with Pure Compressed Corkboard manufactured by Stone & Duryee. Recently these cold storage rooms were inspected and the engineers then stated that the insulation is still giving entire satisfaction and apparently is as good as when installed *over 23 years ago*.

### How Shipped.

"Non-Plus Ultra" Corkboard is protected against damage by crates made of strong Spanish hardwood, which keep the edges square and true, insuring close, tight joints when erected. This means less heat leakage and lower operating costs. Crates are of convenient size for handling, averaging 39 by 32 by 26 ins.

### Samples.

Samples of "Non-Plus Ultra" Pure Compressed Corkboard will be sent to interested parties on request.

# STEVENS PARTITION & FLOOR DEADENER CO.

175 West Washington Street  
CHICAGO, ILL.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

## Product.

"STEVENS SYSTEM" OF FLOOR DEADENING for buildings, bowling alley foundations, music rooms, machinery platforms, etc.

## Sound Transmission.

Prior to the use of the "Stevens System" no satisfactory means had been designed to prevent the large percentage of sound which was conveyed from floor to floor through the medium of partitions. Consequently, deadening the floors alone, which even with the best known methods was done imperfectly, gave only a partial result.

Present conventional methods fail because sound is transmitted by direct contact through nails of nailing strips, also by nailing strips resting on or touching conduits to lighting fixtures, and by drum effect between floors.

## "Stevens System" of Floor Deadening.

Chairs made of steel with cushions inserted comprise the material furnished by this company. Nailing strips and partition floor plates are laid in chairs as per our specification. Saves labor and material; easily installed by any journeyman carpenter. The cost is within reach of all classes of buildings. Equally adaptable in either fireproof or ordinary construction.

**FIREPROOF CONSTRUCTION**—Saves difference in cost and weight between cinder concrete and dry cinder fill, and consequent saving in structural steel and time required to dry concrete fill. Eliminates old trouble of buckled floors, and destroying of conduits in cases of remodeling.

**ORDINARY CONSTRUCTION**—The 1½-in. space between nailing strips and rough floor is free and uninterrupted under entire floor. Pipes and conduits may be run through this space without cutting of nailing strips or floor plates by pipe trades. Space to be filled with dry cinders or stone screenings, making a continuous cellular carpet under entire floor, providing a fire stop. Saves all quilts and 2-in. insulation strips of usual method of deadening, with consequent labor in laying same.

The "Stevens System" saves one-half usual labor in laying, nailing strips being simply laid in chairs, doing away with all cutting and fitting about conduits and nailing of strips to rough floors.

**UNDERWRITERS' APPROVAL**—Passed and approved by the Chicago Board of Underwriters, Aug. 7, 1916, and subsequently by other boards throughout the country.

## Specifications for "Stevens System."

**ORDINARY CONSTRUCTION**—*Note*—All chairs are complete with cushions permanently fastened in same and are ready for use. Distance from top of rough floor to top of finished floor is 4 ins.

**Preparation of Floors**—Lower or rough floor to be left broom clean. Then apply a good quality of building paper, lapped 1 in. Floor or nailing strip chairs are then set, as per specifications below.

**Partition Chairs**—All partition chairs to be spaced 2-ft. centers. Secure every second chair to rough floor with 8d nail. After chairs are in place set in 2 x 4 in. partition plate loose in chairs. See that cushions engage plate on all three sides, partition studs to be nailed to top plate. After partition is formed, raise same and set on plate now in place in chairs, then toe-nail studding into bottom plate. Care should be taken to keep stud-

ding at least 2 ins. away from all metal columns, steam risers and plumbing pipes. When plastering is completed, care must be taken to clean out all debris from under floor plates. (Include this item in plastering specifications.)

**Bearing Partitions**—Where bearing partitions are used, follow method of construction shown on detail No. 4.

**Floor Chairs**—All floor chairs to be spaced 18-in. centers in rows 16 ins. apart. Chairs to be placed directly above joists, so that legs straddle same, where possible. First chairs from enclosing walls to be set 4 ins. away from same. Chairs to be secured to floor with small sized staple or nail. It is advisable to secure first and end chairs of each row to form an alignment for nailing strips, then the intervening chairs can be fastened. After chairs are in place, lay the 2 x 2 in. nailing strip loose in chairs, using care that cushion engages all three sides of strip. After strips are in place, lay two boards on same and nail same temporarily, to hold nailing strips in place while cinder fill is being installed. Cinder fill to be continuous under all nailing strips and partition plates, making a cellular carpet between enclosing brick walls; fill solid with cinders to the top of all nailing strips and bottom plates.

**Hold Down Chairs**—When chairs are spaced in position and nailing strip inserted, secure same to rough floor with 6d nail to prevent movement during cinder fill. All chairs are punched to receive bolts furnished by this company. Nailing strips to be bored directly over each chair and bolts inserted, with nut adjusted to ⅛-in. play at bottom. With this hold down system, any tendency of floors to swell and raise is corrected. All hold down chairs should be secured to floors with heavy 6d or 10d nails driven diagonally.

All hold down chairs should be placed at points of least resistance of floor, namely, the centers of rooms, etc. It is suggested that alternate chairs in alternate rows be "hold downs." No hold downs to be used within 4 ft. of any walls or partitions. No direct contact is made with these hold down chairs unless floors should start to raise slightly.

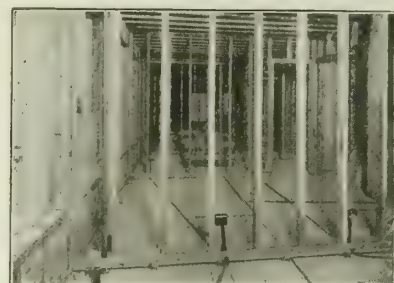
**FIREPROOF CONSTRUCTION**—Stationary partitions of tile or makolite to be set in partition chairs set on 18-in. centers, bedded in concrete mounds, as per specifications of floor chairs. Floor chairs to be embedded in cement. Level chairs while cement is soft with straightedge set on 18-in. centers and in rows 16 ins. apart. All spaces under and between nailing strips and floor chairs to be filled with dry cinders, using ½-in. mesh for screening, making a continuous cellular carpet between enclosing walls. Care to be taken that cinder fill comes to top of nailing strip.

**Hold Down Chairs**—The specification for ordinary construction relative to hold down chairs also applies to fireproof construction where fireproof chairs are secured to subfloor with cement.

**Fire Stops**—To be of concrete, and spaced at 6 ft. 8-in. centers; of size shown on detail No. 5. Fire stops to be continuous between enclosing walls and come within ¾ in. of underside of finished floor.

## Estimates.

Estimates and further information gladly furnished on request.



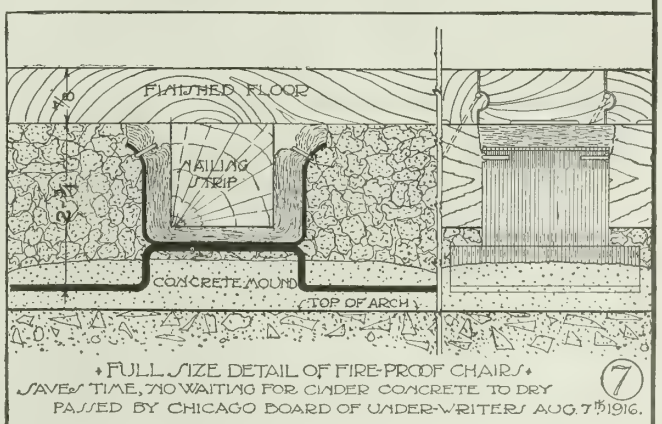
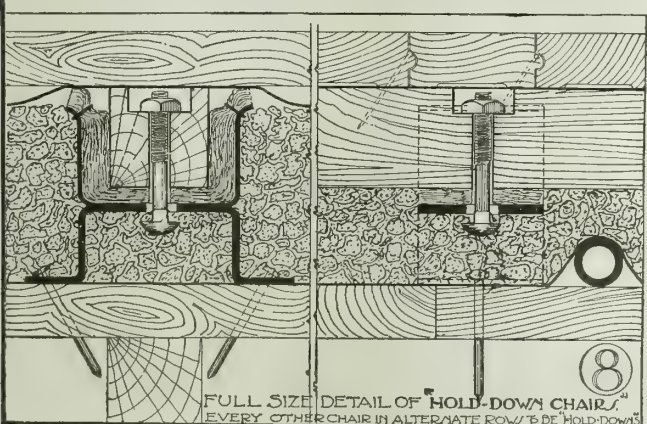
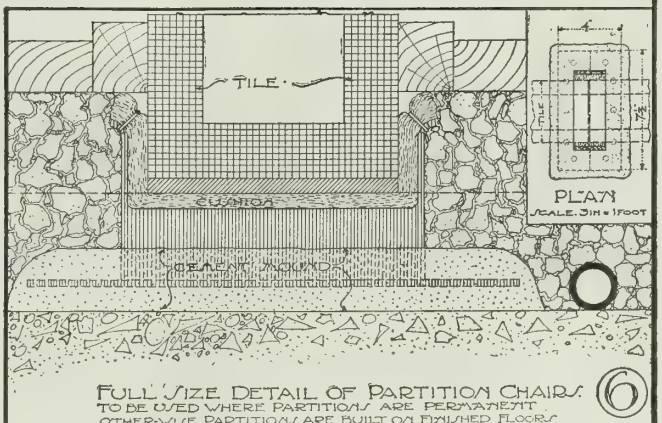
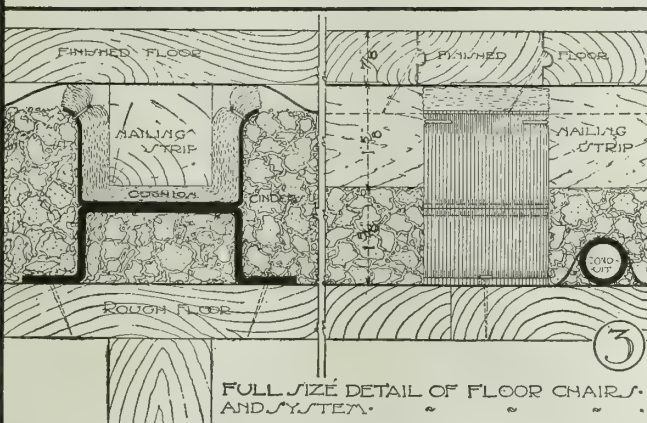
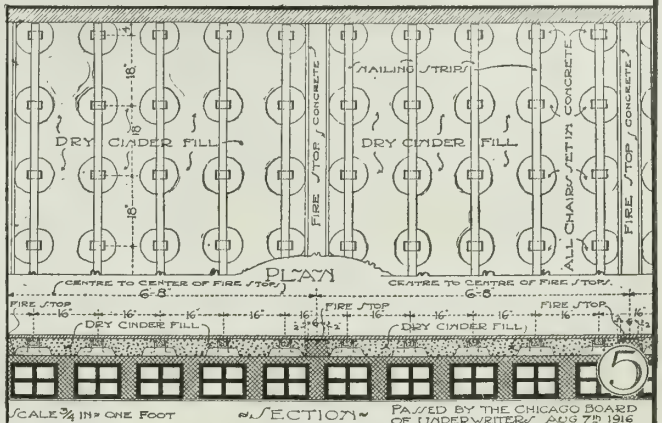
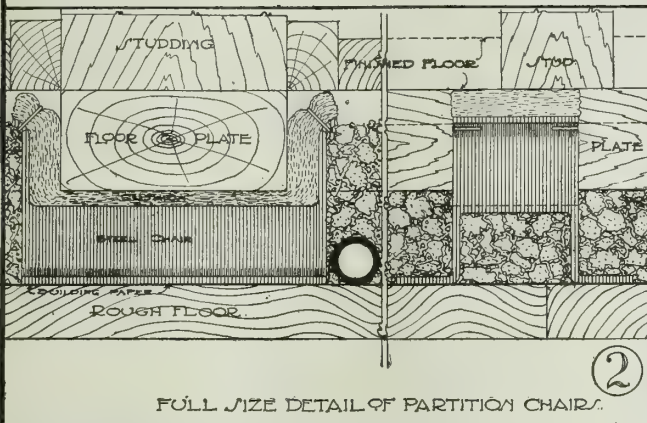
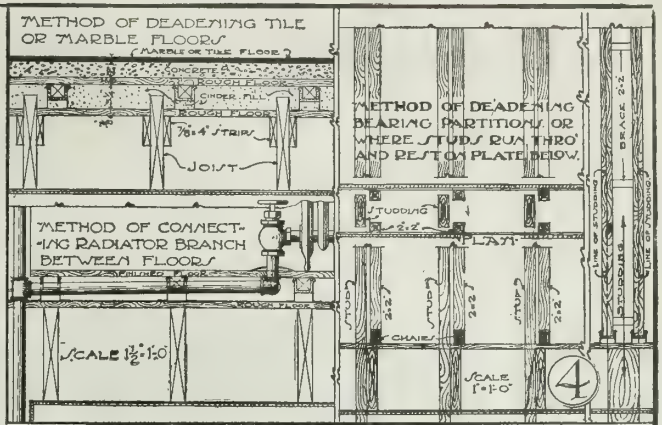
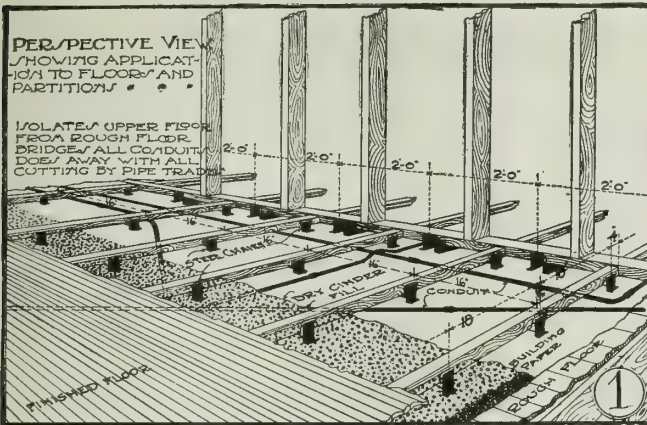
Setting Partitions



Finished Floor Being Laid, Sleepers and Cinder Fill in Place

METHOD OF PLACING PARTITION AND FLOOR DEADENING





# DETAILED DRAWINGS, "STEVENS SYSTEM" OF FLOOR DEADENING

## ORDINARY CONSTRUCTION

1. Isolates upper floor from rough floor. Bridges all conduits. Does away with all cutting by pipe trades. 2. This method eliminates all cutting of the floor plate. It bridges all conduits. 3. This method eliminates squeaky floors. Floors adjust themselves, "always level." 4. No more steam connections above floors. By this method bearing partitions are isolated. 8. Hold down chairs for use where floors have tendency to buckle, in center of rooms, etc.

## FIREPROOF CONSTRUCTION

5. This method eliminates buckling of finished floors. Saves all cinder concrete fill. Conduits easily changed. 6. This method eliminates the partitions as sound conveyors. 7. This method saves time. No waiting for the cinder concrete to dry. 8. Hold down chairs to prevent buckling floors.



# UNITED CORK COMPANIES

50 Church Street  
NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, ILL., Westminster Building, 110 South Dearborn Street  
PHILADELPHIA, PA., Land Title Building, Broad and Chestnut Streets

BOSTON, MASS., 807 Sumpter Building, 88 Broad Street  
ATLANTA, GA., Grant Building  
CLEVELAND, OHIO, Citizens Building, 818 Euclid Avenue

FACTORY AND MAIN OFFICE, LYNDHURST, N. J.

## Products.

STAR BRAND—WATERPROOF CORKBOARD; CRESCENT BRAND—BAKED PURE CORKBOARD; GRANULATED CORK; REGRANULATED CORK for Cold and Heat Insulation, also for Soundproofing and Dampproofing in cold storages, packing houses, bakeries, breweries, ice houses, creameries, ships, hotels, private residences, etc.

CRESCENT CORK TILE; STAR CORK BRICK.

For further information on Cork Tile and Brick, see United Cork Flooring Company, page 328.

## Star Corkboard.

This board consists of 94% pure, screened, granulated natural cork and 6% odorless binder which completely coats every granule of cork, making board *absolutely moistureproof*. Cork is not baked, but remains in its natural state, thus retaining all its life and vitality.

Star corkboard, being waterproof, is particularly adaptable for breweries and packing houses, also cellars, floors, roofs, bunkers, and damp places in general. The cementing substance used gives Star corkboard superior structural strength over all other kinds of corkboards. Unsurpassed for floor work and self-supporting cork partitions.

## Crescent Corkboard.

This board consists of 100% pure, screened, granulated natural cork, compressed in a mould and baked at a moderate temperature. No foreign substance is used as a binder. It meets the United States Government specifications and is approved by the National Board of Fire Underwriters of Chicago. It is used for walls, ceilings, and cold storage insulation generally, except where insulation is continuously exposed to moisture. Used for drying rooms, as it will withstand a temperature of about 200° Fahr.

## Granulated and Regranulated Cork.

Granulated cork, as well as regranulated Star and Crescent, is used for insulating tanks, filling in between joists and studding, and wherever insulation in board form would be too expensive to apply.

## Installation of Corkboard.

Corkboard does not require experienced mechanics to install. Boards can be sawed and fitted like lumber, or built up like masonry. To brick or concrete surfaces, they are applied with a bed of Portland cement mortar or asphalt cement.

On wood surfaces, asphalt may be used, or the corkboards may be nailed on, placing first 1 or 2 courses of waterproof insulating paper. For exposed cork surface a cement finish is recommended, which gives a smooth and even surface that can be kept clean and sanitary.

## Weights, Shipments, etc., of Corkboard.

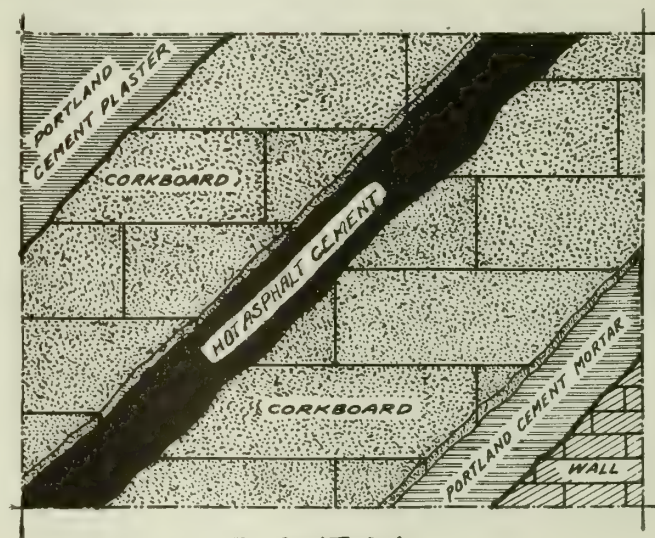
Star Corkboard, 1 sq. ft., 1 in. thick weighs 1.33 lbs.  
Crescent Corkboard 1 sq. ft., 1 in. thick weighs .90 lb.  
Both boards are made 12 by 36 ins. and all thicknesses, from 1/4 in. to 4 ins.

## Cork Tile or Flooring and Cork Brick.

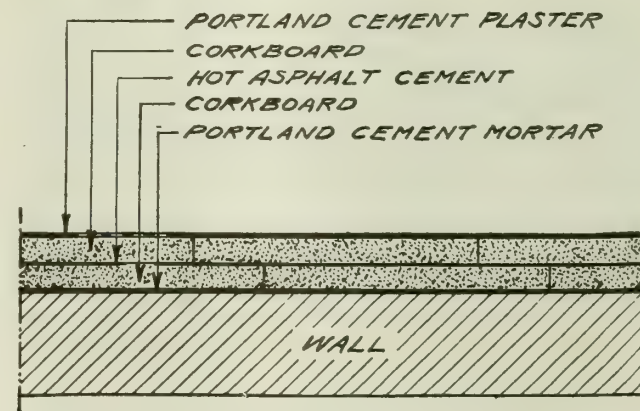
These products are now being distributed by the United Cork Flooring Company, a department of this company.

## Co-operation and Service.

This organization furnishes plans and suggestions, or if desired, will install and erect insulation complete according to customer's specifications. Write for catalogue. Having installed corkboard insulation in thousands of plants throughout the United States, references in all localities can be furnished.



ELEVATION



PLAN

APPLICATION OF CORKBOARD TO BRICK SURFACE



# UNITED STATES MINERAL WOOL COMPANY

TELEPHONE CONNECTION

280 Madison Avenue  
NEW YORK, N. Y.

FACTORY: STANHOPE, N. J. (Railroad Station, Netcong, N. J.)

## Product.

MINERAL WOOL, a Non-combustible Insulator and Sound Deadener.

## Character of Mineral Wool.

A mineral substance, made by converting melted scoria into a fibrous state.

It holds from 92% to 96% of air in suspension, which is more than any other non-combustible substance.

## Uses.

Mineral Wool is used for lining walls, floors, roofs and ceilings, as shown, to some extent, in the accompanying illustration. It is cheap and easily applied.

A house lined with Mineral Wool is warm in winter, cool in summer and is thoroughly deafened. The lining checks the spread of fire and keeps out dampness.

It is also used largely for insulating the walls of cold storage compartments.

## How to Estimate.

To find the quantity of Ordinary Mineral Wool required to fill the outside walls the full thickness of studding:

RULE—1 lb. per sq. ft. for each inch in thickness.

Take the entire distance around the building on a horizontal line and multiply by the height of the studding, which will give the square feet of outside surface. Deduct, ordinarily, one-third to one-half for space occupied by doors, windows, chimneys, studding, bracing, etc. Multiply the remainder by the thickness of the studding; the result will be the number of pounds of Mineral Wool required to fill the space.

## Grades and Cost.

The Ordinary grade of Mineral Wool (the quality invariably used in building construction) weighs about 1 lb. per sq. ft., 1 in. thick, or 12 lbs. per cu. ft.

It costs \$20.00 per ton at factory. Within a radius of 200 miles from New York, N. Y., about \$6.00 per ton will usually cover freight charges. A laborer can apply from  $\frac{1}{2}$  to  $\frac{3}{4}$  of a ton a day.

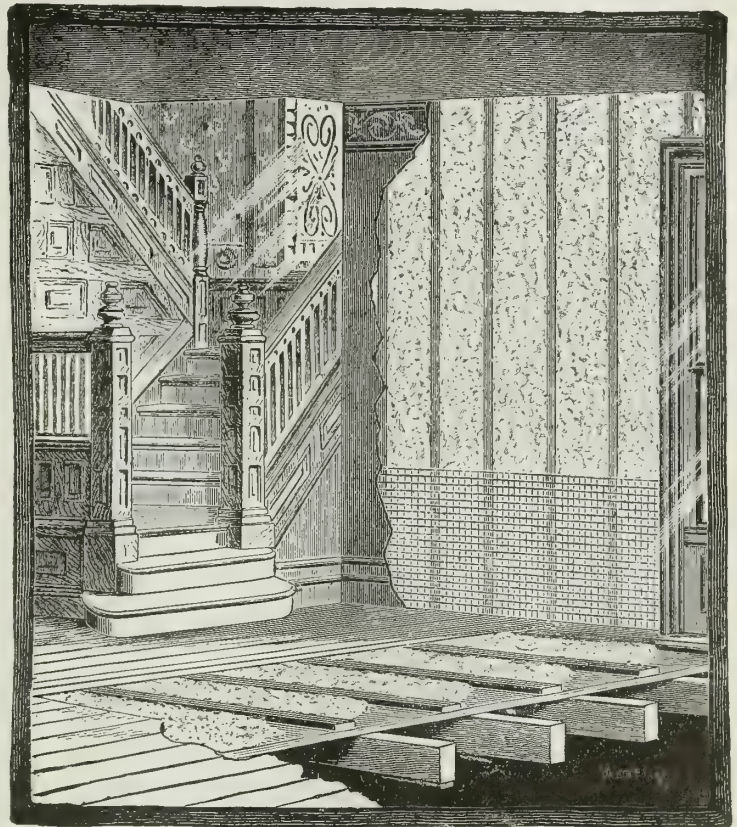
The Selected grade of Mineral Wool, which is manufactured for special purposes, is rarely used in buildings.

## Package.

The material is packed in 3-bushel burlap bags, for which a charge is made; if returned in good condition, within 30 days, and free of all freight charges, an allowance is made for them.

## How to Specify.

"Insulation of Mineral Wool (UNITED STATES MINERAL WOOL COMPANY, 280 Madison Avenue, New York) shall be provided for ..... For floors, it shall be [4 ins.] thick



VIEW SHOWING SOME APPLICATIONS OF MINERAL WOOL

and set upon boards placed between beams on cleats. For walls, it shall fill the spaces between studs and be placed in position as the lathing is being proceeded with. For roofs, it shall fill the space between rafters from eaves to [collar beams]. The Wool shall be pressed compactly but lightly."

## Samples.

Samples and descriptive pamphlets will be gladly supplied, on application.

## A Partial List of Installations.

BUILDING AND LOCATION	ARCHITECTS
Schults Bread Co., Jamaica, L. I., N. Y.	H. C. Sweeney
Ward Baking Company's Plants, New York and Brooklyn, N. Y.	C. B. Comstock
Jno. D. Rockefeller, Jr., Estate; Pocantico Hills, N. Y.	Delano & Aldrich
Baker House, Glen Cove, L. I., N. Y.	Walker & Gillette
The Hebrew Sheltering Guardian Society, Hawthorne, N. Y.	H. A. Jacobs
Paul J. Challen, Matteawan, N. Y.	Jackson & Chambers
Veryl Preston, Hohokus, N. J.	Warren & Wetmore
John Gillespie, Morristown, N. J.	Albro & Lindeberg
Estate of Henry H. Wood, Mill Neck, L. I., N. Y.	A. & F. E. Ware
E. C. Potter, Jr., Hewletts, L. I., N. Y.	H. O. Chapman
John W. Castles, Morristown, N. J.	W. Eyre
Dr. Ernest Fahnestock, Red Bank, N. J.	Albro & Lindeberg
E. T. Holmes, Greenwich, Conn.	Carrère & Hastings

# THE CLASON ARCHITECTURAL METAL WORKS

## Roofing and Sheet Metal Contractors

### PROVIDENCE, R. I.

#### Products.

WIRE SNOW GUARDS, for Slated, Tiled, Shingled, and Metal Roofs, are a specialty product with this company.

ARCHITECTURAL SHEET METAL WORK and ROOFINGS; also GUTTERS, CONDUCTORS, HOLLOW METAL WINDOWS, SKYLIGHTS and VENTILATORS.

#### Special Service.

We are particularly well equipped to handle roofing, skylight, and sheet metal work on buildings of character; and varied experience, in connection with large residences, institutions, public buildings, etc., has developed a permanent working force trained to the careful interpretation of architects' designs and specifications.

We have had exceptionally successful and extensive experience in the laying of graduated and shaded slate roofs, as well as in the design and erection of skylights and other forms of roofing.

#### Snow Guards.

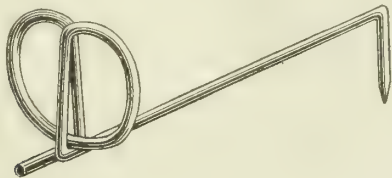
There are many buildings so situated that the use of snow guards is essential to personal safety; there are more cases where the use of snow guards could protect the surrounding roofing and sheet metal work against costly damages.

Sliding snow and ice often injure roofings, and puncture or tear away gutters, etc. The use of our snow guards forestalls these dangers, as they hold the ice and snow where they form. They are a cheap and unobtrusive preventive against damage.

#### Description.

Three general designs of snow guards are manufactured: The "Clason," and the "H-B" for new roofs; the "H-B Special" for roofs already laid.

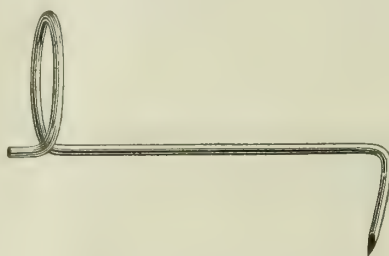
"CLASON"—The "Clason" snow guard for new roofs has been our standard guard for years, and we claim it without hesitation to be the strongest snow



"CLASON" SNOW GUARD FOR NEW ROOFS

guard made. Note from the cut that the "butterfly" loops brace and strengthen each other, while the brace extending below the loops gives additional strength. Although the "Clason" is higher in price than the "H-B" guard, it has consistently been the best seller.

"H-B"—The "H-B" snow guard for new roofs, as may be seen in the illustration, is made with a single loop and extension brace. It is made of the same gage of wire as the "Clason," but is sold at a lower price because less wire and labor is required in its manufacture. It is a strong service-giving guard.



"H-B" SNOW GUARD FOR NEW ROOFS

#### Materials.

These snow guards are made from either pure copper or galvanized steel wire, especially selected for ductility and stiffness. Please note carefully that copper plated or copper covered steel wire is not used. Pure copper guards last as long as the roof.

#### Number Per Square.

The following table gives the approximate number of snow guards which may be safely specified:

ROOF PITCH	NUMBER PER SQUARE
One-quarter .....	50
One-third .....	75
One-half .....	150

This table must be varied to suit conditions. Towers, steep roofs and large sized slate may require more snow guards than indicated in the above.

#### How to Specify.

Apply to all pitched roofs "Clason" [or "H-B"] Snow Guards, as made by THE CLASON ARCHITECTURAL METAL WORKS, Providence, R. I. The guards to be made from pure copper [or galvanized steel] wire. (Here specify the number required per square, dependent upon the pitch of the roof and the size of the roofing material.)

#### Installation.

In applying the "Clason" and "H-B" guards to new roofs, the eaves course should be laid with close joints, as usual, but the next course should be laid with the joints slightly open to receive the shank of the guard. After lining for the third course, place the guards in the joints, with the loop just below the lap of the course, and drive the prong into roof boards; then lay the course, which will leave only the loop exposed. Care should be taken to have the shank well sunk into the joints, so that slate of following course will lie perfectly flat and not bear upon the guard.



## THE AULD & CONGER CO.

Producers of Roofing Slate, Blackboards, Structural Slate, Slaters' Tools, Etc.

Bangor Building  
CLEVELAND, OHIO

QUARRIES  
POULTNEY, VT.  
BANGOR, PA.

### Products.

"ROOFING SLATES of Quality;" BLACKBOARDS and STRUCTURAL SLATE.

Slaters' Tools, Machines, and Supplies.

### Roofing Slates.

We own and operate five quarries and since 1870 have produced annually a large output of Mottled Green and Purple, Unfading Green, Weathering Green, Rough Rustic Gray, Genuine Black Bangor, and Purple Vein "Roofing Slates of Quality," which can be supplied in standard sizes and thicknesses, or varying lengths and random widths, from  $\frac{3}{16}$  in. to 1 in. in thickness.

SERVICE, SAMPLES, ETC.—Our service department is at the command of architects, and will furnish, gratis, roof layouts, any samples desired, and copies of illustrations shown herein.

### Our Mottled Green and Purple.

Purple slates mottled by nature with green, and mixed together with light and dark greens, making a roof which shows its colors and individuality at any distance.

### Our Weathering Green.

Various shades of green laid together with warm buffs and browns. These are from a distinctive bed or

vein in our quarries and should not be confused with any other slate of a like name.



OUR WEATHERING GREEN

### Genuine Certificate Bangor.

Our Bangor Union Quarry slates have always been considered the standard of excellence. Black, strong, durable and unfading. Each bears a label and shipments are accompanied by certificate and warranty insuring genuineness.

### Slate for Church Aisles, Porches and Gardens, etc.

Irregular slabs up to 2 ins. in thickness—various colors—natural split or semismooth.

### Structural Slate and Blackboards.

Sinks, laundry tubs, wainscoting, steps, risers, platforms, shower baths, billiard table tops, morgue slabs, grave vaults, etc.

### Specifications.

We advise incorporating in your specifications the full wording "THE AULD & CONGER CO. 'Slates of Quality,'" etc. Specification forms mailed promptly on request.

### Prices.

Prices, weights and full information on request.



OUR MOTTLED GREEN AND PURPLE

# THE CHAPMAN SLATE COMPANY

BETHLEHEM, PA.

## Products.

Makers and shippers of "WILLIAM CHAPMAN" ROOFING SLATE in graduated lengths and thicknesses and random widths; also in all the regular stock sizes.

## Quarries.

The quarries of THE CHAPMAN SLATE COMPANY were opened in 1850, and today, with a capacity of over 6,000 squares per month, produce more roofing slate than any other single quarry operating in the country.

The Chapman product today is quarried from a depth of over 200 ft.; is made by highly skilled mechanics, many of whom have long been in the service of the company, and the entire output is most carefully inspected to insure the proper grading.

## Heavy Slate.

Owing to the numerous and constantly increasing demands from architects, the company has, for the past year, been making a heavy rough slate ranging from  $\frac{1}{4}$  to 1 in. in thickness, and in graduated lengths and random widths. The artistic effect of a roof laid with the genuine "William Chapman" special rough slate, gives tone and character to a building which can not be produced by the use of any other roofing material.

If an especially heavy effect is desired, the company recommends extra thicknesses, slate to be laid in graduated lengths and thicknesses, and random widths.

Where a roof has a high pitch, a very desirable effect will be produced by using at the eaves a slate 30 ins. long, graduating from 16 to 14 ins. long at the ridge, and in thicknesses from 1 in. at the eaves to  $\frac{1}{4}$  in. at the ridge. All laid in random widths.

For manufacturing plants or other places where particularly hard wear is required, the company recommends the use of "William Chapman" special rough slate,  $\frac{1}{4}$  in. thick.

Any thickness, length or width slate can be made, and THE CHAPMAN SLATE COMPANY will gladly cooperate with architects by submitting detailed plans showing the sizes of slates to be used in the various courses, to produce the most artistic effect as well as most efficient results.

**SPECIFICATIONS**—The following specification form is offered as a suggestion for specifying slate for graduated roofs:

All roofing slate to be "WILLIAM CHAPMAN" Heavy Slate, of graduated thickness and random widths, same to be laid in accordance with plans approved by the architect.

## Roofing Slate.

The excellence of the "William Chapman" roofing slate lies in the toughness of the fiber, which is very

hard and close grained, thus insuring a durability beyond any known limit of time. "William Chapman" roofing slate absorbs no moisture and will not decompose. Largely owing to these characteristics there is practically no breakage in transportation.

**STOCK SLATE**—The stocks of regular sizes are large and complete.

This slate is about  $\frac{3}{16}$ -in. thick, weighing approximately 680 lbs. to the square, allowing for the standard 3-in. lap. There are 14 different sizes, ranging from 6 by 12 ins. to 14 by 24 ins.

Special sizes will be made to order when required.

**SPECIFICATIONS**—To insure customers getting the best roofing slate, the following specification form is given as a suggestion:

"All roofing slate to be 'WILLIAM CHAPMAN' slate, size ..... (as best adapted to the different buildings). Allow a full 3-inch lap of the third slate over the first, and provide 2 [galvanized, or copper] nails to each slate. Each row of slates to break joints with the adjoining row. The slates at the eaves, ridges and valleys to be so cut that every bond will be uniform with the rest, and the slate on one side of the ridge shall project and finish without cresting. In steel construction, when slate is laid direct on steel purlins, use copper nails, which should be bent under the lower part of the flange of angle or purlin; or if preferred, punch 4 holes in each slate and tie under purlins."

## Labels.

To prevent substitution of inferior quality slate, the company has instituted the practice of labeling about 2% of each shipment of genuine "William Chapman"



"WILLIAM CHAPMAN" SLATE LABEL

roofing slate with a label, facsimile of which is reproduced herewith, on which is indicated the grade, whether No. 1, B's, or No. 2.

## Shipping Facilities.

The company ships direct from the Chapman quarry to every State in the Union, to Canada and Mexico, or to seaboard for export to England or France. With the present capacity, any size order for "regular" stock can be supplied promptly.



**References.**

Herewith is given a partial list of buildings covered by "William Chapman" slate roofs:

Brooklyn Bridge Buildings, New York, N. Y.  
 Holy Trinity Church, New York, N. Y.  
 Central Park Buildings, New York, N. Y.  
 Isabella Heimath Residence, New York, N. Y.  
 Long Island Historical Society, New York, N. Y.  
 Metropolitan Opera House, New York, N. Y.  
 Monastery, Hoboken, N. J.  
 Mutual Life Insurance Co.  
 Philadelphia & Reading Freight Station, Subway, Philadelphia, Pa.  
 Roman Catholic Cathedral, New York, N. Y.  
 Roman Catholic Church of the Epiphany, Philadelphia, Pa.  
 Staats-Zeitung, New York, N. Y.  
 State Capitol, Albany, N. Y.  
 State Capitol, Hartford, Conn.  
 St. George's Church, New York, N. Y.  
 St. Vincent's Hospital, New York, N. Y.  
 U. S. Military Academy, West Point, N. Y.

First Presbyterian Church, Newark, N. J.  
 Mt. St. Mary's Convent, Plainfield, N. J.  
 St. Barnaby's P. E. Church, Philadelphia, Pa.  
 The Orphanage, Paterson, N. J.  
 Hackensack Water Co., New Durham, N. J.  
 Hackensack Water Co., New Milford, N. J.  
 Buildings of Asylum, Overbrook, N. J.  
 Morris Plains Asylum, Morris Plains, N. J.  
 U. S. Fort Terry, Plum Island, N. Y.  
 U. S. Fort H. G. Wright, Fishers Island, N. Y.  
 Convent Buildings, Lodi, N. J.  
 St. Ledislaus Polish Catholic Church, Philadelphia, Pa.

**Names of clients:**

Bethlehem Steel Company, Bethlehem, Pa.  
 C. M. Taylor & Co., Philadelphia, Pa.  
 Coleraine Iron Co., Philadelphia, Pa.  
 Consolidated Gas Co., New York, N. Y.  
 Midvale Steel Co., Philadelphia, Pa.  
 Vulcan Iron Works, Wilkes-Barre, Pa.  
 Wm. C. Allison & Sons, Philadelphia, Pa.  
 Wm. Sellers & Co., Philadelphia, Pa.



A ROOF OF "WILLIAM CHAPMAN" ROOFING SLATE, PRODUCT OF THE CHAPMAN SLATE COMPANY'S QUARRY

Owner, GEORGE HOWE, Chestnut Hill, Philadelphia, Pa.  
 FURNESS, EVANS & Co., Architects, Philadelphia, Pa.

# GENERAL SLATE COMPANY

SUCCESSORS TO MAINE SLATE COMPANY OF MONSON, MONSON LUSTRE SLATE COMPANY,  
D. C. SHERMAN SLATE COMPANY

SALES AND GENERAL OFFICE

200 Devonshire Street  
BOSTON, MASS.

QUARRIES:  
MONSON, ME.; FAIRHAVEN, VT.

## Products.

UNFADING ROOFING SLATE.  
ELECTRICAL SLATE AND STRUCTURAL SLABS.

## Quarries.

The Monson Lustre (formerly Maine Slate Company of Monson) Quarry on Greenville branch of Bangor & Aroostook R.R. near Monson, Me. There are no freight charges on slate shipped from this quarry, as there are over the narrow gauge road which serves other Monson quarries; an advantage of 30¢ per square.

The D. C. Sherman Quarry, between Fair Haven and Poultney, Vt.

## Receiving Yard.

The company has established a receiving yard at the junction of the Delaware & Hudson R.R. and the Rutland R.R. L. & P. Electric Railroad, north of Poultney, Vt., at which it regularly carries in stock all sizes and thicknesses of unfading Vermont roofing slates, carefully inspected and graded for thickness, color and quality, and piled ready for immediate shipment in carload lots.

Terrace flagging, hearth stones and floor tiles of the colored slates shown below are carried in stock rough split, ready to trim and ship at short notice.

## Quality and Service.

The company handles no cheap slates and competes for business of the best character only; relying upon quality and service rather than upon low prices to deserve the confidence and patronage of architects and builders. It stamps all its products with its trade-mark, and will be responsible for them.

It is prepared to handle orders for electrical and structural slate.

## Small Size and Random Width Slates.

Particular attention is called to the beauty and desirability of small size slates (12- to 9-in. lengths) for roofs of commensurate scale; also to the advantages gained by using random width slates.

Write for booklet on these subjects.

## Color.

Facsimile color-prints of the fine roofing slates that the company is now prepared to deliver are presented herewith.

All of the slates shown are absolutely unfading in color. The black slates of Pennsylvania contain more or less iron, which oxidizes on exposure to the weather; so also do the fading slates of Vermont, which, with the Pennsylvania slates, constitute 90% of the low priced or commercial slates produced in the United States. This oxidization fades or rusts the slates when on the roof, to a dirty looking surface: smoky-brownish in Pennsylvania slates, and rusty-brown or yellow-green and green in that of the Vermont slates.

The *unfading* slates of Maine and Vermont retain their fresh clean surface absolutely without change. The Sherman quarry slates are of especially brilliant colors; while Monson Lustre slate is distinguished



TRADE-MARK

by a marked lustre, which tends to reflect the changing colors of the sky.

## Strength.

The strength of our leading competitors' slates is shown by the Lehigh University tests (Merriman's; see U. S. Government reports), breaking load being given in pounds per square inch of cross section, as follows:

COMPETITORS' SLATES	BREAKING LOAD (Average of 4 specimens)
Peach Bottom, Md.....	11,260
Brownville, Me.....	9,880
Arvon, Va.....	9,850
Old Bangor, Pa.....	9,810
Red Slate, N. Y.....	9,220
Sea Green, Vt.....	7,250

## STRENGTH OF OUR SLATES—LEHIGH UNIVERSITY TESTS (McKibben's, 1916)

	BREAKING LOAD (Average of 4 specimens)
Monson Lustre, Maine.....	11,805
Unfading Green, Vermont.....	6,410

Many of the black slates of Pennsylvania, especially the "ribbon slates," contain more or less lime, which causes them to disintegrate on the roof in course of time. The Maine slates and Vermont slates are non-disintegrating; and if properly made and laid, never break.

The Monson Lustre quarry has never experienced a claim for breakage of slate in transit. No allowance need be made therefor in ordering this slate.

## Thickness.

To insure a tight and durable roof, uniform and sufficient *thickness* of roofing slate is far more important than size. It can be secured only by careful inspection and sorting of the finished slate; which this company guarantees.

Sherman unfading slates, like most Vermont slates, are weaker than the Maine slates and should be split to a minimum thickness of 3/16-in. That thickness has been adopted as our Sherman quarry standard minimum. We no longer produce, or offer for sale, what are called, in Vermont, "No. 1" slates (namely, an unsorted mixture of thicknesses of slate varying from 1/4-in. to "wafers," averaging in weight about 750 lbs. to the square), except as they are culled for under-thickness or broken corners while inspecting our 3/16-in. grade.

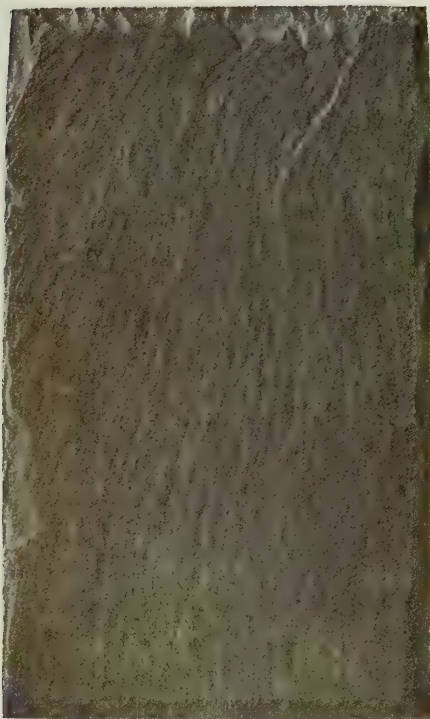
Monson Lustre slates have for many years been split to a 3/16-in. standard thickness; but, owing to their wonderful "metal," can be split six slates to the inch of total thickness, without weakening them too greatly. These "thins" weigh only 550 lbs. to the square, and are sometimes very useful for covering wide spans or weak raftered roofs. They are made only to order, and time must therefore be allowed for their manufacture.

## Graduated Roofing Slates

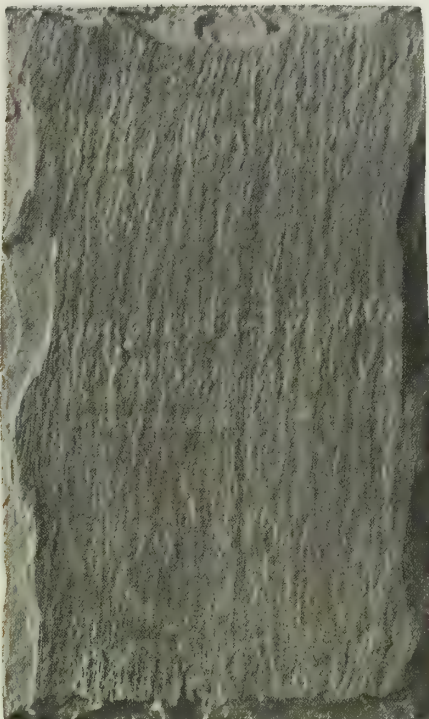
Special attention is given to "thick stuff" orders and "graduated" slate.

Photographs of typical roofs, with suggestions as to color, size and grade of appropriate slate, sent promptly to any interested person on request.

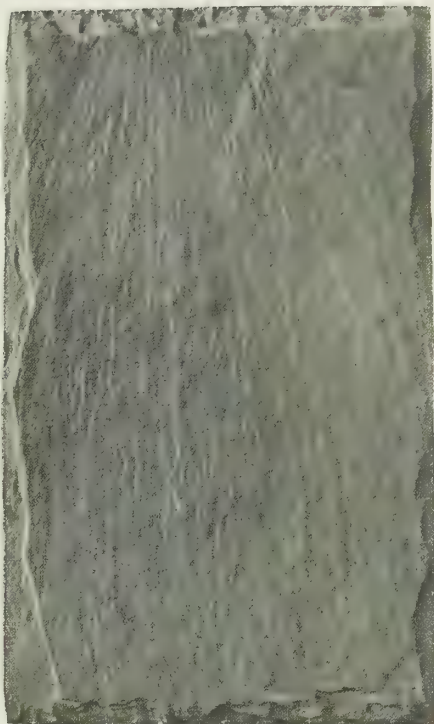




"Old Copper"



"Purple Opal"



"Green Opal"



"Copper Green "



"Olive Gray "



" Monson Lustre "

FACSIMILE COLOR PRINTS OF OUR UNFADING VERMONT AND MAINE SLATES

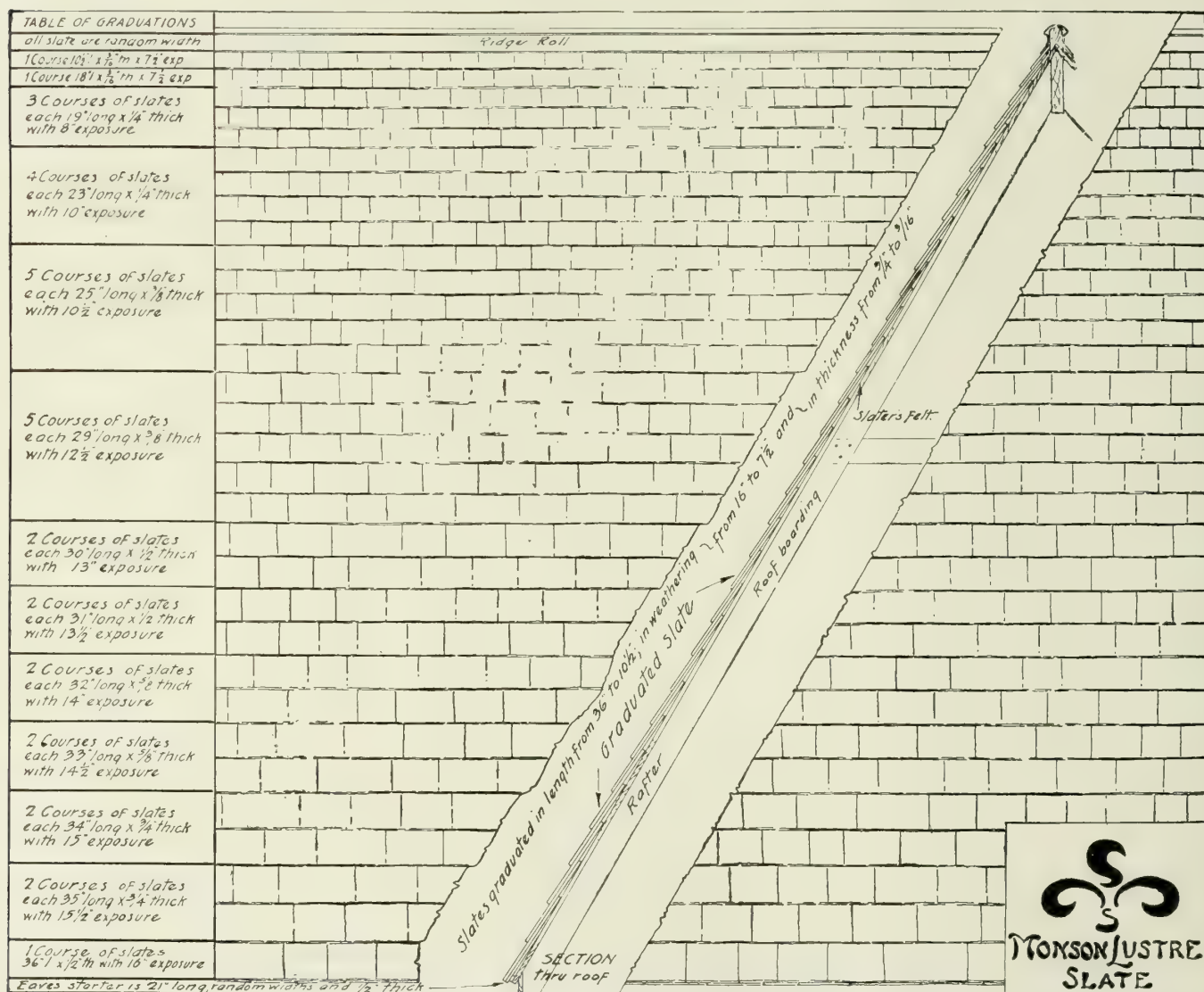
NOTE—Owing to the war and inability to procure certain shades of colors for printing ink formerly imported from Germany, the above vary slightly, but not deceptively, from the color tones of the original slates





RESIDENCE OF F. L. W. RICHARDSON, OF RICHARDSON, BAROTT & RICHARDSON, ARCHITECTS, BOSTON, MASS.

An unusually successful layout of graduated slate by a distinguished architect in roofing his own residence. Both graduation and scale seem perfect. "Monson Lustre" slate was used



ROOF SECTION SHOWING GRADUATED SLATE (RANDOM WIDTHS) LAYOUT. FULL LENGTH RAFTER

Similar graduated layout used on Richardson house illustrated above



INCORPORATED, 1866

## THE PENRHYN SLATE COMPANY

HYDEVILLE, RUTLAND COUNTY, VT.

## DIRECTORS AND OFFICERS

BLAIR S. WILLIAMS, PRESIDENT

Williams, Nicholas &amp; Moran, New York, N. Y.

RICHARD GRIFFITH, VICE-PRESIDENT AND MANAGER, Fair Haven, Vt.

SAMUEL F. BARRY, SECRETARY, New York, N. Y.

MARSHALL L. WARRIN, New York, N. Y.

STEPHEN G. WILLIAMS, TREASURER

Worcester, Williams &amp; Saxe, New York, N. Y.

W. M. MOORE, President John Jones Slate Co.

CHARLES A. MORAN, Attorney, New York, N. Y.

## MILLS AND QUARRIES

POULTNEY, VT.

WEST CASTLETON, VT.

FAIR HAVEN, VT.

HYDEVILLE, VT.

MIDDLE GRANVILLE, N. Y.

**Products.**

"PENRHYN PURPLE" and "PEERLESS UNFADING GREEN" SLATE for Roofing and Structural Purposes.

**Structural Uses.**

Shower, urinal and toilet stalls.  
 Stair treads and platforms.  
 Laboratory table tops, sinks and shelving.  
 Laundry tubs.  
 Rough garden flagging; garden seats.  
 Dairy shelves; pastry boards; kitchen table tops.  
 Pantry shelves and linings.  
 Greenhouse shelves.  
 Book shelves.  
 Baseboards; mouldings.  
 Mausoleum slabs.  
 Electrolytic and chemical tanks.  
 Electrical switchboard bases, etc.

**"Peerless Unfading Green" Slate.**

This slate is applicable to all roofing and structural purposes where an unfading green slate is desired and required.

The United States Government specifies that unfading green slate must come from our quarry or one of three others in North Poultney, Vt. The evident reason is, because the Peerless slate is positively unfading under all normal climatic conditions.

This slate can be furnished in any required size or thickness with smooth or rough edges.

**"Penrhyn Purple" Slate.**

"Penrhyn Purple" slate is a uniformly strong, fine grained product, adaptable to all structural purposes to which slate may be applied. It weighs 14 lbs. per sq. ft. (12 ins. by 12 ins. by 1 in.).

The quality of "Penrhyn Purple" slate makes it unusually valuable for use with electrical appliances, as

is proved by its use by such well-known electrical concerns as mentioned under head of references.

**Estimates.**

Complete quotations will be made promptly on receipt of necessary details.

**Samples.**

Samples of slate will be furnished prospective users on request.

**Orders and Inquiries.**

Orders are shipped on the dates named. Inquiries are promptly answered.

**Facilities.**

The equipment of this company is of the best, and the finished product is not surpassed by that of any firm, and seldom equaled.

**Co-operative Service.**

This organization will gladly co-operate with architects and others interested in slate for structural purposes, in working up the details for its proper application.

This service is gratis.

**References.**

As evidence of the excellent quality of Penrhyn slate, a partial list of the regular users of this product is submitted here.

General Electric Company  
 Westinghouse Electric Mfg. Co.  
 Northern Electric Co.  
 Speakman Supply and Pipe Co.  
 Albert & J. M. Anderson Mfg. Co.  
 Brunswick-Balke-Collender Co.

ESTABLISHED 1884

**E. J. JOHNSON, INC.**

Quarrier of Roof Slates, Slate Blackboards, Structural Slate

19 W. 44th Street  
NEW YORK, N. Y.

QUARRIES: BANGOR, PA.; NORTH POULTNEY, VT.; NORTH GRANVILLE, N. Y.

**Products.**

Roof and Floor Slates.

Slate Blackboards; Structural Slate; Slaters' Tools;  
Snow Guards.**Old European Style of Slate Roof.**

We maintain a special department giving attention of a strictly technical character to the arranging of color effects, graduations, etc.

**Specifications for Old European Method, with the E. J. Johnson, Inc., Slate.**

Our varying shades of purple and green, red, and gray, supply a soft tone and effective color scheme of highly artistic character. They are specified either in one solid color, varying shades of one color, or a mixture of two or more colors. Slates of graduated thickness, random widths all laid haphazard, suggest some of the striking features of our old European slate roofs, not the least of which is the pronounced rough texture. Brochure "Old European Slate Roofs," describing 20 or more color schemes, supplied on application.

Cover all sloping roofs with one thickness of heavy tarred roofing felt to be approved by architect, over which lay the E. J. Johnson, Inc., Slate Color Scheme No. 17 (or other color arrangement as may be desired), with nailholes drilled and countersunk and in random widths and graduated lengths as follows:

Under eave course, 17½ ins. long by ½ in. thick; eave course 30 ins. long by ½ in. thick, 13½ ins. to weather; the next course 30 ins. long by 1 in. thick, 13½ ins. to weather; the next two courses 28 ins. long by ¾ in. thick, 12½ ins. to weather; the next three courses 26 ins. long by ½ in. thick, 11½ ins. to weather; the next three courses 24 ins. long by ¾ in. thick, 10½ ins. to weather; the next three courses 22 ins. long by ¼ in. thick, 9½ ins. to weather; the next three courses 20 ins. long by ¼ in. thick, 8½ ins. to weather; the next three courses 18 ins. long by ⅜ in. thick, 7½ ins. to weather; the next four courses 16 ins. long by ⅜ in. thick, 6½ ins. to weather; the next four courses 14 ins. by ⅜ in. thick, 5½ ins. to weather; the next five courses 12 ins. long by ⅜ in. thick, 4½ ins. to weather. All slate to be fastened with galvanized wire nails of suitable lengths for the various thicknesses.

NOTE—The foregoing is for a roof with a 22-ft. rafter. The arrangement may be varied to suit any length rafter, the thickness increased or decreased, the exposures varied, or the cost reduced by using thinner slates, as the random and graduated effect would be obtained even though full ⅜-in. slates were used entirely. A uniform length of slate and exposure throughout the roof with random widths is another scheme specially adapted to ⅜ in. thickness.

In general the color effects obtainable are solid colors in blue black, gray, green, purple and red. In each color are varying shades—in some mottled effects—making it possible to introduce several shades of one color in a roof, or two or more colors in several shades. The use of "weathering" slate, in part or entirely, adds further possibilities. Specify by number from our pamphlet "Old European Roofs," or special color schemes will be supplied.

**Old European Slate Floor.**

Random and irregular size slabs, wide joints, semi-smooth surfaces, random colors, purple, green and red, especially adapted to church aisles, floors, etc., reproducing the old European cathedral floor effects; also



FIG. 1. E. J. JOHNSON EUROPEAN METHOD OF LAYING SLATE

adapted to porch floors, garden walks, terraces, etc. Sound deadening.

Full description with interesting suggestions furnished on application.

**Standard No. 1 Roof Slate Full ⅜ In. Thick.**

"Standard No. 1 Slate" is the trade-name applied to the ordinary thickness of roof slate, which approximates ⅜ in. in any of the colors, and implies the best material as to quality and smoothness of surfaces. Thickness is not sufficiently or properly established in the trade to make that important point clear and definitely fixed as it should be, but leaves the question open to the use of thin or substantially split slate as may be the policy of those who supply it. We are earnest advocates of substantially split slates and make in all our roof slates a Standard No. 1 full ⅜ in. thick; and if architects will specify the "E. J. Johnson, Inc., Standard No. 1 Slates full ⅜ in. thick," it will insure this point of maximum strength and thickness which is so properly expected in a slate roof.

Among our grades of standard roof slates, full ⅜ in. thick, are the following:

The E. J. Johnson, Inc., Bangorvein (Blue Black), a slate of superior strength, excellent color and wear-



ing quality. Each slate is labeled with the Bangor Slate Association label.

The E. J. Johnson, Inc., Unfading Green, a slate of uniform green, being a light green when first quarried but weathering to a beautiful delicate shade of green, greatly admired.

The E. J. Johnson, Inc., "Superior Gray," a slate of dark gray color, unusual strength, suitable for solid color or mixture with two or more shades of Blue Black.

The E. J. Johnson, Inc., Variegated Green, consisting of several shades of green to be laid at random throughout the roof; the shades of green varying slightly, but enough to give a pleasing variation throughout the roof.

The E. J. Johnson, Inc., Variegated Green and Purple, contains slate of the two colors laid at random throughout the roof. Many of these slates will weather to a yellowish tinge.

The E. J. Johnson, Inc., Mottled Purple and Green, a slate containing the two colors; a goodly proportion of the individual slates showing the two colors in more or less mottled effect, purple predominating, other slates being solid green or purple, but colors that are not in strong contrast.

The E. J. Johnson, Inc., Clear Purple, the slates making a roof of solid purple color.

The E. J. Johnson, Inc., Clear Red, being a handsome uniform shade of terra cotta red, making an exceedingly rich appearing roof.

The E. J. Johnson, Inc., Mottled Red, a slate of slightly varying shades, with occasional slates having markings of a brownish color and others with very slight markings of green. A roof of this slate gives a pleasing variation throughout its surface, which is most delicate and without any sharp contrasts. Its unique appearance is highly artistic and exceedingly attractive.

Variety in color effects is being sought in roofs as never before. It is not generally realized that such a range of colors is to be found in slate. With our own quarries producing every known color, with their variations, we are in position to work out roof schemes in slate of great effectiveness.

It is recommended that in all of the above slates the nailholes be drilled and countersunk at the quarry. In specifying our slates and seeing that they are used, the architect will be assured of substantial, well made slates that are not put on the market to meet cheap competition, and yet they are sold at the lowest prices, quality and make-up considered. We will issue our own certificate with each shipment, which should be required by the architect.

#### Specifications for Ordinary or Standard No. 1 Slate of Full $\frac{3}{16}$ In. Thickness.

Cover all sloping roofs with one thickness of single-ply tarred roofing felt properly lapped and of quality as may be approved by the architect, over which lay the E. J. Johnson, Inc., Unfading Green Roof Slate (or otherwise as may be desired) Standard No. 1 full  $\frac{3}{16}$  in. thick, nailholes drilled and countersunk, size 20 by 10 ins., each slate fastened with two yellow metal slating nails  $1\frac{1}{4}$  ins. long. All slates to be laid with 3-in. lap and exposure of  $8\frac{1}{2}$  ins. (or other dimensions suitable to size of slate used), with butts laying tight. Under eaves and top courses to be of same width (10 ins.) and with grain of slate vertical; no "stretchers" or slate with grain running horizontal will be permitted. Slates at valleys, hips, rakes and ridges to be laid in elastic cement of same color as slate.

Small pieces of slate at valleys and hips will not be allowed. Metal at gutters must run well up under slate. Ridging and hips of 16-oz. cold rolled copper (or other metal), 3-in. flange coming down over slate, covering all nailholes; 14-oz. copper flashings and 16-oz. cap flashings wherever necessary. Boston hips and ridges of slate are not only effective but are exceedingly practical.

(Detailed information respecting specification requirements will be furnished architects on request.)

#### Consulting Service.

This includes supplying technical facts for preparing specifications, submitting samples, making layouts and supplying blue prints, together with practical advice to aid the architect and roofing contractor in obtaining the best results. Our 30 years' experience in producing roofing slate is at the disposal of both architect and roofer.

#### References.

The final test of any building material is found in its selection by prominent architects for their better class of work, where simplicity, purity and durability are sought. Space does not permit of quoting more than a few of the buildings on which our roof slate has been used, but we will gladly furnish to prospective builders or architects names of buildings in their particular locality which may be inspected, or supply such information as will lead to a better understanding of the unusual advantage which our slate has over other material.

Among buildings where our slate productions of "Out of the Ordinary" roof slates have been used are the following, the architects' name also being given:

Nicholas Brady Residence, Roslyn, L. I., N. Y., John T. Windrim  
Algonquin Hotel, St. Andrews, N. B., Barott, Blackader & Webster  
Trinity Church, Asheville, N. C., Cram, Goodhue & Ferguson  
J. E. Aldred Residence, Locust Valley, L. I., N. Y., Bertram Goodhue  
Burke Foundation, White Plains, N. Y., McKim, Mead & White  
Lewis H. Lapham Bungalow, New Canaan, Conn., W. B. Tubby  
Cathedral College, Church of the Immaculate Conception, Brooklyn, N. Y., Gustave Steinbach  
W. R. Coe Farm Buildings, Oyster Bay, L. I., N. Y., Walker & Gillette  
St. Peter's Parish House, Morristown, N. J., Bertram G. Goodhue  
Mrs. Francis Carolan Residence, Burlingame, Cal., Willis Polk & Co.  
Cornell University, Residential Halls "A" and "D," Ithaca, N. Y., Day & Klauder  
H. H. Weeks Residence, Islip, L. I., N. Y., Grosvenor Atterbury  
Joseph D. Schlotman Residence, Garage and Service Building, Grosse Point, Mich., Albert H. Spahr  
Henry Lang Residence, Montclair, N. J., Douglass Fitch  
Paul Moore Residence, Convent, N. J., Harrie T. Lindeberg  
St. Cazunires Church, Worcester, Mass., John William Donohue  
E. L. Ford Residence and Garage, Grosse Point, Mich., Albert H. Spahr  
Bryan Mullanphy School, St. Louis, Mo., William Ittner  
Fred P. Humphreys Residence, Convent, N. J., Harrie T. Lindeberg  
University of Michigan, Martha Cook Dormitory, Ann Arbor, Mich., York & Sawyer  
University of Michigan, Chi Psi Fraternity House, Ann Arbor, Mich., York & Sawyer  
First Presbyterian Church, San Francisco, Cal., Wm. C. Hay  
Women's Reformatory, Chapel, Clinton, N. J., Delano & Aldrich  
Dr. Dudley Allen Residence, Cleveland, Ohio, Chas. Schweinfurth  
Victor Morawitz Residence, Garage and Stables, Delano & Aldrich  
Cathedral of St. John the Divine, Choir School, New York, N. Y., Cook & Welsh  
W. D. Packard Residence, Chautauqua, N. Y., Warren & Wetmore  
Yale University, Zoological Laboratory, New Haven, Conn., C. C. Haight  
Rutherford Stuyvesant Pierrepont Residence and Garage, Peapack, N. J., Montague Flagg, II.  
Sage Memorial Church, Far Rockaway, N. Y., Cram, Goodhue & Ferguson  
Musical Art Building, New York, N. Y., Donn Barber  
South Methodist University, Dallas, Tex., Shipley, Rutan & Coolidge  
Women's College, Cleveland, Ohio, C. F. Schweinfurth  
First Baptist Church, Pittsburgh, Pa., Cram, Goodhue & Ferguson  
University of Indiana, Gymnasium, Bloomington, Ind., R. P. Daggett Co.

ESTABLISHED 1869

# RISING & NELSON SLATE CO.

MAIN OFFICE  
WEST PAWLET, VT.

NEW YORK OFFICE  
101 Park Avenue

BOSTON OFFICE  
4 Post Office Square

CHICAGO OFFICE AND YARD  
2554 West Harrison Street

ARCHITECTS' SERVICE DEPARTMENT: NEW YORK, Architects Building, 101 Park Avenue

## Products.

Miners, makers and shippers of high grade ROOFING SLATE: Graduated, Commercial and Architectural.

**Tudor-stone**

TRADE-MARK  
(Copyrighted)

## Production and Service.

This company owns and operates nearly a dozen quarries in addition to controlling the production of a large number of others both in Vermont and Pennsylvania. This insures promptness, quality and uniformity of result in all slate, especially architectural slate.

The service offered by this company is strictly architectural and is handled through a department quite separate from the commercial offices. Roofs are laid out complete, or designed for period work, either outright or in collaboration. Estimates furnished.

## Graduated Roofing Slate.

All kinds, all colors, in any size, thickness, shades, or combinations, in bulk or to layout. Also black and red slate.

## Commercial Roofing Slate.

Same material as above, but in standard sizes and thickness, and which are carried in stock for immediate shipment.

## Architectural Roofing Slate.

As differentiated from graduated slate and used for period effects, the personal or odd. This company is the originator of this class of material and exclusive miner and worker of several distinct offerings, such as, Tudor-stone, Verde Unique, Cotswold, Velenheli Purple, Tudor-stone Jr., etc.

## Description of Roofing Slate.

Roofing slate is merely stone which can be split into thin flat slices and when freed from quarry sap is immune from disintegration on exposure to the weather. It varies much in color and weathering and less as to hardness and toughness. Vermont slate (colored slate) is practically alike as to permanence, and once laid will never disintegrate. Maine slate and Pennsylvania slate, except small bed and top rock, are also durable for roofing purposes. In texture, slate varies widely. The "best" slate rock splits easily into thin slices with surfaces almost smooth, known as No. 1, Commercial, etc.

Rough rock is not so easily split, and must, if used at all, be made into thick slate. No. 1 rock for economy is, therefore, frequently used in thick slate. Quality is not thereby impaired, but such roofs have little texture and no character except that of weight and size of pieces.

To overcome this the mining of Tudor-stone was started three years ago. Not old material under a trade-name, but slate and near-slate stocks, selected along architectural lines, mined exclusively by this company and coordinated in the yards under true architectural superintendence.

Originally very rough (No. 1 rock was never used) Tudor-stone quickly became recognized as a distinct

material and at present several quarries are devoted to its exclusive production. More colors have been added to the single original weathering mixture as the proper textures and cleavages have been found.

This work is in addition to wholesale quarrying and manufacture of No. 1 and commercial slates, which enables this firm to dispose of the less interesting material mined with the Tudor-stone group, and keep its price, appearance considered, about the same as heavy slate.

## Specifications.

Cover all sloping roof surfaces not otherwise designated with [state the kind of slate desired, the color or mixture, thickness or grade, or if graduated the desired range of thickness and lengths]. If the RISING & NELSON SLATE Co.'s name is also included it will insure accuracy and promptness of result. This is all a slate specification requires. Use any preferred nails, paper, cement, flashings, etc.

## Samples.

Samples of any slate wherever mined forwarded without obligation. Also Tudor-stone samples as well.



TUDOR-STONE IN ANTIQUE REPRODUCTION

## References.

Charles A. Platt—The Myers, Garlick, Starr, Meaker, Williams and other Buildings  
Delano & Aldrich—The Otto Kahn, Burden, Vanderbilt, Palmer and other Buildings  
Carrere & Hastings—The Alfred du Pont, Pforzheimer and Blair Buildings  
McKim, Mead & White—The Jennings and McCurdy Residences  
John Russell Sope—The Stuart Duncan, Hencken, Stout and Branch work  
Goodwin, Bullard & Woolsey—The Goodwin, Christ Church, J. Pierpont Morgan and J. S. Morgan work  
Cortland F. Luce—The Winchell Smith, Allyn, Griggs, Sturnham, Y. W. C. A. and other work.  
Howard VanDoren Shaw—The Fairbanks, Swift, Pick, Clow and other work  
Murphy & Dana—The Scott and Schwab work  
Bertram G. Goodhue—The Hartley and Henry Residences  
Holabird & Roche—Half-Orphan Asylum and the Ferguson Residence



TABLE OF ROOFING SLATE IN GENERAL USE

Trade-name	Occasional name	Color description (See Note A)	Color permanency or weathering value	Range of thickness produced	Price f. o. b. quarry, commercial, stocks	Price per unit thickness, per square, heavy slate at the quarry	Purposes and remarks
1. Unfading Green (a) light (b) dark		Light greenish gray	Unfading	$\frac{3}{16}$ " commercial, also graduated	\$6.50 to \$9.00. Large production	\$11.00 to \$12.00 per $\frac{1}{4}$ "	General roofing purposes and graduated mixtures
2. Unfading Green, special dark	Copper Green, Imperial	Greenish gray	Unfading	$\frac{3}{16}$ " commercial, also graduated	\$7.00 to \$9.50. Limited production	\$11.00 to \$12.00 per $\frac{1}{4}$ "	Where green color is wanted
3. Verde Unique		Dark green	Unfading, although darkens slightly	$\frac{1}{4}$ - $\frac{3}{8}$ " and heavier	Not made thinner than $\frac{1}{4}$ - $\frac{3}{8}$ "	\$16.00 to \$18.00 for $\frac{1}{4}$ - $\frac{3}{8}$ " rough. Large production	Good work calling for unmistakably green roof with rough texture
4. Unfading Mottled Green and Purple (a) light (b) dark	Purple Opal, Old Copper, Old English	(a) Greenish gray with purple clouds (b) Purple with greenish clouds	Unfading	$\frac{3}{16}$ " commercial, also graduated	\$6.50 to \$9.00. Very large production	\$11.00 to \$12.00 per $\frac{1}{4}$ "	General purposes and in graduated mixtures
5. Clear Purple		Dark grayish purple	Practically unchanging	$\frac{3}{16}$ " commercial, also graduated	\$6.75 to \$9.25. Production small	\$11.00 to \$12.00 per $\frac{1}{4}$ "	General purposes and in graduated mixture for dark effects
6. Imperial Purple		Darker than above, rough surface	Fixed color	$\frac{1}{4}$ - $\frac{3}{8}$ " and heavier	Not produced thinner than $\frac{1}{4}$ - $\frac{3}{8}$ "	\$14.00 to \$15.00 for $\frac{1}{4}$ - $\frac{3}{8}$ " rough. Large production	Public buildings, country houses and general purposes
7. Velenheli Purple		Resembling Welsh slate, crepe surface	Fixed color	$\frac{3}{8}$ - $\frac{1}{2}$ " and heavier	Not produced thinner than $\frac{3}{8}$ - $\frac{1}{2}$ "	\$18.00 to \$20.00 for $\frac{3}{8}$ - $\frac{1}{2}$ " rough. Production limited	Distinctive work, public buildings, residences, etc.
8. Vermont Gray or Vermont Black	Colonial, Old English, Vermont black	Medium grays	Both weathering and unfading	$\frac{3}{16}$ " commercial, also graduated	\$6.50 to \$9.00. Moderate production	\$12.00 to \$14.00 per $\frac{1}{4}$ "	Occasional purposes and in graduated mixtures
9. Hard Vein Variegated		Gray and darker, sometimes mottled	Unfading and weathering	$\frac{3}{16}$ " commercial, also graduated	\$6.50 upward. Moderate production	\$12.00 to \$14.00 per $\frac{1}{4}$ "	Low cost buildings and in graduated mixtures
10. Rustic Gray	Shingle	Gray with darker markings	Weathering somewhat variable	$\frac{3}{16}$ " commercial, also graduated	\$6.50 upward. Moderate production	\$12.00 to \$14.00 per $\frac{1}{4}$ "	Occasional buildings and in graduated mixtures
11. Weathering Green (a) light (b) dark	Sea Green	Weathers to greens, grays and browns	Weathering	$\frac{3}{16}$ " commercial, also graduated	\$5.00 to \$7.50. Largest production	\$11.00 to \$12.00 per $\frac{1}{4}$ "	General use, industrial towns, farms, residences; also graduated
12. Mottled Purple and Green	Variegated Purple, Copper	Warm purple with greenish markings	Unfading and very slightly weathering	$\frac{3}{16}$ " commercial, also graduated	\$6.50 to \$9.00. Production large	\$11.00 to \$12.00 per $\frac{1}{4}$ "	Dark and inexpensive. Industrial towns, etc., as above
13. Clear Purple	Copper	Clear purple on exposed end	Slightly weathering to softer color	$\frac{3}{16}$ " commercial, also graduated	\$6.75 to \$9.25. Large production	\$12.00 to \$13.00 per $\frac{1}{4}$ "	Inexpensive and dignified for any purpose requiring warm dark roof
14. Red Slate	Garnet	Garnet red	Unchanging	$\frac{3}{16}$ " commercial, also graduated	\$15.00 to \$18.00. Limited production	\$30.00 and upward per $\frac{1}{4}$ "	A red roof that will not craze
15. Mottled Red		Red with dark spots	Unchanging	$\frac{3}{16}$ " commercial, also graduated	Production too small to quote	On application	Occasionally sold
16. Tudor-stone		Warm grays in wide variety	Selected weathering	$\frac{1}{4}$ - $\frac{3}{8}$ " and heavier	Not produced thinner than $\frac{1}{4}$ - $\frac{3}{8}$ "	\$14.00 to \$16.00 for $\frac{1}{4}$ - $\frac{3}{8}$ " rough. Large production	Inexpensive graduated roof work requiring character
17. Tudor-stone, Jr.	Weathering Green	Warm mottled grays, greens and browns	Pleasantly weathering	$\frac{1}{4}$ - $\frac{1}{4}$ " mixed	\$10.00 with holes. Unlimited production	See Tudor-stone	Inexpensive but with much character. A transition between slate and Tudor-stone
18. Tudor-stone (Cotswold shade)		Dark rough grays with markings like moss	Selected weathering	$\frac{1}{4}$ - $\frac{3}{8}$ " and heavier	Not produced thinner than $\frac{1}{4}$ - $\frac{3}{8}$ "	\$15.00 to \$20.00 for $\frac{1}{4}$ - $\frac{3}{8}$ " rough. Large production	High class work; especially antique reproduction in any period
19. Black Slate. (See Note B)	Blacks, Near Blacks and Ribbons		(See Note C)	$\frac{3}{16}$ " commercial, rarely graduated	\$5.50 to \$9.50. Production unlimited	On application	(See Note D)

NOTE A—Slate color names, unlike paint, are largely a matter of courtesy and usage and the shades themselves are far too delicate for any known reproduction process. In full sunlight they vary and at all hours of the day as well.

NOTE B—Black slate is mined in Maine and Virginia, but the bulk of it in Pennsylvania. There are many kinds, as Genuine Bangor, Albion or Jackson Bangor, Alpha or Herco, Slatington Big Bed, Franklin Tunnel, Chapman, Peach Bottom. There is also Pennsylvania Black, regarding which see Note C. Maine slates are Brownsville and Monson. Virginia slate is Buckingham.

NOTE C—Black slate is unfading and everlasting in all grades except top rock and small bed slates, which fade quickly and disintegrate as well. The unfortunate trade-name for this class of material is "No. 1 Pennsylvania Black," which is a structural slate and should not be used for roofing purposes.

NOTE D—Black slate is widely used for all commercial purposes. They vary widely in production and cost, and to the lay observer appear, when freshly mined, very much alike on the roof. In technical specifications their distinctions are sharply drawn and this firm will gladly supply information to anyone unacquainted with the high grade qualities and desiring to use them.

# F. C. SHELDON SLATE COMPANY

GRANVILLE, N. Y.

REPRESENTATIVES IN ALL LARGE CITIES

## Products.

Miners and shippers of HIGH GRADE ROOFING SLATE in a wide range of natural colors.

Structural and Electrical Slate, Blackboards, Slater's Tools, Snow Guards, Punching and Trimming Machines.

## Co-operative Service.

An architects' Service Department is maintained at the company's main office, thoroughly equipped for supplying detailed layouts, also general and technical information pertaining to our various products and to every phase of the roof question. A representative will confer with members of the profession at any time, and render any desired assistance toward the furtherance of architects' or owners' requirements.

## Special Types.

A special type of slate for every type of roof. Custom made, to "fit" the character of the building and surroundings. If furnished with plans and elevations and informed as to the general color scheme to be employed, this company will submit suggestions covering just the kind of slate for size, color, thickness, etc. as in its best judgment will meet specific requirements. The F. C. SHELDON SLATE COMPANY's recommendations are based on an extensive experience and an exhaustive study of individual conditions. The company specializes in the development of unique and distinctive roof effects.

Old English graduated slate in all sizes, colors and thicknesses, hand wrought by skilled old world artisans, insuring faithful reproductions in texture and appearance of the style of roof peculiar to the Elizabethan period. A special brochure giving complete details, and typical layouts, will be sent gratis to any architect on request. It will prove a valuable reference.

Staunch slates for general usage in permanent and weathering greens and purple, unfading red and black with smooth or rough cleft surfaces. A full range of the usual standard sizes and thicknesses always carried in stock, in all colors, for quick delivery.

## Exclusive Specialties.

GEORGIAN STRICTLY UNFADING GREENS, GRAYS AND BLUES—Represent one of Sheldon's most popular types and color combinations for the artistic roof treatment of residences of the Georgian type of architecture. The graduation in size and thickness, also the percentages of the different colors, can be changed to suit individual tastes and requirements. Any individual color can be readily furnished in slates of one size and thickness when desired.

ARABIAN RED (UNFADING)—Mined in Washington County, N. Y., the only place in the world where slates of this color have been discovered. They insure a roof of unusual attractiveness, and are particularly effective on stucco residences or those presenting a white exterior. Are unequalled for strength and durability. The rarity of these slates distinctively places them in a class by themselves.

WELCHCRAFT BLUE (UNFADING)—Sturdy and rugged in character, after the type of artistic slates mined in the renowned quarries of Wales and as used on early English and Old World structures, the roofs of which still remain intact after 100 years of service.



KENT STONE—Used on Delaware & Hudson Building (illustration on second page following). Represents the most advanced achievement in the development of special slate for high-class private residences, or municipal and government

buildings. This material is supplied under special commission and only after the company has had an opportunity to make a careful study of the exact requirements.

The result insures a roof having just the right characteristics to make a permanently beautiful and complete whole, especially from the architectural viewpoint. More explicit information as to the possibilities of this material will be promptly furnished on application to the service department, main office.

## Popular Types, Designed and Made to "Fit."

SHELDON'S GENUINE UNFADING GREEN (SEE COLOR PLATE)—Light, dark and rustic gray, may be used individually or collectively with marked effectiveness. All sizes and thicknesses.

SHELDON'S GENUINE UNFADING MOTTLED GREEN AND PURPLE (SEE COLOR PLATE)—A rare combination of harmonious colors. Some almost clear purple, with a suggestion of green; others having predominating green tone with tints of purple. No two of these slates are alike in this respect. All sizes and thicknesses.

SHELDON'S HARD VEIN VARIEGATED GREEN and PURPLE (SEE COLOR PLATE)—Furnished in varying shades of greens and purples that "weather" on exposure, or in fast color greens, grays, and purples, or in a combination of both weathering and non-weathering slates.

SHELDON'S WEATHERING GREENS AND GRAYS—Strong, enduring material, imparting a "weathered" effect free from sharp contrasts; particularly adapted for Colonial or rustic surroundings. No. 1 type costs but little, if any, more than shingles or any form of artificial roofing.

SHELDON'S FLAT SLATE ROOFS—A roof of this type covered with No. 1 or thicker Weathering Green, any size, will outlast the building. No expense for upkeep. Ask for Specification Form "D."

## Certificate.

This certificate is intended to protect the architect and owner against a possible unscrupulous attempt to substitute material that might prove inferior to Sheldon's slates. Architects are urged in specifying any of Sheldon's products to make the production of such certificate an absolute, indispensable condition.

## Quality and Facilities.

Extensive facilities, including the most modern equipment obtainable, coupled with a corps of trained executives in close touch with every feature of the operations, insures prompt and satisfactory execution of all commissions entrusted to us. Sheldon's slates represent the highest standard of slate excellence possible to attain, a fact evidenced by the extent to which they are being specified and used both at home and abroad.

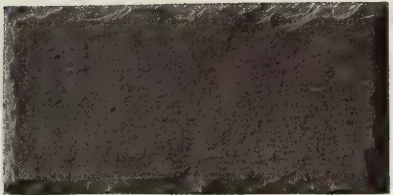
## Samples.

Miniature or full sized samples promptly furnished on request.





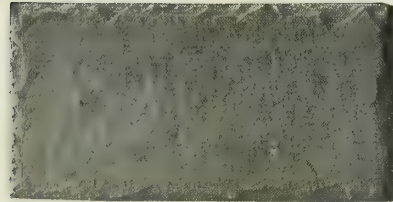
1



2



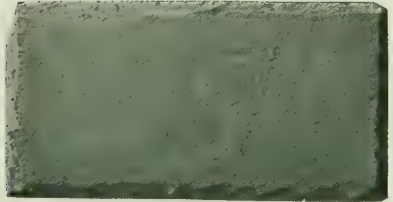
3



Unfading  
Dark Mottled



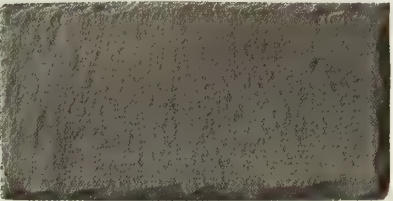
Unfading  
Crimson Red



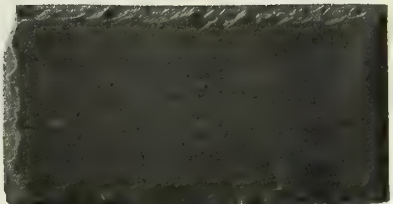
Unfading  
Dark Mottled



4



5



6

PHOTOGRAPHIC REPRODUCTIONS OF HARD VEIN VARIATED GREEN  
AND PURPLE WEATHERING SLATES SHOWING APPROXIMATELY  
THEIR NATURAL COLORS

No. 1 shows approximate color of Weathering Green as first quarried. Nos. 3 and 5 show  
same slate (approximate color) after exposure. Nos. 2, 4 and 6 change sufficiently to avoid  
sharp contrasts

Unfading  
Dark Mottled  
PHOTOGRAPHIC REPRODUCTIONS OF UNFADING SLATES SHOWING  
APPROXIMATELY THEIR NATURAL COLORS  
Dark Mottled shows nailholes machine drilled and countersunk

A Notable Sheldon Project.

On this page is shown one of the many American and foreign projects on which Sheldon's slates are a distinguishing feature.

Albany, being founded by the Dutch and Walloons, the Flemish Gothic style was selected by the architect as particularly appropriate. The tower represents the period about 1150, the main pavilion about 1475, and the Journal Building somewhat later. Some of the detail is very much like a cathedral in Brou, France, as illustrated in Gwilt's Encyclopedia of Architecture.

The buildings are fireproof, and the exterior is faced granite trimmed with lighter stone. The roofs are covered with Kent Stone (approximately 40,000 sq. ft.) in a special combination of colors, graduated in size and thickness, produced by F. C. SHELDON SLATE COMPANY, Granville, N. Y.

The remarkable harmony of color tones and textures secured by the use of this material was the result of careful study and planning, and has won much favorable comment.

Specific roof details will be furnished any architect on request.

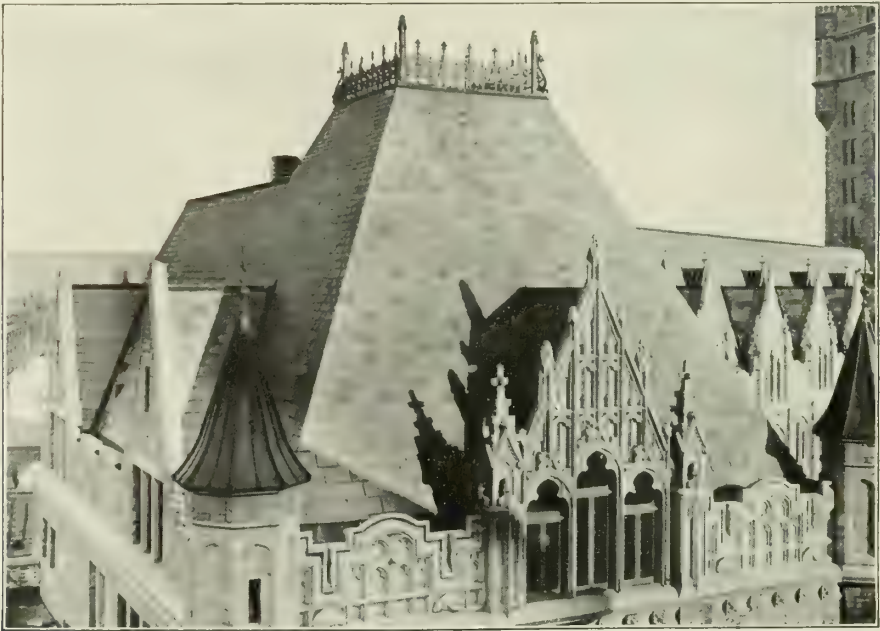


DELAWARE & HUDSON AND ALBANY JOURNAL BUILDING, ALBANY, N. Y.

MARCUS T. REYNOLDS, Architect

JAMES ACKROYD & SONS, Roofing Contractors, Albany, N. Y.

Approximate cost, \$2,000,000



CLOSE RANGE VIEW OF NORTH ELEVATION OF DELAWARE & HUDSON AND ALBANY JOURNAL BUILDING

Elevation has 34-ft. rafter laid with 51 courses of slate in the graduations shown in the accompanying table.

Courses	Undereaves	1	1	3	1	2	3	4	5	7	8	17
Thickness, ins.	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$
Length, ins.	18	30	30	28	26	26	24	22	20	18	16	14
Exposure, ins.			27	37 $\frac{1}{2}$	34 $\frac{1}{2}$	31 $\frac{1}{2}$	38	42 $\frac{1}{2}$	52 $\frac{1}{2}$	52	93 $\frac{1}{2}$	

The same proportionate graduation may be used with entirely satisfactory results on roofs having a shorter or longer rafter.



# VERMONT STRUCTURAL SLATE COMPANY

FAIR HAVEN, VT.

## Products.

VERMONT UNFADING GREEN, UNFADING MOTTLED GREEN and PURPLE, and UNFADING PURPLE SLATES, for all commercial and special purposes.

## Uses.

Sanitary stall partitions, sanitary floors and floor slabs, base, wainscoting, plinths, thresholds, borders for tile floors, garden walks, stair treads, strings, platforms, panelboards, door and window sills, roofing and other structural purposes.

Particular attention is called to the fact that this company is prepared to furnish different color combinations in milled slate in finishes other than the regular sand-rubbed finish. During the past year considerable quantities of floor work have been furnished with rough sawed edges and with surfaces showing the natural cleave of the rock and in some cases with jointed edges and one surface slightly rubbed, thus showing in each stone a partly rough and partly smooth surface. This material may be used to advantage in floors, church aisles, terraces, etc.

## Colors.

The most popular colors are the different shades of unfading green, unfading mottled green and purple, and unfading purple. These colors are furnished in any sizes and finish required.

## Advantages.

Vermont unfading green slate is not affected even by dilute mineral acids, and the permanency of color in combination with the lasting qualities of the rock itself makes it desirable in the many cases where black slate is not used from esthetic reasons.

It is exceedingly strong, hard and perfectly non-absorbent and does not chip or spall easily.

Vermont unfading green slate possesses all of the superior qualities of the highest grades of slate, and in addition to them the charm and permanency of attractive color.

The color is distinct and permanent, light and of pleasing appearance.

Slate stands foremost among natural stones used in architectural and engineering work for its strength and durability. Few possess so fine and firm a texture or so remarkable a transverse resistance.

## Roof Slate.

The popular Vermont colored slates for roofing purposes in any color combination desired will be furnished by this company. A specialty is made of heavy roof slate in the different shades of Vermont Unfading Green.

## Specifications.

**SLATE TILE AND BORDER**—Where slate tile and border are to be laid over concrete, bring concrete slab to within  $3\frac{1}{2}$  ins. of the finished floor line; on top of this fill in to within  $1\frac{1}{2}$  ins. of finished floor; on this lay tile and border in rich mixture of cement mortar, all to be brought up to the floor level. Joints between slate tile and border not to exceed  $\frac{1}{16}$  in., and to be grouted after floor is laid; all to be solidly set, free from cracks, flaws and saw markings.

**SLATE TREADS ON CONCRETE STAIRS**—Where treads are  $1\frac{1}{4}$  ins. thick, bring concrete to within 2 ins. of finished surface of treads, treads to be set in cement mortar or plaster, at the option of the architect; to have a slightly rounded nosing, and to project  $\frac{3}{4}$  in. beyond the finished face of the riser; all to be drilled for 2 iron dowel pins, 1 at each end, and, when set, to incline  $\frac{1}{8}$  in. from back to front, so that water will not stand thereon; to be in perfect alignment; to be free from cracks, flaws, quarry or saw markings.

**SLATE BASE**—Slate base to be securely set against walls, with concealed brass anchors firmly embedded in plaster of paris, or to be set with galvanized iron wire backed with cement plaster, at the option of architect; all to be smooth finish, free from flaws, to be cleaned down on completion, and to receive 1 coat of linseed oil applied in a uniform manner.

**TOILET ROOM WORK**—All wainscot against wall to be securely anchored with concealed brass anchors, embedded in plaster of paris; joints to be close and true; all work standing away from the wall, and free standing, including partitions, stiles, ends, etc., to be firmly fastened together with nickel-plated angles, standards, legs, rod and wall plates, and dowels where necessary; all exposed work to be smoothly finished free from flaws and saw markings, to be cleaned down on completion, and to receive 1 coat of linseed oil applied in a uniform manner.

## Test Tables.

### ABRASION TEST OF VERMONT UNFADING GREEN SLATE

With best black slate, made by J. Horace Cook, Architect and Supervisor, Board of Public Education, Philadelphia, Pa.

All samples were 12 in. x 12 in. x 1 in.; were subjected to the same weight (56 lbs.), and ground under the same conditions for the same length of time (3 minutes).

Best Black wore to  $\frac{1}{16}$  in. on one edge and  $\frac{1}{8}$  in. on opposite edge. Vermont Unfading Green wore to  $\frac{3}{4}$  in. on one edge and  $\frac{1}{16}$  in. on opposite edge.

Vermont Unfading Green thus showed not only 11% less but more uniform wear.

### EXTRACT FROM U. S. ARSENAL TEST OF VERMONT STRUCTURAL SLATE

Test No.	Classification	Color	Size	Ultimate strength	
				Total, lbs.	Per sq. in., lbs.
12,011-13	Compressive test of slabs } Pressure applied at ends }	Green	30 ins. long	409,000	17,035
12,014-16		Purple	12 ins. wide 2 ins. thick	291,800	12,166
12,020	Compressive test of cubes.	Green	4 ins. each way	374,500	23,400
				378,800	28,650
		Purple		438,000	27,560
				476,600	30,300

## Prices.

Prices, samples, etc., will be furnished on request.

# VENDOR SLATE COMPANY

BANGOR, PA.

## Products.

The various grades of ROOFING SLATE listed below are the products of the quarries of the following companies and are sold *exclusively* through the VENDOR SLATE COMPANY.

### GENUINE BANGOR:

Genuine Bangor Slate Co.  
 Old Bangor Quarry  
 American Bangor Quarry  
 Bangor Excelsior  
 Star Quarry  
 Royal Quarry  
 North Bangor Slate Company  
 North Bangor Quarry  
 Bangor Washington Quarry  
 Bangor Quarry Company  
 Bangor Union Quarry  
 East Bangor Consolidated Slate Co.  
 East Bangor Consolidated Quarry  
 Bangor Central Slate Company  
 Bangor Central Quarries  
 Bangor Supreme Slate Company  
 Grand Central Quarries  
 New Bangor Valley Slate Company  
 New Bangor Valley Quarries  
 Bangorvein Slate Company  
 Peerless Quarries

### ALBION OR JACKSON BANGOR:

Jackson Bangor Slate Company  
 United States Quarry  
 Valley Quarries  
 Nos. 5 and 6 Jackson Bangor Quarry  
 Albion Vein Slate Company  
 Stoddard Quarries  
 Genuine Bangor Slate Company  
 Albion Quarries  
 M. L. Tinsman Slate Company  
 Tinsman Quarries

### SLATINGTON BIG BED A1, A and No. 1 CLEAR:

Provident Slate Company  
 Genuine Washington Slate Company  
 Genuine Franklin Slate Company  
 Prudential Slate Company  
 Washington Slate Company  
 Trout Creek Slate Company  
 Blue Mountain Slate Company  
 Blue Valley Slate Mfg. Company  
 Custard Slate Company  
 Carbon Slate Company  
 Thomas Slate Company  
 Ellis Owens Slate Company  
 Lobb, Parry & Company  
 Henry Quarries Company  
 Royal Blue Slate Company  
 Highland Slate Company  
 Manhattan Slate Company  
 Roberts Bros.  
 Blue Vein Slate Company  
 Ellis Owens Sons Slate Company  
 Pennsylvania Slate Company

### ALPHA or HERCO No. 1:

Hercules Slate Company  
 Hercules Quarries  
 Shimer Slate Company  
 Alpha Quarries  
 Hammann Slate Company  
 Northampton Quarries

## Service.

The VENDOR SLATE COMPANY is the largest miner and shipper of roofing slate in the world, operating a majority of the slate quarries in the famous Bangor, Pen Argyl and Slatington districts in Pennsylvania.

In this catalogue only the salient facts regarding slate roofing and the company's service can be briefly stated; but should any further detailed information be desired, the company will give it either direct or through any one of the company's local representatives throughout the country.

The VENDOR SLATE COMPANY's stock of the various sizes and grades are complete at all times, therefore it has no cause for substituting other sizes or grades for those specified. This is a very important fact for the architect to bear in mind, for he is absolutely assured of getting exactly the slate he specifies, if he includes the following clause in his specification:

"The roofing slate shall be as supplied by the VENDOR SLATE COMPANY, Bangor, Pa.

## Facilities.

The annual production of the quarries whose products are sold by this company is more than 500,000 squares. This company can therefore supply promptly the largest requirements, as well as the smallest.

Specify "Vendor" slate for quality and service.

## Inspection at Quarries.

All slate produced in this company's quarries is subject to rigid inspection to insure proper grading, and all standard No. 1 slate (a trade-name applied to the ordinary thickness of roofing slate) must be a full  $\frac{3}{16}$ -in. thickness.

## Representatives.

It is the policy of this company to create its own organization in all sections of the country within reachable freight distances. On application, the company shall be glad to refer architects and others to its nearest resident representative, who will give all needed information.

## Advantages of a Slate Roof.

A slate roof is rustproof, odorless, hygienic, fireproof, absolutely waterproof, not affected by extremes in temperatures or destructive acids, does not attract lightning and does not taint cistern water.

A slate roof does not dry out, does not absorb moisture, does not become waterlogged or moss-grown, does not collect snow and ice, and does not sweat or drip.

The slate roof is the cheapest, because the first cost is the only cost; it needs no repairs or painting, and outwears all other roofs. It effects a reduction of from 10% to 15% in insurance rates on building and contents.

## Prices.

Due to changing conditions, no prices can be given here. Current prices will be quoted on application.



Specification for Laying Standard Slates.

Cover all sloping roofs with 1 thickness of single-  
ply tarred roofing felt properly lapped and of quality  
as may be approved by the architect, over which lay  
[state size and quality of slate], each slate fastened with  
2 yellow metal slating nails 1¼ ins. long. All slates to  
be laid with 3-in. lap with butts tightly laid. Under  
eaves and top courses to be of same width and with  
grain of slate vertical; no "stretchers" or slate with  
grain running horizontal will be permitted. Slates at  
valleys, hips, rakes and ridges to be laid in elastic cement  
of same color as slate. Small pieces of slate at valleys  
and hips will not be allowed.

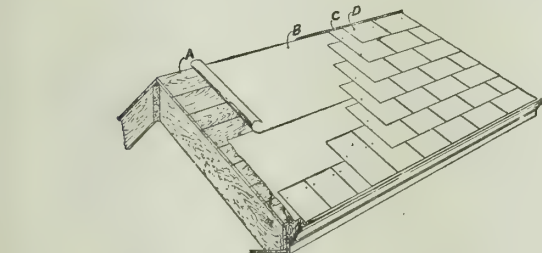
Metal gutters must run well up under slate. Ridg-  
ing and hips of 16-oz. cold rolled copper (or other  
metal), 3-in. flange coming down over slate, covering  
all nailholes; 14-oz. copper flashings and 16-oz. cap  
flashings wherever necessary. Boston hips and ridges  
of slate are not only effective, but are exceedingly prac-  
tical.

Slate Roofs and Fire Protection.

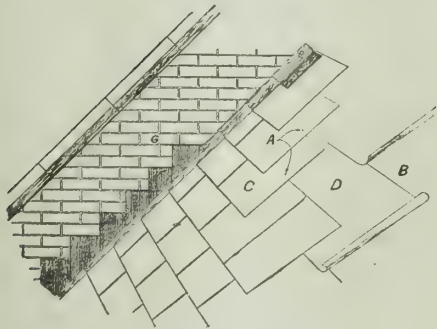
Authentic fire statistics prove that by far the great-

FIRE STATISTICS IN VARIOUS CITIES

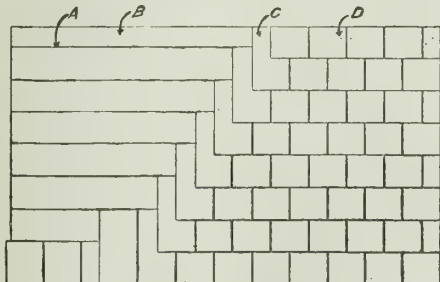
Cities	Total fires	Total chimney and roof fires	Per cent.	Chimney fires	Per cent.	Roof fires from chimney sparks	Per cent.	Roof fires from other sparks	Per cent.
WHERE INFLAMMABLE ROOFS ARE KNOWN TO PREDOMINATE									
Atlanta, Ga.....	579	238	41	72	12½	153	26.4	13	2.2
Chattanooga, Tenn.....	221	115	68	54	24	90	40.7	8	3.6
Jacksonville, Fla.....	283	126	44½	24	8	95	33.5	7	2.4
Knoxville, Tenn.....	195	56	29	14	7½	42	21.5	0	0
Wilmington, N. C.....	151	81	56	38	25	43	28.5	3	2
WHERE SLATE ROOFS ARE KNOWN TO PREDOMINATE									
Allentown, Pa.....	71	11	15	9	12½	0	0	2	2.8
Akron, Ohio.....	174	33	17	15	8½	15	8.6	3	1.7
South Bend, Ind.....	72	54	75	40	54	7	9.7	7	9.7
Easton, Pa.....	68	5	7	5	7.3	0	0	0	0
Lima, Ohio.....	118	37	23	35	29.4	0	0	2	1.6



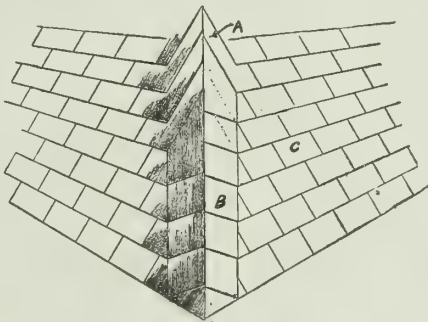
SLATE LAID ON SHEATHING BOARDS  
A—Sheathing. B—Felt paper. C—Roofing slate. D—Nails



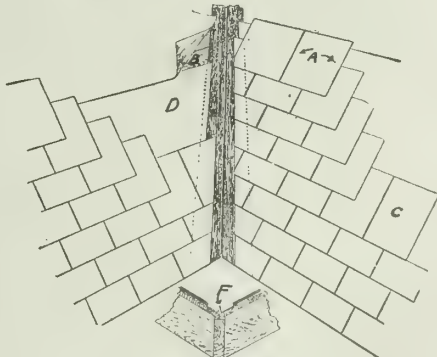
SLATING AND FLASHING AGAINST FIRE OR PARTY WALL  
A—Nails. B—Sheathing. C—Roofing slate. D—Felt paper. E—Flashing. F—Counterflashing. G—Brick wall



USUAL METHOD OF MARKING HEAD LINES PREVIOUS TO LAYING SLATE  
A—Chalk line. B—Felt paper. C—Roofing slate. D—Nails



DETAIL OF SLATING AT HIP  
A—Nails. B—Boston hip



DETAIL OF SLATING AT OPEN VALLEY  
A—Nails. B—Sheathing. C—Roofing slate. D—Felt paper. E—Tin or copper. F—Proper shape of metal

est percentage of fires occur on or threaten roofs (chim-  
ney fires, neighboring conflagrations, etc.).

In some communities (where shingles or other in-  
flammable roofings predominate) this proportion is as  
high as 75%.

All other fire causes average only from 1% to  
2% each. It is a significant fact that the fire records of  
municipalities where slate roofs predominate are the  
most favorable, as shown by the accompanying tables,  
compiled from official annual fire reports.

Sizes and Weights.

"Genuine Bangor" roofing slate is split to a thick-  
ness of about 5 to the inch, and is cut into sizes as per  
the accompanying table.

This table also shows how much should be exposed  
to the weather on the roof, allowing 3 ins. to lap (the  
rule in lathing), the number of pieces in each square,  
and the quantity of nails to lay.

A "square" of slate, the standard of measurement,  
is a sufficient number of any size of slate to lay 100 sq.  
ft. of roof, allowing for standard 3-in. lap.

SIZES OF "GENUINE BANGOR" ROOFING SLATE

Size of slate, ins.	Number in each square	Exposed when laid and distance of lath	Nails to square, 3d galvanized, lbs. ozs.
24 x 14	98	10½	1
24 x 12	115	10½	1 2
22 x 12	127	9½	1 4
22 x 11	138	9½	1 6
20 x 12	142	8½	1 6
20 x 10	170	8½	1 11
18 x 12	160	7½	1 9
18 x 10	192	7½	1 14
18 x 9	214	7½	2 1
16 x 12	185	6½	1 13
16 x 10	222	6½	2 3
16 x 9	247	6½	2 7
16 x 8	277	6½	2 12
14 x 10	262	5½	2 9
14 x 8	328	5½	3 3
14 x 7	374	5½	3 11
12 x 8	400	4½	3 15
12 x 7	457	4½	4 8
12 x 6	534	4½	5 4

# NATURAL SLATE BLACKBOARD COMPANY

PEN ARGYL, PA.

MILLS AT SLATINGTON, WIND GAP, PEN ARGYL AND BANGOR.

## Product.

NATURAL SLATE BLACKBOARDS.

## Organization and Service.

This is a centralized sales and service organization maintained by thirty-five of the large quarries in Pennsylvania.

It is a great step forward in giving effective service to the architect. The contractor and builder are more promptly served because of complete stocks of every desirable size being carried on hand at all seasons of the year.

Inquiries for suggestions in the proper solution of blackboard problems, involving special conditions or requirements, will be gladly and promptly taken care of by the Service Department of this organization.

Full size details of construction and views showing effective installations will be gladly sent on request.

## Natural Slate Blackboards.

This slate is a strong, blue-black product quarried in the Northampton and Lehigh counties of Pennsylvania. It is particularly suited for blackboard use, because of its good, permanent color; its dense structure, and its susceptibility to a fine non-lustrous finish. These qualities assure a splendid writing surface which is non-porous and sanitary, does not hold chalk particles and which permits of quick, easy erasing. Natural slate blackboards are straight in split and, because of the homogeneous structure, will never peel off in layers or disintegrate.

## Advantages.

The universal recognition of the superiority of natural slate for blackboards is based on two essential reasons, namely, (1) it offers best chalk marking surface in existence, and (2) slate, when once properly installed, never requires repairs, replacement or other upkeep beside cleaning.

The following is a brief summary of the advantages of good natural slate for blackboards:

(1) Simple to install; (2) non-absorbent and sanitary; (3) receives chalk markings clearly and sharply; (4) does not discolor; (5) does not warp, crack, peel nor disintegrate; (6) easily washed; (7) requires no resurfacing; (8) least expensive, considering durability.

## Sizes, Weight and Prices.

When writing specifications, architects should bear in mind that slate blackboards are carried in stock in standard heights only, as follows: 3 ft., 3 ft. 6 ins., 4 ft., 4 ft. 6 ins. and 5 ft. Regularly supplied in an average thickness of about  $\frac{3}{8}$  in., and lengths range from about 3 ft. to about 6 ft. Standard heights are always carried in stock in large quantities and there is no reason for delay in shipments for lack of material.

Other heights cut to order, and as proper blocks are not always available, delay in filling such orders may result. Odd heights also cause waste in cutting to sizes, resulting in extra cost. Weight of this material is about 6 lbs. per sq. ft.

Prices quoted on request, f. o. b. quarry.

## Suggestions in Planning and Construction.

**FOR DARK CORNERS**—In planning blackboards, it should be remembered that in recitation rooms, particularly in elementary schools, the more blackboard space provided, the better. Blackboards should not, however, be extended into dark and useless corners, except where used by evening classes with artificial light. In the latter case, spring roller shades, of light, neutral color, are sometimes used for drawing over blackboards not regularly in use, thus lighting up those corners during the day.

**CABINETS**—Cabinets of about 6 sliding blackboards, one upon the other, are valuable in lecture rooms, laboratories, workshops, etc.

**DOUBLE TIER PLAN**—An idea in blackboard construction which has much to commend it is the double tier plan. The main board is a standard 3-ft., 3-ft. 6-in., or 4-ft. board. Above this is installed a 12-in. to 18-in. border, separated from main board by narrow moulding. The object of this plan is to provide blackboard space for the exclusive use of the teacher, for music, "busy-work" exercises, program or other work not intended for erasure. To meet this demand, a limited amount of narrow slate for borders is carried in stock.

**CONSTRUCTION DETAILS**—Here-with are presented four construction details. Fig. 1 is an indorsed method of installing regular blackboard. Fig. 2 shows double tier blackboard arrangement. Fig. 3 shows a shelf arrangement, suitable for primary classes and kindergartens, and also an improved chalk trough construction. Fig. 4 shows construction details of a double faced blackboard used as a panel in a door. This principle may be used in sliding partitions between rooms.

Hooks on under side of troughs, to receive rulers, pointers, etc., should be provided.

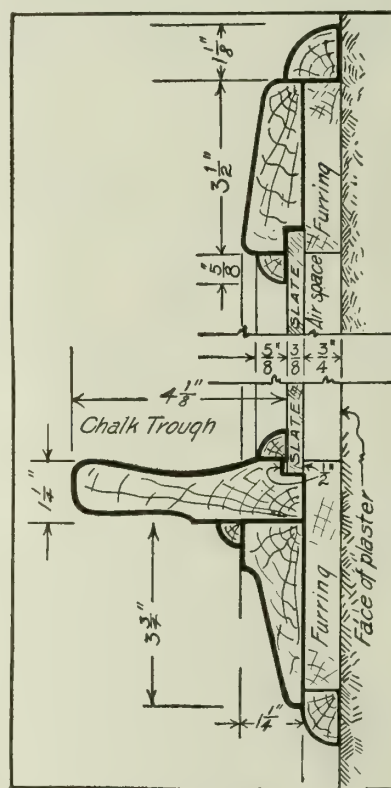


FIG. 1. SECTIONAL DETAIL SHOWING CONSTRUCTION OF SLATE BLACKBOARD



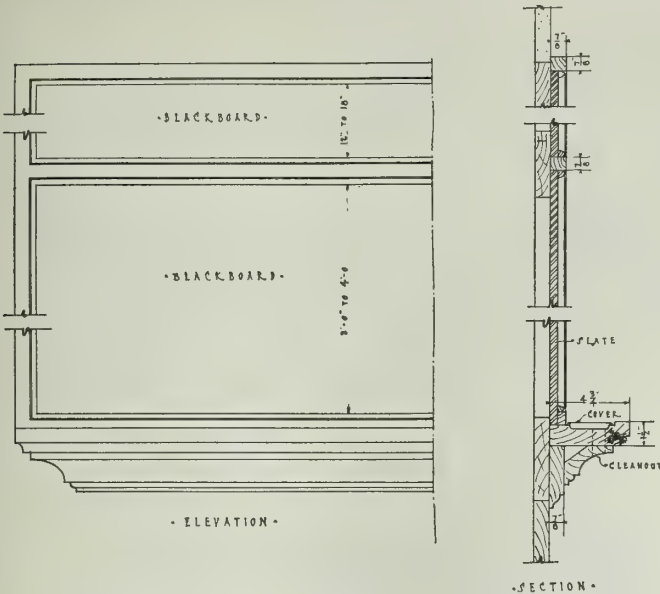


FIG. 2. DETAIL SHOWING DOUBLE TIER BLACKBOARD ARRANGEMENT

HEIGHTS OF BLACKBOARDS—Height from floor to top of chalk rail should be about as follows:

Grades, chalk moulding	Height from floor	
	ft.	ins.
3d	2	1
4th	2	1
5th	2	2½
6th	2	4
*Higher	2	6

\* High schools, etc.

The top of the ordinary blackboard should never be more than 6 ft. 6 ins. above floor.

How to Specify.

Architects and school boards will find the following a useful set of specifications for this branch of work, which, if followed, will insure good quality slate and proper installation.

Furnish and install where directed, best quality, hand finished slate blackboards, in accordance with the following specifications and accompanying detail:

FRAMES (DETAIL A; ERECTED BY CARPENTER)—Fasten securely to walls of rooms kiln dried white pine ground strips, 4 ins. by ¾ in. at top and 5 ins. by ¾ in. at bottom of frames. To this foundation, nail securely at top and bottom 3¾ by 1¼-in. frame mouldings, carefully plumbed to insure exact level. Fasten 4¾ by 1¼-in. chalk trough securely to bottom frame moulding, and support it with apron, as per detail. Furnish ⅝ by ⅝-in. quarter round moulding to secure blackboards in frames at top and bottom and at ends of spaces. Finish frames at ends same as at top. Install cove moulding 1¼ by 1¼ ins. at top of frames to make finish.

SLATE—Furnish best quality natural slate blackboards (NATURAL SLATE BLACKBOARD COMPANY, Pen Argyl, Pa.) ¼ in. to ⅜ in. thick, and in dimensions as tabulated below.

Joints shall be ground straight and true, shall be fitted tight and glued, and after completion of setting shall be shaved and scraped to a uniform, straight, smooth surface, so that writing may be continued across joints.

Spaces 4 ft. or less to be in 1 piece, 4 ft. to 8 ft. in 2 pieces, and proceed likewise with larger spaces; sections over 20 ft. long to consist of approximately even lengths of not less than 4 ft.

LOCATION AND DIMENSIONS OF BLACKBOARDS

Room location or No.	Blackboard location	Slate space		
		Length	Height	Distance from floor

Ordering.

The largest portion of the blackboard business is concentrated in the summer months. Early orders will secure early reservations and prompt shipments.

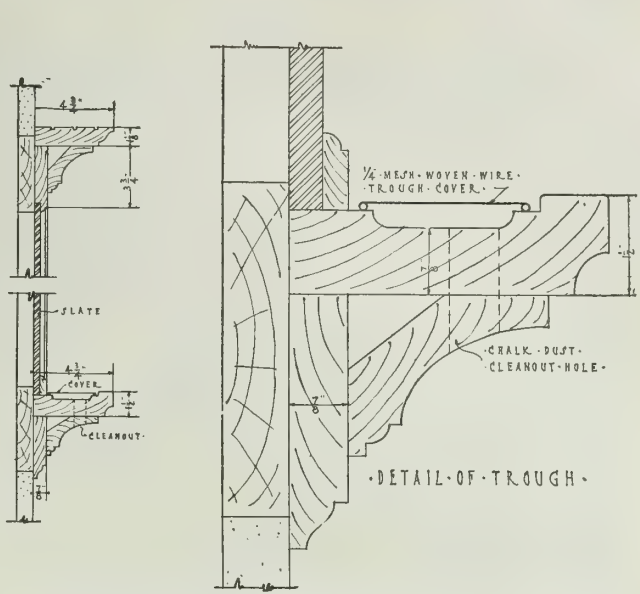


FIG. 3. DETAIL SHOWING CONSTRUCTION OF BLACKBOARD WITH SHELF FOR PICTURES, ETC., AND WITH IMPROVED CHALK TROUGH

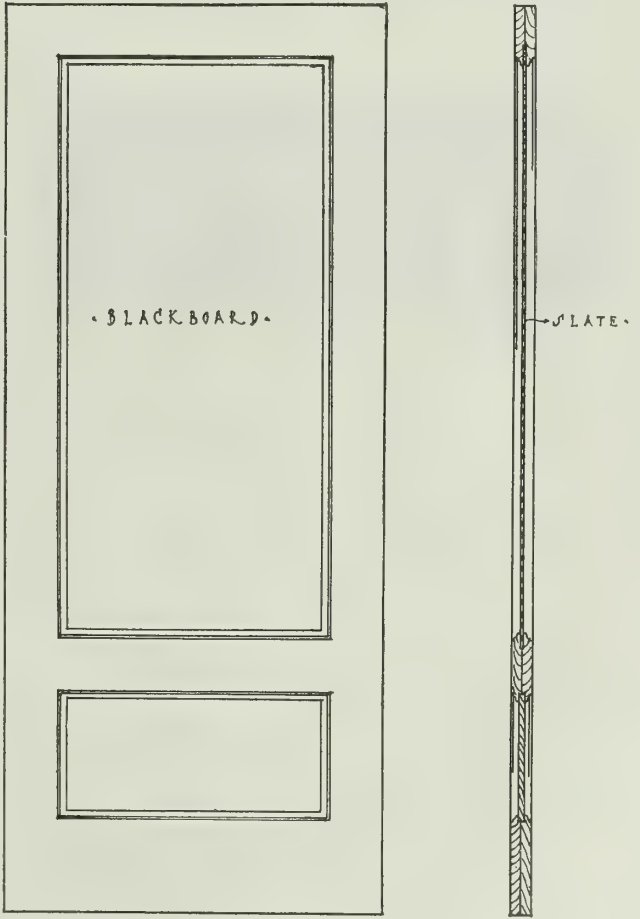


FIG. 4. DETAIL OF SLATE PANEL IN DOOR

Slate ordered is jointed and fitted together at factory to exactly fill the spaces. When shipped, each piece of slate is marked with room number and space length in which it is to fit, also position in space. Intending purchasers are urged to furnish necessary information for intelligent marking.

FOUNDED 1865

## NEW YORK SILICATE BOOK SLATE COMPANY

TELEPHONE CONNECTION

20-24 Vesey Street  
NEW YORK, N. Y.FACTORY  
HOBOKEN, N. J.**Products.**

SILICATE VENEER PLATE, WALL and REVOLVING BLACKBOARDS; SLATED CLOTH; STONE SLATE BLACKBOARDS; SILICATE LIQUID BLACK DIAMOND SLATING.

Book Slates, Blackboard Cloth and Paper Ivorine Sheets, Black Sheets.

**Silicate Veneer Plate Blackboards.**

These blackboards are composed of the best grades of wood pulp, the four veneers firmly united under great pressure. The marking surface is Silicate Black Diamond Slating.

Can be put on any wall.

Blackboards come in sizes 3, 3½ and 4 ft. wide up to 12 ft. long, at 14¢ a sq. ft. for black, and 15¢ for green.

Write for discounts.



FOUR-PLY SILICATE VENEER PLATE BLACKBOARD

SPECIFICATIONS—Architects should specify Silicate Veneer Plate Blackboard made by the NEW YORK SILICATE BOOK SLATE COMPANY.

**Black Diamond Slating.**

PRICES, SIZES AND COVERING CAPACITY

Size of can	Covering capacity, one coat	List price
½ pt.	25 sq. ft.	\$ .55
1 pt.	50 sq. ft.	1.00
1 qt.	100 sq. ft.	1.75
½ gal.	200 sq. ft.	3.25
1 gal.	400 sq. ft.	6.00

Write for discounts.

**Silicate Wall Blackboards.**

Ready made; standard sizes from 1½ by 2 ft. to 4 by 8 ft., finished both sides.

Frames are of oak, made of the best material, thoroughly seasoned, allowing for shrinkage or swelling. The marking surface is Black Diamond Slating.

PRICES AND DIMENSIONS

No.	Ft.	List price	No.	Ft.	List price
0	1½ x 2	\$2.00	5	3½ x 4½	\$9.50
½	1½ x 2½	2.50	6	3 x 6	11.00
1	2 x 3	3.50	7	4 x 5	12.00
2	2½ x 3½	5.25	8	4 x 6	14.40
3	3 x 4	7.00	9	4 x 7	16.80
4	3 x 5	9.00	10	4 x 8	19.20

Write for discounts.

**Stone Slate Blackboards.**

Made of best quality natural slate, finished on

both sides; with varnished oak frames. Sizes 18 by 24 ins. to 4 by 6 ft.

PRICES AND DIMENSIONS

No.	Ft.	List price	No.	Ft.	List price
0	1½ x 2	\$3.00	4	3 x 5	\$11.80
½	1½ x 2½	4.00	5	3½ x 4½	12.50
1	2 x 3	5.00	6	3 x 6	14.00
2	2½ x 3½	7.00	7	4 x 5	15.50
3	3 x 4	9.70	8	4 x 6	19.00

Write for discounts.

**Silicate Revolving Blackboards.**

Support is made of nicely finished oak, put together with bolts, and stands firmly. Made to fit all sizes of boards in regular stock.

Blackboards are of six-ply silicate, with marking surface of Black Diamond Slating, both sides.



REVOLVING BLACKBOARD

**Slated Cloth.**

A flexible Silicate blackboard for lecturers, teachers, stores, etc.

Marks finely, erases quickly. Rolls tightly, without injury to design or surface.

Fastened with tacks or thin paste to wall or wood.

No.	Ft.	List Price
0½	2½ x 3½	\$11.25
1½	3 x 4	13.00
2½	3½ x 4½	15.50
3½	4 x 5	18.00
4½	4 x 6	20.00
5½	3 x 5	15.00
6½	3 x 6	17.00

Support only \$6.00  
Write for discounts

SLATED CLOTH

PRICES AND DIMENSIONS SLATED CLOTH  
Rolls of 12 Yards

Width, ins.	Marking surface	List price, yd.
36	1	\$1.25
48	1	1.60
36	2	1.67
48	2	2.00

Supplied any length desired.  
Write for discounts.**References.**

The Boards of Education of New York and Philadelphia have been supplied with Silicate products for 40 years, and eighty-three Boards of Education in other cities have also been supplied for varying lengths of time.

The United States Government has been supplied for 30 years.

Many of the schools in Havana, Cuba, and Porto Rico, and Manila in the Philippines have also been supplied.

Goods have been shipped to all parts of the world.  
American News Co., 9-15 Park Place, New York, N. Y.  
Tower Mfg. & Novelty Co., 326-330 Broadway, New York, N. Y.

Henry Bainbridge &amp; Co., 99-101 William Street, New York, N. Y.



# WEBER COSTELLO COMPANY

Manufacturers of School Supply Specialties

CHICAGO HEIGHTS, ILL.

## Products.

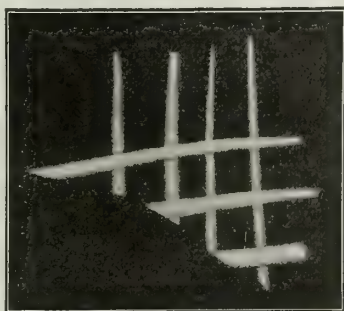
GENUINE HYLOPLATE BLACKBOARD;  
ANDREW'S GRAIN ALCOHOL SLATING;  
SPECIAL AA LIQUID BLACKBOARD SLATING.

Also a full line of School Supply Specialties, including Geographical Globes, Erasers, etc.

## Genuine Hyloplate Blackboard.

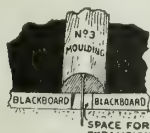
DESCRIPTION—Made of best long stock live spruce wood pulp. Four layers of wood pulp board are compressed and cemented together under a pressure of 40 tons to the sq. in. Thoroughly dried and seasoned. Writing surface carefully smoothed, polished and sized. Two waterproof coats applied to back, and five coats of Hyloplate liquid surfacer to face (if green, seven coats). Each coat carefully sanded down and last coat carefully rubbed.

This briefly describes the manufacture of "old reliable" genuine Hyloplate. From the start to the finish there

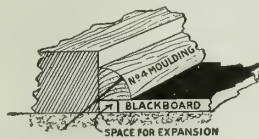


ILLUSTRATING HYLOPLATE WRITING SURFACE

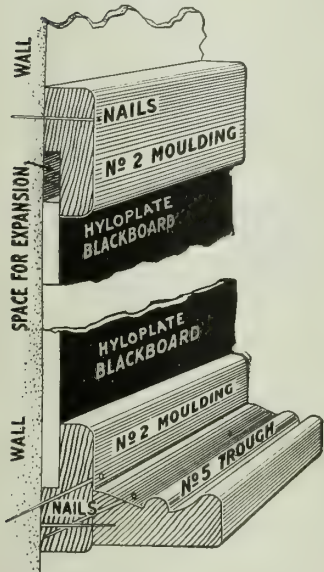
Hyloplate velvet writing surface is hard, close grained and smooth, yet with a "bite" for every chalk or crayon. Uses minimum of crayon. Solid, crisp lines. Easily erased. No place for the dust on Hyloplate. This cut is from a photograph of "old reliable" genuine Hyloplate



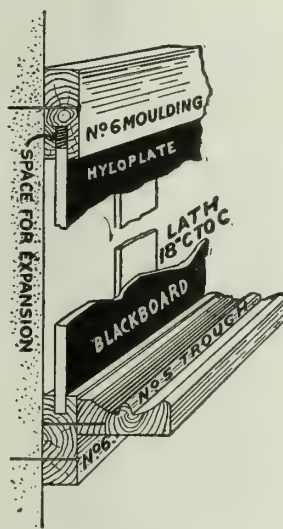
No. 3 Moulding  
¾ in. Wide



No. 4 Moulding ¾ in. Wide



No. 2 Moulding, No. 5 Trough, Both  
2 ins. Wide



No. 5 Trough used with No. 6  
Moulding, Which is 2 ins.  
Wide

SHOWING APPLICATION OF MOULDINGS USED WITH  
GENUINE HYLOPLATE

are ninety-six operations. The result is a blackboard that will not bulge, warp or curl up.

DISTINCTIVE FEATURES—"Old reliable" genuine Hyloplate blackboard is elastic, standing all degrees of heat and cold, and rough handling in shipping and installation.

It is hard enough to stand the wear of chalk and crayon properly and yet erase completely and quickly.

It is non-porous and light in weight, averaging less than 1 lb. to the square foot.

The back of genuine Hyloplate is waterproof.

Genuine Hyloplate does not reflect light objectionably. It never sweats, never gets greasy, and has a uniformly smooth writing surface.

It is not noisy when written upon; will not chip, crack or break; and has an elastic surface which prevents "spider checking" so often found in composition boards.

TRADE-MARK—As a protection to the purchaser, the words "Trade-mark Hyloplate" are die cut at 8-in. intervals into the back of all genuine Hyloplate.

COLORS—Genuine Hyloplate blackboard is dead jet black or a live green, as preferred.

SIZES—Genuine Hyloplate blackboard is made regularly 4-ply, about ¼ in. in thickness, and surfaced on one side only.

For special requirements, genuine Hyloplate is supplied double faced and either 4-, 5- or 6-ply in thickness.

Stock lengths are from 1 to 12 ft., never longer, and made in widths of 3, 3½ and 4 ft.

Any desired length will be cut, but price is always made on the basis of even feet in length, and standard widths.

GOVERNMENT STANDARD—The United States government has tested genuine Hyloplate blackboard and adopted it as its standard.

Over 30,000 genuine Hyloplate blackboards made by WEBER COSTELLO COMPANY have been supplied through the United States Bureau of Education for the schools in the Philippines.

In 1916, genuine Hyloplate blackboard went into 12,081 schools in this country.

SAMPLES—Samples of genuine trade-marked Hyloplate blackboard, both black and green, will be sent on request, with prices.

GUARANTEE—Genuine trade-marked Hyloplate is guaranteed by the manufacturers to give entire satisfaction for ten years or more of schoolroom use.

## Andrew's Grain Alcohol Slating.

Made of pure grain alcohol and shellac, carrying in proper proportion finely ground emery and other ingredients.

It makes a perfect slate surface when applied to hard finish plaster, paper or boards, or to old blackboards of any kind. Made in black and green.

A gallon will cover about 250 sq. ft., 3 coats.

## Special AA Liquid Blackboard Slating.

A high grade liquid slating, recommended where for any reason something less expensive than Andrew's is wanted. Made in black and green.

# DUDFIELD MANUFACTURING CO.

Manufacturers of Chalk Rails and Eraser Cleaners

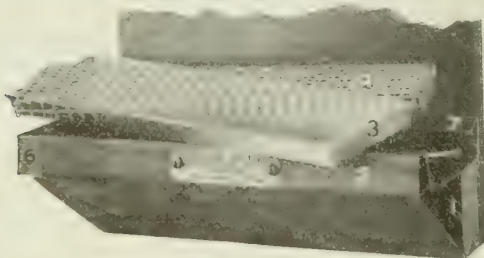
116 West Kansas Street  
LIBERTY, MO.

## Products.

DUSTLESS ALL-METAL CHALK RAILS and ERASER CLEANERS.

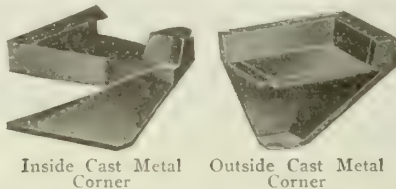
## Description of Dudfield's Dustless All-metal Chalk Rail and Eraser Cleaner.

The main trough is made of one piece of steel in 10-ft. lengths. Sections are butted together, a concealed cast metal bracket being used at the joints.

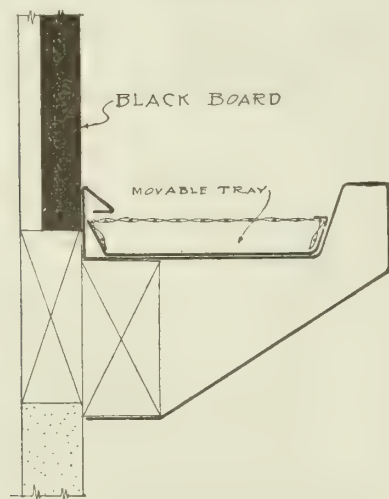


DUDFIELD'S DUSTLESS ALL-METAL CHALK RAIL AND ERASER CLEANER

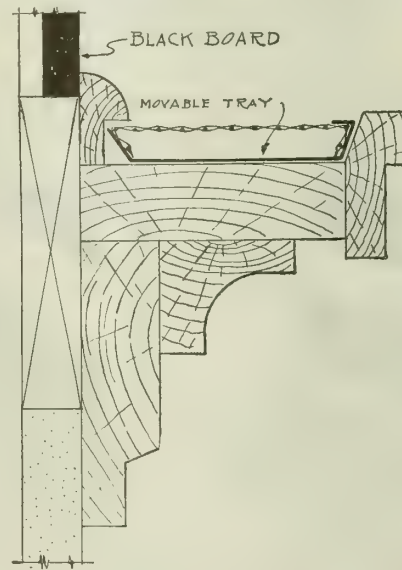
1—Nailing strip; 2—Main trough, made in 10-ft. lengths of No. 26-gage metal, finished in flat black; 3—Movable dust tray, made in 4-ft. lengths, of galvanized iron; 4—Heavy galvanized wire screen, 1/4-in. mesh, holds erasers and crayon out of dust; ready eraser cleaner; 5—Blackboard; 6—Cast metal return ends; 7—Dust flange, holds firmly to blackboard



PARTS FOR DUDFIELD'S DUSTLESS ALL-METAL CHALK RAILS



All-metal  
Only metal parts furnished by manufacturer



Wood, with Metal Tray

Cast metal ends and corners are used, adding to its stability and making installation easy.

Removable dust tray and removable wire screens are made of galvanized material in 4-ft. lengths for easy handling in cleaning.

The dust tray and wire screen may be installed in a specially constructed wooden moulding as illustrated, installation being the same as in the all-metal product.

## Distinctive Features.

The following features are embodied in Dudfield's all-metal chalk rail and eraser cleaner:

It is sanitary, because chalk dust falls into the removable dust tray, where it remains until cleaned; thus the dirt is prevented from permeating the air and settling into the lungs and on the floor or clothing. In general practice, it is cleaned about once each week.

Its all-metal construction adapts it for use in fire-proof buildings and prevents defacement by mischievous pupils.

It holds firm to the blackboard, and does not warp away as wood often does.

It is adjustable to all blackboards.

It is very easily installed.

No nails are visible.

The eraser cleaner, made of No. 20-gage, 1/4-in. mesh galvanized wire, holds the eraser and crayon out of the chalk dust.

Erasers may be cleaned as often as used.

## Samples.

Samples and other information will be sent to architects on request.

## Official Indorsement.

The products of this company have been indorsed by the State Board of Health of Missouri.

SECTIONAL VIEWS OF DUDFIELD'S DUSTLESS CHALK RAILS

One-half actual size



# H. S. BARBER CRE-SOTE STAINED SHINGLE CO., INC.

Creosoted, Stained Shingles, Shingle Stains and Wood Preservatives

LOCAL TELEPHONE:  
EDGEWOOD 1317

173-183 Beaufait Avenue  
DETROIT, MICH.

LONG DISTANCE TELEPHONE:  
EDGEWOOD 1318

## Products.

Manufacturers of H. S. BARBER  
"CRE-SOTE-STAINED" SHINGLES.  
"CRE-SOTE-STAINS," including IVORY  
WHITE.  
"CRE-SOTE" WOOD PRESERVATIVES.



## Texture and Grain of Shingles and Process of Treating.

Selected sound, live British Columbia red cedar, close grained, sapless heart wood is used. All grades, except Star A Star, are strictly vertical grain, 100% clear, square sawed, parallel widths, and perfectly dried by our slow process, giving increased life to the shingle. They are then treated by our exclusive process, insuring uniformity and permanency of color, each shingle treated separately and bundled.

**COLORS AND QUALITIES OF STAINS**—Beautiful architectural effects and pleasing color harmonies may be secured by combining selections from twenty regular colors or any special shades. The colors are clear, transparent and lasting. The strongest permanent earth pigments and purest distilled creosote and linseed oils are used in manufacturing H. S. Barber's "Cre-Sote-Stained" shingles and shingle stains.

**LENGTHS, WIDTHS AND THICKNESSES**—Sawed extra thick in all standard sizes, 16, 18 and 24 ins. long, random and dimension widths, none very narrow or extremely wide, and measuring fully their respective thicknesses and therefore stand the maximum amount of wear and exposure.

**COVERING CAPACITY AND WEATHERING QUALITY**—H. S. Barber's "Cre-Sote-Stained" shingles are so well manufactured, carefully graded, closely packed and rigidly inspected that they cover at least 10% more surface than ordinary grades of untreated stock. In estimating costs, make allowance accordingly. Being sawed extra thick and thoroughly creosote treated three-fourths their length, they will give several years' additional service, making the lowest yearly cost of any roof or wall covering.

**FIRE RETARDANT**—"Cre-Sote-Stained" shingles do not curl up and split, but lie flat and smooth, thus overcoming the principal objection of the National Board of Fire Underwriters to untreated shingles (see "Code of Suggestions").

**OTHER ADVANTAGES**—No waste of time, labor or materials; as they come packed in bundles ready to lay. Every shingle can be used, saving cost of double handling and disappointments of all kinds incident to staining shingles on the premises.

**THATCHED EFFECTS**—We have an exceptionally beautiful pattern for creating the thatched effect, exposures varying from 2 to 8 ins., creeping in and out in pleasing artistic lines; sawed, bent, stained and ready to apply.

**MOTTLED EFFECTS**—Laying two or more shades of shingles at random gives a distinctive and

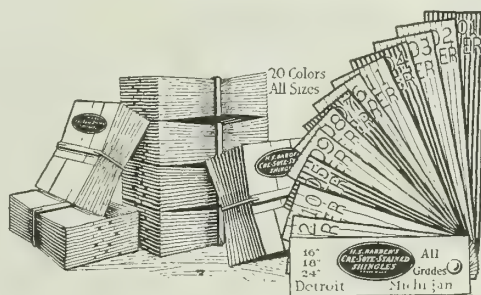
pleasing effect. The soft, rich tones of H. S. Barber's "Cre-Sote-Stained" shingles blend harmoniously with each other. Any number of colors may be packed in the same bundle, at random, saving extra labor cost of carrying shingles to the roof and of laying them according

to the color scheme, eliminating personal supervision.

**FOR WALL COVERING**—Laid in straight, alternately wide and narrow or double courses, H. S. Barber's "Cre-Sote-Stained" shingles furnish most economical wall coverings, both in first cost and cost of upkeep.

**24-INCH SHINGLES**—Measuring full ½ in. at butt end, they make an extremely attractive roof, especially when doubled or tripled every two or three courses. 18-in. Perfections may be used for the under courses. The mottled or variegated effect described above would give additional distinction and variety. Walls sided with 24-in. shingles exposed 10 ins. to the weather are attracting considerable attention. The first as well as upkeep cost is about one-third less than painted 10-in. beveled siding.

**IVORY WHITE STAIN**—A clear, beautiful and lasting flat white stain, manufactured exclusively by this company for brush-coating H. S. Barber's "Cre-Sote-Stained" shingles after first having been treated with our No. 100 "Cre-Sote-Stain" in our factory.



COLOR PAD AND SHINGLES BUNDLED READY FOR USE  
Each shingle treated separately

**HOW TO SPECIFY**—To avoid substitution or mistake, insert the following in specifications:

"H. S. Barber's 'Cre-Sote-Stained' Shingles [color number, grade, length, width and thickness of butt to be mentioned] as manufactured by H. S. BARBER CRE-SOTE STAINED SHINGLE Co., Inc., Detroit, Mich."

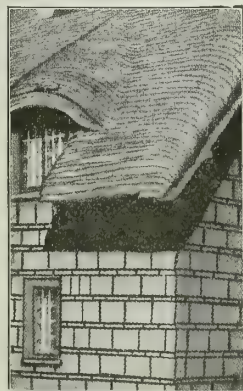
In specifying stains, say: "H. S. Barber's 'Crest'" and give color number. In specifying wood preservatives, say: "H. S. Barber's 'Crest' Wood Preservative." Mention address of manufacturer.

## Satisfaction and Deliveries.

Our trade-mark appears on each bundle for customer's protection and guarantee of quality. Satisfactory deliveries are assured anywhere in the country by careful packing.

## Samples, Prices and Advisory Service.

Color pad showing 20 or more colors or full sized samples of any special shades furnished free, with full information regarding covering capacities, weathering qualities and prices of various grades and sizes. Plans sent will be promptly returned. Send for folder "How to lay a 40-year roof."



BENT SHINGLES ON  
ROOF, ALTERNATE  
COURSES OF  
SHINGLES ON WALL



# CREO-DIPT COMPANY, INC.

STANDARD STAINED SHINGLE CO.

## Originators and Sole Manufacturers of "Creo-Dipt" Stained Shingles

GENERAL OFFICES, WAREHOUSE AND FACTORY

NORTH TONAWANDA, N. Y.

DISTRIBUTING PLANT: CHICAGO, ILL., FOR WESTERN TRADE

### Products.

"CREO-DIPT" STAINED SHINGLES preserved with Creosote; delivered to the job all bundled; stained any shade desired.

"CREO-DIPT" SHINGLE STAINS, including "CREO-DIPT" DIXIE WHITE STAIN.

"CREO-DIPT" STAINED SHINGLES to produce the Thatched Effect.

### "CREO-DIPT"

TRADE-MARK

thoroughly preserve the wood against dry rot and other decay. No kerosene, gasoline or other cheapeners used.

COLORS PERMANENT — "Creo-Dipt"

Stained Shingles, being perfectly dry at the time of creosoting, allow the wood to absorb more of the preservative; and the ground colors are taken up into the

### Originators and Sole Manufacturers.

CREO-DIPT COMPANY, INC., with general offices, warehouse and factory at North Tonawanda, N. Y., distributing plant, at Chicago, Ill., are the pioneers in the production of stained shingles, and are the only concern manufacturing exclusively stained shingles, and are the originators and sole manufacturers of "Creo-Dipt" Stained Shingles. They have been on the market for over 9 years. They have stood the test against all conditions. They are being specified by leading architects throughout the country, indorsed by responsible contractors, and approved by home builders, and the most representative lumber dealers are recommending and selling them to their customers.

### "Creo-Dipt" Stained Shingles.

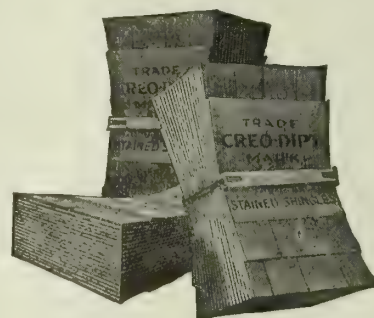
**QUALITY**—"Creo-Dipt" Stained Shingles are sawed from logs cut from the best portions only of the bodies of selected first growth British Columbia coast cedar, sawed from live timber and not from stumpage left in the forest. Neither are they baked to death in a dry kiln. 100% vertical grain; all parallel widths; no wedge shaped "Creo-Dipt" Stained Shingles, and free from sap. Quality guaranteed.

**TREATMENT**—Our process of creosoting and coloring "Creo-Dipt" Stained Shingles causes each one to be treated separately, so that the shades are uniform and permanent and the preserving sure and thorough.

**CREOSOTE AS A PRESERVATIVE**—Creosote is the best known wood preservative. Wood treated with it is not subject to dry rot or other decay, and no process of wood preserving is better established than the process that "Creo-Dipt" Stained Shingles undergo. "Creo-Dipt" Stained Shingles will last twice as long as shingles painted, brush coated, or treated in any other manner.

**DO NOT REQUIRE A BRUSH-COAT**—"Creo-Dipt" Stained Shingles do not require an additional brush coat, as the color on every shingle is uniform, and the shades are exactly as intended, selected, and specified.

**COLORS**—The colors used in the creosoting and staining of "Creo-Dipt" Stained Shingles are the strongest and most expensive pigments, ground to the finest possible condition in pure linseed oil in our own mills. They are then suspended in a vehicle of pure creosote oil, which is especially refined so it will properly carry the colors without injuring them and will



"CREO-DIPT" STAINED SHINGLES

pores in a much greater quantity, obtaining a permanent color that is impossible to procure by the old method of treating on the premises where the shingles have been exposed to the weather and dampness before staining.

**30 REGULAR SHADES**—"Creo-Dipt" Stained Shingles are manufactured in 30 regular shades, or we will make any special shades and submit samples without charge.

**COLOR SAMPLES**—A color pad showing all regular shades on red cedar shingles will be sent to architects on request. Shades are shown on red cedar shingles sawed 2½ by 10 ins., put up as shown, for convenient handling.



COLOR PAD

**LABOR SAVING** — "Creo-Dipt"

Stained Shingles are handled as easily and quickly as unstained shingles, saving the unnecessary cost of double handling, which is necessary when treating on the premises. They save the labor of dipping, and the cost of an additional brush coat, which is usually necessary when the shingles are treated on the premises.

**COST**—"Creo-Dipt" Stained Shingles cost 25% less than shingles dipped on the premises, or painted. They cost at least 50% less to lay; and the results are as anticipated, and not a disappointment, as is often the case when the shingles are treated in any other manner.



WHERE ROOF WATER IS USED—Creosote is not in the least harmful, and after the first few rains leaves no taste in the water. The first two or three rains should be allowed to go to waste, and not get into the cistern, as they wash off the superfluous stain, oil of cedar and dirt. "Creo-Dipt" Stained Shingles have been used on a great many fine country homes where cistern water is used, and we have not had a single complaint.

ARCHITECTURAL EFFECTS—"Creo-Dipt" Stained Shingles, properly selected, blend and harmonize with all surroundings. There is no handsomer or more permanent roof or side wall covering that will save continual repairing and repainting cost. They combine utility and beauty, satisfying every requirement so essential in the best of architecture.

### Thatched Effect With "Creo-Dipt" Stained Shingles.

We have devised a successful method of laying "Creo-Dipt" Stained Shingles, which produces the texture and softness of thatch, without gross imitation.

The thatched effect is obtained by having no sharp angles, by rounding the hips, ridges, gable ends and eaves, and furring the valleys, and by using "Creo-Dipt" Stained Shingles on rounded surfaces bent with or against the grain as the architecture may require. The butts of all "Creo-Dipt" Stained Shingles are sawed in our thatch pattern, except those to be used on the first course at the eaves, and laid out of the horizontal in long, irregular waves, varying in width of exposed surface from 1 to 5 ins.

A great many architects and home builders have desired to use the thatched roof with shingles, but it has been a vexing problem, not knowing that "Creo-Dipt" Stained Shingles are furnished by us for thatched roofs, ready for instant application.

"Creo-Dipt" Stained Shingles have been furnished for hundreds of houses on which thatched roofs were used, and in every case where the roof was constructed and the "Creo-Dipt" Stained Shingles laid according to our instructions, there was absolutely no trouble in obtaining the effect desired, and the results were as anticipated by architect and client. The thatched roofs with "Creo-Dipt" Stained Shingles have been pronounced very artistic and they have caused considerable comment. The work must be seen, however, to have its beauty fully appreciated.

We will submit special color samples of "Creo-Dipt" Stained Shingles which have been used on a great many fine homes on which "Creo-Dipt" Stained Shingles were used to produce the thatched effect. These shades were matched to some straw used on a thatched roof which had weathered for about 9 years.

Instructions as to how the "Creo-Dipt" Stained Shingles are laid to give the thatched effect, together with details showing method of construction of the roof and giving other valuable information, as well as photographs of houses on which "Creo-Dipt" Stained Shingles were used to produce the thatched effect, and quotations on our product for this work, will be furnished on request.

### Specifications.

We advise incorporating in specifications the full wording "Creo-Dipt" Stained Shingles (giving color number, grade, width, and length desired), manufactured only by the CREO-DIPT COMPANY, INC., of North

Tonawanda, N. Y. This will avoid misunderstanding and substitution.

### Grades and Sizes "Creo-Dipt" Stained Shingles.

"Creo-Dipt" Stained Shingles are manufactured in 17 grades and sizes, as follows:

#### RANDOM WIDTHS

*Imperials*—24 ins. long, clear shingles, random width, 9/16 in. in thickness at butt end.

*Royals*—24 ins. long, clear shingles, random width, 4 shingles to 2 ins. at butt end.

*Perfections*—18 ins. long, clear shingles, random width, 5 shingles to 2 1/4 ins. at butt end.

*Eurekas*—18 ins. long, clear shingles, random width, 5 shingles to 2 1/4 ins. at butt end.

*Extra Clears*—16 ins. long, clear shingles, random width, 5 shingles to 2 ins. at butt end.

*XXX Clears*—16 ins. long, clear shingles, random width, 6 shingles to 2 ins. at butt end.

*Star-A-Stars*—16 ins. long, random width, 6 shingles to 2 ins. at butt end. These admit of defects in 20% of the shingles above 10 ins. from butt end, such as knotholes and feather ends; 80% are clear.

#### DIMENSION WIDTHS

*Perfections*—18 ins. long, 6 ins. wide, clear shingles, 5 shingles to 2 1/4 ins. at butt end.

*Perfections*—18 ins. long, 5 ins. wide, clear shingles, 5 shingles to 2 1/4 ins. at butt end.

*Extra Clears*—16 ins. long, 6 ins. wide, clear shingles, 5 shingles to 2 ins. at butt end.

*Extra Clears*—16 ins. long, 5 ins. wide, clear shingles, 5 shingles to 2 ins. at butt end.

*Star-A-Stars*—16 ins. long, 6 ins. wide, 6 shingles to 2 ins. at butt end.

*Star-A-Stars*—16 ins. long, 5 ins. wide, 6 shingles to 2 ins. at butt end.

We can also furnish 24-in. "Creo-Dipt" Stained Shingles in red cedar in 5- and 6-in. widths, and 24 by 7-in. hand rived cypress.

### 24-inch "Creo-Dipt" Stained Shingles.

The larger "Creo-Dipt" Stained Shingles have become very popular with architects and home builders who are designing and building homes a little different from the ordinary shingled house or bungalow. The butts are very heavy, and give the appearance of the old fashioned shingles of Colonial days, and are especially adapted to the Colonial style of architecture. Can be given from 7-in. to 11-in. exposure.

### "Creo-Dipt" Dixie White.

"Creo-Dipt" Dixie White is a successful white shingle stain. One brush coat gives the desired white-wash effect to the "Creo-Dipt" Stained Shingles after they are laid, they having been creosoted and stained at our factories with a special preparation which acts as filler, primer and preservative. We have the only successful method of producing the real whitewash effect. Special samples on request.

### Shipped to All Parts of the Country.

"Creo-Dipt" Stained Shingles are shipped in perfect safety to all parts of the United States from our North Tonawanda, N. Y., and Chicago, Ill., plants.

### Co-operative Service.

A service department is maintained to co-operate with architects, contractors and home builders. We go over plans carefully, criticising them if requested, and offering suggestions, giving approximate quantity of "Creo-Dipt" Stained Shingles required and other information which is of assistance in obtaining the best results.

# TRANSFER STAINED SHINGLE CO., INC.

NORTH TONAWANDA, N. Y.

## Product.

WEATHERBEST STAINED SHINGLES in any color desired, bundled ready to lay.

**Weatherbest**  
**STAINED SHINGLES**  
TRADE-MARK

## Saving in Cost.

They cost less to buy, less to lay and less to maintain than home stained shingles. All staining done in our factory under the supervision of men who thoroughly understand colors. Weatherbest stained shingles save the time, labor and waste due to staining shingles on the premises, besides making it unnecessary for the architect to constantly supervise the job.

## Quality of Shingles.

Only the finest grades of Washington red cedar shingles are used; those which are all vertical grain, full thickness, parallel edges and free from all defects.

## Quality of Colors.

Color pigments of the highest grade and strength are combined with pure linseed and creosote oils to produce Weatherbest stain. A sufficient amount of "fixative" material, or binder, is included to insure the fastening of the colors securely to the wood, enabling them to give the longest possible service.

## Method of Treatment.

All stock is stored so as to insure its being perfectly dry at all times. The bunches are broken open and the shingles treated separately by a process that insures uniform color and the maximum amount of stain being absorbed by each shingle. After being dried the shingles are then rebundled, during which process all that do not come up to Weatherbest specifications are thrown out. Weatherbest stained shingles do not require brush coating when laid.

## Stained Full Length.

The entire shingle is treated, not merely one-half or three-quarters of the way as in most cases. The preserving qualities of the stain prevents the accumulation of mould and dampness on that part of the shingle not exposed to the sunlight.

## Imitation Thatched Effect.

This company has an unusually large call for shingles stained and bent, with and across the grain, with either square or shaped butts to produce the thatched effect, and our experience along these lines enables us to produce stock that proves entirely satisfactory.

## Appearance.

Weatherbest stain brings out to excellent advantage the natural texture of the wood, giving to a building an artistic appearance. Where one color is used on the roof and a harmonizing color on the side walls, the effect is highly desirable.

## No Effect on Rain Water.

Weatherbest stain does not in any way affect rain water, if the first two or three rains, which wash off the superfluous stain and dirt, are allowed to run to waste.

## Colors.

Weatherbest colors consist of 21 of the most desirable and dependable shades. Aside from these, the company will match, without extra charge, any special colors and shades desired, and submit samples. Color pads, showing the regular colors on wood, sent on request.

## Sizes.

Furnished in 16-in., 18-in. and 24-in. lengths, random width; 5 by 16 ins., 6 by 16 ins. and 6 by 24 ins. in dimension widths, either square or fancy shaped butts.

## Guarantee.

The Weatherbest label on every bundle guarantees the utmost satisfaction, placing directly upon the manufacturer all responsibility. This company stands back of Weatherbest shingles, insuring quality of wood and stain, color permanency, and uniformity of shade.

## Specifications.

In order to be insured from mistakes of contractors and the substitution of inferior products, insert the following in specifications:

Weatherbest stained shingles (giving color number, grade, width and length required) produced by TRANSFER STAINED SHINGLE CO., INC., North Tonawanda, N. Y.

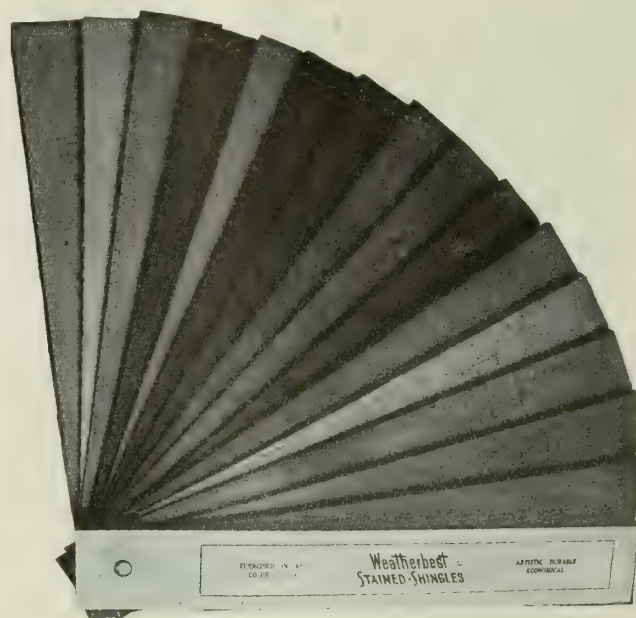
## Promptness and Service.

All orders executed and shipped within 48 hours from time received.

If assistance is desired in the preparation of specifications for any particular style of Weatherbest roof, write, and the company will promptly co-operate.

## Distribution.

Weatherbest stained shingles are sold by representative lumber dealers everywhere. Popular colors are usually carried in stock by most of them. Write for any additional information or special samples.



WEATHERBEST SHINGLE COLOR PAD

These architects' samples are full length red cedar shingles and truly represent the appearance of Weatherbest colors. They will be found invaluable for reference and determining the effects of various color combinations. Sent on request



# THE NATIONAL ASBESTOS MANUFACTURING CO.

## Asbestos Tapered Shingles and Slates

163-193 Henderson Street

JERSEY CITY, N. J.

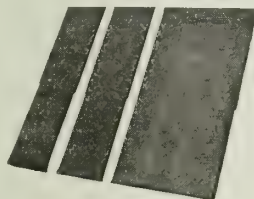
### Products.

The NATIONAL ASBESTOS TAPERED SHINGLES and NATIONAL ASBESTOS TAPERED SLATES.

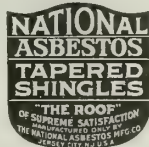
Also the well-known Flat Shapes of other asbestos shingle manufacture now on the market.

### Description of Tapered Shingles and Slates.

They are  $\frac{9}{16}$  in. thick at butts tapering to  $\frac{3}{16}$  in. thick at head. The shingle type have a texture surface resembling the charming hand-hewn effect of cedar and cypress shingles and have the sides cut out  $\frac{1}{8}$  in. (length of weather gauge) to emphasize the line of demarkation between shingles. The slate type is made plain, and also ribbed surface to intensify the shadows; roughly beveled on ends and sides (length of weather gauge) to simulate the irregularity of slate. Both tapered types are cored or corrugated on the underside to decrease weight and add massiveness to the butts. Either type weighs about 500 lbs. per square.



NATIONAL ASBESTOS  
TAPERED SHINGLE



WEAR FOREVER  
NEVER BURN  
TRADE-MARK

laid all one type and style of surface, or either type may be laid in any manner that good workmanship and esthetic taste will dictate. Both types of surface are made with numerous variations to secure the desired irregularity.

### Advantages.

These shingles and slates will last forever without either paint or repairs; are indestructible and unalterable; are non-conductors of heat, cold and lightning (the air cells or air chambers between each overlapping slate or shingle add to their natural inherent non-conductivity); are sanitary and dampproof, fireproof and economical.

### Fireproof.

As hydraulic cement and silky asbestos fibers do not burn, they make National Asbestos Tapered Shingles and Slates an absolutely fireproof roofing, a positive protection from firebrands, or other means of spreading fire from exterior causes.

### Size.

Both tapered types are made in sizes 8 by 16 ins. and 6 by 12 ins. The roofer may cut his own splits or half shingles in the usual manner.

### Colors.

Both types are made in red, the popular color; in gray, the natural color, and the usual black. Shingle type is also made in brown, a color repeatedly asked for; the slate type is also made in purple. As mineral coloring is used, they do not fade.

### Cost.

Prices will be made known on application.

### Guarantee.

Every individual tapered shingle and slate bears the imprint of the shield—the company's guarantee against defects in the material or manufacture and disintegration or deterioration from weather conditions.

### Specifications.

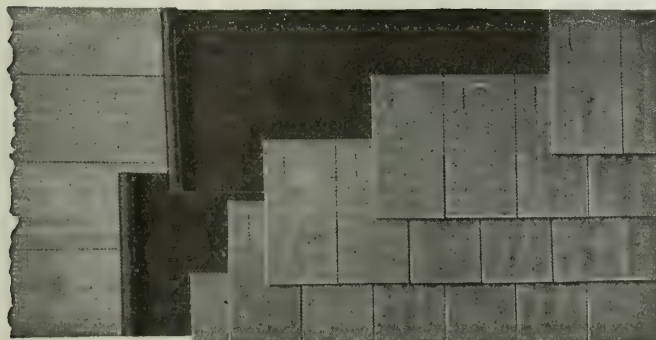
In order to prevent mistakes or substitution, it is suggested that the full name of the product and the company be used—thus: National Asbestos Tapered Shingles [or Slate] as manufactured by THE NATIONAL ASBESTOS MANUFACTURING Co., Jersey City, N. J.

Cover all roofs with sheathing boards just the same as for natural slate.

Cover all sloping roofs with one thickness of National roofing felt with not less than 4-in. lap, and at all hips, ridges, valleys, etc., overlap each side 8 ins., over which lay National Asbestos Tapered Shingles [or Slates] red color [or other color desired] as manufactured by THE NATIONAL ASBESTOS MANUFACTURING Co., Jersey City, N. J., each slate or shingle bearing their shield brand, size 8 by 16 ins., laid with a 2-in. head lap exposing the shingle [slate] 7 ins. to the weather, using proper starting course; each shingle to be secured with two  $1\frac{1}{4}$ -in. copper slating nails.

Ridges and hips to be covered with National Asbestos Ridge Saddle or Cresting, properly secured with copper fasteners supplied for the purpose, using 2-in. nails (either copper ridge roll or the Boston style hip and ridge finish may be used if preferred).

Flashings, valleys, etc., of 14-oz. copper to be used wherever necessary (2-lb. sheet lead, or sheet zinc may be used instead)



APPLICATION OF NATIONAL ASBESTOS TAPERED SHINGLES  
Showing the method to be the usual well-known slate method of laying



# H. W. JOHNS-MANVILLE CO.

## Asbestos Shingles

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910

### Products.

JOHNS-MANVILLE TRANSITE ASBESTOS SHINGLES.

JOHNS-MANVILLE ASBESTOS SLATERS' FELT. For Acoustical Service and Waterproofing Materials, see page 36; for Asphalt Mastic Flooring, see page 331; for Roofing Material, see pages 402-05; for Radiator and Steam Traps, see page 930; for Underground System of Pipe Insulation, see page 910; for Pipe and Boiler Insulation, see pages 1076-77.

### Johns-Manville Transite Asbestos Shingles.

Made of abestos rock fiber and a binding cement, united under great hydraulic pressure and cut to shingle shapes. Of relatively high tensile strength, tough and resilient, these shingles are unaffected by climatic conditions, except that they become more durable as they age on the roof.

Because of their construction, they are fireproof and waterproof, are not liable to break from timber shrinkage or settlement, and require no painting—thus effecting considerable saving in upkeep for the owner. They are light in weight and therefore do not require heavy supporting construction. They can be applied by any roofer or slater following printed directions.

These shingles are made in four colors—Natural Gray, Indian Red, Autumn Brown and Conglomerate Brown, which latter color is a composite of blending shades of brown. The shingles in the first three colors named are made in various shapes, sizes and thickness, the  $\frac{1}{8}$ -in. shingles being made with smooth edges and the  $\frac{1}{4}$ -in. with rough edges. The Conglomerate Brown shingles or "Colorblende" roof embodying Conglomerate Brown shingles is laid only in the American Method and is furnished only in the extra thick rough edge shingle.

UNDERWRITERS' APPROVAL—Johns-Manville Transite asbestos shingles are examined, approved and labeled by the Underwriters' Laboratories, Inc., under direction of the National Board of Fire Underwriters. Laid "American method," they are given class "A" rating; laid "hexagonal method," they are given class "B" rating.

DATA ON JOHNS-MANVILLE TRANSITE ASBESTOS SHINGLES

Catalogue No.	Size in ins.	Weight in lbs. per 100 shingles	Weight in lbs. per sq. applied	Number required per sq.	Weathering (exposed surface), ins.	Galv. nails required per sq., lbs.	Catalogue No. of starter
3	12x12	215	515	240	5x12	2	16
4	12x12	205	495	240	5x12	2	16
5	8x16	185	480	260	7x8	2½	51
6	8x16	175	455	260	7x8	2½	51
9	16x16	345	300	87	13x13	1	17-11
12	12x12	200	320	160	9½x9½	1½	17-14
50	9x18	320	650	204	8x9	2	51
60	12x12	200	320	160	9½x9½	1½	17-61
70	16x16	345	300	87	13x13	1	17-71

Nos. 9 and 12 are laid by "diagonal method."

Nos. 60 and 70 are laid by "hexagonal method."

Do not deduct for skylights, etc., if less than 4 sq. ft. each. Allow one-half of openings from 4 to 8 sq. ft. each, and total areas over 8 sq. ft. each. Use chalk line in laying. Do not cut with saw; score and snap as in glass cutting. It pays to use soft rolled copper for valley flashings.

### Standard Specifications for Johns-Manville Transite Asbestos Shingles.

In these specifications, definite sizes and styles of shingles are given. Where other sizes are used, style number of the shingle may be inserted as desired.

AMERICAN METHOD—Lay roof boards in the usual manner,



breaking joints and nailing securely in place with at least 2 nails at each purlin, leaving no loose ends. The roofing boards should be well seasoned and of narrow width. Over the roof boards lay 1 thickness of Johns-Manville Asbestos Slaters' Felt (described on this page), or preferably a heavier felt such as Johns-Manville Phoenix or Johns-Manville 2-ply Service Roofing or Neptune Keystone Hair Insulator, laying horizontally with a

4-in. lap, and with 12-in laps on hips and valleys. Apply furring strip  $\frac{1}{4}$  to  $\frac{1}{2}$  in. thick by  $1\frac{1}{2}$  ins. wide, parallel with and flush with eaves; then apply 1 course of No. 51, 9 by 18-in. shingles at eaves, lengthwise and parallel to same, overhanging the eaves about  $\frac{1}{2}$  in. Apply the second course, using No. 5 shingle, entirely covering first course, breaking joints, after which proceed in the regular manner as with wooden shingles or slate, exposing 7 ins. to the weather and fastening each shingle in place with at least 2 galvanized iron roofing nails furnished for the purpose. Never drive nails down tight; it is only necessary to drive them firmly as with slate. Over the ridges and hips apply Johns-Manville Transite Asbestos Ridge and Hip Rolls with not less than 3-in. lap, fastened in place with special ridge roll fasteners furnished for the purpose; or still better, finish off ridges and hips with Boston Hip. Where the ridge pole does not project high enough above the roof boards to allow direct application of ridge roll, it is necessary to put in a false pole so that it is possible to get a direct fastening through top of ridge roll.

Flashings—Flash all chimneys and valleys with copper or other approved material.

HEXAGONAL METHOD—Lay roof boards in the usual manner, breaking joints and nailing securely in place, leaving no loose ends. The roofing boards should be well seasoned and of narrow width. Over the roof boards lay 1 thickness of Johns-Manville Asbestos Slaters' Felt, laying horizontally with a 4-in. lap, and with 12-in. lap on hips and valleys. Over the felt lay Johns-Manville Transite Asbestos Shingles in the following manner: Apply a furring strip  $\frac{1}{4}$  to  $\frac{1}{2}$  in. thick by  $1\frac{1}{2}$  ins. wide, parallel with and flush with eaves; then lay 1 course of No. 17 Johns-Manville Transite Asbestos Shingles end to end, parallel with and overhanging the eaves  $\frac{1}{2}$  in., over which apply 1 course of No. 61 shingles, entirely covering the starter No. 17, breaking all joints as shown in detail. Cover balance of roof with No. 60 shingles, 12 by 12 ins., laid as shown, exposing  $9\frac{1}{2}$  by  $9\frac{1}{2}$  ins. to the weather. Securely fasten all shingles in place with galvanized, needle-pointed nails, and fasten the points of the No. 60 main body shingles with special Johns-Manville copper storm nails. Never drive nails down tight; it is only necessary to drive them firmly as with slate. All the main body shingles, i. e., the No. 60, should be laid with the diagonal lines on a 45° angle with the eaves. Over the ridges and hips apply Johns-Manville Transite Asbestos Ridge and Hip Rolls, with not less than 3-in. lap, fastening in place with special ridge roll fasteners furnished for the purpose. Referring to the detail illustrations, the copper storm nail is first laid head down; next, pushed half way underneath a shingle; then the next shingle in the course is laid with its cut or abutting side against the nail; the shingle of the course above is then slipped over, and finally the nail is bent down. This operation is repeated until the entire roof is covered.

Flashing—Flash all chimneys and valleys with copper or other approved material.

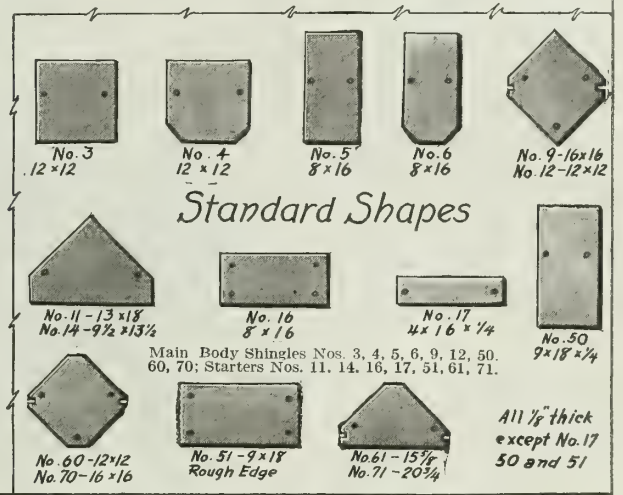
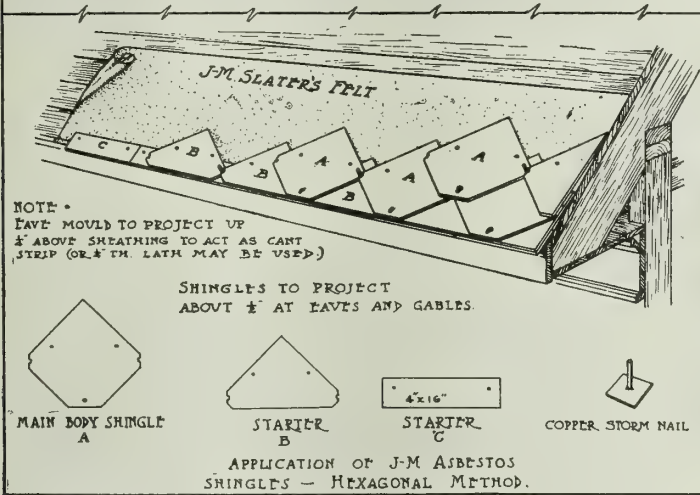
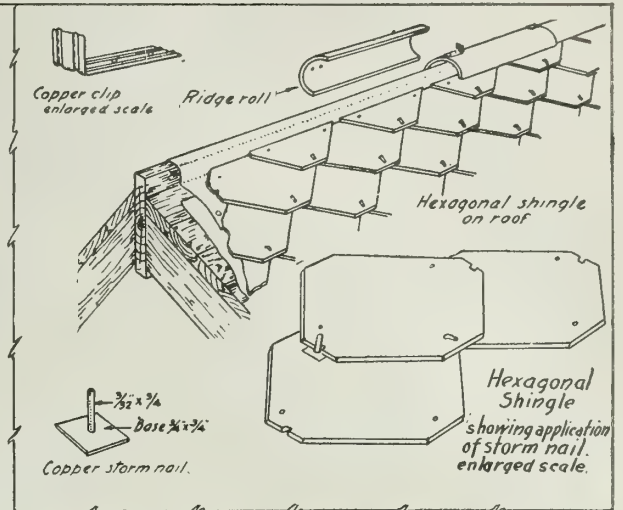
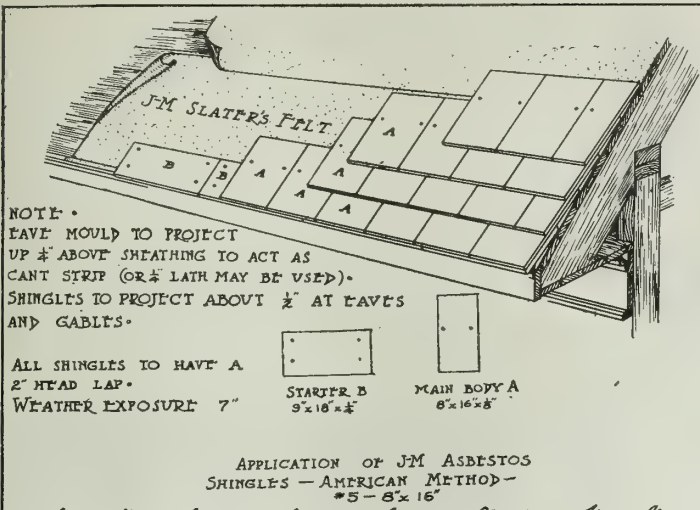
DIAGONAL METHOD—Figure the same number of shingles to the square as for the hexagonal method. The starting courses for this method will be No. 17, 4 by 16 ins., then No. 14, while the main body shingle will be No. 12, these numbers to apply to the 12 by 12-in. size. In the 16 by 16-in. size, use first No. 17, 4 by 16 ins., then No. 11, and No. 9 will be the main body shingles.

### Johns-Manville Asbestos Slaters' Felt.

As an insulating and waterproofing material between roof boards and shingles or between siding and shingles, Johns-Manville asbestos slaters' felt is unequalled.

It is composed of pure asbestos felt, saturated with natural asphalts—both minerals. Due to the total absence of vegetable, animal and organic matter, it is odorless, dampproof and weatherproof. It will not rot.



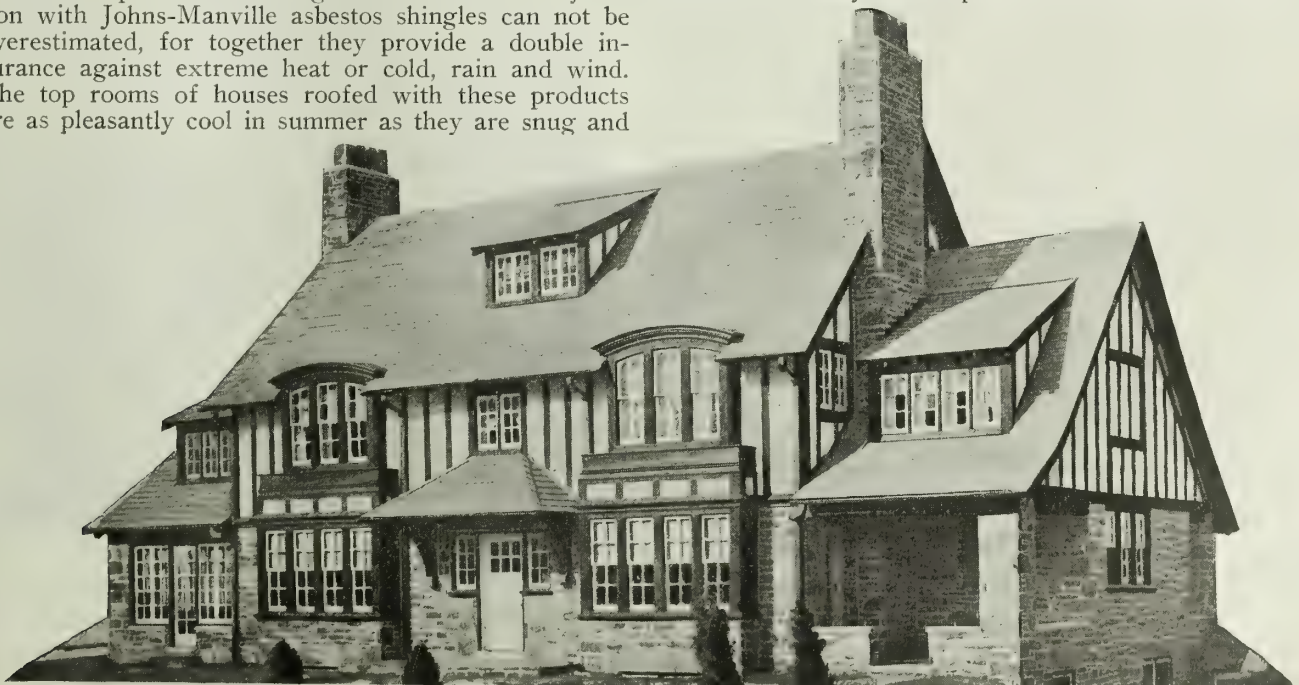


JOHNS-MANVILLE TRANSITE ASBESTOS SHINGLES—METHODS OF LAYING AND SHINGLE UNITS

It is supplied in rolls 32 ins. wide. Put up in 3-square rolls.

The importance of using this material in conjunction with Johns-Manville asbestos shingles can not be overestimated, for together they provide a double insurance against extreme heat or cold, rain and wind. The top rooms of houses roofed with these products are as pleasantly cool in summer as they are snug and

cozy in winter. They make the roof as sound and solid as the foundation, and eliminate the care and attention necessary where perishable materials are used.



ONE OF THOUSANDS OF FINE EXAMPLES OF JOHNS-MANVILLE TRANSITE ASBESTOS SHINGLE INSTALLATIONS  
Residence of E. Searing, Merion, Pa.

DRUCKENMILLER & WILLIAMS, Architects, Philadelphia, Pa.

# ASPHALT READY ROOFING COMPANY

9 Church Street  
NEW YORK, N. Y.

WORKS: JONES POINT, N. Y.

## Products.

ROOFINGS; ASPHALT SHINGLES; ASPHALT FELTS.



TRADE-MARK

## Protection Brand 6-in. Lap Roofing.

Has an absolutely tight 6-in. lap (patented). Laid with all nails covered, making the roof same as one continuous sheet. Nails are driven through the 6-in. lap. Overlapping sheet is put in place and welded to underlapping sheet with Hudson asphalt cement, so that all nails are completely covered, making the joints the strongest part of the roofing. The danger of leaks through nailholes is eliminated.

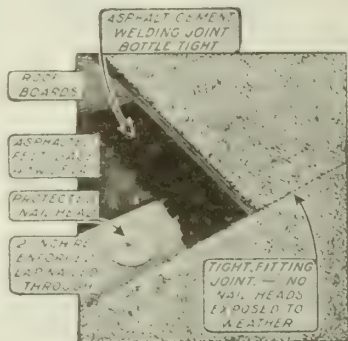
Can be laid on steep as well as flat roofs. Coating will not slide when subjected to severe sun heat, no matter how steep roof may be.

An ideal roofing for sawtooth buildings.

A heavier roof can be obtained when reinforced with Hudson brand asphalt felts and Hudson asphalt cement.

**SURFACING**—Surfaced with white grit, fine beach sand, red or green crushed slate.

**CONSTRUCTION**—Made from high grade asphalt saturated felt, coated with our special high melting point asphalt, carefully compounded, in which the mineral surface is securely embedded. No coal tar is used.



PROTECTION BRAND ROOFING

## Arrow Brand Roofing.

Sand and gravel surfaced. Made in the same manner as the Protection brand roofing, but has a 2-in. lap.

## Red, Green and Gray Rockland Roofing.

For roofing or siding. Natural mineral surfaces of red or green slate or gray feldspar.

Very attractive for bungalows and small cottages where its decorative color possibilities are taken advantage of. Can be used very advantageously for siding.

## Hudson Brand Asphalt Felt.

Specially made for sheathing buildings, built-up roofs, waterproofing and reinforcing slate and tile roofs.

When placed over roof boards under slate or tile, it prevents leaks, especially during driving snowstorms. Does not become hard or brittle.

Approximate weights per square of 108 sq. ft. are 14, 30 and 40 lbs. Special weights made to order.

## Hudson Wide Space Asphalt Shingles.

Size 9 by 14 ins. Laid 4 ins. to the weather with 6-in. space between each shingle.

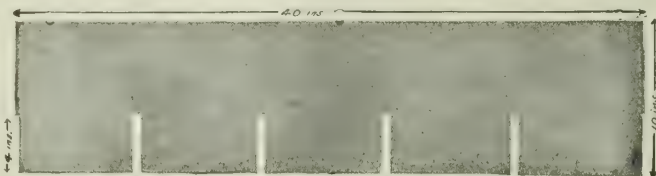
An attractive roof at low cost.

## Hudson Strip Asphalt Shingles.

Come in strips 10 ins. wide by 40 ins. long, each

strip containing 5 shingles. Nails are driven above slots separating the shingles.

Can be laid in half the time required to lay other shingles. Labor cost is much reduced by using them.



HUDSON STRIP ASPHALT SHINGLE

## Hudson Individual 8-by 12½-in. Asphalt Shingles.

Surfaced with red, green or mottled crushed slate or brown sand. Can be bent and laid according to the thatched method.

Special attention is called to the mottled Hudson shingles for artistic beauty.



RESIDENCE OF SAMUEL F. PRYOR, ESQ., GREENWICH, CONN.  
CROSS & CROSS, Architects, New York, N. Y.

Roofed with Hudson shingles laid according to the thatched method



SHOWING HUDSON SHINGLES LAID ACCORDING TO THE THATCHED METHOD

## Underwriters' Approval and Labels.

Hudson asphalt roofing products are approved by the National Board of Fire Underwriters and bear Underwriters' labels.

## Catalogue and Samples.

Sent on request.



# THE NATIONAL ROOFING CO.

## Manufacturers of Asphalt Roofing

FACTORIES AND GENERAL OFFICES

TONAWANDA, N. Y.

BRANCH OFFICES

PITTSBURGH, PA., 607 Publication Building

BALTIMORE, MD., 1048 West Baltimore Street

DISTRIBUTERS

BALTIMORE, MD., CLARKE ASPHALT ROOFING & PAINT Co.,  
1048 West Baltimore Street

BINGHAMTON, N. Y., GILLET-BARNES Co., 91 State Street

BUFFALO, N. Y., CORDES, AYRAULT & Co., Inc., 51 Broadway

CLEVELAND, OHIO, NATIONAL ROOFING & SUPPLY Co., 6318  
Kinsman Road

DETROIT, MICH., NATIONAL ROOFING & PAINT Co., 395 Michi-  
gan Avenue

LOCKPORT, N. Y., CORDES, AYRAULT & Co., 13 Cottage Street

LOUISVILLE, KY., CENTRAL PAINT & ROOFING Co., 314  
West Main Street

MILWAUKEE, WIS., CREAM CITY ROOFING & PAINT MFG.  
Co., 219 Eighth Street

NEW ORLEANS, LA., KRACKE & FLANDERS Co., 819 Julia  
Street

NIAGARA FALLS, N. Y., CORDES, AYRAULT & Co., 1405 Main  
Street

PROVIDENCE, R. I., NARRAGANSETT SUPPLY Co., 830 Eddy  
Street

SYRACUSE, N. Y., ONONDAGA BUILDERS SUPPLY Co., 569  
South Clinton Street

TONAWANDA, N. Y., CORDES, AYRAULT & Co., Fillmore  
Avenue

### Products.

PREPARED ASPHALT ROOFINGS surfaced with Gravel, Crushed Red and Green Slate, and Feldspar Rock, including SECURITY WIDE-WELD, SPARKLOID and NATROCO ASPHALT ROOFING; NATROCO ASPHALT SHINGLES.

Security Wide Lap Strip Shingles; Triumph, Jefferson and Champion Rubber Roofing; National Asphalt Roofing Felt; "Fixit" Mineral Asphalt and National Liquid Asphalt Cements; National and Union Roofing Cements.

### Security Wide-weld Asphalt Roofing.

Security Wide-weld roofing is made with a patented 6-in. joint that can not leak, welds the whole roof into one continuous piece and covers all nailheads with the full thickness of the roofing. Each sheet is lapped over the 6-in. ungraveled margin of the sheet below and welded to it with hard asphalt cement.

Our roofings are approved by the National Board of Fire Underwriters.

HOW THE CEMENT WELD IS MADE—In the illustration above the indication of the lettering is as follows:

A—Upper portion of a sheet of Security roofing lying on roof.

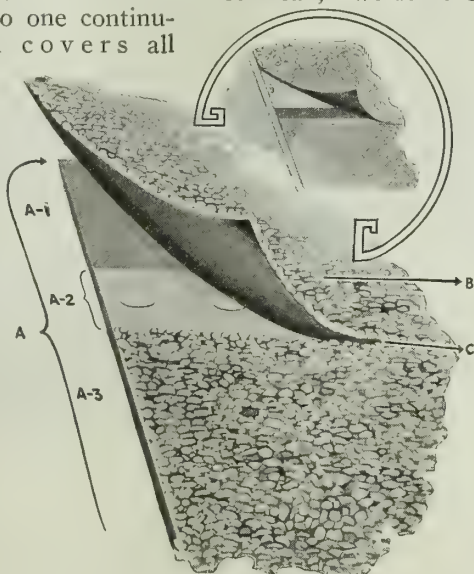
B—Lower portion of sheet lying next above on roof, turned back to show ungraveled margin of sheet "A."

A1—Bottom layer of lower sheet of asphalt saturated felt, 36 ins. wide, extending 4 ins. beyond other layers, and along the upper edge or margin of the entire sheet or roll of roofing.

A-2—Full thickness of two layers of felt and two of natural mineral asphalt, 32 ins. wide, extending 2 ins. beyond the surfacing, and covered with tissue paper tape to prevent sticking



TRADE-MARK



6-INCH CEMENT WELD

in the roll. The nails are driven through this full thickness of the roofing as shown.

A-3—Gravel surfaced portion of sheet "A," 30 ins. wide, composed of two layers of asphalt saturated felt, two of mineral asphalt, one of white sea gravel (fine feldspar or crushed slate if preferred).

In applying, the roofing "A-1" and "A-2" are covered with a thick layer of hard asphalt cement (hot) and "B" is then brought down over the entire 6 ins., and welded firmly to it. Thus one unbroken sheet of gravel surfaced roofing is had, covering all nailheads and making a continuous one-piece roof without a nailhole in it.

NO COAL TAR—Security roofing is made of special high grade, long fibered wool felt, saturated with natural mineral asphalt, which is refined by our own formula, the result of over 25 years' experience. Not a particle of coal tar or pitch in any form enters into the composition of any of our roofings.

SURFACING—The surfacing of Security roofing is a heavy layer of natural mineral asphalt cement, in which is permanently embedded a final layer of white sea gravel, crushed slate or crushed feldspar rock. This adds to the durability, weatherproofing and fire resisting qualities, and obviates all need of painting and repairs. It can, however, be changed in color by using our "Asphaltus" Coating.

FOUR STYLES—Security roofing is made in four styles: gravel surface, red slate, green slate, and fine feldspar. It can also be furnished with burlap insertion for siding, or for roofs over one-half pitch. Security roofing is satisfactory for all classes of roofs, and easily applied by any intelligent workman.

### Natroco Asphalt Shingles.

Natroco asphalt shingles are made from the same high grade materials as the roofings, surfaced with crushed red and green slate or gray rock. They are fire resisting, durable and sightly for residences, public buildings and similar structures.

They are cut 8 ins. wide by 12¾ ins. long, to be laid about ½ in. apart and 4 ins. to the weather; 424 shingles cover 100 sq. ft. Shipped in cartons, each containing one quarter square, of 106 shingles.

### Other Brands.

Sparkloid asphalt roofing is made in three weights, surfaced with crushed feldspar, finished on lower side with protective layer of flake mica. Natroco roofing is made in four styles, surfaced with gravel, red and green slate and feldspar rock.

ESTABLISHED 1795

## BIRD &amp; SON

Manufacturers of Building Papers, Roofings, Paint and Waterproofing Products  
EAST WALPOLE, MASS.

## BRANCH OFFICES

NEW YORK, N. Y.

WASHINGTON, D. C.

CHICAGO, ILL.

HAMILTON, ONT.

## MILLS

EAST WALPOLE, MASS.

NORWOOD, MASS.

PHILLIPSDALE, R. I.

CHICAGO, ILL.

HAMILTON, ONT.

**Products.**

**WATERPROOF BUILDING PAPERS:** Neponset Black; Neponset Red Rope.

**SOUND DEADENING FELT:** Neponset Florian.

**WATERPROOF INSULATING PAPER:** Neponset Insulating Paper.

**WATERPROOFING FELT:** Neponset Asphalt Felt.

**BUILT-UP ROOF:** Neponset Built-up Roof.

**WALL BOARD:** Neponset Wall Board, Quartered Oak Finish on one side, Burlap Finish on the other side.

**ASPHALT SHINGLES:** Neponset Twin Shingles, Red or Green; American Twin Shingles, Red or Green; Proslate Shingles, Red or Green.

**READY ROOFINGS:** Neponset Paroid Roofing, Gray, Red or Green.

**PAINTS and COMPOUNDS:** Neponset Roofing Paint, Black or Red; Neponset Compound for Built-up Roofs and Waterproofing Work.

**Neponset Black Waterproof Building Paper.**

A high grade waterproof building paper; the standard of architects for general use under stucco, shingles or clapboards, under slate or tile roofs, and between floors, especially in fireproof construction, over the screeds and under finished wooden floors to prevent warping and to lay dust.

Put up in rolls 36 ins. wide, containing 500 sq. ft.

**Neponset Red Rope Sheathing and Roofing.**

The highest grade waterproof sheathing paper for use under stucco, shingles or clapboards, and under slate or tile roofs. Particularly valuable where the building is to be stuccoed at some future time, as it will remain waterproof if exposed to the weather for several years. Also used as a low cost and temporary roofing or siding.

Put up in rolls 36 ins. wide, containing 500 sq. ft.

**Neponset Florian Sound Deadening Felt.**

A scientific, sanitary sound deadener for use under floors and in partitions. Built on the dead air cell principle.

Used under metal roofs as insulation against heat and cold.

Put up in rolls 40 ins. wide, containing 500 sq. ft.



TRADE-MARK  
Reg. U. S. Pat. Office

**Neponset Insulating Paper.**

For cold storage and refrigeration work. Used very generally for refrigerator cars by such representative concerns as Cudahy Packing Company, Swift & Company and Anheuser-Busch Brewing Company.

Standard stock rolls 36 ins. wide, containing 1000 sq. ft., and 112 ins. wide, containing 3110 sq. ft. Special widths to order.

**Neponset Asphalt Felt.**

For built-up roofs and general waterproofing work, in connection with Neponset Compound. Specifications furnished on application.

Weight, 14 lbs. per 100 sq. ft.

**Neponset Wall Board.**

Made with quartered oak finish on one side, burlap finish on the other side. Used instead of, or directly over laths and plaster, and for partitions in all kinds of low cost work.

Sheets 32 and 48 ins. wide; 7, 8, 9, 10 and 12 ft. long, and about  $\frac{1}{8}$  in. thick.

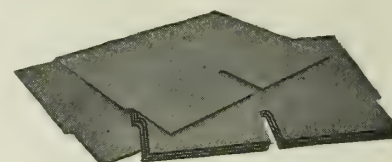
**Neponset Twin Shingles.**

For all pitch roofs. Their red or green colors, form, size, and slate surface make as handsome a roof as it is possible to find.

Tough felt, saturated with the best waterproofing material

known (everlasting asphalt), coated with crushed slate and asphalt, and pressed into one solid thick sheet guarantees extra wear. Similar materials in the famous Neponset Paroid Roofing are still giving good service on roofs laid 19 years ago, when Paroid was new. Their uniform shape, and double width, halve the cost of laying, because two shingles are really laid at one time. Cracks and nailholes are reduced to a minimum. On a Neponset Twin Shingle roof, sparks and flying embers burn out harmlessly. Most conflagrations spread from roof to roof.

These shingles are approved by the National Board



NEPONSET TWIN SHINGLES



of Fire Underwriters. 180 of these shingles cover 100 sq. ft.



**NEPONSET TWIN SHINGLES**  
When laid, the "twin" feature is not visible

#### **American Twin Shingles.**

A good shingle for pitch roofs, but not as large in size as Neponset Twin Shingles. Made with red or green slate surfaces. 180 of these shingles cover 100 sq. ft.

#### **Proslate Shingles.**

Made with red or green crushed slate surfaces. Single type, not twin. An excellent shingle of its kind, but lacking the special features of the twin shape. 424 of these shingles cover 100 sq. ft.

#### **Neponset Paroid Roofing.**

Now made in gray, red and green colors, the latter two with natural red or green crushed slate surfaces. For industrial, railroad, farm, and similar buildings. Approved by the National Board of Fire Underwriters. Already has a past record of over 19 years' service on buildings throughout the world. Complete directions and fixtures, large headed flexible nails, and cement for laying, packed in each roll.

Put up in rolls 36 ins. wide, containing 108 sq. ft.; also in rolls 18 ins. wide containing sufficient to cover 1 square.

#### **Neponset Roofing Paints.**

These asphalt paints are made in black or red. Especially adapted for ready roofing, and for outside use on all kinds of metal.

#### **Neponset Orders Easily Filled.**

There are thousands of dealers in this country who sell Neponset waterproof building products. Specifications can thus be easily and quickly filled.

#### **Co-operative Service.**

Any special roofing, waterproofing or other problems, on which advice is desired, may be referred to the consulting department of BIRD & SON.



**THE MILLS AT EAST WALPOLE, MASS., WHERE NEPONSET PRODUCTS ARE MADE**  
There are three mills in the United States and two in Canada making the complete line of Neponset products

# C. S. GARRETT & SON CORP.

Manufacturers of Building, Roofing and Insulating Papers

TELEPHONE:

BELL, MARKET 971  
KEYSTONE, MAIN 499

PHILADELPHIA, PA.

## Products.

INSULATING, SHEATHING and WATER-PROOF PAPERS; TARRED and COMPOSITION ROOFING FELTS; WOOL DEADENING FELT; DAMP RESISTER and PLASTER BOND; ASPHALT COATING CEMENT; PLASTIC ROOFING CEMENT; STRIP SHINGLES.

Marley Rubber Roofing; Rosen Sized Sheathing; Waterproofing Paste.

## Insulating, Sheathing and Waterproof Papers.

"RAW HIDE" WATERPROOF PAPER—It is not a question of how cheap, but how good.

"Best"—for ice houses, cold storage, refrigerator car insulation, "Raw Hide" has no equal. Especially adapted for all high class dwellings.

Prices—No. 210, \$14.00 per 1,000 sq. ft.; weight, 200 lbs.

Nos. 200 and 205, \$11.00 per 1,000 sq. ft.; weight, 125 lbs.

RED ROPE PAPERS—An all-manila rope fiber sheathing paper, especially adapted for strictly first class work. Furnished in 6 different weights.

Largely used for refrigerator cars, ice and cold storage houses, on top of concrete floors where overlaid with wood or tile to prevent stain or chemical action from cement.

Perfect insulation is guaranteed wherever used.

List Prices—\$5.00, \$6.00, \$9.00 and \$15.00 per 1,000 sq. ft.

EXPERIENCE—All of the above insulating, sheathing and waterproof papers are made under the company's supervision, and after an experience extending over 40 years.

## Tarred Roofing Felt.

"Niagara Special" Tarred Roofing Felt used in the "Garrett Specification," put up in rolls 32 ins. wide, 60 lbs. to 400 sq. ft., when used with Gibraltar Straight-Run Coal Tar Pitch, will make good a 10 years' guarantee by the roofer who uses it.

Prices furnished on application.

## Garrett Specification for Slag Roofing.

Lay full 4 thicknesses of "Niagara" Tarred Felt, breaking joints and allowing 1-in. lap at each joint. Quantity of felt paper to be not less than 60 lbs. to square.

Coat or mop each thickness of felt over at least two-thirds of surface with heavy coat of Gibraltar Straight-Run Coal Tar Pitch. After above felt is properly laid and coated between thicknesses, then mop entire surface with heavy coating of Gibraltar Straight-Run Coal Tar Pitch, and apply heated slag or gravel  $\frac{1}{4}$  to  $\frac{3}{8}$  in. in size.

Slag to be hot enough to bed in pitch, but not hot enough to burn the wool fiber in the felt paper.

Quantity of Gibraltar Pitch used in above roof to be not less than 150 lbs. to square.

If applying a steep roof, use tin caps and nails between layers of felt, to fasten to roof boards.

If applying roof on mill or other building where damage may be caused from dropping pitch, first apply 1 thickness of "Niagara" Felt, then lay roof as per specifications.

Where applying a roof over concrete surface, first use a priming coat of Pyramid or other reliable waterproofing paint. Over this mop a coat of Gibraltar Pitch and then apply the roof as above.



TRADE-MARK

## Garrettite Strip Shingles.

These shingles are made of highest quality wool felt, saturated with high grade asphalt. A heavy coating of asphalt is applied to upper side of felt, and while hot is run through a machine, which presses into the surface a layer of either red or green chipped slate.

Garrettite strip shingles are strips of Garrettite slate surfaced roofing,  $32\frac{1}{2}$  ins.

long and 10 ins. wide, with notches cut 4 ins. deep. Each strip consists of 4 shingles, requiring but 5 nails to a strip. Each shingle has an exposed surface of  $7\frac{1}{2}$  ins. by 4 ins. with  $\frac{1}{2}$ -in. space between. The "notch" or space between being but 4 ins. deep, leaves 6 ins. of solid roofing under the next layer of shingles.

Put up in bundles containing 56 strips, sufficient to cover 50 sq. ft. of roof surface.

## "C. S. G." Wool Deadenng Felt.

Made of a wool fiber, and very tough and elastic, it will always remain "springy" as well as agreeable and noiseless. Will not flatten out and become dead.

WEIGHTS—No. 18, 1 lb. to sq. yd.; No. 19,  $1\frac{1}{2}$  lbs. to sq. yd.; No. 20, 2 lbs. to sq. yd.

## "C. S. G." Damp Resister.

"C. S. G." Damp Resister and Plaster Bond No. 383, applied to inside of outside walls, removes the necessity for furring and makes a solid and dampproof plastered wall.

## "C. S. G." Asphalt Coating Cement.

"C. S. G." Asphalt Coating Cement No. 407A, applied to outside cellar walls in 1 or 2 coats, is sufficient to arrest dampness where no water pressure is present.

## Pyramid Plastic Roof Cement.

A combination of asphaltic carbon gum, pure long fiber genuine asbestos, and other waterproof materials thoroughly amalgamated by a special mechanical process.

Pyramid Plastic Roof Cement is waterproof, weatherproof, flexible, fire retardant, indestructible. Sets slowly to a tough, flexible mat on dry or wet smooth board, felt, concrete, slag or metal surface. Leaky brick walls can be made watertight with Pyramid Plastic Roof Cement.

Foundation walls can be waterproofed by any ordinary workman with Pyramid Plastic Roof Cement about  $\frac{1}{8}$  in. thick, applied with smoothing trowel. A continuous Pyramid surface presents a solid, unbroken mat or covering without a lap, seam or nailhole; does not dry out but remains tough and elastic; the older it gets the firmer it becomes.

Pyramid may be applied in warm, cold, wet or dry weather with equally satisfactory results; and for patching roofs, down spouts, valley or gutters, Pyramid excels.

Consult this company's Service Department on individual conditions. Service is free of charge. Booklets furnished on application.



# THE STANDARD PAINT COMPANY

## Roofing, Building Papers and Metal Preservative Paints

BOSTON, MASS.

NEW YORK, N. Y.

CHICAGO, ILL.

MONTREAL, CAN.

### Products.

ROOFINGS; SHINGLES; FELTS; PAPERS; DECK CLOTH; LAP FASTENERS for Prepared Roofing; FLOORING; TECHNICAL PAINTS; INSULATING MATERIALS; IMPERVITE CEMENT WATERPROOFING COMPOUND, for which see also pages 48-49. Asphalt Specialties.

### Ru-ber-oid Roofing, Gray Color.

The original smooth surfaced ready-to-lay roofing, made from the same formula for a quarter century. Costs more than ordinary prepared roofings, but it wears longer.

Ru-ber-oid roofing consists of tough, heavy felt, which is incased in an especially prepared coating containing vegetable and animal substances, making it weatherproof, waterproof, rustproof and fire resisting. It is unaffected by temperature extremes, and will not crack in zero weather or drip under a torrid sun. Made in 4 weights.

Put up in rolls 36 ins. wide, complete with fixtures. Furnished also in 216 sq. ft. rolls.

### Colored Ru-ber-oid Roofing (Patented), Red and Green.

Same quality and durability as Ru-ber-oid, with permanently colored coating. Put up in rolls 24 ins. or 36 ins. wide. Rolls contain 108 sq. ft. of the 36-in. width, and 110 sq. ft. of the 24-in. width. Fixtures furnished with the rolls, including cement the same color as roofing.

### Ru-ber-oid Individual Shingles, Gray and Red.

Extra heavy, smooth surfaced shingles of the same composition and durability as Ru-ber-oid. They measure 8 by 12¾ ins., packed in crates.

### Ru-ber-oid Strip Shingles (Patented), Gray and Red.

Same material as Ru-ber-oid individual shingles. Made in strips containing 4 shingles each.

### Imp, Cronolite, Zylex and Starex Roofings.

Moderate priced, high grade roofings. Made in 3 weights.

### SPC Slate Suraced Roofing, Red and Green.

Surfaced on one side with crushed slate, firmly embedded in the coating. Made in 1 weight.

### SPC Individual Shingles, Red and Green.

Same composition and finish as the SPC slate surfaced roofing.

### Standard Strip Shingles (Patented), Red and Green.

Same composition and finish as SPC slate surfaced roofing. Made in strips containing 4 shingles each.



### Wyron Lap Fasteners (Patented).

For the application of prepared roofing; obviate the necessity of cementing the seams.

### Ru-ber-oid Built-up Roofs.

Specifications for laying over concrete or wood sent on request.

### Ru-ber-oid Shadow Roofing (Patented).

At last an attractive, artistic roofing at moderate cost. Sheets, 72 by 24 ins., are creased to lay over wooden battens 1¾-in. square, spaced on 20-in. centers. Has same proportions and gives same massive effect as a copper roof on battens, with no chance of leakage. Sheets lay smooth, because an expansion space (patented) is provided. Special data on request.

### Ru-ber-oid Waterproof Cloth.

Duck, coated on under side with bitumen, upper side to be painted. Adapted for porch roofs and boat decks. Made in 1 weight.

### Ru-ber-oid Flooring, Gray and Red.

Waterproof, non-absorbent and sanitary floor covering.

### Ru-ber-oid Waterproofing Felt, Ru-ber-oid Saturated Felt and SPC Sheathing Felt.

Saturated; also saturated and coated felts for sheathing and membrane waterproofing.

### Giant, Hercules and Universal Papers.

Saturated; also saturated and coated papers for building, sheathing and insulating purposes.

### Paints, Electrical Compounds, Etc.

Ru-ber-ine and Peacock Roof Paints; Flexite, very high class oil paint with pigment, for coating metal; SPC Dampproofing Paint; SPC Boiler and Stack Paint; SPC Cement Floor Finishes and Masonry Coatings; Graphite Paints.

Imp Asbestogum Roof Cement, applied cold.

SPC Pipe Seal Compound, for waterproof joints.

P&B Electrical Compounds, Varnishes and Tape, for all electrical and insulating work. The standard of efficiency for over 34 years.

### Impervite Cement Waterproofing Compound.

Impervite is unique, being a bituminous emulsion (patented) and free from calcium stearate or other soap. Received gold medal (highest award) at California Exposition. A ¾-in. inside facing of Impervite mortar is guaranteed to waterproof a leaky wall 50 ft. below the ocean.

Specify for stucco, 1 bag cement, 3 bags sand, 4 lbs. Impervite, as this is the only formula that secures waterproofing and avoids hair cracks.

# THE BARRETT COMPANY

Manufacturers of Coal-tar Products for Roofing, Waterproofing, Dampproofing and Paving; also Sheathing and Lining Papers

NEW YORK	CHICAGO	PHILADELPHIA	BOSTON	ST. LOUIS	CLEVELAND
CINCINNATI	PITTSBURGH	DETROIT	NEW ORLEANS	BIRMINGHAM	KANSAS CITY
MINNEAPOLIS	NASHVILLE	SALT LAKE CITY	SEATTLE	PEORIA	

## THE BARRETT COMPANY, LIMITED

MONTREAL TORONTO WINNIPEG VANCOUVER  
ST. JOHN, N. B. HALIFAX, N. S., SYDNEY, N. S.

### Products.

#### ROOFING MATERIALS:

BARRETT SPECIFICATION (a built-up roofing); EVERLASTIC READY ROOFING; EVERLASTIC MULTI-SHINGLES; EVERLASTIC TYLIKE SHINGLES and EVERLASTING SLATE-SURFACED ROOFING; BARRETT'S SLATERS' FELT.

#### INSULATING, SHEATHING, LINING and WATERPROOFING MATERIALS:

BARRETT'S TOMB BRAND DEADENING FELT; BARRETT SPECIFICATION FELT; RED SEAL FELT; TARTEX WATERPROOFING FELT.

#### DAMP-PROOFING and PRESERVATIVE PAINTS:

HYDRONON, "the Dampproofing Paint"; EVERJET ELASTIC PAINT; BARRETT'S VELVEX CREOSOTE SHINGLE STAINS; ETERNIUM METAL PAINT.

#### WOOD PRESERVATIVES:

BARRETT'S CARBOSOTA CREOSOTE OIL.

#### FLOORING:

TAR-ROK SUBFLOORS.

#### PAVING MATERIALS:

TARVIA, which preserves roads and prevents dust.

For Holt Roof Leader and Roof Vent Connections, see page 442.

### Barrett Specification Tarred Felt.

Made from specially selected materials for use with Specification Pitch in roofing and waterproofing. (See Roofing Specification following.) Particular care is given each step of manufacture, and there is no other felt so uniformly good for the purposes mentioned. It weighs from 14 to 16 lbs. per 100 sq. ft.; is put up in measured rolls containing 400 sq. ft., and every roll is labeled, as per illustration, except that the label is printed in red and black.

Highly recommended for sheathing purposes.

### Barrett Specification Pitch.

Made from selected coal-tars mixed in the proportion which experience and modern laboratory tests show

The *Barrett* Company  
TRADE-MARK

will give the best results when used for roofing and waterproofing purposes. It is of the highest quality, and will be vouched

for by all expert roofers, who well know that poor pitch is never cheap enough to warrant its use. Other pitch may have the same appearance; but whether it is as good or not can be determined only in a well-equipped laboratory by one familiar with not only the technical but also the practical side of the business. Every barrel of Barrett Specification Pitch is labeled as per illustration, except that the label is printed in red and black. It is put up in barrels weighing from 300 to 600 lbs., and is sold by the hundredweight.



TRADE-MARK LABEL

### Barrett Specification Roofs.

A 20-Year Guaranty Bond will hereafter be given on all Barrett Specification Roofs of 50 squares or more in all towns in the United States and Canada of 25,000 population and over, and in smaller places where our Inspection Service is available.

To secure the Guaranty Bond, give the roofing contractor a copy of The Barrett Specification dated May 1, 1916, and tell him to figure on that basis. The specification of that date includes the 20-Year Surety Bond provision. Our only requirements are that the roofing contractor shall be approved by us and that the specification of the date mentioned shall be strictly followed.

The Surety Bond will be issued by the United States Fidelity & Guaranty Company of Baltimore, and will be furnished by us without charge.

Our inspector will pass upon the quality and quantity of materials and workmanship and see that the roof is laid so as to give maximum service.

For further information, write our nearest office.

*Barrett Specification Roofs*

TRADE-MARK



TRADE-MARK LABEL



**The Barrett Specification.**

The following Specification is for a slag or gravel roof laid over boards. A roof of this kind is adapted for use on all kinds of buildings (except where the roof is very steep), and is preeminently the best roof for most purposes. Its cost per year of service is much less than that of any other form of reliable roof covering known. As compared with metal roofing, it is immeasurably superior and more economical, as it requires no painting and no repairs of any kind for years after it has been laid.

**Roofing Specification for Use over Board Sheathing.**

**INCLINE**—This Specification should not be used where roof incline exceeds 2 ins. to 1 ft.

**TRACING**—Tracing of roofing details is provided so that same may be inserted in plans.

**ROOF DECK**—The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knotholes, and free from loose material.

**ROOFING**—(1) Lay one thickness of sheathing paper or unsaturated felt weighing not less than 5 lbs. per 100 sq. ft., lapping the sheets at least 1 in.

(2) Over the entire surface lay two plies of Specification Tarred Felt, lapping each sheet 17 ins. over preceding one, and nail as often as is necessary to hold in place until remaining felt is laid.

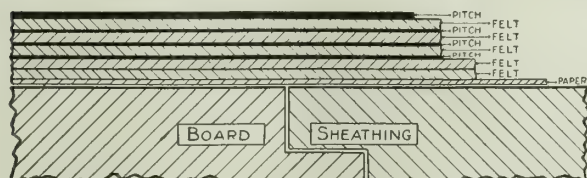
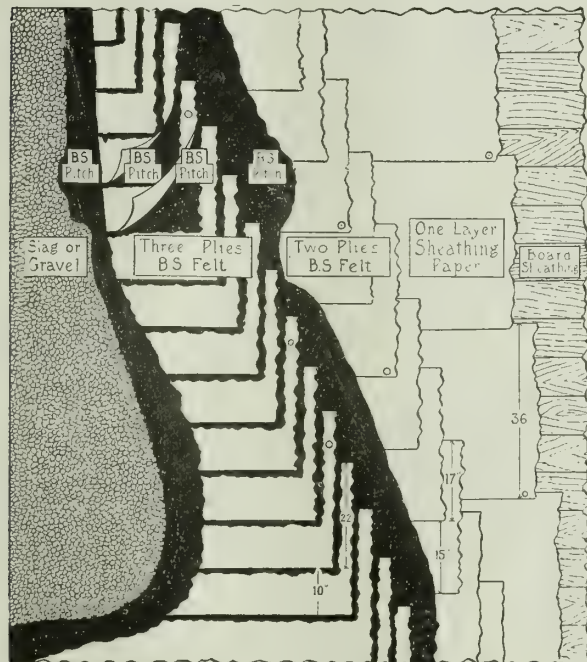


DIAGRAM SHOWING CONSTRUCTION OF STANDARD  
SLAG OR GRAVEL ROOF

Enlarged cross section; without gravel

(3) Coat the entire surface uniformly with Specification Pitch.

(4) Over the entire surface lay three plies of Specification Tarred Felt, lapping each sheet 22 ins. over preceding one, mopping with Specification Pitch the full 22 ins. on each sheet, so that in no place shall felt touch felt. Such nailing as is necessary shall be done so that all nails will be covered by not less than two plies of felt.

(5) Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than 400 lbs. of gravel or 300 lbs. of slag for each 100 sq. ft. The gravel or slag shall be from  $\frac{1}{4}$  to  $\frac{3}{8}$  in. in size, dry and free from dirt.

**General**—The felt shall be laid without wrinkles or buckles. Not less than 150 lbs. of pitch shall be used for constructing each 100 sq. ft. of completed roof, and the pitch shall not be heated above 400° Fahr.

**20-YEAR GUARANTY BOND**—The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the United States Fidelity & Guaranty Co., of Baltimore, covering a period of 20 years from date of completion, in accordance with Note 1.

**Note No. 1**—THE BARRETT COMPANY will give its 20-Year Guaranty Bond on all jobs of 5,000 sq. ft. or more in cities of 25,000 population and upwards in the United States and Canada and in smaller centers where its Inspection Service is available, providing the roof is laid by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett's inspection and approval.

**Note No. 2**—We advise incorporating the full wording of the specification and inserting roofing details in plans, in order to avoid any misunderstanding. If an abbreviated form is desired, the following is suggested:

**ABBREVIATED SPECIFICATION—Roofing**—Shall be a Barrett Specification Roof (for use over board sheathing) laid in accordance with The Barrett Specification dated May 1, 1916, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for 20 years in accordance with Note 1 of said Specification.

**Roofing Specification for Use over Concrete.**

**INCLINE**—This Specification should not be used where roof incline exceeds 1 in. to 1 ft.

**TRACING**—Tracing of roofing details is provided so that same may be inserted in plans.

**ROOF DECK**—The roof deck shall be smooth, firm, dry, properly graded to outlets and free from loose material.

**ROOFING**—(1) Coat the concrete uniformly with Specification Pitch.

(2) Over the entire surface lay two plies of Specification Tarred Felt, lapping each sheet 17 ins. over preceding one, mopping with Specification Pitch the

full 17 ins. on each sheet, so that in no place shall felt touch felt.

(3) Coat the entire surface uniformly with Specification Pitch.

(4) Over the entire surface lay three plies of Specification Tarred Felt, lapping each sheet 22 ins. over preceding one, mopping with Specification Pitch the full 22 ins. on each sheet, so that in no place shall felt touch felt.

(5) Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than 400 lbs. of gravel or 300 lbs. of slag for each 100 sq. ft. The gravel or slag shall be from  $\frac{1}{4}$  to  $\frac{5}{8}$  in. in size, dry and free from dirt.

**General**—The felt shall be laid without wrinkles or buckles. Not less than 225 lbs. of pitch shall be used for constructing each 100 sq. ft. of completed roof, and the pitch shall not be heated above 400° Fahr.

**20-YEAR GUARANTY BOND**—The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the United States Fidelity & Guaranty Co., of Baltimore, covering a period of 20 years from date of completion, in accordance with Note 1.

**Note No. 1**—THE BARRETT COMPANY will give its 20-Year Guaranty Bond on all jobs of 5,000 sq. ft. or more in cities of 25,000 population and upwards in the United States and Canada and in smaller centers where its Inspection Service is available, providing the roof is laid by a roofing contractor approved

by THE BARRETT COMPANY in strict accordance with the above Specification and subject to Barrett's inspection and approval.

**Note No. 2**—We advise incorporating the full wording of the Specification and inserting roofing details in plans, in order to avoid any misunderstanding. If an abbreviated form is desired, the following is suggested:

**ABBREVIATED SPECIFICATION—Roofing**—Shall be a Barrett Specification Roof (for use over concrete) laid in accordance with The Barrett Specification dated May 1, 1916, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for 20 years in accordance with Note 1 of said Specification.

We shall be very glad to hear from architects and engineers regarding this Specification, and will welcome criticism or suggestion. Address General Specification Department of THE BARRETT COMPANY, 17 Battery Place, New York, N. Y.

### Waterproofing—Foundation, Reservoir, Swimming Pool, Subway, Tunnel, etc.

Special specifications for waterproofing will be furnished upon request. There is always *one sure way* of making foundations, reservoirs, swimming pools, subways, tunnels, etc., permanently watertight, and that is by the membrane method—the use of Barrett Specification Felt and Pitch. When writing for specifications, outline your problem.

### Everlastic Roofing.

This is a "rubber," or smooth surface, ready roofing of the highest grade, made in 1-ply, 2-ply and 3-ply, in rolls 36 ins. wide, containing 108 sq. ft., weighing 35, 45 and 55 lbs. respectively. Nails and cement are packed in the center of each roll. This is largely used for steep surfaces in place of shingles or slate.



### Barrett's Slaters' Felt.

This is a well-seasoned felt, and is made especially for sheathing under slate. Put up in rolls 36 ins. wide, containing 500 sq. ft.

### Barrett Tomb Brand Deadening Felt.

A sound deadener for use in walls and floors; also insulates against heat and cold. Made in three weights: 4½, 6 and 9 sq. ft. to the pound. Put up in rolls 36 ins. wide, containing 450 sq. ft.

### Sheathings.

For sheathing purposes use Barrett's Tarred Felts; namely, Barrett Specification Felt and 2-ply and 3-ply Red Seal Felt. Composed as they are largely of coal-tar products, they are far superior to the so-called rosin-sized sheathing for all sheathing purposes. These felts are warmer, far more permanent, airtight, and a protection against vermin of all kinds.

### Hydronon.

A dampproofing paint, especially recommended for use above the ground level on the interior of stone,

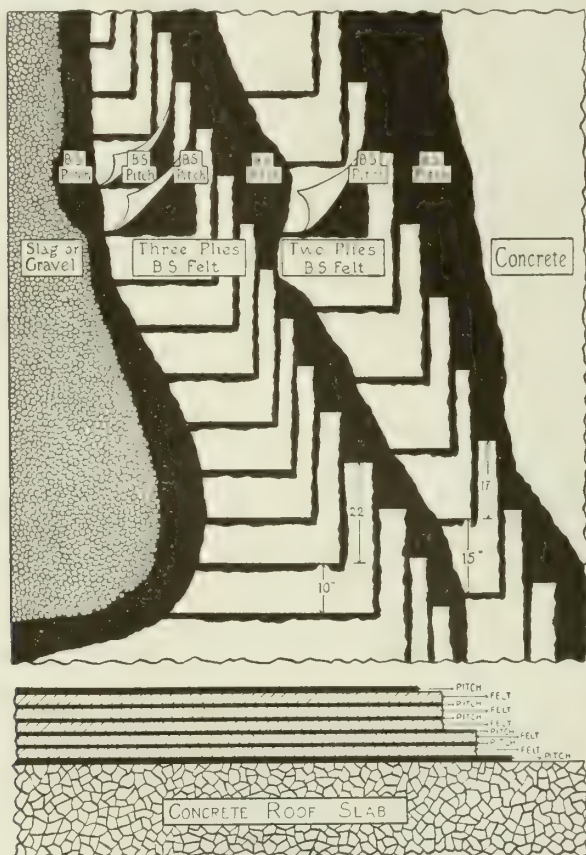


DIAGRAM SHOWING CONSTRUCTION OF CONCRETE ROOF



brick or concrete walls, to exclude dampness. Plaster may be applied directly on the Hydronon, as Hydronon has ample adhesive power, thus saving all the costs of furring or lathing, and expediting construction. Where walls are masonry, every living room should be protected with Hydronon. Send for Hydronon booklet.

**Hydronon**  
TRADE-MARK  
**The Damp-Proofing Paint**  
TRADE-MARK

#### Tarvia.

Tarvia preserves roads and prevents dust. It acts as a binder of macadam, prolongs its life, and decreases maintenance charges.

Three grades: "Tarvia-B," applied cold for dust suppression and road preservation, one application lasting a season; "Tarvia-A," applied hot for thorough surface work; "Tarvia-X," for road and pavement construction. Special booklets on request.

**Tarvia**  
TRADE-MARK  
*Preserves Roads  
Prevents Dust-*  
TRADE-MARK

#### Tartex.

Reinforced waterproofing felt of extra tensile strength for use in waterproofing foundations, tunnels, etc., at points such as footings and angles where the waterproofing course will be subjected to unusual strain.

**TARTEX**  
TRADE-MARK

#### Eternium Metal Paint.

Especially prepared for use over red lead priming coat on structural steel. Extensive tests prove that a red lead priming coat on structural steel is essential, and that such a coat, followed by a coat of Eternium Metal Paint, furnishes the best protection yet devised.

#### Everjet Elastic Paint.

A dense, glossy black waterproof paint for metal and woodwork. A high grade, waterproof, carbon paint; brilliant black, durable. Will not rub, peel, scale or crack. Especially good for rubber and all felt ready roofings, farm machinery, silos, fences, pipes, metal roofs and other metal surfaces. Very low in price.

**Everjet**  
**ELASTIC**  
**PAINT**  
TRADE-MARK

#### Everlastic Multi-Shingles.

This is one of the newest Barrett products, and is called "the 4-in-1 roofing," as it consists of a strip of four shingles in one, size 32¼ by 10 ins. Everlastic Multi-Shingles are made on a waterproof felt base with a surface covering of either red or green slate, and these are natural colors that will never fade.

Everlastic Multi-Shingles provide double covering

all over the roof, except cut-outs, and triple covering where the wear is most severe. This makes an exceedingly durable and attractive roof.

#### Everlastic Tylike Shingles.

For steep-roofed buildings requiring a moderate-priced roof of great beauty and durability, use Tylike Shingles. They are made in both red and green of pure crushed slate on a tough waterproof base, without any artificial coloring. Require no painting. Are fire resisting. Laid like slate, but look better and cost much less.

EVERLASTIC  
**TYLIKE SHINGLES**  
TRADE-MARK

#### Barrett's Velvex Creosote Shingle Stains.

The ideal coloring and preservative for shingles and all rough, unplanned timber. Cheaper than paint and easier to use. The creosote penetrates and preserves the wood. All colors, in beautiful, soft, velvety tones. Color samples on request.

#### Barrett's Carbosota Creosote Oil.

A standardized, pure coal-tar distillate, from which all objectionable properties of crude creosote oil have been completely eliminated.

Barrett's Carbosota Creosote Oil is superior to the patented or proprietary wood preservative, because it is purely a refined coal-tar creosote, the action and results of which are understood and proved. No further claims are made.

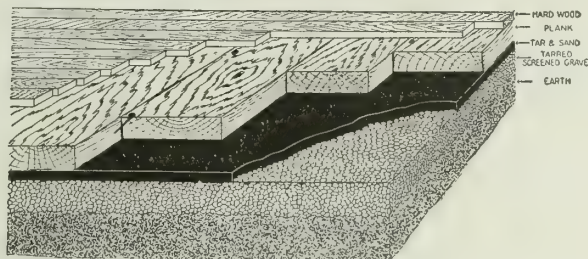
**Barrett's**  
**Carbosota**  
Grade One Liquid  
**Creosote Oil**  
TRADE-MARK

#### Tar-Rok Subfloor Construction.

Provides the most suitable surface on which to bed plank (without the use of sleepers) where a wooden floor is desirable in factories, machinshops, storehouses, etc., effecting a maximum of strength, rigidity and protection against dry rot or decay and fire, at a minimum cost.

Can be applied directly over earth as well as over concrete slab. Send for Tar-Rok booklet.

**TAR-ROK**  
TRADE-MARK



TAR-ROK SUBFLOOR CONSTRUCTION

#### Co-operative Service.

We are at all times prepared to submit additional information on the subject of either roofing or waterproofing, and to substantiate our position in any further way desired.

# THE PHILIP CAREY COMPANY

## Roofing Materials

LOCKLAND, CINCINNATI, OHIO

FIFTY BRANCHES AND DISTRIBUTING POINTS IN NORTH AND SOUTH AMERICA AND EUROPE  
 FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

### Products and Services.

CAREY FLEXIBLE CEMENT ROOFING; CAREY BUILT-ROOFING; CAREY ASFALTSlate SHINGLES.

Carey Rubber and Prepared Roofing; Asbestos Top Roofing; Manco Asphalt Roofing Cement; Waterproofing Felts; Feltex (Asphalt Saturated Wool Felt); Fiberock (Asphalt Saturated Asbestos Felt); Fabricseal (Saturated and Coated Burlap); Fireproof Insulating Paper; Elastite Expansion Joint; Roof Repair and Slater's Cement; Carey Steam Pipe and Boiler Coverings; Roofing Paints.

This company contracts to furnish and apply Carey Flexible Cement Roofing and Carey Built-Roofing to any style of roof surface in any part of the United States and Canada, guaranteeing material and proper application of same.

For Ceil-Board, Insulating Papers and Percoproof, a dampproofing, see page 172.

### Carey Flexible Cement Roofing.

SCOPE OF USE—Carey flexible cement roofing has been erected since 1885 on all classes of buildings in all climates—flat or steep surface roofs; concrete, tile or sheathing, etc. Also, the built-up form of Carey roofing gives maximum protection against fumes, gases, acids and other similar conditions; and this roofing meets requirements best in the case of railroad round-houses, fertilizer plants, chemical works, etc.

CONSTRUCTION—Its foundation consists of a wool felt (best grade) saturated so as to render it waterproof and permanently flexible; over it is laid the *heavy body of asphalt cement*, which is tempered (to resist extremes of heat and cold) and treated so that it maintains its body and elasticity in the original state indefinitely, thus eliminating a tendency to dry out, crack or break; and the top reinforcement consists of a strong Calcutta burlap embedded into the asphalt composition, giving great tensile strength to the firmly compressed *indivisible roofing sheet*.

THE PATENT LAP—It is formed by a 2-in. extension of the burlap in main body of roofing sheet and is used to cover nail heads as well as joints of the sheets, thus preventing rust, rendering joints watertight and windproof and making practically a solid sheet over entire roof surface (Style B illustration).

SIZE OF SHEETS—Length, 36 ft.; width, 36 ins.; sufficient to cover 100 sq. ft., allowing for lap.

WEIGHT—Approximately, 75 lbs. per square, without any completing materials.

### Carey Built Specifications.

CAREY FLEXIBLE CEMENT ROOFING SPECIFICATION, STYLE "B," FOR WOOD SHEATHING—Carey roofing laid over wood sheathing surface. Weight per square, when applied, approximately 106 lbs.

SPECIFICATION, STYLE "B," FOR CONCRETE OR TILE—Carey roofing thoroughly bonded to concrete or tile surface, with Carey asphalt cement. Weight per square, when applied, approximately 164 lbs.

CAREY 5-PLY BUILT SPECIFICATION No. 1, FOR WOOD SHEATHING—Carey roofing applied over 1-ply Fiberock felt, with broken joints. Weight per square, when applied, approximately 146 lbs.

CAREY 5-PLY BUILT SPECIFICATION No. 2, FOR WOOD SHEATHING—Carey roofing applied over wood sheathing with 1-ply Fiberock felt bonded securely to same. Weight per square, when applied, approximately 146 lbs.

CAREY 4-PLY BUILT ASBESTOS ROOFING SPECIFICATION No. 3, FOR WOOD SHEATHING—A 2-ply asbestos roofing laid complete over roof surface, after which 2 sheets Fiberock felt are cemented securely to same. Weight per square, when applied, approximately 147 lbs.

SPECIFICATION 3-PLY No. 4, FOR CONCRETE AND TILE SURFACES—3 sheets Fiberock felt bonded thoroughly to concrete. Weight per square, when applied, approximately 179 lbs.

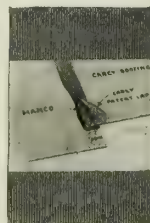
### Carey Asfaltslate Shingles.

Natural colors, red or green; average weight, 240 lbs. per square. Size, 8 by 12¾ ins. Laid 4 ins. to the weather with ½-in. spacing.

Shipped in sealed cartons and paper bundles.

### Specification Booklet.

Send for a copy of the booklet, "Architects' Specifications for Carey Building Materials."



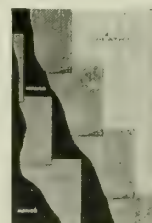
For Wood Sheathing  
 CAREY ROOFING, STYLE "B"



For Concrete or Tile Surfaces  
 CAREY ROOFING, STYLE "B"



No. 1, for Wood Sheathing



No. 2, for Wood Sheathing

CAREY 5-PLY ROOFING



4-ply No. 3, for Wood Sheathing



3-ply No. 4, for Tile and Concrete

CAREY ASBESTOS ROOFING

**CAREY Asfaltslate**  
 REGISTERED TRADE-MARK  
 APPROVED BY UNDERWRITERS LABORATORIES  
 TRADE-MARK



# CERTAIN-TEED PRODUCTS CORPORATION

PROPRIETORS OF GENERAL ROOFING MFG. CO., GREGG VARNISH CO., MOUND CITY PAINT & COLOR CO.

Manufacturers of Asphalt Roofing and Shingles, Building Papers, Waterproofing Materials, Coal Tar Products, Paints and Varnishes

ST. LOUIS, MO.

MILLS AND PLANTS

EAST ST. LOUIS, ILL. ST. LOUIS, MO. (2) MARSEILLES, ILL. YORK, PA. NIAGARA FALLS, N. Y. RICHMOND, CAL.

NEW YORK  
CLEVELAND  
MILWAUKEE  
KANSAS CITY  
RICHMOND, VA.  
DES MOINES

CHICAGO  
PITTSBURGH  
CINCINNATI  
SEATTLE  
GRAND RAPIDS  
HOUSTON  
DULUTH

SALES OFFICES  
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DETROIT  
NEW ORLEANS  
INDIANAPOLIS  
NASHVILLE  
LONDON, ENG.

ST. LOUIS  
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ATLANTA  
ALBANY  
SYDNEY, AUS.

BOSTON  
SAN FRANCISCO  
MINNEAPOLIS  
MEMPHIS  
SALT LAKE CITY  
HAVANA, CUBA

WAREHOUSES

ATLANTA  
CHICAGO  
HOUSTON  
LOS ANGELES  
JERSEY CITY  
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BIRMINGHAM  
CINCINNATI  
DALLAS  
MILWAUKEE  
SPRINGFIELD, MASS.  
SALT LAKE CITY

BOSTON  
CLEVELAND  
INDIANAPOLIS  
MINNEAPOLIS  
PITTSBURGH  
SEATTLE

BANGOR  
DES MOINES  
KANSAS CITY  
MEMPHIS  
RICHMOND  
PORTLAND

BUFFALO  
DULUTH  
WICHITA  
NASHVILLE  
LYNCHBURG  
SPOKANE

UTICA  
GRAND RAPIDS  
OKLAHOMA CITY  
NEW ORLEANS  
NORFOLK

## Products.

ASPHALT ROOFINGS (all grades and general prices); CERTAIN-TEED ASPHALT SHINGLES, RED OR GREEN; RED OR GREEN SURFACED ASPHALT ROOFING; CONSTRUCTION ROOFS; INSULATING PAPER; ASPHALT FELTS; PLASTIC ROOFING CEMENT; ASPHALT CEMENT.

PAINTS AND VARNISHES, including:

Aluminum Paint	Inside Floor Paint
Auto Paint	Light Liquid Wood Filler
Auto Top and Seat Dressing	Liquid Dryers
Barn Paint	Master Painters' Colors in Oil
Bathroom Paint	Metal Paints
Bridge Paint	Mill White Paint
Car, Bridge and Building Paint	Paste Wood Filler
Carriage Paint	Porch Paint
Crack and Crevice Filler	Porch Furniture Enamel
Deck Paint	Screen Paint
Enamel, First Coater	Shingle Stains
Flat Wall Paint	Snow White Enamel
Floor Stains	Varnish Stains
Floor Wax	Varnishes for every purpose
Graphite Paint	Wagon Paint
House Paint	Wood Preservative
Implement Paint	Wood Stains
Interior Enamel	Zinc Whites in Oil
	Zinc Whites in Varnish

Also, Building Papers; Tarred Felts; Roof Coating; Refined Coal Tar; Tar Coating; Pitch; Wood Preservatives.

## Facilities and Distribution.

Products are handled by jobbers and dealers everywhere in the United States and Canada. They are retailed by lumber, hardware, paint and building material dealers who constantly carry a complete line of our goods in their stores.

The distribution is supplemented by a system of warehouses which are located in the principal distributing centers of the country, thus assuring prompt delivery and reliable service to everybody.

Each of the seven big plants is located in the most favorable position, which enables us to take advantage



TRADE-MARK

of all economies in production and distribution. One-third of all the finished roll roofings made in America comes from our plants.

## Certain-teed Roofing.

Certain-teed is an especially high quality roofing made of excellent roofing felt, which is thoroughly saturated and coated with properly blended asphalts. It is finished with a smooth surface and is put up in rolls containing 108 or 216 sq. ft. per roll. Nails, cement and full directions for laying are packed in the core of each roll.

Certain-teed roofing is made in three thicknesses, 1-ply being guaranteed 5 years; 2-ply 10 years, and 3-ply 15 years. This guarantee is backed by the responsibility of our big mills.

Red or green Certain-teed roofing is preferable to the smooth surfaced roofing in cases where appearance and artistic effects are desired. The red or green surfacing is natural and permanent. It is non-fading, and there is no expense for staining or painting involved. It is guaranteed for ten years.

Certain-teed roofing is used for covering buildings of all kinds, including warehouses, factories, machine-shops, railroad buildings, cantonments, farmhouses, modest residences, barns, etc.

In addition to Certain-teed roofing, we also manufacture several other grades of roofing in various kinds of surfaces and finishes, and of lower quality and price.

## Certain-teed Asphalt Shingles, Red or Green.

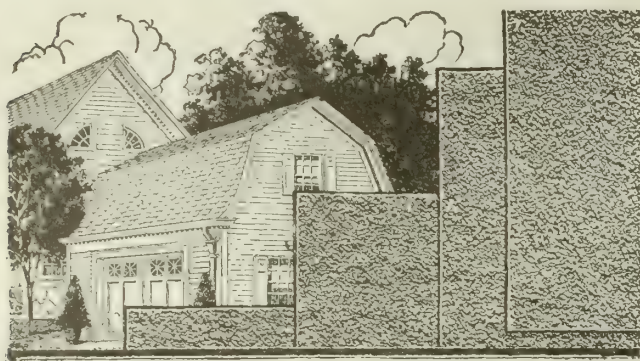
Made of the same high grade materials as are used in the manufacture of Certain-teed roofing. They are heavily surfaced in natural red or green colors, which are natural and permanent.

Certain-teed shingles are recommended for use on residences and substantial country barns and on church buildings, garages, and other structures where good appearance and long service are desired.



ROLL OF CERTAIN-TEED ROOFING





CERTAIN-TEED ASPHALT SHINGLES

They are sparkproof and fire retardant; are superior to wood shingles in that they will not crack, rot, split or dry out. Cost no more than the average wood shingle and will give a better and longer service. They are guaranteed for a period of 10 years.

Certain-teed shingles are put up in cartons, each containing 212 shingles, four cartons being sufficient to cover 100 sq. ft. of roof surface; gross weight per square, 240 lbs.

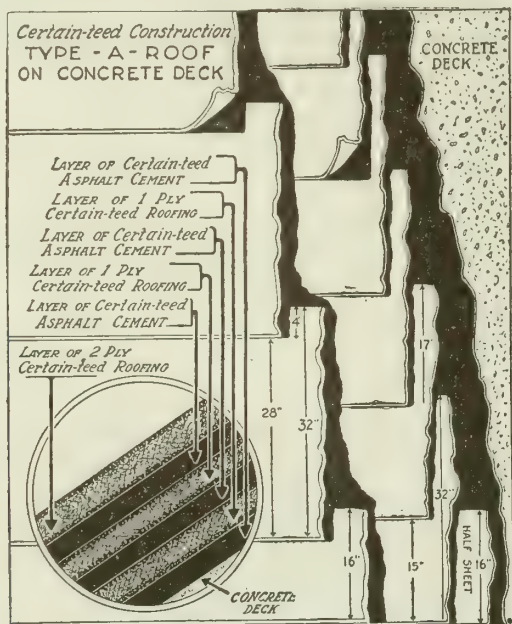
Each shingle measures 8 by 12 $\frac{3}{4}$  ins. and should be laid 4 ins. to the weather.

### Certain-teed Construction Roofs.

These are built-up asphalt roofs consisting of two or more layers of Certain-teed roofing cemented together with Certain-teed asphalt cement, according to printed specifications revised March, 1917, a copy of which will be sent without obligation to any interested architect, engineer, or builder.

Certain-teed construction roofs have an advantage over tar and gravel roofs in that no gravel is necessary. Gravel is used on tar roofs to keep the tar from running in hot weather; often it does not accomplish its purpose, but on the contrary the tar melts and clogs downspouts and gutters. Certain-teed roofs, however, wash smooth and clean with every rain and are therefore not open to this objection.

There are two types of Certain-teed construction roofs, Type A, consisting of 3 layers of Certain-teed



METHOD OF LAYING TYPE A OVER CONCRETE DECK

roofing, guaranteed for 15 years; Type B, consisting of two layers of Certain-teed roofing, guaranteed for 10 years. We will be glad to furnish complete set of specifications for laying either type over concrete deck or board sheathing.

### Certain-teed Insulating Paper.

A high grade paper which is both saturated and coated with our special blend of asphalts. It contains no coal tar and does not stain. It is odorless and tasteless, and on account of its insulating properties is extensively used for cold storage and refrigerator work, where its low cost and long life add to its value for this kind of construction.

It is extensively used as a sheathing between walls, and, as it is waterproof, it prevents moisture from penetrating the walls and it insulates against heat and cold. It is especially adaptable for dampproofing between the subfloors and the finished floors of packing houses, breweries, chemical plants, mercantile buildings, dairies, creameries, residences, etc. In case of fire it prevents water from leaking through upper floors to the lower part of the building, and thereby saves valuable goods from damage.

Certain-teed insulating paper is put up in rolls containing 500 sq. ft. per roll in the following weights: Medium weight, about 20 lbs.; heavy weight, about 35 lbs.; extra heavy weight, about 45 lbs.

Also made saturated only; in two weights, 30 and 45 lbs.



INSULATING PAPER

### Certain-teed Asphalt Felt.

For waterproofing or dampproofing foundations and footings, the use of Certain-teed asphalt felt is recommended. It is also used under slate, tile and other roofing materials requiring a waterproof liner, and for built-up asphalt roofs. Made in three thicknesses; No. 1 weighing about 20 lbs. per 100 sq. ft.; No. 2, 15 lbs.; and No. 3, 12 lbs.

### Certain-teed Plastic Roofing Cement.

For patching leaks and holes in all kinds of roofs. Consistency is about the same as putty, and it can be easily and quickly applied with a putty knife or trowel. Elastic, waterproof, weatherproof and acidproof.

Supplied in barrels, half barrels, 50-lb. and 25-lb. metal pails, and in small cans, 6 to a crate.

### Certain-teed Paints.

The line of Certain-teed paints is very complete and extensive. A partial list is shown under the heading "Products" on page preceding.

All classes of these paints are furnished in the most representative colors and in convenient sizes.

One of the essential requirements in good paint making is the care and skill employed in mixing, grinding and combining the pigments and liquids from which the finished paint is made; in this respect Certain-teed paints have no equal. Furthermore, the raw materials used are of the best known, and are accepted by paint authorities. When Certain-teed paints are used, absolute assurance of unusual covering capacity, durability, long life and permanency of color is had.

Write to the nearest sales office for color cards, prices and further information. A list of sales offices heads the preceding page.



### Certain-teed Flat Wall Paint.

This paint embodies all the desirable qualities which could be demanded of the ideal interior finish. The choice of colors is large and varied.

Beauty is but one of the many virtues of Certain-teed Flat Wall Paint. It is washable, sanitary and germproof. Its service is a service of years, not seasons. Its extreme durability, unequalled by any other decorating medium, makes Certain-teed Flat Wall Paint the most economical of all methods of wall decoration.

This paint can be used over plaster (smooth or rough), woodwork, metal, burlap or wallboard.



CERTAIN-TEED VARNISH AND PAINT PACKAGES

### Certain-teed House Paints.

These paints represent the proper combination of the best known and accepted paint pigments, thoroughly mixed and ground in strictly pure and properly aged raw linseed oil, with the necessary addition of turpentine and the best grade of Japan dryer.

Certain-teed House Paints are machinemade; the raw products are ground and mixed by special machinery to assure uniformity of color, texture, fineness of pigment, hiding power and unusual spreading qualities.

### Certain-teed Interior Enamel.

These enamels are adapted for use in finishing or refinishing all kinds of interior woodwork and furniture. They are found to be most satisfactory finishes for kitchen walls and similar work. Where the surface gives indication of being in an unfavorable condition, Certain-teed Enamel First Coater should be used.

Certain-teed Bathroom Enamel is prepared in white only, for special use in enameling bathrooms, ceilings and woodwork.

### Certain-teed Floor Stains.

These stains are made especially for durability and permanency in order to give satisfactory service on floors, which is the most severe test for any finish. However, their value is not restricted to this limited use, as they are serviceable and suitable for finishing or refinishing interior woodwork and furniture.

### Certain-teed Inside Floor Paint.

The pigments used in the manufacture of this paint are selected for their durability. The liquids are especially prepared in order that they may withstand the hard usage to which floor paint is ordinarily subjected. This paint will dry over night.

It is intended for interior use only.

### Certain-teed Porch and Deck Paint.

This paint is manufactured from raw material which tests of time have proved to produce a paint that will give the most satisfactory service for use on verandas, steps, decks of vessels and other exposed surfaces.

The pigments and liquids are properly mixed and combined, thereby insuring elasticity and a glossy finish.

### Certain-teed Bridge and Building Paint.

This paint is especially manufactured for use in painting bridges, warehouses, factories, roofs and similarly exposed surfaces. In this connection Certain-teed Metal Paints are found valuable and reasonable for painting structural iron or steel.

### Certain-teed Mill White.

This paint is admirably suited for interior surfaces of all kinds. It is non-poisonous; it can be used for dairy buildings, candy factories, warehouses, and those places where food products are manufactured or handled. It is elastic, durable and very white. It is very economical because of its exceptional covering capacity.

For flat finishes, two coats of Certain-teed Mill White Flat should be applied. Where a gloss finish is desired, the first coat should consist of Certain-teed Mill White Flat and the second coat of Certain-teed Mill White Gloss.

### Certain-teed Shingle Stains (A Creosote Product).

As a result of very thorough tests, we have developed a proper mixture of pigments and oils necessary to insure a permanency of color, and at the same time to allow thorough penetration of the creosote oil below the surface of the shingles.

The creosote oil used in the manufacture of Certain-teed Shingle Stains is the most satisfactory wood preservative known.

### Certain-teed Varnishes.

The high quality of Certain-teed Varnishes is the result of three factors—high grade raw materials, care and efficiency in manufacturing, and prolonged aging.

The ingredients which enter into Certain-teed Varnishes are carefully selected. Only high grade products, tested by expert varnish chemists, are used in the production of varnishes bearing the label of Certain-teed.

The process of manufacture is regulated with the strictest surveillance to insure proper mixing, blending and heating.

The enormous storage capacity of the Certain-teed factory makes possible the proper aging which is so essential to good varnish. When freshly made, varnish is raw and of poor quality. No matter how excellent the raw materials, nor how careful the manufacture, varnish is not suitable for use without months and years of aging. In specifying Certain-teed varnishes, the architect may be sure that the product is properly aged.

Certain-teed gives the luster and gloss which can be obtained only from quality varnishes. Whether they are used on floors, furniture, linoleum and interior wood work, or whether they are applied to carriages and automobiles, Certain-teed varnishes will last long, resist wear and especially please the eye.

### Co-operative Service.

This company will cheerfully submit samples and detailed information relative to any of its products. Expert advice will be given regarding any roofing or waterproofing problem.

# H. W. JOHNS-MANVILLE CO.

## Roofing Material

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910

### Products.

JOHNS-MANVILLE ASBESTOS ROOFING, Built-up and Ready-to-lay; ASBESTOSIDE, a Sheet Wall Siding; ASBESTOS CORRUGATED ROOFING; REGAL ROOF COATING, a Preservative Roofing Paint; ELASTIC ROOF PUTTY.



For Acoustical Service and Waterproofing Materials, see page 36; for Asphalt Mastic Flooring, see page 331; for Asbestos Shingles, see page 386; for Radiator and Steam Traps, see page 930; for Underground System of Pipe Insulation, see page 910; for Pipe and Boiler Insulation, see pages 1076-77.

### Johns-Manville Asbestos Roofing.

Asbestos rock—a fire resisting, practically impenetrable mineral—is the base of Johns-Manville Asbestos Roofing in both built-up and ready-to-lay form. By a special manufacturing process, this rock is fabricated into rugged, fire-safe, weather resisting sheets, thoroughly saturated with a durable combination of natural asphalts.

In built-up form, several sheets of these asbestos felts are mopped onto the roof deck with hot asphalt cement. The number of layers of asbestos felts and asphalts used depends upon the roof deck construction and incline. This type of roofing is laid exclusively by Johns-Manville workmen, under the supervision of representatives of Johns-Manville Contract Departments.

In ready-to-lay form, Johns-Manville Asbestos Roofing consists of the same asphalt impregnated asbestos felts as are used in the built-up roofing. The plies of this "ready roofing," however, are cemented together at the Johns-Manville factory, and cut in sheets and rolls of suitable size to enable quick and easy application.

### Johns-Manville Asbestos Built-up Roofing Over Wood.

On all wood roof decks with an incline of not more than 6 ins. to the foot, Johns-Manville 4-ply Phoenix Asbestos Built-up Roofing is recommended.

### Specifications for Built-up Roofing Over Wood.

**PREPARATION OF ROOF SURFACE**—Sheathing boards shall be dry, well seasoned and of uniform thickness, laid closely; tongue and grooved sheathing preferred. Roof surface shall be graded to properly drain all water freely into gutters and down-spouts. Ends of all sheathing boards shall rest on and be properly secured with at least 2 nails to joists or purlins. If edges of sheathing boards are curled up, they shall be drawn down and properly secured to joists or purlins, eliminating all standing nail heads and other projections. All loose knots and other flaws shall be removed and all holes properly filled or covered. All loose nails, chips and other rubbish shall be removed and the deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. A 3 by 3-in. triangular wood strip will be furnished and installed (wherever base flashings are to be used) in the angle formed by roof and vertical surface. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

**MATERIALS**—A double-ply sheet of asbestos roofing felt, 32 ins. wide, both plies to be asphalt impregnated, and weighing approximately 40 lbs. per 100 sq. ft., cemented together at factory with asphalt cement; to be Johns-Manville Phoenix Asbestos Roofing.

$\frac{7}{8}$ -in. barbed nails and flat tin caps; to be same as supplied by H. W. JOHNS-MANVILLE CO.

Asphalt cement; to be Johns-Manville Ajax Asphalt Cement.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32 ins. wide and weighing approximately 14 lbs. per 100 sq. ft.; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

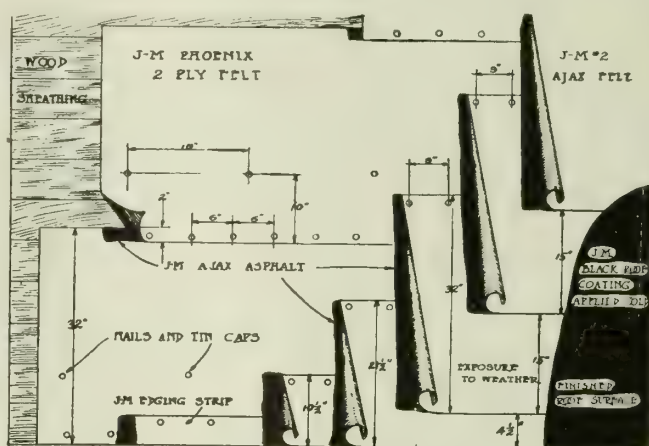
Flashing materials as specified hereinafter.

Liquid asphalt roof coating; to be Johns-Manville Asphalt Roof Coating. There shall be used approximately 1 gal. per 100 sq. ft. of finished roof surface.

Such materials shall be applied over wood sheathing as follows:

**APPLICATION OF MATERIALS**—(1) Lay the Johns-Manville Phoenix Roofing sheets next to the sheathing, lap the joints 2 ins. and seal them with Johns-Manville Ajax Asphalt Cement. Nail these sheets with barbed nails driven through flat tin caps, at 6-in. centers along laps and at 18-in. centers in line 10 ins. from the bottom edge of each sheet.

(2) Mop the entire surface of the Phoenix sheets with Ajax Cement, heated to flow freely and, while the cement is hot, embed into it sheets of Johns-Manville No. 2 Ajax Felt in 2-ply construction. At eaves, over base sheet of Phoenix and over edging strip, start with



METHOD OF LAYING STANDARD JOHNS-MANVILLE BUILT-UP ROOFING OVER WOOD

one-third width sheet of Ajax, then two-thirds width sheet of Ajax both laid flush with eaves. Then lay full width sheets, setting first full width sheet back  $4\frac{1}{2}$  ins. from eaves and then expose 15 ins. of each succeeding sheet to the weather. Mop the entire surface between plies with hot Ajax Cement and roll the felts closely behind the mop, so that no missing of asphalt can take place. Nail each Ajax sheet with capped nails at 9-in. centers along its upper edge and approximately  $\frac{3}{4}$  in.



therefrom, so that all nails and caps will have 2 plies of felt over them.

(3) After such materials have been properly applied, and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating, and neatly finish it to provide an even, black appearance.

**FLASHINGS**—Walls and all other elevations above roof surface shall be carried vertically at least 12 ins. to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8 to 10 ins. above roof surface, unless demanded by local building authorities.

Roofing material shall be carried up on vertical surface 2 ins. All flashings, except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings of special asbestos flashing material, approximately 10½ ins. wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System.

### Johns-Manville Asbestos Built-up Roofing Over Concrete or Gypsum.

On all concrete roof decks, Johns-Manville 3-ply Ajax Asbestos Built-up Roofing is recommended.

### Specifications for Built-up Roofing Over Concrete or Gypsum.

H. W. JOHNS-MANVILLE Co.'s standard built-up construction over non-combustible surfaces. Applied only by the manufacturer.

**PREPARATION OF ROOF SURFACE**—Roof surface shall be graded to properly drain all water freely into gutters and down-spouts. Roof surface shall be finished smooth and hard, containing no depressions nor projections; the concrete to be thoroughly set and air-dry, and free from frost. All rubbish shall be removed and deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. Right angle at base of parapet wall shall be rounded into proper cove. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

**MATERIALS**—Asphalt concrete primer; to be Johns-Manville Asphalt Concrete Primer over concrete. There shall be used approximately 1 gal. per 100 sq. ft. of roof surface. Over gypsum there shall be used approximately 2 gals. per 100 sq. ft. of roof surface, applied in 2 coats.

Asphalt cement; to be Johns-Manville Ajax Asphalt (a combination of natural asphalts) Cement. There shall be used approximately 90 lbs. per 100 sq. ft. of finished roof surface.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32 ins. wide and weighing approximately 14 lbs. per 100 sq. ft.; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

Flashing materials as specified hereinafter.

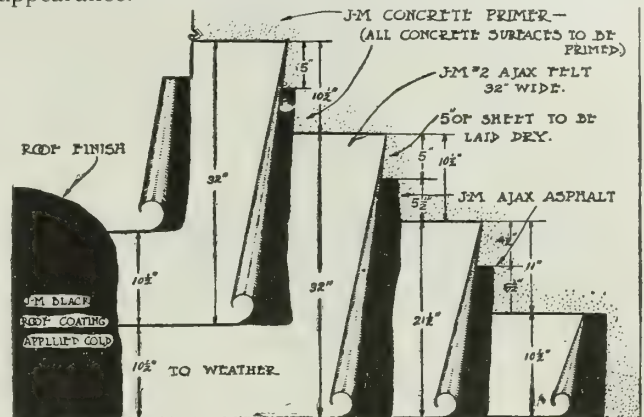
Liquid asphalt roof coating; to be Johns-Manville Roof Coating. There shall be used approximately 1 gal. per 100 sq. ft. of finished roof surface.

Such materials shall be applied over concrete as follows:

**APPLICATION OF MATERIALS**—(1) Coat the concrete with cold Johns-Manville asphalt concrete primer, to provide a proper bond between concrete and asphalt, allowing primer to dry.

(2) Mop the surface thus primed intermittently (see illustration on this page) with Johns-Manville Ajax Cement, heated to flow freely and, while the cement is hot, imbed into it sheets of Johns-Manville No. 2 Ajax Felt, in 3-ply construction. Expose to weather 10½ ins. of each ply, mop the surface between plies with hot Ajax Cement and roll the felt closely behind the mop, so that no missing of asphalt can take place. Over gypsum, the back edge of first ply to be nailed to roof slab with proper nails driven through flat tin caps, in addition to mopping as above.

(3) After such materials have been properly applied, and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating, and neatly finish it to provide an even, black appearance.



METHOD OF LAYING STANDARD JOHNS-MANVILLE BUILT-UP ROOFING OVER CONCRETE

**FLASHINGS**—Walls and all other elevations above roof surface shall be carried vertically at least 12 ins. to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8 to 10 ins. above roof surface, unless demanded by local building authorities.

Roofing material shall be carried up on vertical surface 2 ins. All flashings, except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings of special asbestos flashing material, approximately 10½ ins. wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System.

### Johns-Manville System of Flashings.

On all Johns-Manville Built-up Asbestos Roofs, the valleys and flashings are specially reinforced. The flashings vary to meet conditions and are a combination of special flashing felt and Asbestile Cement, applied according to the Johns-Manville system.

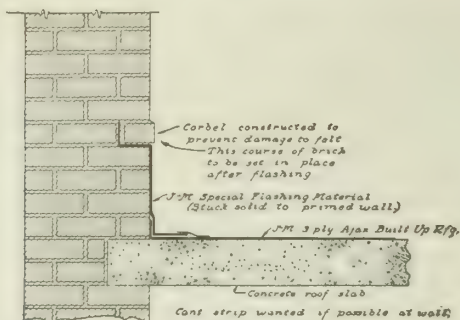
This system and the materials and specifications used on Johns-Manville Asbestos Built-up Roofing are the exclusive property of Johns-Manville. No roofing mechanic other than a Johns-Manville representative may use them.

And it is due entirely to the strength and effectiveness of this system that the performance of all Johns-Manville Roofing, including the Flashings, is backed up with Johns-Manville responsibility.

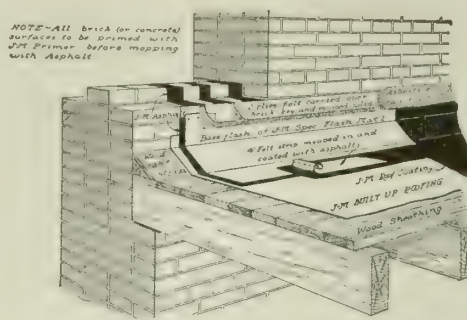
### Johns-Manville Asbestos "Ready" Roofing.

There are two kinds of Johns-Manville Asbestos Ready-to-lay Roofings:

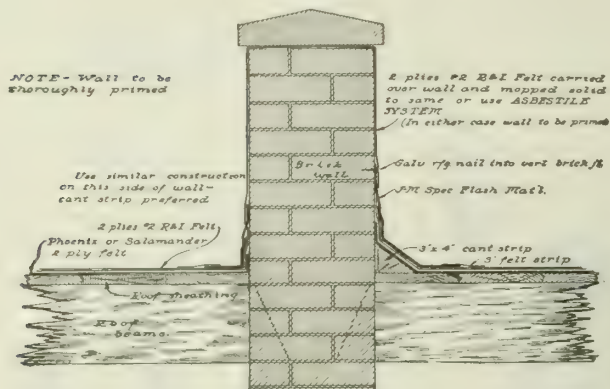
**JOHNS-MANVILLE FLEXSTONE ASBESTOS "READY" ROOFING**—A black top, fire-safe, asbestos "ready" roofing in 3-ply and 4-ply.



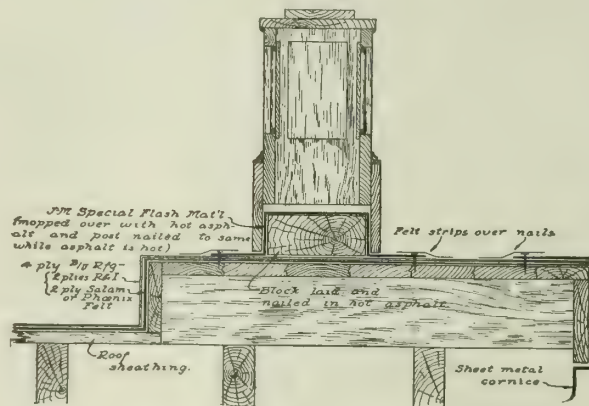
Flashing Material Built in Brick Wall



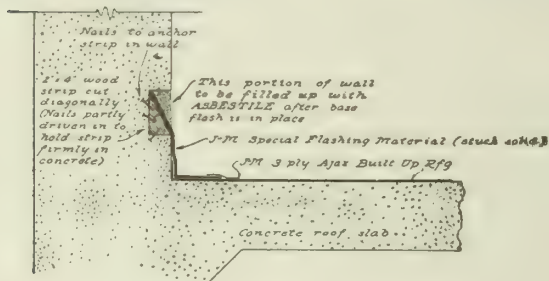
Asbestos System of Flashing



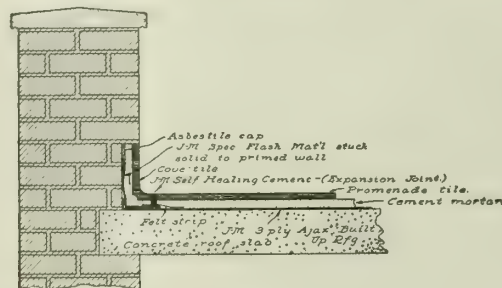
Flashing of Party or Fire Wall



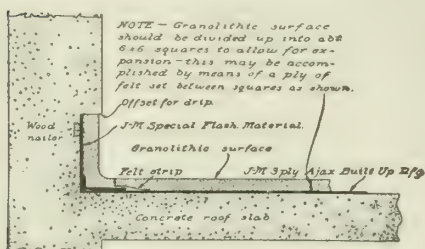
Flashing Details



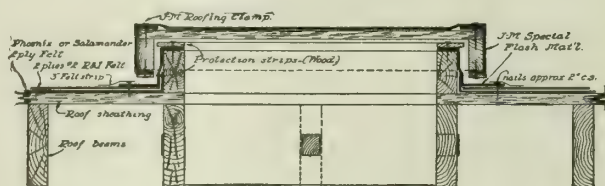
Flashing at Concrete Parapet Wall



Flashing with Promenade Tile Roofing

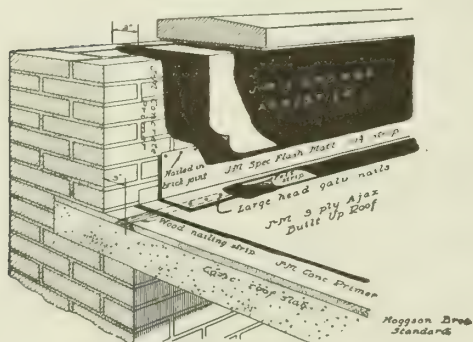


Johns-Manville Asbestos Roofing and Flashing

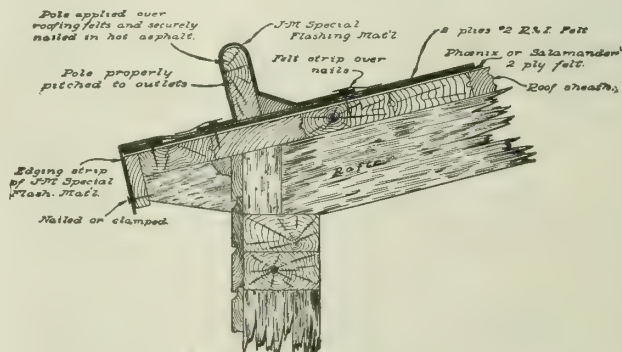


NOTE—Scutlets cover to have sufficient clearance so that same will not bind on curb.

Flashing of Hatchway



Asbestos System of Flashing



Philadelphia Gutter Construction

## FLASHINGS AND GUTTER OF JOHNS-MANVILLE BUILT-UP ASBESTOS ROOFING



The 3-ply is shipped in 1-square roll 32 ins. wide, and in flat sheets 32 by 80 ins., 5 squares to the crate. It weighs 70 lbs. per square, crated without completing materials; 61 lbs. per 108 sq. ft. when packed with nails and cement, and 63½ lbs. per 108 sq. ft. when packed with Johns-Manville Roofing Clamps and Cement.

The 4-ply is supplied in flat sheets 32 ins. wide by 80 ins. long; 6 sheets to the square, 4 squares to the crate. It weighs from 88 to 91 lbs. per 108 sq. ft., crated.

**JOHNS-MANVILLE BROOKS ASBESTOS "READY" ROOFING**—A white top, fire-safe, asbestos "ready" roofing in 3-ply and 4-ply.

The 3-ply is packed in 1-square rolls of 108 sq. ft. or 2-square rolls of 216 sq. ft. It weighs 61 lbs. per 108 sq. ft. when packed with nails and cement, and 63½ lbs. per 108 sq. ft. when packed with Johns-Manville Roofing Clamps and Cement.

The 4-ply is furnished in sheets 32 ins. wide by 80 ins. long; 6 sheets to the square, 4 squares to the crate. It weighs from 88 to 91 lbs. per 108 sq. ft., crated.

### Johns-Manville "Rubber Type" Ready Roofing.

**JOHNS-MANVILLE REGAL ROOFING**—The best grade "rubber type" roofing made. Furnished 32 ins. wide in 1-ply, 2-ply and 3-ply weights in rolls of 1 or 2 squares. The 1-ply weighs approximately 35 lbs. per 108 sq. ft.; 2-ply approximately 45 lbs. per 108 sq. ft.; 3-ply approximately 55 lbs. per 108 sq. ft.; including materials for application.

**JOHNS-MANVILLE SERVICE ROOFING**—A slightly lower priced "rubber type" roofing than Johns-Manville Regal. Looks and weighs the same as Johns-Manville Regal. Packed in 1-square rolls of 108 sq. ft.

**JOHNS-MANVILLE SLATEKOTE ROOFING**—A heavy sheet of felt saturated with natural asphalts, and armored with a coating of granulated slate cemented to the surface with natural asphalt. Made in red and green. Comes in rolls 32 ins. wide, containing 108 sq. ft. Weighs approximately 80 lbs. per 108 sq. ft.

### Approval Underwriters' Laboratories.

Johns-Manville Asbestos Roofing in both ready and built-up form is examined, approved and labeled by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters. The different forms secure the classification shown below:

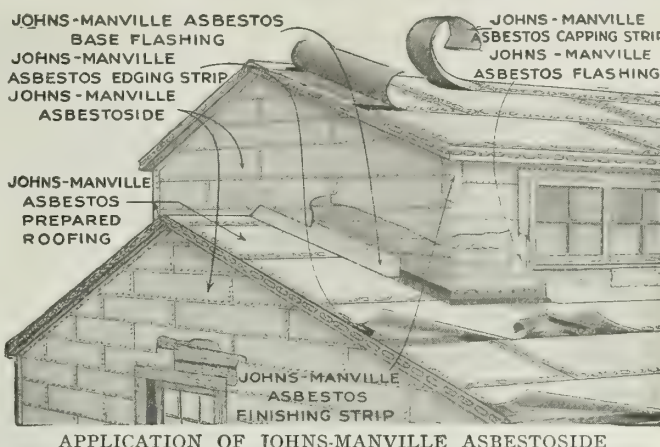
4-ply Salamander built-up over wood.....	Class A
3-ply Ajax built-up over concrete.....	Class A
4-ply Brooks "Ready".....	Class A
4-ply Phoenix built-up over wood.....	Class B
3-ply Brooks "Ready".....	Class B
4-ply Flexstone "Ready".....	Class B
*3-ply Flexstone "Ready".....	Class B

\*Class A and B take base rate and are admitted in restricted zones.

### Johns-Manville Asbestoside.

Johns-Manville Asbestoside is an asbestos sheet wall siding for application directly over rough wood sheathing on barns, dairies, bungalows, factories and other types of buildings where protection against fire, water, gases, chemical fumes and all weather conditions is desired.

This siding is made of asbestos felts thoroughly saturated with natural asphalts and cemented together with asphalts into sheets of 3-ply and 4-ply, 16 ins. wide by 50 ins. long. It presents an attractive white surface to the weather and, as it is an excellent non-conductor of heat or cold, it keeps the building warmer in winter and cooler in summer.



APPLICATION OF JOHNS-MANVILLE ASBESTOSIDE

### Johns-Manville Asbestos Corrugated Roofing.

Where a rigid, structurally strong asbestos roofing is required for application directly over purlins, and where the roof pitch is not less than 3 ins. to the foot, Johns-Manville Asbestos Corrugated Roofing is recommended.

This roofing is easily and quickly laid on the purlins, no expensive cementing or special jointing being required. It is applied in the same manner as corrugated iron, and never needs painting nor similar maintenance.

Johns-Manville Asbestos Corrugated Roofing can not rust nor corrode, nor is it affected by gases, acid, acid fumes, smoke, salt air or electrolytic action, because its metal reinforcement is armored by an envelope of asbestos felt, thoroughly impregnated with natural asphalts.

DATA, JOHNS-MANVILLE ASBESTOS CORRUGATED ROOFING  
WEIGHTS PER 100 SQ. FT. MATERIAL, IN LBS.

Gage	3-ply Black Top		4-ply Black Top		5-ply Black Top*	
	Corr.	Flat	Corr.	Flat	Corr.	Flat
28	129	113	157	138	186	163
26	143	125	172	150	200	175
24	172	150	200	175	230	200
22	200	175	230	200	257	225
20	228	200	257	225	286	250

\*Where necessary, 4- and 5-ply white top can be furnished with the same weights.

AREAS OF SHEETS IN SQ. FT. MATERIAL MEASUREMENT

Length		28-in. material, corr.	32-in. material, flat	Length		28-in. material, corr.	32-in. material, flat
ft.	ins.			ft.	ins.		
1	0	2½	2½	7*	0	16½	18½
1	6	3½	4	7	6	17½	20
2	0	4½	5½	8*	0	18½	21½
2	6	5½	6½	8	6	19½	22½
3	0	7	8	9*	0	21	24
3	6	8½	9½	9	6	22½	25½
4	0	9½	10½	10*	0	23½	26½
4	6	10½	12	10	6	24½	28
5	0	11½	13½	11*	0	25½	29½
5	6	12½	14½	11	6	26½	30½
6*	0	14	16	12*	0	28	32
6	6	15½	17½				

\*Denotes standard size sheets.

### Johns-Manville Roofing Accessories.

**JOHNS-MANVILLE REGAL ROOF COATING**—A preservative roofing paint, the use of which enables builder or house owner to secure the harmonious color effects with most types of ready-to-lay roofing. It forms a tough, elastic, durable surface not affected by contraction or expansion, gases or alkalis. Furnished in light red, maroon, brown, terra cotta, green or black.

**JOHNS-MANVILLE ELASTIC ROOF PUTTY**—A roofing cement for stopping holes in tin, zinc, slate shingles, wood or composition roof, gutter or flashing. May be used for any job where a durable, leakproof cement is desired. Put up in plastic form ready for application. Furnished in gray, green, brown, red or black. Used cold.



# PATENT VULCANITE ROOFING CO.

GENERAL OFFICES  
49th Street and Oakley Avenue  
CHICAGO, ILL.

## BRANCH OFFICES

NEW YORK, N. Y., 738 Woolworth Building  
BIRMINGHAM, ALA., 1624 First Avenue, North

MINNEAPOLIS, MINN., 528 Lumber Exchange

CINCINNATI, OHIO, 425 Main Street

BUFFALO, N. Y., 130 Broadway

## FACTORIES

ALBANY, N. Y. CHICAGO, ILL. KANSAS CITY, MO. FRANKLIN, OHIO ANDERSON, IND. SAN FRANCISCO, CAL.

## Products.

VULCANITE ASPHALT SELF-SPACING SHINGLES; VULCANITE ROLL ROOFING; VULCANITE BUILT-UP ROOFING.

Continuous Strip Shingles and Ornamental Roofings; Asphalt Paints, Cements, Papers and Foundation Dampcourse.

## Vulcanite Specifications.

A basis of felt made in this company's mills from best grade rags rigidly tested for tensile strength. Coating is wearproof mineral compound saturated with a composition of mineral wax and asphalt. Finishes: flaked mica, gravel, silica, and crushed granite.

No tar or straw paper enters into the composition of these roofings.

## Vulcanite Roofings.

Fabrics made up and saturated in conformity with these specifications produce fire resisting, weather-proofing materials from which 20 years' service is a reasonable expectancy. A graceful finish added wherever used. Require neither paint, stain nor repairs. Outlast any other similar roof coverings, remaining bright and beautiful.

## Vulcanite Self-spacing Shingles.

These roofing units are 8 by 12¾ ins. each, made according to Vulcanite specifications, in permanent reds and greens.

These shingles weigh one-third less than slate for a given area and are extremely elastic. They are easier to handle than slate and can not crack.

Their use means that a lighter and less rigid roof construction may be employed, greatly reducing cost of construction. An important safety factor is also provided, as the roof will not collapse as quickly as heavier roofings when exposed to fire. Insurance companies rate them on the same basis as metal, slate, etc., because showers of live sparks and burning embers fall harmlessly upon them. The waterproofing compounds used contain gas-forming ingredients which ignite when exposed to sufficient heat, but as these shingles will not support their own combustion, nor spread fire more than a few inches when ignited, the blaze dies out of its own accord. Furthermore, they will not crack under the impact of water when exposed to heat, as will slate and many asbestos shingles.

The cost is practically the same as that of the best grade wooden shingle roof, and far below that of other forms of fire retarding roof coverings.

Approved by the Underwriters' Laboratories, Inc.



**SELF-SPACING DEVICE**—Vulcanite self-spacing shingles have a distinct advantage over any other kind of shingle when laying, in that it is not necessary to lay off the roof, the self-spacing device insuring absolutely straight lines and regularity. They are more even and regular than wood shingles and can be laid much faster.

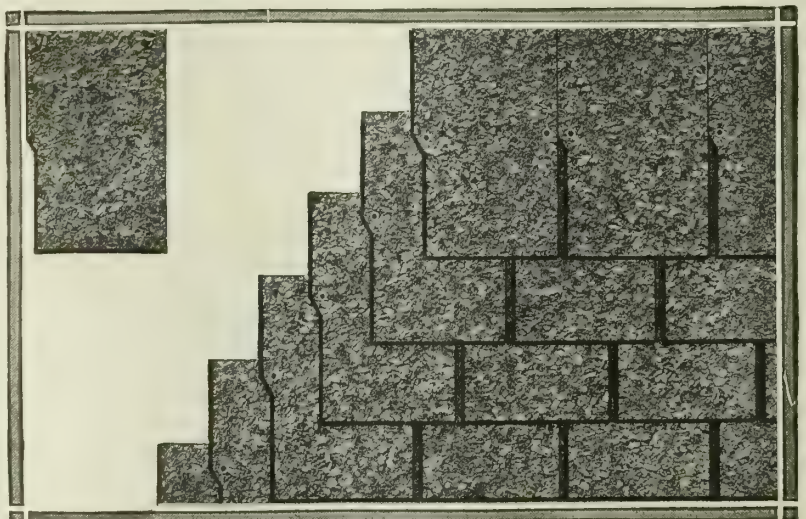
On account of the shape of the shingle it is laid closer together so that no rain can get between the spacings, eliminating entirely all possibility of moisture or air getting through to the roof boards on account of the closed-up top or back. Vulcanite self-spacing shingles make the roof a solid sheet and can be laid by any one. They are beautiful in appearance and will outlast practically any other roof covering. They are fire resisting and stormproof and will more than pay for themselves in long wear.

Self-spacing shingles are made in both red and green and are surfaced and colored with unfading natural crushed rock. Made in two weights, Standard and Jumbo. Packed in cartons; 4 cartons to the square, laid 4¼ ins. to the weather, 3-ply, weighing approximately 225 lbs.

**SPECIFICATION DATA**—Roof boards must be swept clean, well matched, laid close together. Attach galvanized iron drip edge, painted both sides (or narrow wood strip) at eaves to support ends of first course. Lay lowest or first course 2-ply breaking joints, nailing each shingle 4¾ ins. from bottom, 1 in. from each side. Start second course, at right, with one-third shingle; third course with two-thirds shingle, fourth course with full shingle. Repeat this method on succeeding courses. Cut for irregular shapes with sharp knife. Use strips furnished (8, 16, and 32 ins. to match) for valleys, ridges and flashings.

Valleys: Lay 16-in. strip, over which lay 32-in. strip.

Ridges: Lay 2 thicknesses 8-in. or 16-in. strip.



VULCANITE SELF-SPACING SHINGLES  
Showing single unit and method of laying



**Flashings:** All junctions of roof with walls, coping, curbs, skylights, chimneys, etc., must be well flashed with plain roofing strips, reinforced, or of metal (copper preferred), the same as in slate, tile, or shingle roof. Extend flashing under 3 shingles.

All courses except first ply of bottom course lay  $4\frac{1}{4}$  ins. to weather.

### Vulcanite Roll Roofing.

Vulcanite roll roofing is coated with ground mica and is guaranteed to excel all other smooth surfaced roofings.

Mica is greatly superior to talc, so commonly used, and it retains its brilliant luster indefinitely without turning black or yellow on the roof.

Specially adapted for barns, sheds, quarries, warehouses, etc.

Put up in rolls 32 ins. wide by  $40\frac{1}{2}$  ft. with cement and nails for laying packed in each roll.

Approved by the Underwriters' Laboratories, Inc.

WEIGHTS ARE AS FOLLOWS:

1-ply (108 sq. ft. to roll) 35 lbs.

2-ply (108 sq. ft. to roll) 45 lbs.

3-ply (108 sq. ft. to roll) 55 lbs.

Extra heavy (108 sq. ft. to roll) 65 lbs.

### Vulcanite Built-up Roofings.

The advantage of Vulcanite built-up roofing over tar and gravel is that the Vulcanite roof will weigh about 150 lbs. as against 500 or 600 lbs. This heavy weight causes sagging and water standing which is detrimental to the life of the roof, eventually causing rotting of the material.

This will not happen with Vulcanite, and besides there is no danger of slag or gravel getting into the gutters and stopping up sewerage.

Regarding tar and gravel roofs, it is known from actual experience that hot water will deteriorate roofing quicker than cold water. Therefore, at the time of rain the slag and gravel having had the dust settled, the roof holds the water; when the sun comes out and heats the water to a high degree as it often does, the pitch and felt quickly deteriorate.

**SPECIFICATIONS—Roofing—**Vulcanite roofing, not less than 50 lbs. per square, single thick.

**Asphalt—**Vulcanite roofing asphalt, not less than 50 lbs. per square.

**Nails—** $\frac{7}{8}$ -in. No. 10 roofing nails.

**Roof Deck—**Well seasoned 1-in. kiln dried sheathing, preferably T. & G., surfaced one side and swept clean. Projecting pipes, etc., placed before roofing is laid, and provided with flashings. All knotholes covered with tin. Place 4-in. kant strip at intersection of roof line and fire walls, skylight, flues, etc.

**Application—**(1) Begin at lowest point in roof. Lay a half sheet Vulcanite asphalt roofing, sand surface down, and nail at lower edge to hold in place.

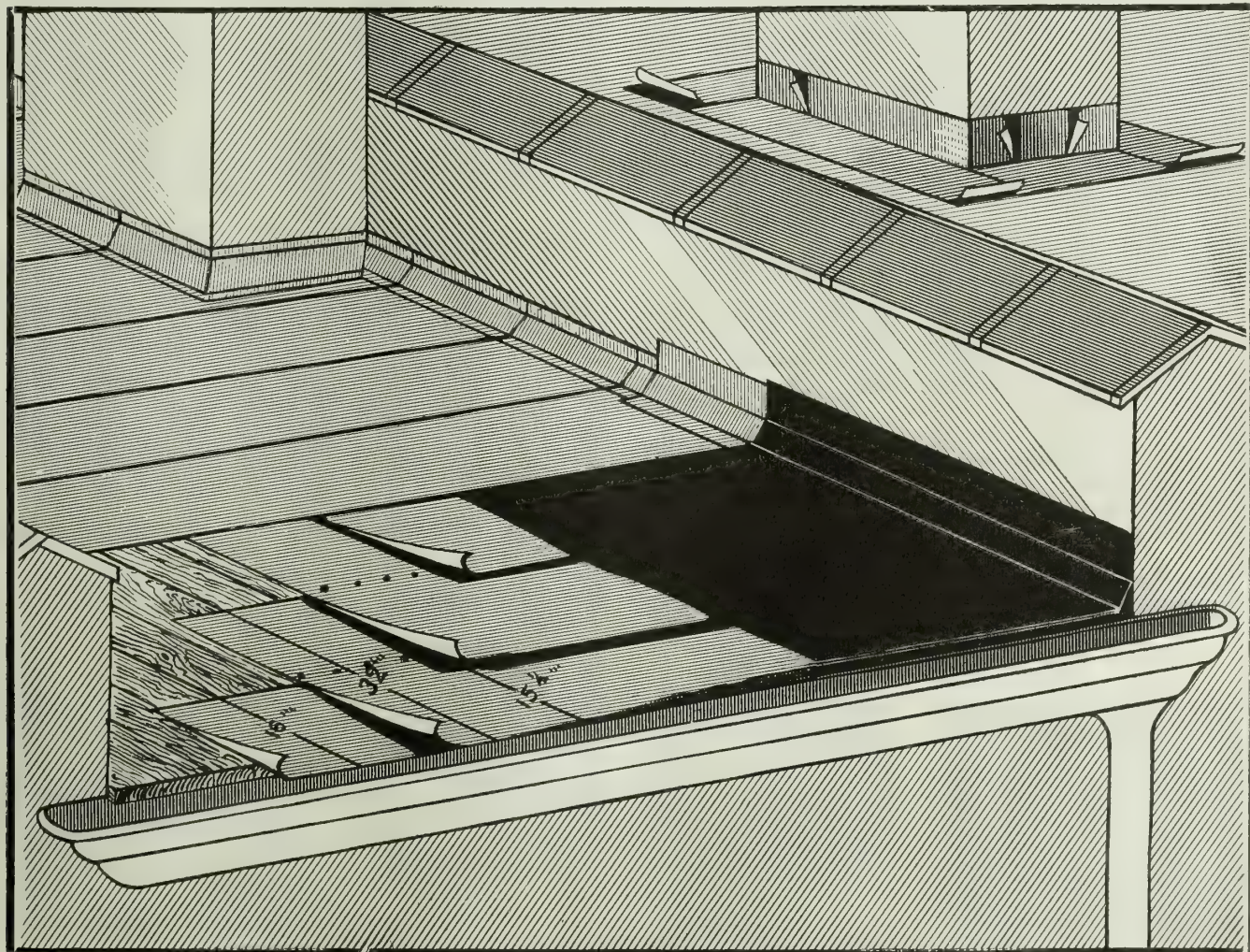
(2) Coat entire surface with uniform coating Vulcanite roofing asphalt, into which, while hot, roll a full width sheet, sand surface down, making layers 2-ply. Nail 6 ins. centers to catch upper edge of half sheet.

(3) Cover entire surface, lap each sheet 1 in. more than half its width over preceding sheet, mop full width of lap.

(4) Coat entire surface with uniform coating Vulcanite roofing asphalt not less than 25 lbs. per 100 ft. of surface.

**Flashings:** Made by extending all roofing 6 ins. up all projections.

**Counter Flashings:** As per architect's instructions.



VULCANITE BUILT-UP FOUR-PLY ASPHALT ROOF

Vulcanite roofing can be applied over concrete or wood



# WARREN CHEMICAL & MFG. DIVISION

THE BARRETT COMPANY

Manufacturers of Asphalt Roofing, Insulating and Waterproofing Materials

17 Battery Place  
NEW YORK, N. Y.

49 Federal Street  
BOSTON, MASS.

## Products.

WARREN'S ANCHOR BRAND ASPHALT ROOFING and WATERPROOFING MATERIALS; ASPHALT ROOFING TILE MASTIC; TILE-TITE ASPHALT ROOFING FELT; AQUANON ASPHALT WATERPROOFING FELT; AQUANON ASPHALT WATERPROOFING COMPOUND; "SAFEGUARD" GRANITE ROOFING; ANCHOR ASPHALT ROOF COATING, and ANCHOR ASPHALT PAINT.

Sheathing and Lining Papers.

For Asphalt Floors and Pavements, see page 309.

## Asphalt as a Roofing Material.

Asphalt possesses a certain enviable reputation as a roofing material. Obviously this rests upon the service rendered by the earlier asphalt roofs. Except for a very few isolated cases, such old roofs were laid with the Anchor Brand materials described below. The first asphalt ever employed for roofing was Anchor Brand.

## Warren's Composite Roofing Felt.

Used for roofing (specifications on next page) and sheathing. A sheet of long fiber dry felt saturated with natural asphalt and reinforced by, and cemented to, a tough jute paper with natural asphalt cement. In roofing it makes a tough waterproof foundation, obviating need for the usual extra sheathing paper. Strength and dampproof characteristics combined, qualify it as desirable sheathing for walls. Has neither taint nor odor. Put up in rolls 32 ins. wide, containing 432 sq. ft., weighing 65 to 70 lbs. Rolls labeled (see illustration), the label being printed in red and black.

## Warren's Anchor Asphalt Felt.

Used for roofing (specifications on next page), waterproofing and sheathing. Consists of a felt made from high grade fiber saturated with a natural asphalt compound which 40 years' experience has proved the most permanent. Has neither taint nor odor, thus making it especially suitable for insulating and waterproofing cold storage compartments. Put up in rolls 32 ins. wide, containing 324 sq. ft., weighing 50 to 54 lbs. Rolls labeled (see illustration), the label being printed in red, black and gray.

## Warren's Anchor Asphalt Roofing Cement.

Refined from highest grades of natural asphalts

fused together in the proper proportions to produce a compound combining to the fullest degree those cementitious and enduring qualities most essential to a perfect roofing cement. Our cement is unique in that it is refined by the old style process, insuring a continuance of high quality which experience has demonstrated can not result from the newer and less thorough methods now employed by many. Put up in double head barrels of about 50 gals. capacity, and weighing about 525 lbs. each. The head of each barrel is stenciled (see illustration) in black on a gray background.

## Warren's Eclipse Asphalt Cement.

A modified form of Anchor Roofing Cement tempered to render it particularly adaptable for coating and sealing the pores of concrete surfaces before applying roofing or waterproofing felt. Shipped in double head barrels of about 50 gals. capacity, weighing about 525 lbs. each. The head of each barrel is stenciled (see illustration) in black on a blue background.

## Quantities.

A roof laid according to the specifications requires the following materials for each 100 sq. ft. of surface:

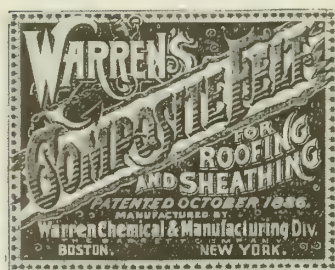
- 1/2 roll (216 sq. ft.) Composite Felt.
- 2/3 roll (216 sq. ft.) Anchor Felt.
- 120 to 150 lbs. Anchor Cement, over boards.
- 150 to 180 lbs. Anchor Cement, over concrete.
- 40 to 50 lbs. Eclipse Cement, over concrete.

The quantity of Roofing Cement varies with weather conditions and the skill of the workmen employed.

## Specifications for Warren's Anchor Brand Roofing.

Many architects and engineers appear to be laboring under the mistaken impression that it is impossible to successfully maintain a high class built-up composition roof on inclined surfaces. While this may be true where certain materials are employed, the difficulty can be solved by using the felts and cements here described. Many years' experience with sawtooth and other steep surfaces has proved this conclusively. We confidently advocate the Anchor Brand Roof for inclines up to 6 and 7 ins. to the foot as well as for flat roofs.

The following specification is for a slag or gravel covered roof laid over boards (form suitable for concrete surfaces furnished on request). This roof is adapted for use on both steep and flat surfaces.



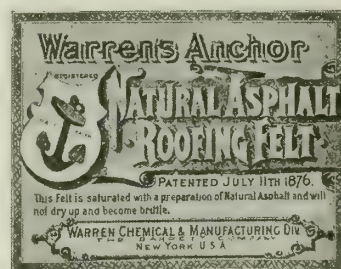
LABEL ON ROLL OF WARREN'S COMPOSITE ROOFING FELT



STENCILED LABEL ON BARREL OF WARREN'S ANCHOR ASPHALT ROOFING CEMENT



STENCILED LABEL ON BARREL OF WARREN'S ECLIPSE ASPHALT CEMENT



LABEL ON ROLL OF WARREN'S ANCHOR ASPHALT FELT



FOR USE OVER BOARD SHEATHING—Commencing always at the low points, cover the roof with two thicknesses of Warren's Composite Roofing Felt, manila side down, lapping each sheet 17 ins. over the sheet preceding, securing both edges with nails driven through tin disks not more than 20 ins. apart.

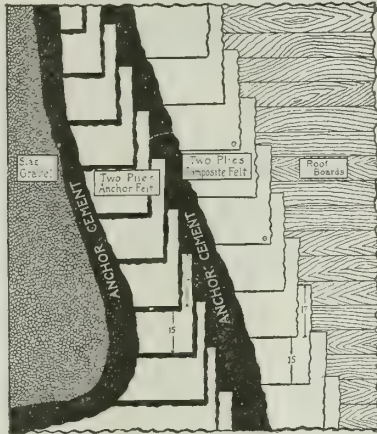


DIAGRAM SHOWING CONSTRUCTION OF STANDARD SLAG OR GRAVEL ROOFING

Mop over this entire surface with a thorough coating of Warren's Anchor Roofing Cement, into which while hot lay two thicknesses of Warren's Anchor Roofing Felt, lapping each sheet 17 ins. over the sheet preceding, securing with nails through tin disks along the upper edge,\* nails to be not more than 20 ins. apart, and cementing the full width between the laps with Warren's Anchor Roofing Cement.

Over the entire surface thus laid, spread an even coating of Anchor Cement, covering it immediately with a sufficient body of dry crushed slag or gravel.† If the roofing is applied in cold weather, the slag or gravel must be heated.

All layers of felt must be turned up at least 4 ins. against battlement walls, skylight curbs, or any other projections raised above the roof.

In case of sawtooth roofs, an extra layer of Anchor Brand Felt shall be laid in all valleys, turning up 10 ins. against the front of the monitor, and rising up the back of the next monitor to a height equal to 20 ins. perpendicular. This layer must be laid in hot Anchor Cement, and receive a thorough mopping over its surface. It must be laid over the Composite Felt before the two layers of Anchor Felt are applied.

We recommend that the full text of the specifications be used. If, however, an abbreviated form is desired, we suggest:

"Roofing shall be Warren's Heavy Standard Anchor Brand Roofing for use over boards or planks‡ laid strictly in accordance with printed specifications revised September 15, 1913, using the material specified."

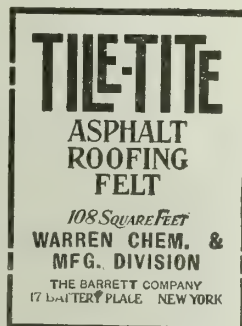
NOTES—\*For steep roofs add "and through the center."  
†For steep roofs omit the words "or gravel."  
‡Insert here "steep surfaces" or "flat surfaces," as required.

### Warren's No. 239 Asphalt Roofing Tile Mastic.

Provides a waterproof and elastic bed and joint filler for promenade tile roofs. Its elasticity obviates cracks which so frequently occur where Portland cement mortar is used. This guards the waterproof membrane from injury and keeps water out from under the tile, where it would do a great deal of damage especially in freezing weather.

### Tile-Tite Asphalt Felt.

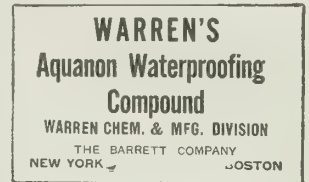
Placed beneath tile or slate roofs it prevents leaking, especially that which results from drifting snow. The necessity for such reinforcement is admitted by the tile makers themselves. It is also a most effective dampproof sheathing, and an invaluable insulator, reducing fuel requirements. Made of warm dry felt protected by a thorough saturation of natural asphalt. In rolls 32 ins. wide, containing 108 sq. ft. Two weights, Nos. 30 and 40, weighing approximately 30 and 40 lbs. respectively. Each roll is labeled (see illustration) with green and red colored label.



LABEL ON ROLL OF WARREN'S TILE-TITE ASPHALT FELT

### Warren's Aquanon Asphalt Waterproofing Compound.

Prepared from the purest grades of asphalt to withstand the peculiar conditions of underground waterproofing. High in cementing value, producing in conjunction with asphalt felt a permanently unbroken and impenetrable membrane. Plastic enough to allow for necessary expansion without that excessive softness which results in settling. Shipped in either metal or wooden barrels weighing from 300 to 500 lbs. Barrels marked with this label:

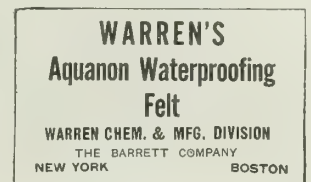


LABEL ON BARREL OF WARREN'S AQUANON WATERPROOFING COMPOUND

### Warren's Aquanon Asphalt Felt.

Used for waterproofing, roofing and sheathing. A long fiber dry felt saturated with high grade natural asphalt. Has neither taint nor odor.

This makes it especially desirable for insulating and waterproofing cold storage compartments. Put up in rolls 32 ins. wide, each containing 324 sq. ft., weighing 50 to 54 lbs. Rolls bear this label:



LABEL ON ROLL OF WARREN'S AQUANON ASPHALT FELT

### Granite Roofing.

A gravel surfaced ready roofing with a record of service equaling many built-up roofs. Made with a 3-in. lap, bare of gravel, allowing a perfect bond at the seams and assuring an absolutely watertight joint.

In rolls 32 ins. wide, containing 110 sq. ft. and weighing about 140 lbs., including necessary nails and cement for applying.

### "Safeguard" Granite Roofing.

Same as above, with a 6-in. lap. Used as a special precaution on roofs of slight incline.

The "Safeguard" Roofing is almost unique in that the nail heads are completely covered, preventing all corrosion at that vital point.

In rolls 32 ins. wide, containing 120 sq. ft., and weighing about 145 lbs., including necessary nails and cement for applying.

### Anchor Asphalt Roof Coating (99.8% Pure).

For treating all surfaces where a paint with saturating properties is desired, including old (sun cracked) wooden shingles, rubber roofing, prepared roofing, gravel surfaced ready roofings, asphalt shingles and kindred roofings. Restores the life and waterproof qualities of roofings which have been exhausted by exposure to the sun.

Shipped in	Capacity
Barrels.....	50 gals.
Half barrels.....	25 gals.
Kits.....	10 gals.
Kits.....	5 gals.
Cans.....	1 gal.
(6 cans packed in strong wooden case)	

### Anchor Asphalt Paint (99.8% Pure).

For dampproofing brick, concrete and stone walls, and for protecting metal surfaces against the ravages of the elements. Dries quickly and with a glossy lustrous finish sufficiently flexible to prevent scaling.

For treating roofs of all kinds, smokestacks, boilers, fences and metal surfaces generally.

Shipped in packages same as the Anchor Asphalt Roof Coating.



# WILLIAM L. BARRELL CO.

Manufacturers of Canvas Roofing

8 Thomas Street  
NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS., 185 Devonshire Street

CHICAGO, ILL., Royal Insurance Building

DISTRIBUTERS

CHICAGO, ILL., GEO. B. CARPENTER CO., 430-40 Wells Street  
SAN FRANCISCO, CAL., PACIFIC BUILDING MATERIALS CO.

WASHINGTON, D. C., ASBESTOS COVERING CO.  
LOS ANGELES, CAL., WATERHOUSE & PRICE CO.

## Products.

CON-SER-TEX CANVAS for ROOFING, and FLOOR COVERING of Porches, Balconies, Piazzas, Kitchen and Laundry Floors, etc.



TRADE-MARK

## Con-Ser-Tex Canvas for Roofing and Floor Covering.

Con-Ser-Tex is a specially woven, chemically treated, tough cotton fabric. Prepared for durable and highly efficient service in covering flat roofs and exterior and interior floors. Besides being ideal for covering roofs and floors of porches, sleeping balconies, piazzas and other exterior surfaces having slopes not over 4 ins. to the foot, Con-Ser-Tex is most effective as a covering for floors of kitchens, laundries, garages, etc.

The chemical process to which Con-Ser-Tex is subjected renders it in its every fiber permanently waterproof and immune to the ravages of dry rot or mildew. The effectiveness of the process is proved by the great endurance of the similarly bitumen soaked mummy cloths of the ancient Egyptians. This treatment also exercises a distinct rot preventive and anti-septic effect upon the wood over which it may be laid.

Con-Ser-Tex, being specially woven, is constructed to overcome the tendency to curl of the ordinary cotton fabrics, with the result that it lies flat, as is essentially necessary. This fabric will, moreover, never split—not even under severe vibration and strain, as is proved by the fact that it has been the accepted standard for passenger car roofing for 16 years.

Architects who have consistently specified Con-Ser-Tex in preference to any other material for exterior roofs used as floors are now advocating the use of Con-Ser-Tex in place of other forms of floor covering, in kitchens, laundries and similar places. In addition to the economical, lasting and sanitary features, it is one of the most comfortable under foot materials made. It may also be turned up at all sides to form a sanitary, verminproof and waterproof base, integral with the floor.

## Characteristic Features.

Both sides of Con-Ser-Tex are finished with a tooth to which paint readily adheres.

The chemical treatment protects the fabric absolutely from the rotting tendency of the oil in paints.

Con-Ser-Tex is immune from the attacks of coal gas or acid fumes.

Con-Ser-Tex is sound deadening and non-heat-radiating as well as non-conductive of heat or cold.

## How to Specify.

NOTES—Where it is customary to have the finished painting done by the painting contractor, the clause which follows should be amended to state that only the painting under the canvas shall be done by the contractor laying same.

The outside coats need only be 2 in number with Con-

Ser-Tex, a distinct saving over ordinary canvas treatment.

Provision should be made in the specification for turning up the Con-Ser-Tex at all walls or adjoining roofs, etc., allowing for a substantial lap of the counterflashing or other materials against which the canvas abuts.

FOR WOOD SURFACES—Surfaces to be canvas covered, as indicated on plans, shall be covered with (where practicable indicate grade desired) Con-Ser-Tex Canvas Roofing (WILLIAM L. BARRELL CO., 8 Thomas Street, New York, N. Y.). These surfaces shall first be coated with 1 heavy coat of white lead in oil paint, and Con-Ser-Tex laid, dark side down, while paint is wet. Laps of canvas to be arranged so as to permit free drainage and to be not less than 1½ ins., the edge of canvas below being painted before next piece is overlapped. The laps shall be fastened while canvas is being slightly stretched, with flat head copper [or galvanized] tacks ¾ in. apart.

When canvas is laid and set, apply 2 coats of good lead in oil paint.

All work to be done in a thoroughly workmanlike manner.

## Prices.

The following are list prices per lineal yard:

Widths	E	G	I
30-in. ....	\$0.53	\$0.59	\$0.67
36-in. ....	.64	.71	.81

NOTES—E grade is intended for roofing small porches and floors where the traffic is limited or light, and in sizes that do not exceed 10 by 20 ft.

G grade is admirably adapted for seashore residences, porch floors and roofs. I grade is used principally for public buildings and all places where the most onerous conditions exist.

## Co-operative Service.

On receipt of sketch showing dimensions of surface to be covered, a diagram showing cost and most economical method of laying will be supplied by this company, so as to avoid waste of material.

## A Few References.

W. J. Wilkins & Co., Florence, S. C.  
David Bloomfield, Meriden, Conn.  
Charles I. Barber, Knoxville, Tenn.  
O. J. Dean, Huntingdon, Pa.  
A. F. Rosenheim, Los Angeles, Cal.  
Sage Foundation Homes Co., Forest Hills, N. Y.  
John Bacon Hutchins & Sons, Louisville, Ky.  
D. Everett Waid, Ferruccio Vitale, Jardine, Hill & Murdock,  
Taylor & Mosley, Hoggson Brothers, E. S. Straffe,  
New York, N. Y.



HOME OF CHAS. L. CORNELL, ORANGE, N. J.  
WILSON EYRE, Architect  
Porch floors covered with Con-Ser-Tex



# JOHN BOYLE & CO., INC.

Manufacturers of Roof and Deck Cloth, Roofing Canvas and Awning Materials

112-114 Duane Street, 70-72 Reade Street

NEW YORK, N. Y.

BRANCH HOUSE: ST. LOUIS, MO., 202-204 Market Street

## Products.

- “BAYONNE” ROOF AND DECK CLOTH.
- “GULF STREAM” ROOFING CANVAS.
- AWNING STRIPES.
- COTTON DUCK.

## “Bayonne” Roof and Deck Cloth.

“Bayonne” roof and deck cloth is a special cotton canvas, treated by a process which renders it waterproof and increases its tensile strength and wearing quality. Being applied under high pressure, the treatment thoroughly permeates the fabric, depositing a preservative coating on each strand of the cotton and rendering the whole cloth absolutely waterproof. It is therefore the most practical covering for porch floors and decks, flat roofs, and like places.

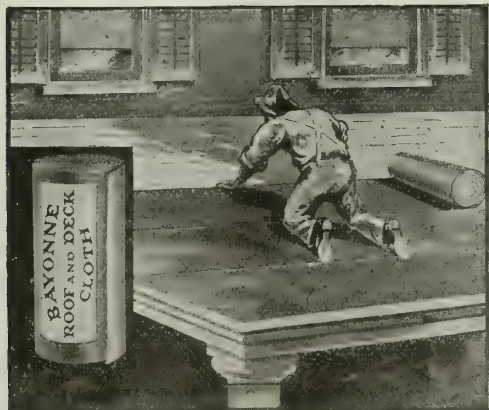
It is made in three weights as follows: Fabric 1287, Fabric 1288, and Fabric 1299. Sample book will be furnished on application; also, discount from the list prices given below.

It is applied directly to the boards, instead of being laid in wet paint, as is usual with unprepared duck, thereby making a much simpler operation, a neater appearance generally, and a saving of material and labor. Directions for laying accompany each shipment, but it would be well to incorporate them in the specifications in addition.

After laying, only one coat of paint need be ap-



TRADE-MARK



METHOD OF APPLYING “BAYONNE” ROOF AND DECK CLOTH

LIST PRICES OF “BAYONNE” ROOF AND DECK CLOTH, PER LINEAR YARD

Width	Fabric 1287	Fabric 1288	Fabric 1299
30-in.....	\$1.16	\$1.39	\$1.56
36-in.....	1.39	1.68	1.88

Subject to discount. The above widths carried in stock. Other widths processed to order. List prices adopted July 20, 1917.

plied, unless the floor is to be subject to considerable walking, in which event two coats are recommended.

Architects have specified and used “Bayonne” roof and deck cloth for a great many residences and institutions throughout the country, and it has in every case fully proved our claims for it.

Names and addresses where this material is in use, in any locality specified by inquirers, will be given on request.

HOW TO SPECIFY—The floors and decks of porches shall be covered with “Bayonne” roof and deck cloth, Fabric [1288] made by JOHN BOYLE & CO., INC., 112 Duane Street, New York, N. Y. Material shall be laid directly on the floor or deck boarding, with 1½-in. or 2-in. laps, fastened with flat head [copper] tacks spaced not over ½ to ¾ in. apart and within ⅛ in. of the edge of canvas. Cloth shall be held taut while being tacked.

After laying, give decks [one] and floors [two] coats of white lead and linseed oil paint of color directed.

## “Gulf Stream” Roofing Canvas.

“Gulf Stream” roofing canvas is our best grade of white untreated canvas for covering porch floors and decks, flat roofs and like places.

It is made in four standard grades as follows: Grade D and Grade F for surfaces subject to considerable walking, and Grade H and Grade J for surfaces where the traffic is light.

Samples will be furnished on application.



TRADE-MARK

LIST PRICES OF “GULF STREAM” ROOFING CANVAS, PER LINEAR YARD

Widths	GRADES			
	D	F	H	J
26-in.....	\$1.10	\$0.98	\$0.86	\$0.72
30-in.....	1.28	1.12	.98	.84
36-in.....	1.52	1.34	1.18	1.00

Discount on the above and quotations on other widths on application. List prices adopted July 9, 1917.

HOW TO SPECIFY—The floors and decks of porches shall be covered with “Gulf Stream” roofing canvas, made by JOHN BOYLE & CO., INC., 112 Duane Street, New York, N. Y. Grade [D] shall be used for the floors, and grade [H] for the decks. The floors and deck boarding shall be given a coat of paint and the canvas shall be laid while the paint is wet. Fasten with flat head [copper] tacks spaced not over ½ to ¾ in. apart and within ⅛ in. of the edge of the canvas. Laps shall be at least 1½ ins. and the edge of canvas below shall be painted before being covered by the lap of the next piece. Canvas shall be held taut while being tacked.

Paint canvas [two] coats, the first immediately after laying and the other after first is dry. Use white lead and linseed oil paint of color directed.

## Awning Stripes.

“Boyle’s” guaranteed awning stripes have been the standard for over fifty years. They are the best looking and longest wearing stripes, and retain their colors better than any others.

awnings made from this cloth are guaranteed to give permanent satisfaction.

# AMERICAN SHEET AND TIN PLATE COMPANY

GENERAL OFFICES  
PITTSBURGH, PA.

DISTRICT SALES OFFICES

CHICAGO  
DETROIT  
PHILADELPHIA

CINCINNATI  
NEW ORLEANS  
PITTSBURGH

DENVER  
NEW YORK  
ST. LOUIS

EXPORT REPRESENTATIVES:  
NEW YORK, N. Y., UNITED STATES STEEL PRODUCTS COMPANY

PACIFIC COAST REPRESENTATIVES:

SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE, UNITED STATES STEEL PRODUCTS COMPANY

## Products.

Manufacturers of SHEET and TIN MILL PRODUCTS of every description. BLACK SHEETS for all purposes; AMERICAN BESSEMER and AMERICAN OPEN HEARTH STEEL SHEETS; APOLLO BEST BLOOM, KEYSTONE COPPER STEEL and CHARCOAL HAMMERED BLOOM GALVANIZED IRON SHEETS; AMERICAN OLD STYLE, AMERICAN NUMETHODD, and MF ROOFING TIN PLATES.

KEYSTONE COPPER STEEL SHEETS, either Black or Galvanized; CORRUGATED SHEETS; FORMED METAL ROOFING and SIDING MATERIALS.

W. Dewees Wood Company's Cleaned, Refined, Smooth Finish, and Patent Planished Iron Sheets; Wellsville Polished Steel Sheets; American Coke and American Charcoal Bright Tin; Tinned Dairy Stock.

## General.

The standing and superiority of American products are so thoroughly appreciated by the building trades throughout the country that a detailed account of their various points of merit is not necessary here. Full information and quotations will be furnished by addressing the nearest district sales office.

## Roofing Tin Plates.

Metal makes the safest and most satisfactory roof. The roofing tin, or terne plates, now produced by this company is made exclusively of open hearth Keystone Copper Steel. It is perhaps needless to say that the decision to use this new alloy in preference to regular open hearth steel was arrived at only after careful thought and exhaustive research.

Service tests that have been made, however, in rural districts, in coke regions, and at the seashore, have convinced us that Keystone Copper Steel is far more durable, either coated or uncoated, than regular steel, and there is no hesitancy in recommending it to architects and builders as the highest quality and most durable roofing tin on the market.

Copper Steel roofing tin is stamped "Keystone Copper Steel" in addition to the brand.

Special attention is directed to the MF brand. This plate has been made continuously since 1822, and is unquestionably the most popular roofing tin manufactured. The coating—32 lbs.—is applied by the hand dipped, pure palm oil process.

Other high grade roofing plates are also made under the following brands:

U. S. Eagle.....	40 lbs. coating
American Old Style AAAAAA .....	40 lbs. coating
American Old Style AAAA .....	35 lbs. coating
American Old Style AAA .....	30 lbs. coating
American Old Style AA .....	25 lbs. coating
American Old Style A .....	20 lbs. coating

American Special.....	15 lbs. coating
American Extra.....	12 lbs. coating
American .....	8 lbs. coating
American Numethodd B .....	40 lbs. coating
American Numethodd D .....	30 lbs. coating
American Numethodd F .....	20 lbs. coating
American O. H. Fire Door Stock....	20 lbs. coating

Keystone Copper Steel terne plates bear the stamp, "Keystone Copper Steel," added to brand and weight of coating, as indicated by MF trade-mark.

## Galvanized Sheets.

Apollo Best Bloom galvanized sheets are without question the highest quality and best known galvanized sheets manufactured. The sheets are produced from selected materials, by the most modern and scientific methods. The non-corrosive coating is always reliable, and the sheets are true to gauge, uniform in working qualities and trustworthy in every respect. Made in gauges Nos. 10 to 30 inclusive.

Send for our Pocket Reference Book, giving full information, and an Apollo Weight Card.

We also manufacture Charcoal Hammered Bloom galvanized iron sheets, adapted to all purposes requiring sheets with a pure iron base.

## Keystone Copper Steel Sheets.

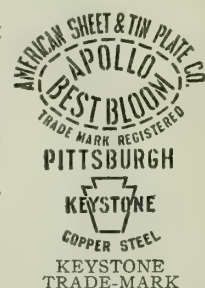
Having retained all of value that has made our Apollo Best Bloom galvanized sheets the standard in all markets of the world, we are now prepared to supply this product made with a copper steel base, thereby insuring longer life should the coating, for any reason, be injured.

Write for full information relative to Apollo-Keystone Copper Steel galvanized sheets.

All corrugated and formed products can also be supplied in Keystone Copper Steel.

## Corrugated Sheets.

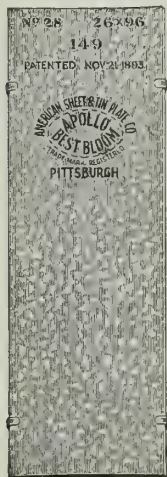
Corrugated sheets are the strongest form of sheet metal known, and do not suffer from contraction or expansion. Sheets are full standard weights per square, and specially adapted to roofing and siding purposes. Furnished either in black, painted or galvanized.



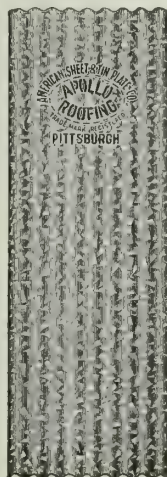


The galvanized patterns are stenciled "Apollo," as indicated; the plain and painted, "American." Following are the standard corrugations:  $\frac{5}{8}$ ",  $1\frac{1}{4}$ ", 2",  $2\frac{1}{2}$ ", 3" and 5", in lengths of 5, 6, 7, 8, 9, 10 and 12 ft., with a covering width of 24 ins.

We also manufacture  $2\frac{1}{2}$ " patent edge corrugated sheets, with a covering width of 24 ins.; genuine re-worked iron corrugated sheets, with standard corrugations; and special corrugated sheets.



APOLLO BEST  
BLOOM GAL-  
VANIZED  
SHEETS



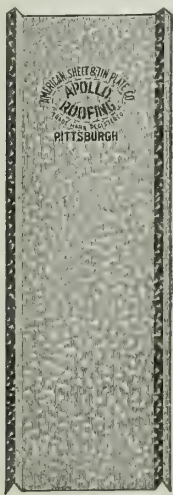
APOLLO COR-  
RUGATED  
ROOFING  
SHEETS

### Formed Roofing Materials.

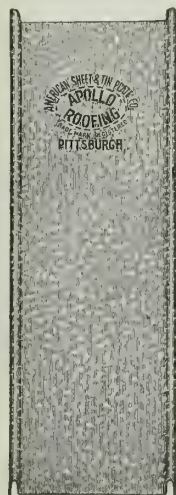
V-crimped roofing is made from No. 20-gauge and lighter; black, painted or galvanized sheets. Standard lengths, 5, 6, 7, 8, 9 and 10 ft.; maximum length, 12 ft. Standard covering width 24 ins. Wood sticks furnished if desired.

3 V-crimped roofing is made from No. 20-gauge and lighter; in length same as the V-crimped.

Pressed standing seam roofing is made from No. 20-gauge and lighter; black, painted or galvanized sheets. Standard lengths, 5, 6, 7, 8, 9 and 10 ft.; maximum length 12 ft. Standard covering width 24 ins. Cleats furnished if desired.



V-CRIMPED  
ROOFING



PRESSED STAND-  
ING SEAM  
ROOFING

Roll self-cap roofing or plain roll roofing is made from No. 24-gauge and lighter; black, painted or galvanized sheets. Standard full width,  $26\frac{1}{2}$  ins. Each roll contains 50 lin. ft., and when applied will cover 100 sq. ft. Cleats furnished if desired.

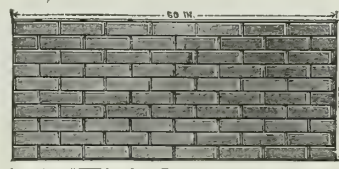
Roll and cap roofing is made from No. 24-gauge and lighter; black, painted or galvanized sheets. Standard full width, 26 ins. Each roll contains 50 lin. ft., and when applied will cover 100 sq. ft. Caps and cleats are furnished. Cross locks are single seamed, but double seamed can be furnished.



ROLL AND CAP ROOFING

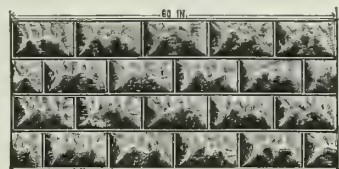
### Formed Siding Materials.

Plain and rock-face brick siding are exceptionally popular patterns. Made from black, painted or galvanized sheets, 28 by 60 ins.; size of each brick approximately  $2\frac{4}{5}$  by  $8\frac{4}{7}$  ins.



PLAIN BRICK SIDING

Rock-face stone siding is made from No. 26-gauge and lighter; black, painted or galvanized sheets, 28 by 60 ins. Size of single stone, approximately 7 by 12 ins., and  $9\frac{1}{2}$  by 20 ins.



ROCK-FACE STONE SIDING

Weatherboard siding is made from No. 22-gauge and lighter; black, painted or galvanized sheets. Standard lengths, 5, 6, 7, 8, 9 and 10 ft.; maximum length, 12 ft. Covering width, 24 ins.

Beaded ceiling or siding is made from No. 24-gauge and lighter; black, painted or galvanized sheets. Standard lengths, 5, 6, 7, 8, 9 and 10 ft. Maximum length, 12 ft. Standard covering width, 24 ins. Beads are 3 ins. from center to center.

### Service and Weather Tests.

This company has conducted extensive tests and research work in producing materials of highest quality standards and developing products that will give greatest durability and rust resistance under regular service conditions. Actual time and weather tests have proved the marked superiority of Keystone Copper Steel for roofing tin plates, black and galvanized sheets, corrugated roofing, and materials used for exposed sheet metal work. The proof of superiority is indisputable, and fully established.

### Booklets and Literature.

We shall be pleased to send to architects booklets covering these various tests, and also literature descriptive of our products. These booklets are size  $8\frac{1}{2}$  by 11 ins., recommended by architects as most convenient for filing and reference.

# ASPROMET COMPANY

FORMERLY ASBESTOS PROTECTED METAL COMPANY (ESTABLISHED 1905)

PRINCIPAL OFFICE

CABLE ADDRESS:  
"ASPROMET, NEW YORK"  
Western Union Code

First National Bank Building  
PITTSBURGH, PA.

ASBESTOS FELT WORKS  
WALTHAM, MASS.

WORKS: ECONOMY, PA.

SALES OFFICES AND AGENCIES

BALTIMORE, MD.  
BIRMINGHAM, ALA.  
BOSTON, MASS.  
BUFFALO, N. Y.  
BUTTE, MONT.  
CHICAGO, ILL.  
CINCINNATI, OHIO

CLEVELAND, OHIO  
DENVER, COLO.  
DETROIT, MICH.  
EASTON, PA.  
EL PASO, TEX.  
HOUSTON, TEX.  
KANSAS CITY, MO.

LOS ANGELES, CAL.  
MACON, GA.  
MINNEAPOLIS, MINN.  
NASHVILLE, TENN.  
NEW ORLEANS, LA.  
NEW YORK, N. Y.  
OMAHA, NEBR.

PHILADELPHIA, PA.  
PORTLAND, ORE.  
SAINT LOUIS, MO.  
SALT LAKE CITY, UTAH  
SAN FRANCISCO, CAL.  
SCRANTON, PA.  
SEATTLE, WASH.  
MONTREAL, P. Q., CAN

EXPORT DEPARTMENT: NEW YORK, N. Y., 170 Broadway

## Products.

ASBESTOS PROTECTED METAL (APM) (patented), in CORRUGATED, MANSARD, FLAT SHEETS; RIDGE CAPPING and FLASHINGS, RUST RESISTING MATERIALS for Fastening Sheets to Structure; ASPROMET GLAZING CONSTRUCTION (patented), for Skylights, Sawtooth and Monitor Sash; ASPROMET VENTILATORS; ASPROMET GYPSUM (MONOLITHIC) ROOF CONSTRUCTION.

Asbestos Protected Metal Gutters and Downspouts; Asbestosteel Roof, Floor and Wall Construction (patented); APM Eave Gutters and Conductors; APM Hoods for pickling tanks, paper machines, etc.; Asbestos Building Paper.

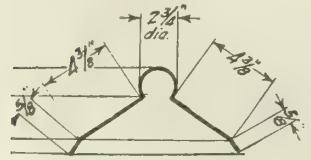
## Asbestos Protected Metal (APM) (Patented).

A lasting roofing and siding material that is rust-proof and impervious to the corrosive action of acid fumes, alkalis, etc. Made in corrugated, mansard and flat sheets, and in various standard gages. Colors, red and black.

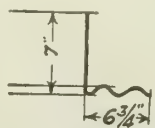
Effects a substantial saving in structural steel by reason of its extremely light weight. As quickly and economically applied as the ordinary metal sheets. *Requires no painting.*

Annealed, solid sheets of steel are thoroughly cleaned and immersed in a bath of special asphaltic compound which forms an elastic, gasproof, fume-proof, and moistureproof film completely incasing the metal.

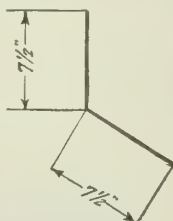
This asphaltic coating is protected from light, heat and mechanical abrasion by an insulating covering of pure asbestos felt, laid over the hot asphalt and forced into it under pressure, and *folded over the edges*, hermetically sealing the asphalt protected sheet. The asbestos is toughened and waterproofed by an original process that materially increases its insulating value.



APM RIDGE CAP



APM CORRUGATED SIDE WALL FLASHING

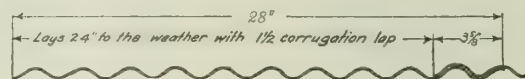


APM FLAT FLASHING

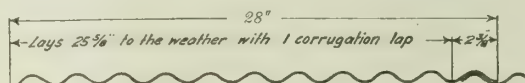


TRADE-MARK  
Reg. U. S. Pat. Off.

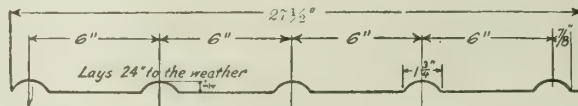
A heavy envelope of toughened waterproof and fumeproof compound is then applied as a finish.



APM Roofing Sheet, 5 to 12 ft. Long



APM Siding Sheet, 5 to 12 ft. Long



APM Mansard Sheet, 5 to 12 ft. Long

DETAILS OF SHEETS AND METHOD OF FASTENING THEM



SMALL SECTION OF  
ASBESTOS  
PROTECTED  
METAL  
CORRUGATED  
SHEET

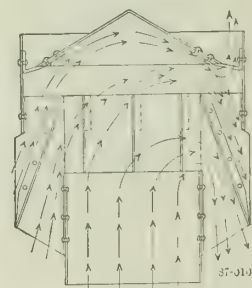
Showing how it  
is made

## Aspromet (formerly APM McAllister) Ventilator.

The Aspromet ventilator is made of Asbestos Protected Metal throughout. Impervious to corrosion either from weather or action of fumes and gases, which necessarily pass through it. *Never requires painting nor repairs.* No movable parts or bearings to become clogged from rust or dirt.



ASPROMET  
VENTILATOR



CROSS-SECTIONAL  
VIEW OF VENTI-  
LATOR

Winged siphons catch  
every air current regardless  
of direction

## Aspromet (formerly Waugh) Glazing Construction.

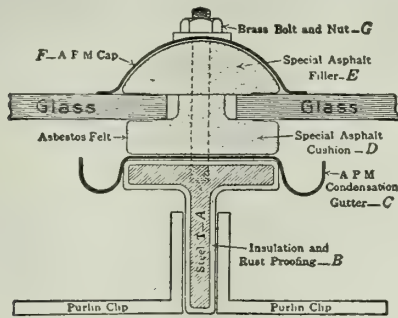
Aspromet skylights, sawtooth and monitor sash are designed *throughout* on engineering principles and



every feature has been subjected to long and exceptionally severe service tests. In this construction exhaustive effort has been made to eliminate every defect and cause of failure which engineers and others had come to believe were necessarily associated with roof glazing—and to absolutely do away with maintenance cost. Leakage, deflection of glass supports, glass breakage, damage from condensation and loss of strength by corrosion are all made practically impossible by this construction—and periodical painting is unnecessary.

**ADVANTAGES**—The supporting bar beam is a standard rolled steel shape, of a size selected for each specific case, to carry the necessary live and dead loads *without deflection*—which is the principal cause of glass breakage.

APM protection of all metal parts prevents ultimate deflection from rust or corrosive action of fumes.



CROSS SECTION OF ASPROMET GLAZING CONSTRUCTION

A—Rolled Steel Bar Beam: always initially stiff enough (regardless of span) to carry its load without deflection—the main cause of glass breakage and maintenance cost.

B—Protective Coating: acidproof, alkaliproof and moistureproof, heat and fire resisting. Absolutely preserves steel beam from corrosion and consequent loss of initial stiffness.

C—Asbestos Protected Metal Gutter: not a part of the beam. Can not corrode. Never needs painting. No maintenance cost.

D—Asphaltic Glass Cushion: provides a non-absorbent, resilient, permanent and *bar-insulating* bed for glass. Extends upward between the glass plates thus preventing their contact with hard substances, such as bolts, a frequent cause of glass breakage. Provides a broad, continuous and *non-absorbent* glass bearing—hence does not hold moisture in contact with metal and hasten its corrosion.

E—Asphaltic Cap Filler: leaves no hollow spaces; keeps moisture away from interior metal parts, follows contour of glass surface and *adheres* to it—hence absolutely prevents leakage.

F—Asbestos Protected Metal Cap: protects filler and distributes pressure evenly and continuously. Spring tension locks the cap nuts.

NOTE—In sawtooth and continuous monitor sash, the condensation gutter illustrated above (C) is omitted.



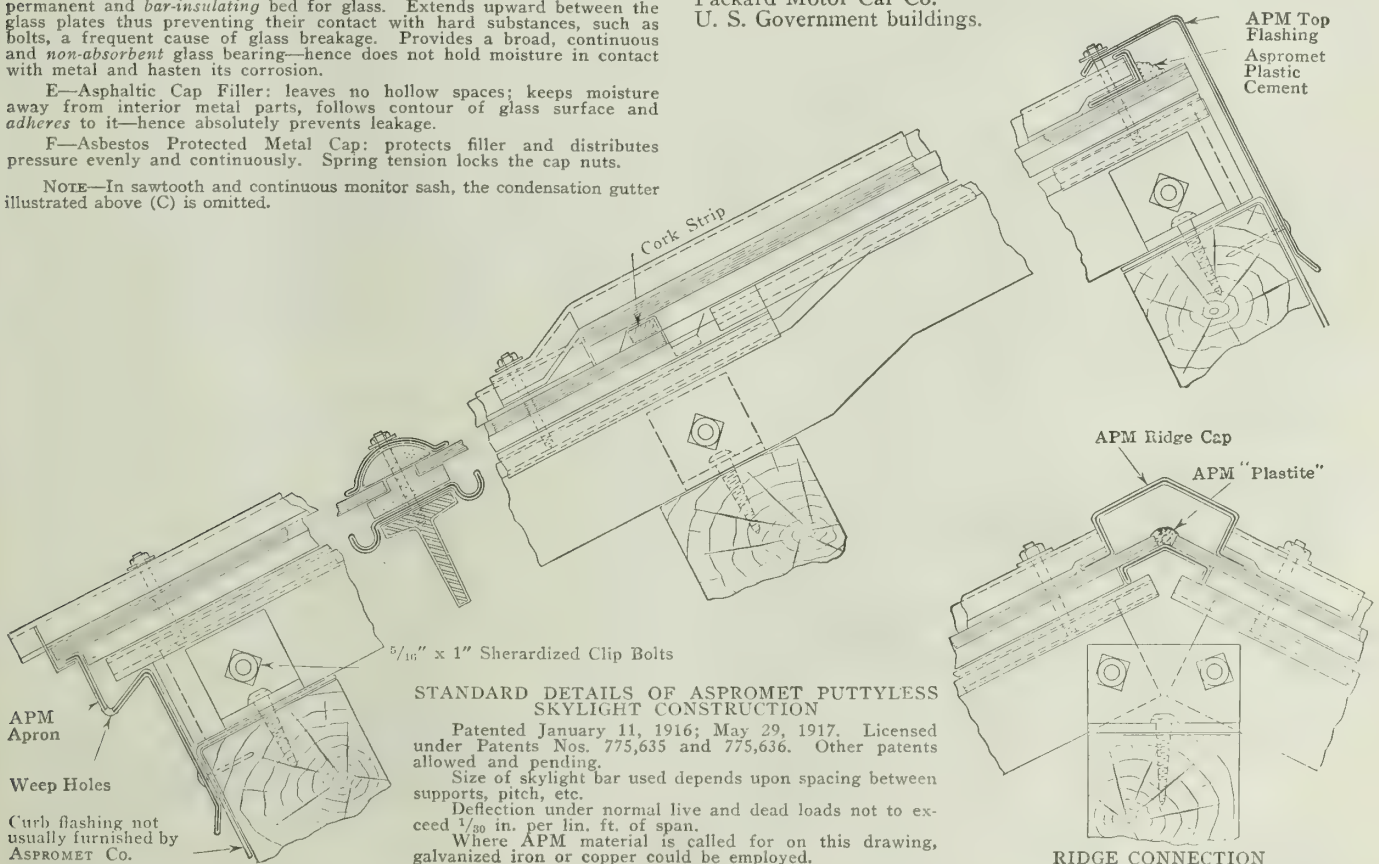
MINNESOTA STATE HISTORICAL SOCIETY BUILDING,  
ST. PAUL, MINN.  
6,800 Square Ft. Aspromet Skylight

Asphaltic cushions and cap fillers *adhere to* and seal glass, preventing leakage. Aspromet glazing eliminates maintenance expense. APM protection of metal parts makes *painting unnecessary*.

### Prominent Installations, Aspromet Glazing Construction.

Aspromet glazing construction has been used on numerous representative edifices and industrial buildings throughout the country, some of which are:

Charleston Museum, Charleston, S. C.  
Framingham Civic League Building, Framingham, Mass.  
Hibbing Library Building, Hibbing, Minn.  
Minnesota State Historical Society Building, St. Paul, Minn.  
John Wanamaker Building, Philadelphia, Pa.  
Savannah Auditorium, Savannah, Ga.  
Roessler-Hasslacher Chemical Co., Perth Amboy, N. J., and St. Albans, W. Va.  
Public Service Corporation, Newark, N. J.  
Pennsylvania Railroad Co., various locations  
Pierce-Arrow Motor Car Co., Buffalo, N. Y.  
Western Electric Co., Inc., Chicago, Ill.  
Union Iron Works (Bethlehem Steel Co.), San Francisco, Cal.  
Detroit Edison Co., Detroit, Mich.  
Standard Acid Works, Inc., Baltimore, Md.  
Security Bank & Trust Co., Bank Building, Wheeling, W. Va.  
Saxon Motor Car Corporation, Detroit, Mich.  
American Steel & Wire Co., Worcester, Mass.  
Dodge Brothers Co., Detroit, Mich.  
Packard Motor Car Co.  
U. S. Government buildings.



### STANDARD DETAILS OF ASPROMET PUTTYLESS SKYLIGHT CONSTRUCTION

Patented January 11, 1916; May 29, 1917. Licensed under Patents Nos. 775,635 and 775,636. Other patents allowed and pending.

Size of skylight bar used depends upon spacing between supports, pitch, etc.

Deflection under normal live and dead loads not to exceed 1/30 in. per lin. ft. of span.

Where APM material is called for on this drawing, galvanized iron or copper could be employed.

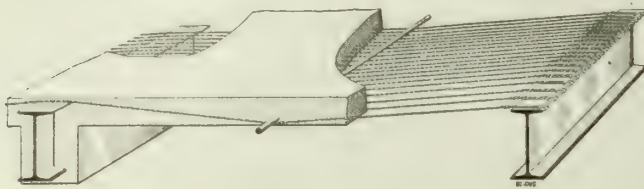
**Aspromet Gypsum Fireproof Floor.**

A poured slab of gypsum composition supported by securely anchored steel cables in deflection.

**ADVANTAGES—Fire Resisting**—Meets all of the most exacting requirements of a standard fireproof material.

Sustained temperature of 1700° to 2100° Fahr. for more than 5 hours has no effect beyond a slight depth of recalcination on exposed surface. Subsequent application of water merely washes away recalcined surface, leaving slab structurally uninjured and capable of carrying, without abnormal deflection, the designed load with a factor of safety of 4.

Approved for many years as standard fireproof construction for floors and roofs by the building departments of the principal cities.



DETAILS OF ASPROMET GYPSUM FLOOR OR ROOF CONSTRUCTION TYPE 2

**Strength**—Can be accurately proved by accepted engineering formulæ, as the desired live and dead load capacity of the floor is calculated solely upon the structural value of the securely anchored cables, in suspension, under a factor of safety of 4.

Can be designed for any load with absolute certainty of results. The human element, as in concrete, is practically eliminated.

**Economical**—The usual 4-in. floor slab, weighing but 16 lbs. per sq. ft. in place, permits of a large saving being effected in structural steel tonnage.

Can be installed on beams spaced up to 8 ft. on centers for floors or 10 ft. 4 ins. on centers for roofs.

**Rapid Construction**—The gypsum composition sets in 30 minutes after pouring. Forms can be dropped within an hour, leaving floor below ready for proceeding with other work, and a working floor on top that is usable under the load for which it is designed.

**Sound Deadening**—Has been proved by long service to be the most nearly perfect non-conductor of sound of any structural material.

Especially important in apartment houses, hotels, educational institutions and factories containing running machinery.

**Aspromet Gypsum Roof.**

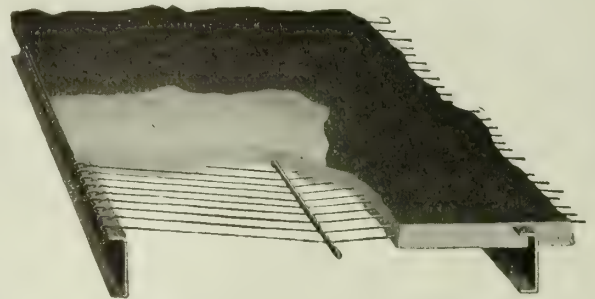
Identical in construction and principle of design with Aspromet gypsum floor already described.

**ADVANTAGES**—Possesses all of the advantages set forth under Aspromet gypsum floor, with the additional ones peculiar to roof construction for factory buildings as follows:

**Prevents Condensation**—Exhaustive tests and long service have proved it to possess such a high degree of

insulating efficiency as to prevent condensation from forming under practically any combination of low outside temperature and inside temperature and humidity.

**Saves Cost of Heating**—This same low heat conductivity offers a real, readily calculated saving, both in the initial cost of boilers and radiation and the annual coal consumption in any building which requires heating during the winter months.



DETAILS OF ASPROMET GYPSUM ROOF CONSTRUCTION TYPE 1

**Elasticity**—Aspromet gypsum composition possesses such a peculiar degree of toughness and elasticity that it successfully resists, without traces of cracking, the most severe vibrations such as are frequent in buildings having travelling cranes, or running machinery or transmissions suspended from the roof trusses.

**Waterproofing**—Offers especially good surface for application of built-up or composition waterproof roofing.

Slab is free from the hard, projecting points produced by the aggregate in concrete which punches up through waterproofing, causing leaks.

**Service**—Installed exclusively by our own trained field organization under careful engineering supervision, fixing cost in advance, and assuring careful workmanship and full responsibility by this company.

**Submission of Proposals.**

Proposals submitted upon floors and roofs installed complete.

This company's Engineering Department will accompany bids with guaranteed estimates of steel tonnage which can be saved with Aspromet gypsum floors or roofs, and will also prepare complete steel layouts when desired.

**Prominent Installations, Aspromet Gypsum Construction.**

United States Arsenal, Watervliet, N. Y.  
 United States Navy Yard, League Island, Philadelphia, Pa.  
 American Radiator Co., Buffalo, N. Y.  
 Ingersoll-Rand Co., Phillipsburg, N. J.  
 General Electric Co., Schenectady, N. Y.  
 Carnegie Steel Co., Clairton, Pa.  
 Jones & Lamson Machine Co., Springfield, Vt.  
 Erie Forge & Steel Co., Erie, Pa.  
 Detroit Shipbuilding Co., Wyandotte, Mich.  
 Pennsylvania Lines Shops, Columbus, Ohio  
 Mesta Machine Co., Pittsburgh, Pa.  
 Wheeling Mould & Foundry Co., Wheeling, W. Va.  
 Aluminum Co. of America, Maryville, Tenn.  
 Gurney Ball Bearing Co., Jamestown, N. Y.  
 T. H. Symington Co., Rochester, N. Y.  
 Sharon Steel Hoop Co., Lowellville, Ohio.



# THE BERGER MANUFACTURING CO.

Manufacturers of Steel Ceilings

CANTON, OHIO

## BRANCHES

NEW YORK, N. Y., S. E. Corner 22nd Street and 11th Avenue  
PHILADELPHIA, PA., Corner 16th Street and Washington Avenue  
SOUTH BOSTON, MASS., 450-56 Broadway

CHICAGO, ILL., 20 North Market Street  
ST. LOUIS, MO., 16 South Tenth Street  
MINNEAPOLIS, MINN., 300-312 10th Avenue, South  
SAN FRANCISCO, CAL., 1120 Mission Street

## Products.

BERGER'S "CLASSIK" STEEL CEILINGS.

For Concrete Reinforcement and Metal Lath, see pages 202-05; for Metal Lumber, see pages 175-82; for Metal Furniture, see pages 1406-08.

## Description.

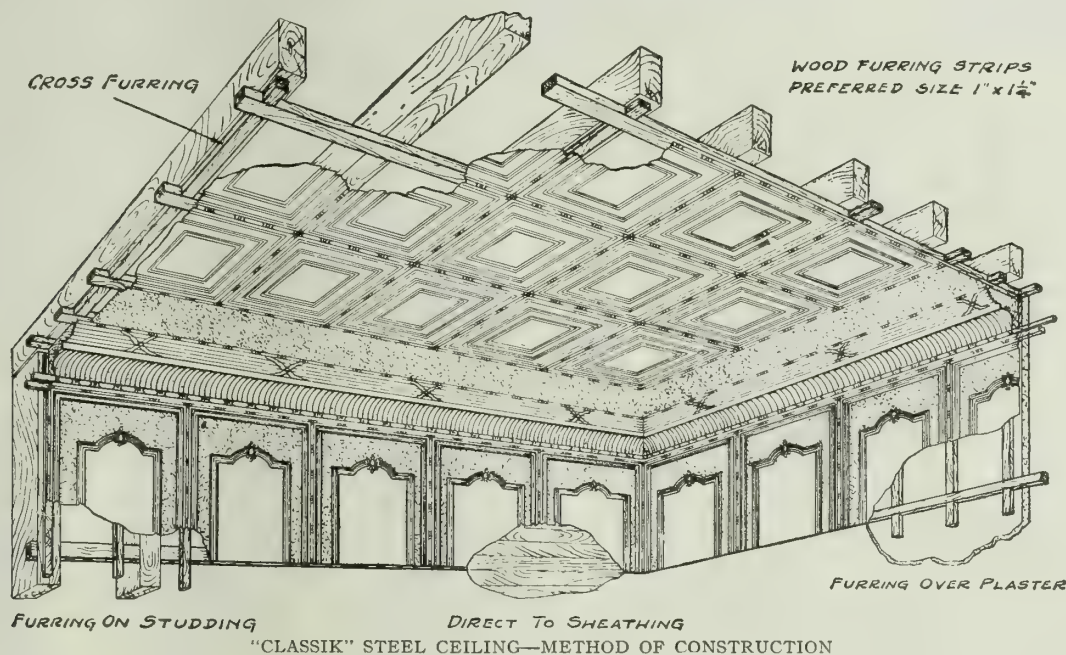
Berger's "Classik" steel ceilings comprise twelve distinct architectural classes: Stucco, Greek, Roman, Romanesque, Gothic, Moorish, Italian Renaissance,

**"BERGER'S"**  
**Classik**  
**STEEL CEILINGS**  
TRADE-MARK

## New Features.

The bead is made extra long and in shape of half an oval, reinforcing the ceiling plates at joints, fitting snugly over underlapping bead, making a tight and perfect fitting joint.

Each ceiling unit, plate or panel, is made on our new and specially constructed draw press (the largest and strongest press in the world for the pressing of steel ceilings), having a pressure of more than 900 tons, guaranteeing absolute mechanical correctness and detail of ornamentation heretofore unobtainable.



German Renaissance, French Renaissance, Rococo, Empire, Colonial—each elaborated in a great variety of patterns to meet the requirements of various sizes and shapes of rooms. The ceilings give a handsome, decorative, embossed finish, retaining artistic harmony in the effects throughout.

The construction is planned to facilitate erection, reduce number of pieces to handle and to minimize number of joints.

## Estimates and Drawings for Steel Ceiling Work.

Architects are invited to avail themselves of the services of our estimating department in preparing suggestive drawings free of cost and estimates on contemplated steel ceiling and side wall work.

Send sketch and accurate dimensions of room; state height of ceiling; indicate preferences as to style or design of ornamentation desired, with any other information helpful in determining a practical, effective and appropriate treatment to comply specifically with the ruling conditions.

## Architectural Catalogue.

Architects are invited to send for our new Catalogue No. 21-S illustrating "Classik" steel ceilings.



DETAIL OF BEAD, SHOWING COUNTERSUNK NAILING BUTTON  
(Patent pending)

# THE EDWARDS MANUFACTURING CO.

INCORPORATED 1901

Sheet Steel Building Material and Steel Equipment

CINCINNATI, OHIO

BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 81-83 Fulton Street  
 PHILADELPHIA, PA., Land Title Building  
 DALLAS, TEX., 1635-39 Pacific Avenue  
 BOSTON, MASS., 6 Beacon Street  
 WASHINGTON, D. C., 1419 G Street, N. W.  
 CLEVELAND, OHIO, 401 Leader News Building

PITTSBURGH, PA., 1501 Oliver Building  
 BALTIMORE, MD., 7 Clay Street  
 LOS ANGELES, CAL., 1610 North Spring Street  
 SAN FRANCISCO, CAL., 1137 Mission Street  
 PORTLAND, ORE., 17 Ainsworth Building  
 SEATTLE, WASH., 401 Central Building

## Products.

"THE EDWARDS" METAL CEILINGS and WALLS, METAL SHINGLES, METAL SPANISH TILE, PATENTED PRESSED STANDING SEAM CORRUGATED STEEL ROOFING.

"Reo" Cluster Shingles, Metal Door and Window Frames and Sash, Metal Culverts, Metal Garages, Portable Steel Buildings, Metal Wall Coverings, Metal Lath, Corrugated Iron Roofing and Siding, Steel Imitation Brick and Stone Siding, Galvanized Iron Cornice. Skylights, Ventilators, Eaves Trough, Conductor Pipe, Cellular Metal Fireproofing and "Keyridge" Reinforcement and Lath, "Edmanco Tightcote" Fire Resisting Paint.

For Rolling Doors and Shutters, see pages 664-65.  
 For steel Lockers and Shelving, see pages 1410-11.

## "The Edwards" Metal Ceilings and Walls.

Metal ceilings are no longer a luxury—they may almost be said to be a necessity. Where formerly they were used almost exclusively in churches, stores, halls and other buildings, they are now extensively used also in private residences. There are a number of excellent reasons for this growing popularity. From every viewpoint the metal ceiling is the ideal ceiling.

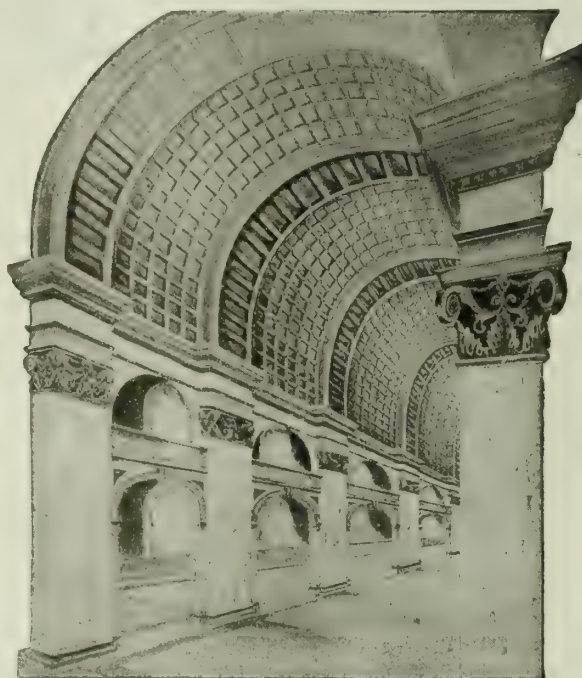
In the first place, it is unusually attractive. With the wide variety of patterns which comprise "The Edwards" line to choose from, any architectural effect can be obtained. Nor do the advantages of a metal ceiling end with its beauty and attractiveness. It is economical, the first cost being slight, and, with proper care, no subsequent expense for repairs. It is the most sanitary and easiest to keep clean of any ceiling; is absolutely proof against fire, moisture and vermin; makes the room cool in summer and warm in winter; and eliminates danger from falling plaster.

## "The Edwards" Metal Shingles and Metal Spanish Roofing Tile.

Are made from best quality terne plate, furnished painted or "Tightcote" galvanized, also in copper.

Their exceedingly attractive appearance is only one of the numerous advantages which commend them to builders and architects. They are proof against fire, lightning, rain, snow and wind; do not warp nor rot as wooden shingles do; and when laid according to the simple directions, will last a lifetime.

All Edwards metal shingles and metal Spanish tile are made with a patented side lock. Their interlocking device permits of a tight interlocking of each shingle or tile with the one lying next to it, so that, when the entire roof is laid, it is practically the same as one solid sheet of metal, without a crack or crevice anywhere through which a drop of water can seep. Although the seams are absolutely watertight, the lock



EDWARDS METAL CEILING INSTALLATION  
 In cathedral at Pasto, Colombia, South America

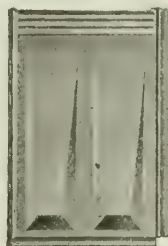


FIG. 211  
 Roman  
 10 by 14 ins.

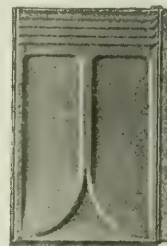


FIG. 208  
 Temco  
 10 by 14 and 14  
 by 20 ins.



FIG. 157  
 Queen Anne  
 10 by 14 ins.



FIG. 104  
 Gothic  
 10 by 14 ins.

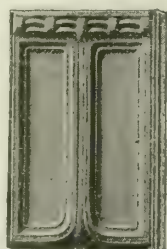


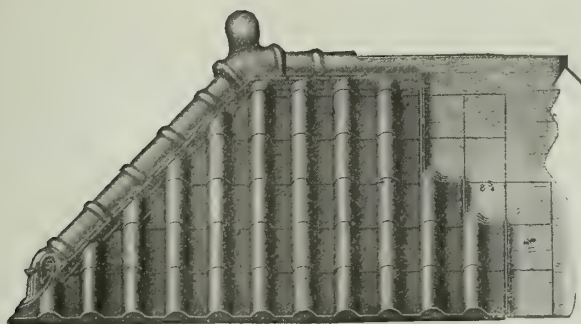
FIG. 118  
 Colonial  
 10 by 14 ins.



FIG. 175  
 Ohio  
 14 by 20 ins.

"EDWARDS" METAL SHINGLES





Method of Applying Tile and Fixtures

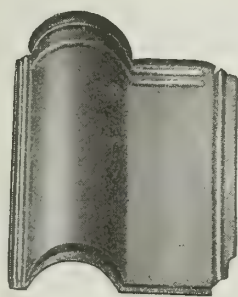


FIG. 367. Tile for Main Part of Roof

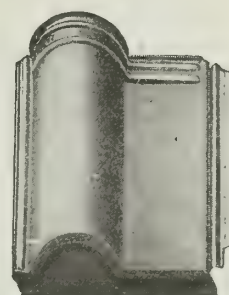
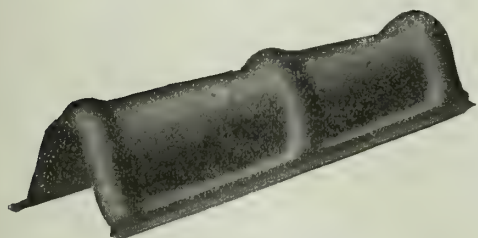
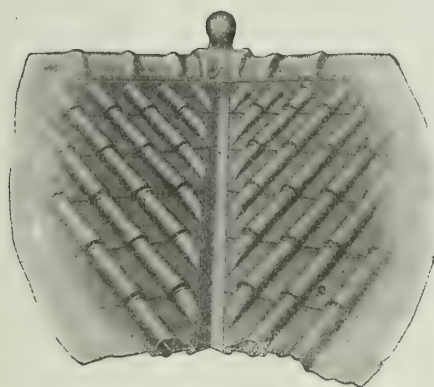


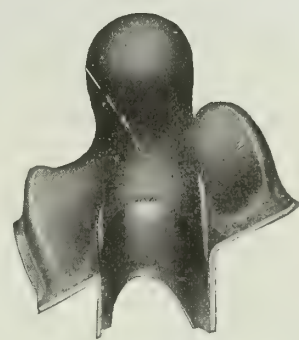
FIG. 369. Tile-Starter or Eave Tile, with Closed End for Edge of Roof at Gutter

FIG. 414. Hip or Ridge Finish  
Height, 6 ins.; width, 7 ins.; length, 28 ins.

Method of Locking Valley Tile into Valley



FIG. 409. Ridge Flashing Nailed to 2 x 4-in. Strip on Ridge. Ridge Finish Fastened to Flashings with Cleats, 10-ft. Lengths

FIG. 397. 3-Way Finial, 2 Hips, 1 Ridge  
Height, 17 ins.; width, 17 ins.

## DETAILS "EDWARDS" METAL SPANISH ROOFING TILE

is so devised as to allow for expansion and contraction of the metal due to heat and cold, and thus there is never any danger of the roof buckling, warping and springing leaks.

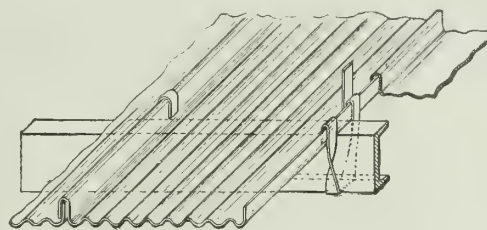
### Patented Pressed Standing Seam Corrugated Steel Roofing.

"Edwards" patented pressed standing seam corrugated steel roofing is especially adapted for use on structural steel buildings, as will be seen by the accompanying details. This roof has perfectly tight seams and can be applied directly to the purlins without rivets of any kind. Made in Nos. 16- to 28-gage, painted or galvanized.

In the use of this new roofing, a saving of 11% can be effected on side seams alone, and a much tighter side lock is assured. The method of cleating makes the cleats absolutely tight and at the same time allows for vibration. It makes a 50% more water-tight job. It has another advantage in that it can be placed on the roof and worked entirely from above, no scaffolding of any kind being necessary; and an entire roof can be put on without puncturing the sheets in the least, preserving the galvanized coating intact.

While the cost of this material is somewhat more than the regular corrugated sheets, the saving in side laps and application more than makes up for the difference.

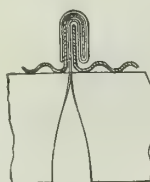
This roofing has been applied to a number of large buildings in various parts of the country and is giving absolute satisfaction. One roof, put on 6 years ago, covers a single building requiring over 1,000 squares.



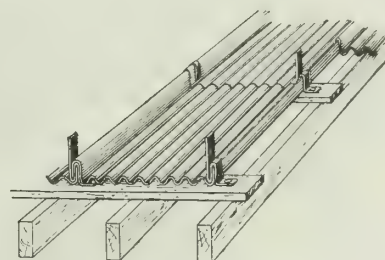
Applied to Steel Purlins



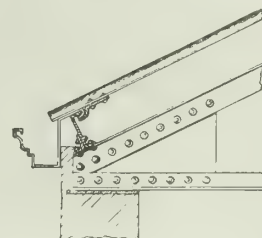
Cleat after Sheet is Applied



Section through Cleat



Applied to Wood Sheathing



Finishing out Eaves when Gutters are Used

## DETAILS "EDWARDS" PATENTED PRESSED STANDING SEAM CORRUGATED STEEL ROOFING

POWELL EVANS, PRESIDENT

**MERCHANT & EVANS CO.**

ESTABLISHED 52 YEARS (1866-1918)

Manufacturers of Metal Roofing Products

PHILADELPHIA, PA.

WORKS  
PHILADELPHIA  
WHEELING  
CHICAGO

PHILADELPHIA	NEW YORK	BALTIMORE	ATLANTA	CLEVELAND
WHEELING	CHICAGO	ST. LOUIS	KANSAS CITY	

OFFICES AND WAREHOUSES

**Products.**

MERCHANT & EVANS CO. HIGH GRADE ROOFING and BRIGHT PLATES; SHINGLES, made from Galvanized Terne Plate or Copper; GALVANIZED TILES, made from Galvanized Terne Plate or Copper—many designs; SOLDER, LEAD, ZINC, BRASS, BRONZE and COPPER; IRON and STEEL of every sort.

For Fire Doors, see page 680; for Ventilators, see page 470.

**Merchant & Evans Co. Tin and Terne Plate.**

This company's works at Wheeling (Warwood), W. Va., specialize in the manufacture of high grade terne plates for building purposes. These plates can be recommended and specified with the utmost confidence. Our experience of over 50 years is back of them.

"MERCHANT'S OLD METHOD"—This old established brand has always maintained its supremacy, because of its inherent and sustained merit. It is a roofing plate without a peer.

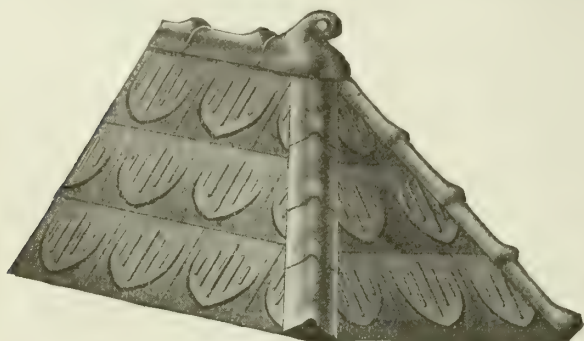


BRAND-MARK

"FRANKLIN OLD STYLE"—When for some reason a less expensive plate than "Merchant's Old Method" is desired, the company offers "Franklin Old Style," guaranteed to carry 40 lbs. of coating per box, evenly distributed on the best base obtainable.



BRAND-MARK



TYPICAL MERCHANT &amp; EVANS CO. GOTHIC SHINGLE

**Merchant & Evans Co. Metal Shingles.**

Made in sheet metal in accordance with scientific

principles. These are in wide use on all types of buildings for siding and gables, as well as for roofs. They are fire resistant, stormproof and ornamental. In first cost, lightness and endurance, they are superior to slate, asbestos or wood

shingles. They require no soldering; are laid with side lock having a large overlap, and do not leak. The galvanized shingle is produced from terne plate redipped after forming, thus giving a double protective coating which does not crack or scale. Many designs.

**Merchant & Evans Co. Metal Spanish Tiles (Copper or Steel).**

These are made of sheet metal in the form of the usual clay product, with none of its disadvantages, such as weight, cracking, etc. They are fire resistant, absolutely stormproof, easily adjusted, durable and ornamental.



MERCHANT &amp; EVANS CO. SPANISH TILES

Sizes: 7 by 10 ins.; 10 by 14 ins.; 14 by 20 ins. and graduated sizes. Tin, painted; copper; or galvanized-terne

Graduated tiles are supplied for domes, towers and all conical surfaces.

**Steel, Iron, Brass, Bronze and Copper Products.**

MERCHANT & EVANS CO. also supply metal products of every character for building purposes, such as sheet iron, steel, brass, bronze, copper, lead and zinc in every form; also metal roofing, siding and ceilings, and a complete line of roofers' and tinner's supplies.

**Catalogues and Prices.**

Send for illustrated catalogue and prices. Millions of square feet of this company's products are in use throughout the United States and all over the world.



# MILWAUKEE CORRUGATING CO.

MILWAUKEE ARTISTIC METAL CEILING CO. (A DEPARTMENT)

MILWAUKEE, WIS.

BRANCH AT KANSAS CITY, MO.

## Products.

"INVISIBLE JOINT" STEEL CEILINGS, and SIDE WALLS; "TITELOCK AMERICAN" and "TITELOCK" METAL SHINGLES and SPANISH TILE.

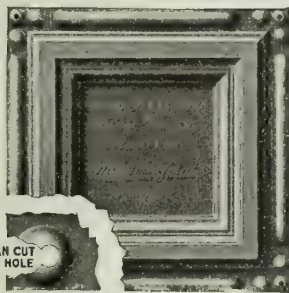
For Metal Lath and Corner Bead, see page 209; for Ventilators, see page 471.

## "Invisible Joint" Steel Ceilings.

DESCRIPTION — "Invisible Joint" steel ceilings are furnished in the following architectural classes:

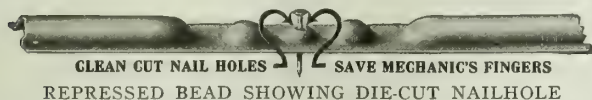
Louis XIV, Colonial, Romanesque, Stucco, Gothic, French Renaissance, L'Art Nouveau and Residence—each comprising a large variety of designs. Whatever the requirements may be, size or shape of room, for hall, church, café, school, store building, residence, etc., the most pleasing and satisfying patterns can be selected from the Milwaukee complete line. "Invisible Joint" ceiling patterns are exclusive, decorative, handsome and conform to the artistic treatment desired.

SPECIAL FEATURES—"Invisible Joint" ceiling plates have repressed beads and die-cut nailholes. The overlapping beads produce a snug fitting, perfect joint. Further, nailing is easy. The plates are in perfect alignment. Slightly rounded corners eliminate bending or turning in handling. These features make not only for more efficient erection, but greatly reduce the labor cost.



"INVISIBLE JOINT" STEEL CEILING PLATE  
One plate fits another exactly

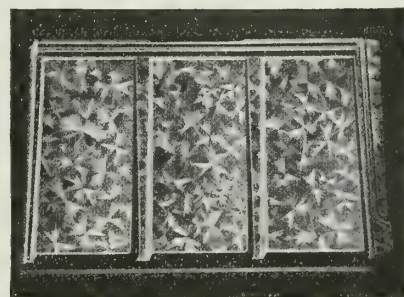
NEW CATALOGUE—The most elaborate, valuable Ceiling Catalogue has just been completed. Besides illustrating some of the newest and most exclusive designs, it contains information every architect should have. A copy will be furnished on request written on inquirer's official stationery.



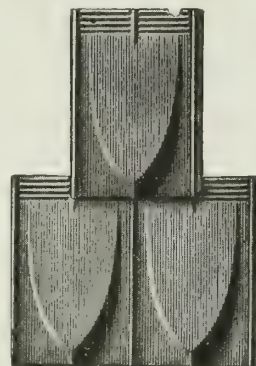
## "Titelock American" and "Titelock" Metal Shingles and Spanish Metal Tile.

METAL SHINGLES—"Titelock American" metal shingles are positively the last word in metal shingles.

For simplicity of design, effective appearance and adaptability for houses, churches, bungalows, schools, etc., they are unexcelled. They are furnished painted or galvanized and in six different designs, affording combinations that produce the most pleasing effects. A full line of especially designed trimmings in architectural conformity can be furnished also. The design as shown is exclusive in the "Titelock American" shingle and can not be secured elsewhere.

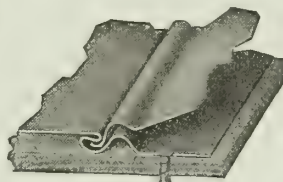


STYLE R "TITELOCK AMERICAN" METAL SHINGLE

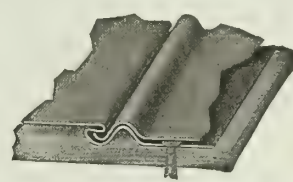


STYLE B "TITELOCK" METAL SHINGLE  
Furnished, painted or galvanized in three distinct styles

*The Perfect Lock*—The following illustrations show clearly the titelock features of "Titelock American" and "Titelock" metal shingles. The proper provision for construction and expansion is made; also, no water has any possible chance to find its way to the sheathing. Because of its construction there is no rattling under the most severe conditions.



LAYING SHINGLE

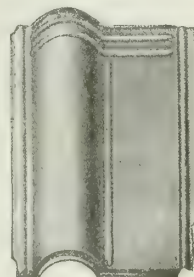


LAIID IN PLACE

*Outstanding Feature*—These metal shingles are fireproof, lightningproof, windproof and waterproof. For economy, durability and efficiency they are unexcelled.

This company's line of metal shingles with complete set of trimmings will cover every requirement.

SPANISH METAL TILE — The popular "Titelock" Spanish metal tile. Furnished painted (red or green) or galvanized.



SPANISH METAL TILE

# MEURER BROS. CO., INC.

Manufacturers of Roofing Specialties

TELEPHONE:  
WILLIAMSBURG 1567

567-577 Flushing Avenue  
BROOKLYN, N. Y.

WORKS  
BROOKLYN, N. Y.  
LONG ISLAND CITY, N. Y.

PACIFIC COAST MANAGER, A. H. McDONALD, 628-30 Third Street, SAN FRANCISCO, CAL.

## Products.

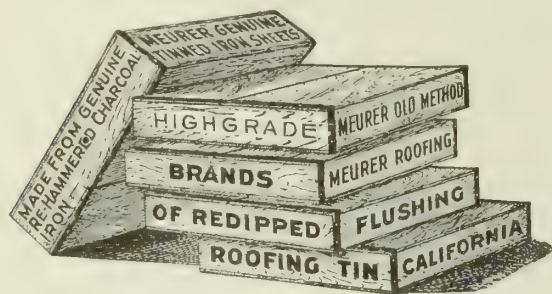
High Grade Brands of ROOFING TIN; "MEURER FIRE DOOR TERNES"; METAL SPANISH ROOFING TILE; METAL MISSION TILE; METAL SLATES; METAL SHINGLES; FINIALS; HIP and RIDGE ROLLS; ANCHOR VENTILATORS.

Sole importers of "MEURER'S" GENUINE TINNED IRON SHEETS.

## "Meurer's" Genuine Tinned Iron Sheets (Imported).

"Meurer's" genuine tinned iron sheets are a heavily coated plate on a base of pure re-hammered charcoal iron, manufactured in Wales and furnished the trade in original boxes. They are coated with palm oil, by hand, in old style open pots. Only prime plates come to this country.

These plates have been in use over 25 years on private, public and government buildings throughout the United States and this company has never had a complaint. With care they will last a lifetime.



HIGH GRADE BRANDS OF ROOFING TIN

## Domestic Manufacture.

Steel base plates are all coated on a base of high grade puddled steel and are well known for their lasting qualities.

## Meurer Old Method.

Meurer Old Method, as its name denotes, is a hand dipped, palm oil plate made in old style open pots. Carries 40 lbs. of rich coating and is the best plate made.

## Meurer Roofing.

Meurer roofing is made the same way as Old Method, except it is dry finished and has a large, hand-

some mottle. Carries 40 lbs. of coating and differs from Old Method only in the finish.

## Flushing.

Flushing is a dry coated plate very rich in tin; has a small, beautiful mottle; carries 25 lbs. of coating and is one of the best plates made of medium grade.

## Pullman.

Pullman is an oil finished plate; carries 20 lbs. of coating. One of the best for cheap work.

## California.

California is a handsome mottled plate made expressly for Western coast trade. Carries 15 lbs. of coating and is very popular.

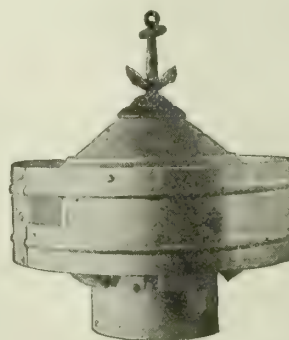
## "Meurer Fire Door Ternes."

"Meurer fire door ternes," IC, for fire doors and shutters, are made under exact specification of the National Board of Fire Underwriters. Terne plates, 14 by 20, stamped with brand and thickness.

## Anchor Ventilators.

As an automatic ventilator the Anchor stands alone. It is the only ventilator that works at the low wind velocity of 1¼ miles an hour. Its exhaust capacity is very great. This, added to the fact that from its peculiar construction, it is absolutely stormproof, renders it the most perfect of all ventilators. Made with glass tops it combines the advantages of skylight and ventilator. Made principally in galvanized iron and copper.

Send for book on "Automatic Ventilation and Tests." It is free.



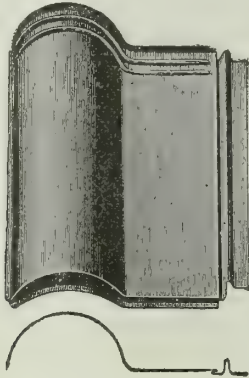
ANCHOR VENTILATOR, METAL TOP



**Metal Spanish Roofing Tile, Tiffany Design.**

Meurer's metal Spanish roofing tile produces that most desirable of all architectural effects, viz., lights and shadows, as is demonstrated in the illustration of the Pacific Telephone and Telegraph Building. The nose is square, thereby casting a deep shadow. Round off or bevel the nose and the shadow is lost. The end is recessed, thereby producing a deep shadow, and giving a clean, sharp, clear cut eave line.

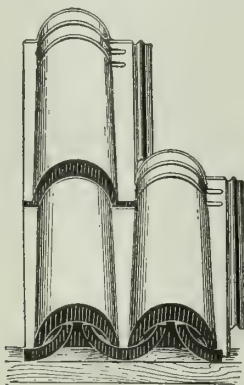
This starting tile, designed by the late Stanford White for the Tiffany building, is the only one of its kind made and is patented.



METAL SPANISH TILE, SHOWING HIGH WALL SIDE LOCK

**Metal Mission Tile.**

The metal mission tile is a perfect reproduction of the old California clay mission tile and was designed especially for mission buildings. It is bold and handsome and the only one of its kind made. The starting tile is also recessed, giving the same clear cut sharp eave line and light and shadow effect as the Tiffany starter.



METAL MISSION TILE

**Side Lock, Material and Application.**

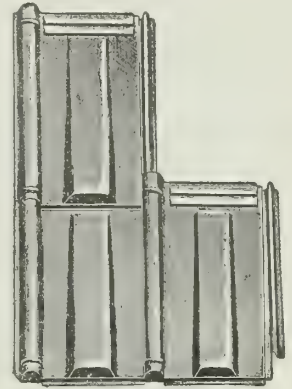
All "Meurer" tiles have the patent high wall side lock, making it impossible for them to leak. Made in tin painted, tin galvanized, zinc and copper. "Meurer" shingles and tiles are as easily put on as wood shingles or slate and require no soldering except at valleys.

**Hip and Ridge Covering.**

Suitable finials, hip and ridge rolls are made for "Meurer" shingles and tiles.

**Unique Metal Slates.**

Unique metal slates are different from the ordinary metal shingles in that they do not break joints. The lines are all straight, giving the appearance on the roof of ribs. Having patented high wall side lock they never leak even on a low pitch. Made in tin painted, tin galvanized, zinc and copper. The galvanized are stamped out of terne plates, then galvanized, thus insuring no scaled edges to rust out.



UNIQUE SLATES

**Specification.**

When in want of the best goods of their class specify any of the above, not forgetting the word "Meurer," and insist on getting them.



PACIFIC TELEPHONE AND TELEGRAPH BUILDING, CHINATOWN EXCHANGE, SAN FRANCISCO, CAL.

# THE STARK ROLLING MILL CO.

Manufacturers of Toncan Metal Rust and Corrosion Resisting Sheets,  
Roofing, Siding and Accessories

MILL AND MAIN OFFICE  
CANTON, OHIO

## Products.

TONCAN METAL BLACK and GALVANIZED RUST and CORROSION RESISTING SHEETS for Roofing, Siding, Cornice, Eaves Trough, Conductor Pipe, Lath, Shingles, Window Frames, Ventilators, Skylights, Reinforcing, Refrigerators, Tanks and Blower Systems and all other purposes where durable sheet metal is needed.

## Description.

Toncan Metal is a rust and corrosion resisting metal sheet made from an iron ore base, and procurable in galvanized, painted or black form.

Briefly, its durability is due to its purity, homogeneity, and scientific processes of manufacture.

## Advantages.

In Toncan Metal lies the architect's solution to the sheet metal problem.

It enables him to specify durable sheet metal at a moderate price instead of being compelled to resort to either prohibitive priced copper or cheap, but short lived, steel or iron sheets.



TRADE-MARK

## Evidence and Data.

Years of experience under the most severe conditions have conclusively proved Toncan Metal's durability.

There are hundreds of Toncan Metal

installations.

The "Evidence Book," containing photographs of prominent installations, and "Corrosion—The Cause—The Effect—The Remedy," containing complete data, will be sent on request.

## Source of Supply.

Any sheet metal contractor, roofer or tinner can furnish Toncan Metal promptly, as prominent jobbers everywhere carry complete stocks for prompt delivery.

## Identification.

The trade-mark shown above is stencilled in red from two to three times on every sheet, and die-stamped on all eaves trough, conductor pipe, elbows, etc.



HECKSCHER BUILDING,  
NEW YORK, N. Y.

All ventilating ducts made of Toncan Metal Sheets



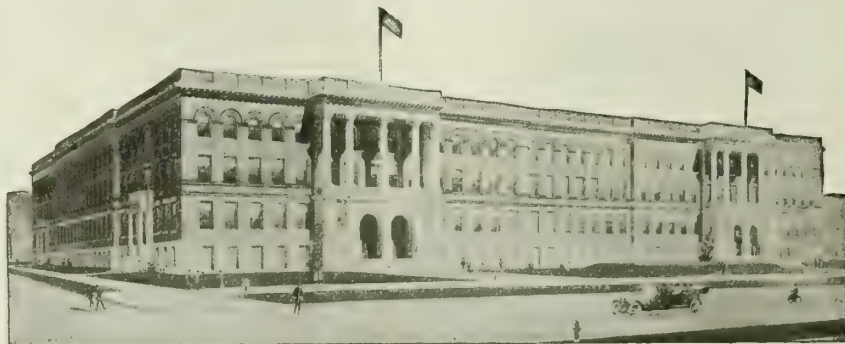
EDGEWATER BEACH HOTEL,  
CHICAGO, ILL.

Toncan Metal used for all window frames, fire doors, skylights, etc.



POST DISPATCH BUILDING,  
ST. LOUIS, MO.

Toncan Metal used for air washers, heating and ventilating systems



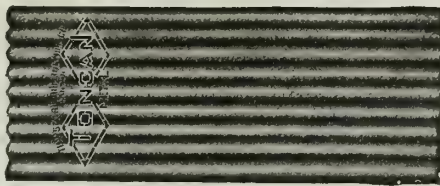
UTICA FREE ACADEMY AND TECHNICAL HIGH SCHOOL, UTICA, N. Y.

Ten tons of Toncan Metal used for cornice and capping



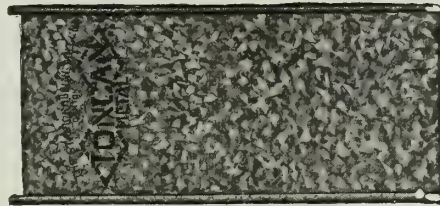
**Roofing.**

**CORRUGATED**  
— Covering  
width, 24 ins.  
Gauges, Nos.  
10 to 28, inclu-  
sive. Lengths 5  
to 12 ft.



CORRUGATED ROOFING

**STANDING SEAM** — Covering  
width 24 ins.  
Gauges, Nos. 20  
to 28, inclusive.  
Lengths 5 to  
12 ft.



PRESSED STANDING SEAM ROOFING

**V-CRIMPED**  
— Covering  
width 24 ins.  
Gauges, Nos. 16  
to 28, inclusive.  
Lengths 5 to  
12 ft.



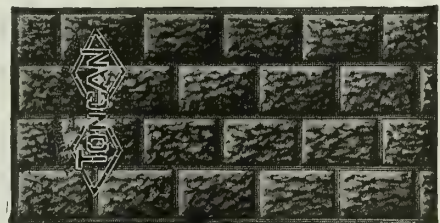
V-CRIMPED ROOFING

**ROLL**—Covering  
width 24  
ins. Each roll  
contains 100  
sq. ft.



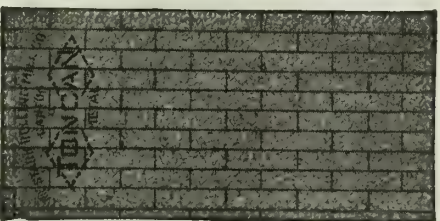
ROLL ROOFING, ALL STYLES

**IMITATION  
ROCK FACE**—  
Sheets 28 by  
60 ins. Gauges,  
Nos. 24 to 28,  
inclusive.



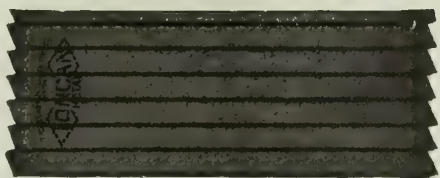
IMITATION ROCK FACED STONE SIDING

**IMITATION  
BRICK FACE**—  
Sheets 28 by  
60 ins. Gauges,  
Nos. 24 to 28,  
inclusive.



IMITATION BRICK FACED SIDING

**IMITATION  
WEATHER  
BOARD**—Covering  
width 24 ins.  
Lengths 5 to 10  
ft. inclusive.



IMITATION WEATHER BOARD SIDING

CORRUGATED RIDGE  
ROLL

2½- or 1¼-in. corrugations. Lengths,  
28 ins. to 46 ins.

CORRUGATED END  
WALL FLASHING

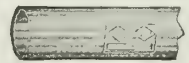
Lengths, 28 ins. to 96 ins. Flat side  
on wall, 2 ins. Corrugated apron,  
4 ins.

CORRUGATED SIDE  
WALL FLASHING

2½-in. or 1¼-in. corrugations. Any  
length up to 96 ins. Corrugated  
apron, 8 ins. Flat side, 5½ ins.

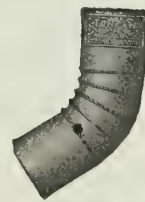
PLAIN (ROUND) RIDGE  
ROLL

With or without nailing flange.  
Lengths, 8 ft. and 10 ft.  
Girths, 6, 7, 8, 10, 12  
and 14 ins.



CONDUCTOR PIPE

Round corrugated, square cor-  
rugated, and plain round con-  
ductor pipe. Lengths, 8 ft. and  
10 ft. All diameters. Elbows,  
miters and cut-offs to match

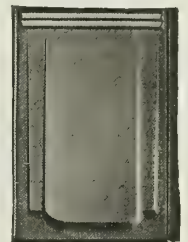
EAVES TROUGH  
Lengths, 8 and 10 ft.; all  
diameters

TONCAN METAL CONDUCTOR PIPE ELBOWS

All sizes and angles are procurable

**Shingles.**

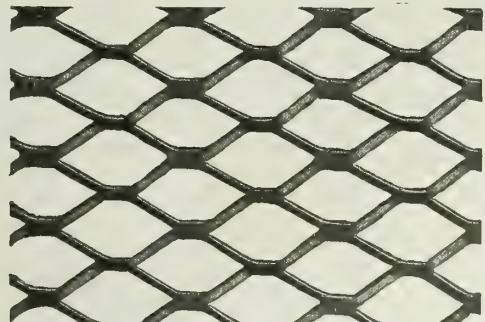
The style shown is one of many.  
They are made 10 by 14 ins. and  
14 by 20 ins.



SHINGLE

**Expanded Lath.**

Galvanized or black. Fireproof, durable and sani-  
tary. Gauges, Nos. 22 to 27 inclusive. Lengths 18  
by 96 ins.



TONCAN METAL EXPANDED LATH



# N. & G. TAYLOR COMPANY

Manufacturers of Tin Plate of all Kinds

ESTABLISHED 1810  
109TH YEAR

Chestnut and Third Streets  
PHILADELPHIA, PA.

WORKS  
CUMBERLAND, MD.

## BRANCH OFFICES

NEW YORK, Townsend Building, 1123 Broadway  
SAN FRANCISCO, 245 Mission Street

CHICAGO, 208 South LaSalle Street

## STOCK CARRIED AT

Philadelphia, New York, Chicago, St. Louis, San Francisco, Denver, Los Angeles, Portland, Seattle, and by Wholesale Hardware and Sheet Metal Supply Houses in all parts of the United States

## Products.

"TARGET AND ARROW" BRAND OF ROOFING TIN, formerly known as "Taylor's Old Style."

"Taylor's Special 40 Pounds Coating, Pure Open Hearth Base"; "Taylor's Columbia Extra Coated," "Fire Protection Terne"; with other brands of Roofing Tin, Ternes, Bright Tin Plate and Blackplate.

## Advantages of Tin Roofing.

These can be summed up briefly as follows: (1) Durable. (2) A time tried, long established material. (3) Easily applied. (4) Adaptable to any kind of surface. (5) Moderate first cost. (6) Low cost of maintenance. (7) Easily and quickly repaired, if damaged. (8) Loses nothing in appearance with age. (9) Light in weight. (10) Weatherproof. (11) Not affected by heat or cold. (12) Gives protection against lightning. (13) Incombustible and prevents spread of fire. (14) Can be painted any color.

## Maintenance.

A coat of paint every four or five years, to keep the surface in first class condition. Use for first coat only metallic brown, Venetian red, iron oxide, red lead, or white lead with pure linseed oil. Afterward any color to suit the color scheme of the building.

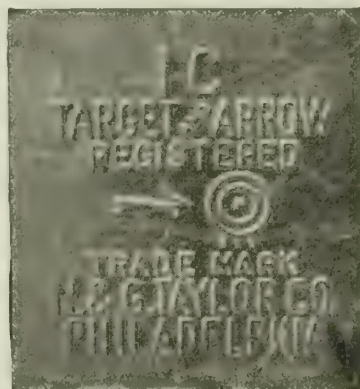
Cost of painting about  $\frac{1}{2}\text{¢}$  per sq. ft. Each painting restores the roof to its original condition. With this slight attention a "Target and Arrow" tin roof will usually outlast the building it covers.

## "Target and Arrow" Brand Roofing Tin.

This is our highest grade and the same durable quality of roofing tin that we have supplied to the American sheet metal roofing trade for more than 60 years. It is an old specialty, made by a process handed down from the early days of our business. The base plate is a special quality, developed in our complete works, following the best practice of former years. Extreme durability is obtained by an exclusive coating process of ours, by which an exceptionally heavy coating is applied, rich in pig tin. The black sheets used are cut accurately to the finished standard size, 14 by 20 ins. or 28 by 20 ins. before tinning, to prevent uncoated edges. The finished sheets are closely inspected, and only the primes or perfect sheets are stamped with the "Target and Arrow" trade-mark.

This tin has in many cases lasted in good condition on the roof for more than 60 years.

Furnished in three standard thicknesses, known as 1C (pronounced *eyesee*), approximately No. 30-gauge U. S. Standard; 1X (pronounced *one-cross*), approximately No. 28-gauge, and 2X (pronounced *two-cross*), approximately No. 27-gauge. Odd sizes can be made to order.



## Recommendations in Laying Tin Roofing.

SECTION OF "TARGET AND ARROW" TIN  
Note appearance of trade-mark stamped on each sheet

The following suggestions are in accordance with the standard working specifications adopted by the National Association of Sheet Metal Contractors:

**SLOPE OF ROOF**—If tin is laid flat seam or flat lock, roof should incline  $\frac{1}{2}$  in. or more to the foot; and if laid standing seam, 2 ins. to the foot. Gutters, valleys, etc., should have sufficient incline to prevent water standing in them or backing up. A good pitch is always desirable.

Tongued and grooved sheathing boards are recommended. Dry lumber, narrow width, even thickness, free from holes. If laid thus, sheathing paper is not necessary. If steam, fumes or gases are likely to reach underside of tin, use a standard waterproof building paper. Never use tar paper.

Never lay a new tin roof over old tin, rotten shingles or tar roofs. No nails should be driven through the sheets.

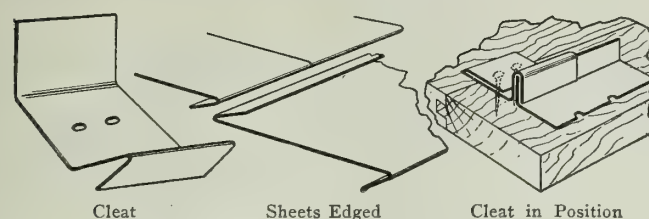
Never use graphite or tar paints on tin roofing.

## For Fireproof Buildings.

The small amount of wood required for a light deck, supported by steel roof framing, and covered with tin, represents so small a fire risk as to be negligible in the case of fireproof buildings. The tin roofing protects the roof from exposure risks, and in the case of fire within the building prevents the flames from breaking through. Moreover, there is a considerable saving in using this type of roof in contrast with heavy, costly forms of roof construction.

If the use of wood is prohibited, specify the Metropolitan type of roof construction (of Keystone Fireproofing Company) to be covered with "Target and Arrow" tin, the tin roofing to be applied in the same manner as to wood sheathing, nailing directly into the gypsum slab with cement coated nails 2 ins. long. No nailing strips required.

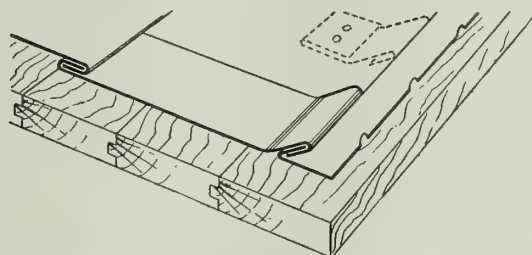




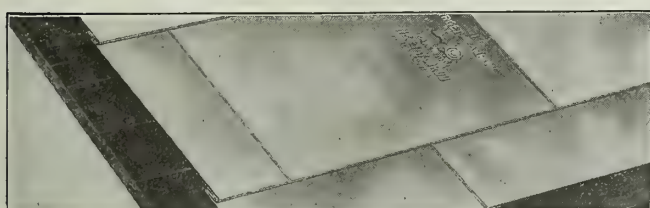
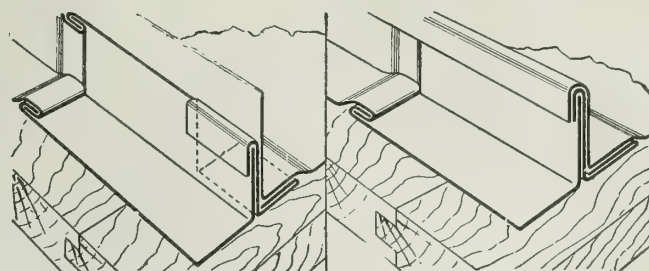
Cleat

Sheets Edged

Cleat in Position

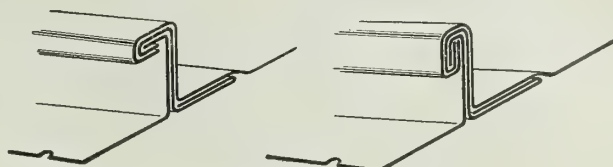


Sheets in Position for Hammering Down and Soldering

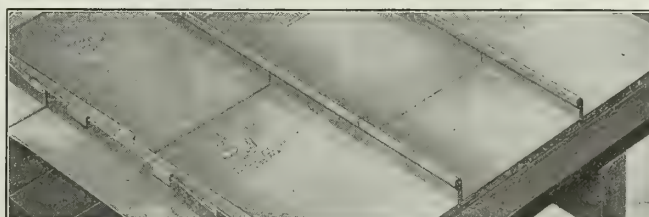
Appearance of Finished Roof  
FLAT SEAM ROOFING

First Operation

Second Operation



Third and Fourth Operations

Finished Appearance of Roof  
STANDING SEAM ROOFING

### Specifications for Standing and Flat Seam Roofing.

Form recommended by the National Association of Sheet Metal Contractors for the use of architects:

**TIN ROOFING WORK**—All tin used on this building shall be Taylor's "Target and Arrow" brand. No substitute for this brand will be allowed. Use IC thickness for roof proper, decks, etc., and IX thickness for valleys, gutters and spouts, as required by design. One coat of red or white lead, iron oxide, metallic brown, or Venetian red paint, with pure linseed oil, shall be applied to underside of tin before laying.

**FOR FLAT SEAM ROOFING**—Edges of sheets to be turned  $\frac{1}{2}$  in.; all seams to be locked together and well soaked with solder. Sheets to be fastened to sheathing boards by cleats spaced 8 ins. apart; cleats locked into seams and fastened to roof with two 1-in. barbed wire nails; no nails to be driven through the sheets.

**FOR STANDING SEAM ROOFING**—Sheets to be put together in long lengths in shop; cross seams to be locked together and well soaked with solder. Sheets to be made up the narrow way in the rolls and fastened to sheathing boards by cleats spaced 1 ft. apart. Valleys and gutters to be formed with flat seam well soldered; sheets to be laid the narrow way. Flashings to be let into joints of brick or stonework, and cemented. If counterflashings are used, lower edge of counterpart shall be kept at least 3 ins. above roof. Solder to be of best grade, bearing the manufacturer's name, and guaranteed one-half tin and one-half lead—new metals. Use rosin only as a flux. Never use acid.

**CAUTION**—No unnecessary walking over tin roof or using it for storage of material shall be allowed. In walking on the tin, care must be taken not to damage paint nor break coating of tin. Rubber soled shoes or overshoes should be worn by men on the roof.

**PAINTING TIN WORK**—All painting of tin work to be done by roofer, using red or white lead, iron oxide, metallic brown, or Venetian red paint, with pure linseed oil. No patent dryer or turpentine to be used.

All paints to be applied with a hand brush and well rubbed on. Tin to be painted immediately after laying. A second coat shall be applied in a similar manner, two weeks later.

No deviation from these specifications shall be made unless authority be given in writing by the architect. Only a first class roof will be accepted.

**NOTE**—Extra copies of this form ready for insertion in building specifications will be sent on request.

SIZES AND WEIGHTS, FLAT SEAM AND STANDING SEAM ROOFING

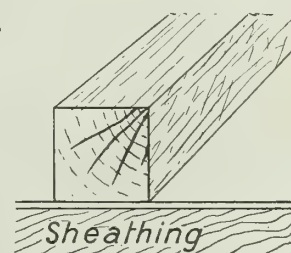
Method of laying	Size of sheets, ins.	Sheets per box	Covering size of sheet, ins.	Covering capacity per sheet, sq. in.	Covering capacity per box, sq. ft.
Flat seam.....	14x20	112	$12\frac{1}{2} \times 18\frac{1}{2}$	231.25	180
	28x20	112	$26\frac{1}{2} \times 18\frac{1}{2}$	490.25	381
Standing seam.....	14x20	112	$11\frac{1}{4} \times 18\frac{3}{8}$	212.34	165
	28x20	112	$25\frac{1}{4} \times 18\frac{3}{8}$	476.59	360

"Target and Arrow" roofing tin is usually furnished in two sizes: 14x20 in. and 28x20 in., packed 112 sheets to box. For convenience, this tin is also put up in rolls 14, 20 and 28 ins. wide. Each roll contains 108 sq. ft. Tin is painted one or both sides as desired. Seams are carefully soldered by hand, using good 100 to 100 solder, and rosin as a flux. "Target and Arrow" tin is furnished in three thicknesses; IC thickness weighs approximately 65 lbs. per 100 sq. ft. laid on roof.

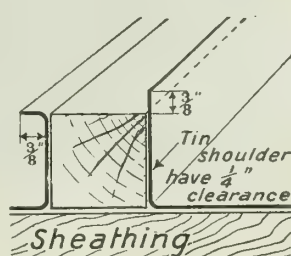
### Ribbed Tin Roofing—Laying.

(First) Cover the wood sheathing with a good quality of building felt or waterproof paper, free from tar or acids; then nail the wood strip of desired size over the felt. Ribbs are spaced  $17\frac{3}{8}$  ins. on centers for 2 by 2-in. ribbs and 20-in. width sheets of tin.

(Second) Tin is applied over the felt and between the ribbs, using either rolls or sheets, fastened together with flat horizontal seams, and turned up against the rib to stand  $\frac{3}{8}$  in. above it; this  $\frac{3}{8}$  in. is then turned over flush with the top of the rib and is ready to receive the clips or cleats.



FIRST OPERATION

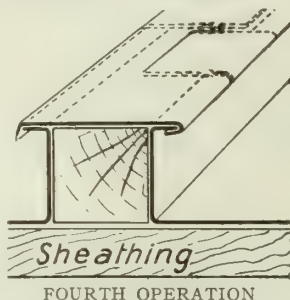
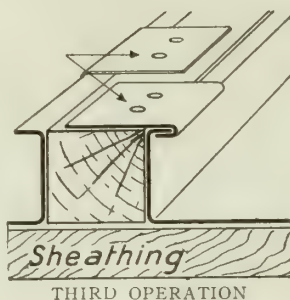


SECOND OPERATION

Continued on next page

(Third) Tin cleats, 1 for each side, are locked over the laps and nailed securely to the top of the rib. These cleats should be spaced 8 to 10 ins. apart along the entire length of rib.

(Fourth) The cap is cut  $3\frac{3}{4}$  ins. wide (for 2-in. width wood rib) allowing  $\frac{3}{8}$  in. on each side to turn; one edge is turned completely over as a groove for the tongue of the standing sheet and the other side is turned at a right angle. Insert the tongue in the groove, press the cap down to the surface of the rib and lock the other side by folding under the down turned flange.



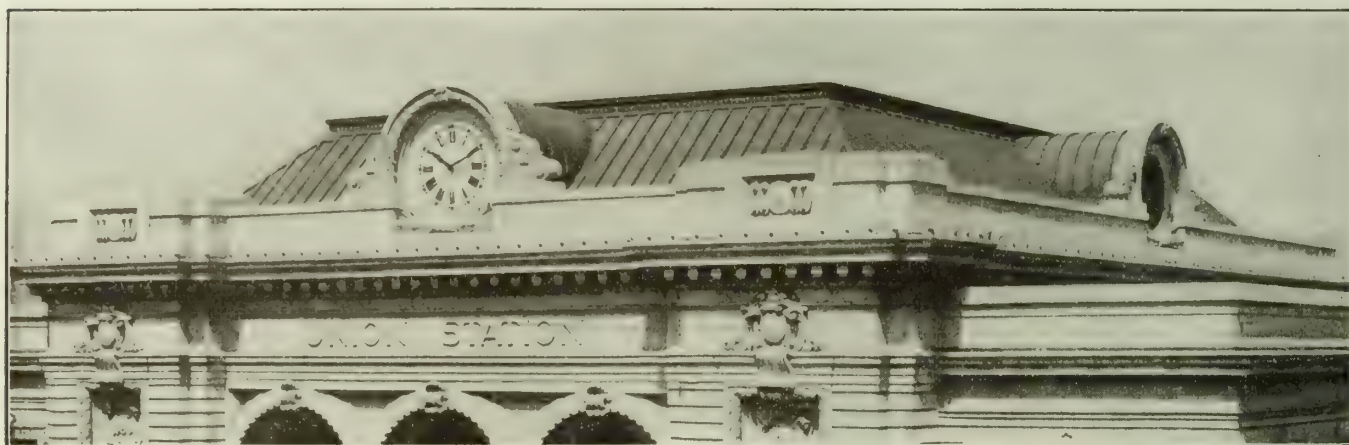
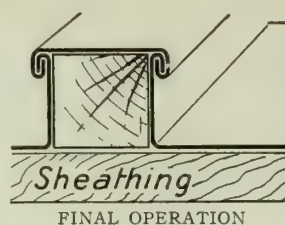
(Finally) Turn both folds down snugly against side of rib, completing the joint. Cover the end of rib with tin lapped out on all sides and finish same as cap.

GENERAL REMARKS—Ribs may be any size or shape, and spaced any distance apart, depending upon the character of the building and the effect desired.

WORKING DRAWINGS—Four large detail sheets, giving full information on this subject, and showing various color effects, will be sent on request. The sheets will also be found in the portfolio of "Service Sheets," issued to architects by the Architectural Service Corporation of Philadelphia.

#### Bulletin.

"The Arrow," a little, breezy and instructive illustrated publication, sent quarterly to architects and their draughtsmen on request.



APPEARANCE OF RIBBED TIN ROOFING, NEW UNION STATION, DENVER, COLO.



APPEARANCE OF RIBBED TIN ROOFING, NEW CHEMICAL LABORATORY, VASSAR COLLEGE, POUGHKEEPSIE, N. Y.



# FEDERAL CEMENT TILE CO.

Westminster Building

CHICAGO, ILL.

WORKS, HAMMOND, IND.

## Products.

"FEDERAL" REINFORCED CEMENT SLABS, for roofs, gutters, walls, floors, etc.

Hollow Slabs, with 1-in. non-conducting air space, are furnished for pitched roofs in standard lengths, and for flat surfaces in lengths spanning up to 10 ft. in the clear.

## "Federal" Reinforced Cement Slabs.

Impervious to severest elements. Not affected by heat, cold, fire or water; strengthen with time. Laid directly on steel purlins, making a fireproof construction. All joints interlock and overlap. Require no painting, repairing, or other maintenance; and, once in place, will last as long as the structure.

### "FEDERAL" SLAB DATA FOR STANDARD PITCHED ROOFS

Covers 24 by 48 ins.	Wire reinforcement
Over all length, 52 ins.	Purlin spacing, 4 ft. 0 in.
12½ slabs per square (100 sq. ft.)	Least allowable slope, 1/5 pitch
16 lbs. weight per sq. ft.	Safe carrying load, 100 lbs. per sq. ft.
Thickness, 1 in.	Breaking load, 300 lbs. per sq. ft.

## Cost.

"Federal" slabs make the best and cheapest roof on the market, because they are indestructible and everlasting; no expense for maintenance; cut the rates if fire insurance is carried; save steel in the building frame; eliminate wood sheathing, also repairs and renewals.

## Estimates.

Estimates made from plans for roofs laid complete and guaranteed.

## Co-operative Service.

Our engineers are structural experts and will assist patrons in detailing steel work to carry "Federal" slabs, making no charge for this service.

## Details.

Details and half tones in large scale, also catalogue, on application.

## References.

"Federal" slabs cover a large variety of structures, as shown by the following partial list of contracts:

### BOILER, ENGINE AND ELECTRIC POWERHOUSES

United States Steel Corporation, 6 plants  
International Harvester Co., 5 plants  
Elgin, Joliet & Eastern Ry., Joliet, Ill., and Gary, Ind.  
American Maize Products Co., Roby, Ind.  
Studebaker Corp., South Bend, Ind., and Detroit, Mich.  
Wisconsin Steel Co., South Chicago, Ill.  
Pullman Co., Pullman, Ill.  
Calumet Steel Co., Chicago Heights, Ill.  
Iroquois Iron Co., Chicago, Ill.  
J. T. Ryerson & Son, Chicago, Ill.  
Illinois Brick Co., Chicago, Ill.  
Sioux Falls Light & Power Co., Sioux Falls, S. D.  
City of Fremont, Neb.

### MACHINESHOPS

United States Steel Corporation, various plants  
Durand Steel Locker Co., Chicago Heights, Ill.

City of Chicago, various buildings

John Mohr & Son, Chicago, Ill.

Great Western Smelting & Refining Co., Chicago, Ill.

### FOUNDRIES, BLACKSMITH AND FORGE SHOPS

United States Steel Corporation, Gary, Ind.; Joliet, Ill.  
Industrial Works, Bay City, Mich.  
National Brake & Electric Co., Milwaukee, Wis.  
American Brake Shoe & Foundry Co., Chicago, Ill.  
Advance Rumely Co., LaPorte, Ind.; Battle Creek, Mich.  
Crane Co., Chicago, Ill.  
American Seating Co., Grand Rapids, Mich.  
National Tool Co., Cleveland, Ohio  
Deere & Co., Moline, Ill.  
International Harvester Co., 5 plants  
National Malleable Castings Co., Chicago, Ill.  
Union Drop Forge Co., Chicago, Ill.  
American Steel Foundries Co., Indiana Harbor, Ind.; Granite City, Ill.

### RAILROAD BUILDINGS

New Kansas City Station and Train Sheds  
Illinois Central Railroad, Memphis, Tenn.  
Elgin, Joliet & Eastern Ry., Joliet, Ill.; Gary, Ind.  
Pennsylvania Railroad, Chicago, Ill.; Indianapolis, Ind.  
Chicago & Northwestern R.R. Co., 3 plants  
Kansas City Southern Railway Co., Port Arthur, Tex.  
Chicago Great Western R.R., Stockton, Ill.  
Baltimore & Ohio R.R., Chicago, Ill.  
Grand Trunk System, Chicago, Ill.

### PAPER MILLS

Nekoosa-Edwards Paper Co., Port Edwards, Wis.  
Kimberly-Clark Co., Kimberly, Wis.  
Henry Weis, Quincy, Ill.  
Weis Manufacturing Co., Monroe, Mich.

### AUTOMOBILE PLANTS

Ford Motor Co., Detroit and Dearborn, Mich.  
General Motors, Flint and Detroit, Mich.  
Willys-Overland Company, Toledo, Ohio  
Studebaker Corporation, Detroit, Mich.  
Maxwell Motor Co., Detroit, Mich.  
Packard Motor Car Co., Detroit, Mich.  
Hudson Motor Car Co., Detroit, Mich.  
Haynes Automobile Co., Kokomo, Ind.  
Dodge Bros., Detroit, Mich.

### IMPLEMENT PLANTS

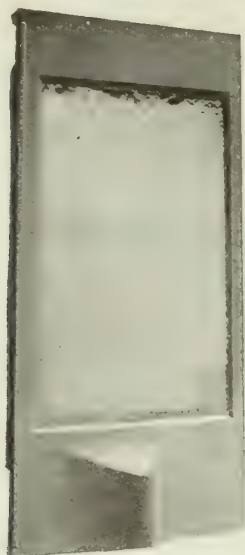
International Harvester Co., 5 plants  
Deere & Co., Moline, Ill.  
Oliver Chilled Plow Works, South Bend, Ind.  
Emerson-Brantingham Co., Rockford, Ill.  
Advance Rumely Co., LaPorte, Ind.; Battle Creek, Mich.  
Studebaker Corp., South Bend, Ind.; Detroit, Mich.  
Mandt Wagon Co., Stoughton, Wis.  
J. I. Case Plow Works, Racine, Wis.  
Western Wheeled Scraper Co., Aurora, Ill.  
Austin Manufacturing Co., Harvey, Ill.

### AUDITORIUMS AND THEATERS

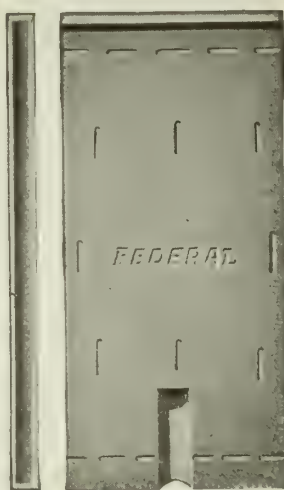
Orpheum Theater, Detroit, Mich.  
High School, Harvey, Ill.  
Franklin Theater, Saginaw, Mich.  
Regent Theater, Detroit, Mich.  
Globe Theater, Kansas City, Mo.  
Michigan State College Auditorium, Ypsilanti, Mich.  
Juneau Theater, Milwaukee, Wis.

### COKE, GAS AND OIL PLANTS

United States Steel Corporation, various plants  
Solvay Process Co., Detroit, Mich.  
Milwaukee Coke & Gas Co., Milwaukee, Wis.  
Citizen Gas Co., Indianapolis, Ind.  
Texas Co., Texas City, Tex.  
Coal Products Manufacturing Co., Joliet, Ill.  
Gulf Refining Co., Port Arthur, Tex.  
Standard Oil Co., Tulsa, Okla.  
International Harvester Co., various plants



GLASS INSERT SLAB  
5 sq. ft. lighting area



Back



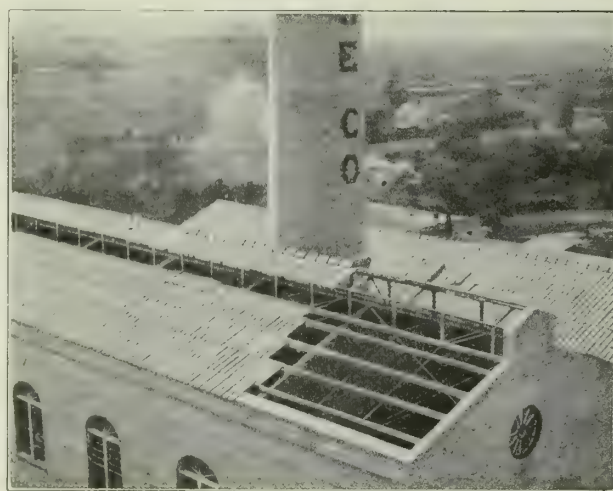
Front

"FEDERAL" INTERLOCKING SLAB



FACTORY WHERE "FEDERAL" REINFORCED SLABS ARE MADE

Two main buildings, each 100 by 500 ft. "Federal" slabs cover roofs. "Federal" glass inserts light factories. Strictly fireproof; no fire insurance required or carried.



POWER PLANT AND OTHER BUILDINGS, AMERICAN MAIZE PRODUCTS CO., ROBY, IND.

Covered with "Federal" standard and glass insert slabs. Illustration shows slabs while erection of roof is in progress



ALL-GLASS INSERT SLAB ROOF, GREAT WESTERN SMELTING AND REFINING CO., CHICAGO, ILL.



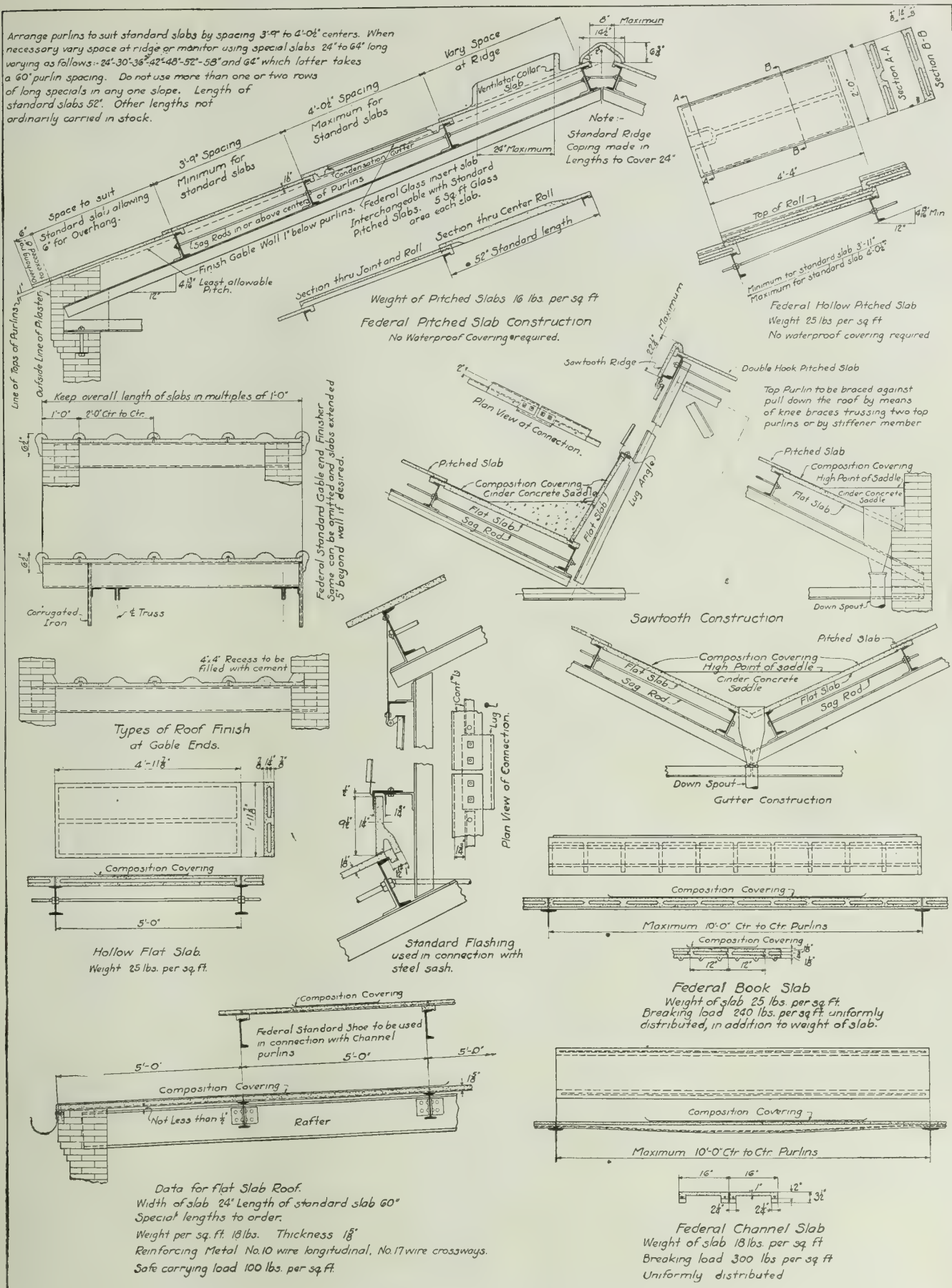
PURE CARBONIC COMPANY'S ROOF, CHICAGO, ILL.

Laying "Federal" cement hollow roof (book) slab, 10-ft. lengths, in zero weather. Note 6-in. covering of snow on roof. Joints hermetically sealed with elastic cement. Composition covering required. Channel slabs 17 lbs. per sq. ft. are laid in same manner.

For details of Roof Construction, see page following



Arrange purlins to suit standard slabs by spacing 3'-9" to 4'-0" centers. When necessary vary space at ridge or monitor using special slabs 24" to 64" long varying as follows: 24"-30"-36"-42"-48"-52"-58" and 64" which latter takes a 60" purlin spacing. Do not use more than one or two rows of long specials in any one slope. Length of standard slabs 52". Other lengths not ordinarily carried in stock.



DETAILS OF FEDERAL ROOF CONSTRUCTION

# AMERICAN CEMENT TILE MFG. CO.

## Cement Tile Roofing

INCORPORATED 1902

Oliver Building  
PITTSBURGH, PA.

### BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street  
BIRMINGHAM, ALA., P. O. Fairfield, Ala.

PHILADELPHIA, PA., Otis Building  
CLEVELAND, OHIO, Rose Building

WORKS  
WAMPUM, PA., LINCOLN, N. J.  
FAIRFIELD, ALA.

### Products and Services.

We manufacture and erect in place on the roof our "BONANZA" REINFORCED CEMENT TILE ROOFING, CEMENT TILE GUTTER PLATES and CEMENT TILE WALL PLATES.

### Construction.

The tiles are made with best Portland cement, reinforced with expanded metal. The reinforcing metal is placed in its theoretically proper position, which is near the lower side of tile, the metal being well protected. The underside presents a smooth appearance, white in color (not ordinary cement finish), which adds greatly to the light in building, so that painting is not necessary.

"Bonanza" is simplicity in modern roof construction. Can be applied in any weather.

### Properties.

Cement roof tiles are not affected by variations in temperature, nor by ordinary plant conditions. They are impervious to water and fireproof. Tiles, not being subjected to a process of burning, are not warped.

### Load Tests.

Under tests, "Bonanza" tile placed on supports, 4-ft. centers, show a carrying capacity up to 350 lbs. per sq. ft. of evenly distributed load.

No tiles are shipped or placed on roof unless they are at least 30 days old.

### Dimensions and Weights.

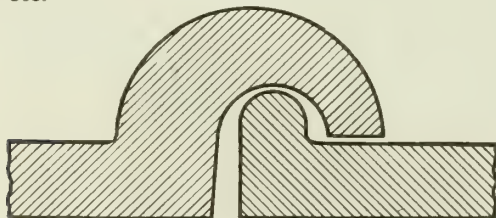
Thickness of tile.....Approximately 1 in.  
Size of tile.....26 by 52 ins.  
Weight per square foot.....12½ lbs.  
Surface exposed to weather.....24 by 48 ins.  
Number of tiles per square of roof (100  
sq. ft.).....12½  
Weight of single tile.....116 lbs.  
Weight per square of roof.....1450 lbs.

### Prices.

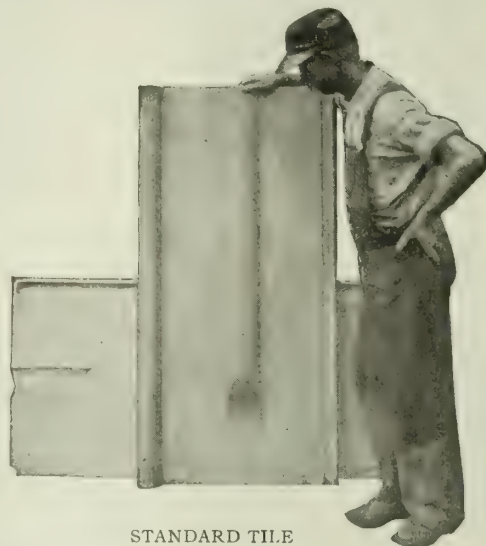
"Bonanza" tile are erected by our experienced roofers. On receipt of drawings and all necessary information, quotations will be furnished.

### Type of Buildings Covered.

"Bonanza" cement tile roofing is especially adapted for manufacturing plants, foundries, warehouses, machine, blacksmith and forge shops, steam and electric power plants, railroad buildings, train sheds, etc.



SECTION THROUGH SIDE ROLL



STANDARD TILE

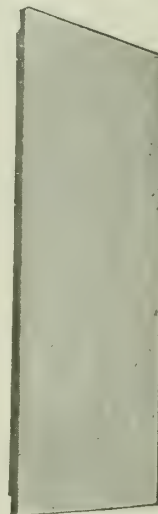
### Flat Tile.

For flat roofs we offer our 1½-in. flat tile laid on I-beams, 5 ft. centers; a light fireproof construction. Weight, 16 lbs. per sq. ft. Carries 150 lbs. per sq. ft., uniformly distributed load. See illustration.

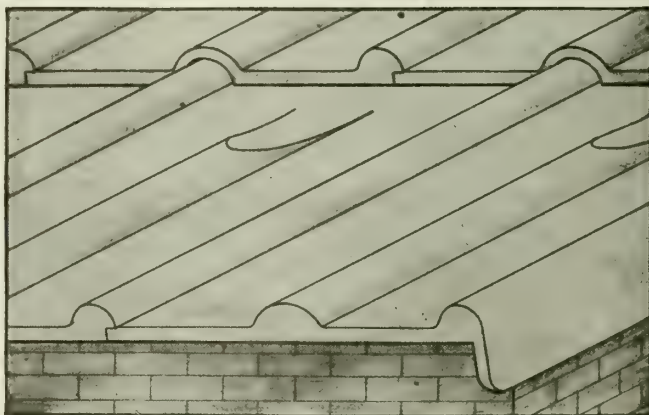
We also manufacture and erect hollow flat tile with 1-in. air space. Weight, 25 lbs. per sq. ft. Laid on I-beam purlins spaced 7½ ft. center to center.

### Details.

On application, the Engineering Department will gladly furnish details and general drawings covering the use of "Bonanza" tile. Write for fully illustrated catalogue.

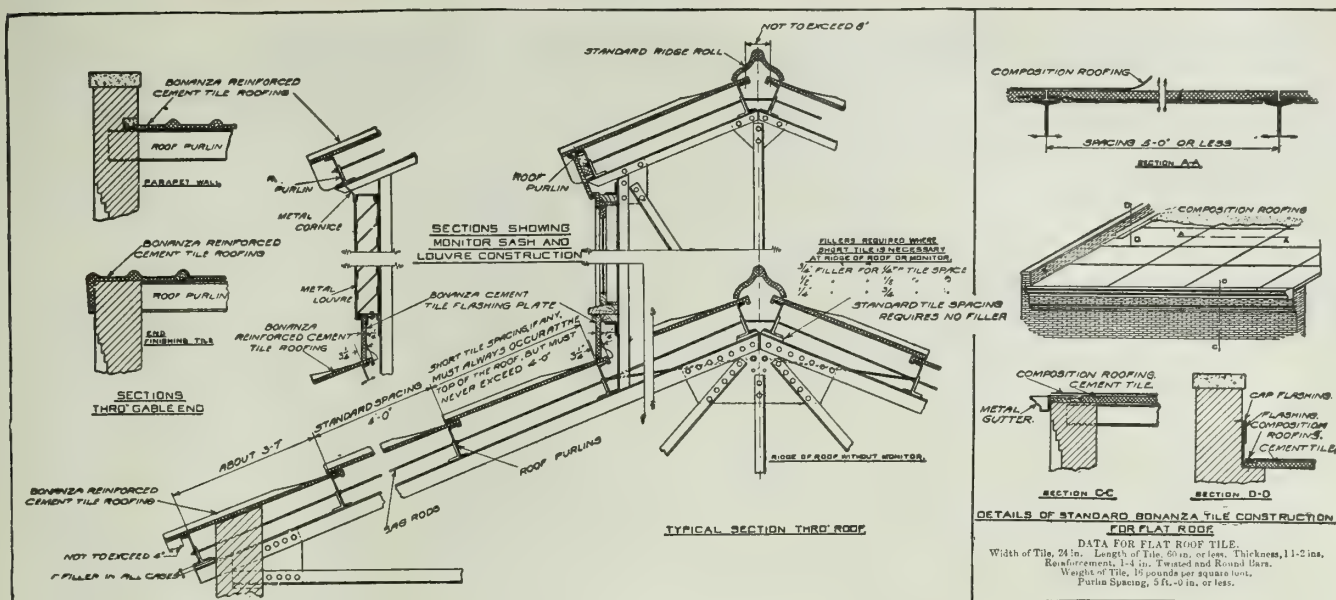


FLAT TILE



METHOD OF LAYING TILE





DETAILS OF ROOF CONSTRUCTION

### Specifications for Pitched Roofs.

**ROOF DESIGN**—Tiles are laid on steel purlins spaced 4 ft. apart. This is the standard spacing, which, if required, can be varied from 3 ft. 10 ins. to 4 ft. 8 ins.

**ROOF PITCH**—The least permissible slope of roof is one-fifth pitch, by which is meant that the rise of roof is equal to one-fifth of the span.

**ROOF PURLINS**—The roof purlins must in all cases be channels or I-beams. The use of trussed angle purlins is not to be allowed, for the reason that they are not stiff enough laterally.

**SAG RODS**—All purlins must be straight and held in alignment by the use of sag rods. For bays up to 16-ft. span, 1 line of sag rods to be used; for larger spans 2 lines are used.

The eave purlin course must be raised 1 in. by means of a plate of that thickness between channel and truss, in order to give to the last tile the same slope as that possessed by the other tiles. A similar arrangement holds good for first purlin at roof apex where short tile are used.

Should the pitch length of roof not allow the use of standard tile length throughout, the short course is placed as a ridge course and can be spaced 20, 24, 28, 32, or 36 ins.

### References:

A partial list of installations of "Bonanza" Reinforced Cement Tile Roofing:

ENTIRE PLANTS  
American Brake Shoe & Foundry Co., Erie, Pa.  
Ammo-Phos Corp., Carteret, N. J.  
Benzol Products Co., Marcus Hook, Pa.  
Board of Water Supply, 47 buildings, New York, N. Y.  
Chas. Boldt Glass Co., Huntington, W. Va.  
Crescent Portland Cement Co., Wampum, Pa.  
Crucible Steel Co., Syracuse, N. Y.; Harrison, N. J.; Midland, Pa.  
Eagle-Picher Lead Co., Point-No-Point, N. J.  
Edgewater Steel Co., Pittsburgh, Pa.  
Grant Motor Car Co., Cleveland, O.  
Harrison Bros., Paulsboro, N. J.  
Lehigh Coke Co., Bethlehem, Pa.  
Nelson Valve Co., Philadelphia, Pa.  
Pittsburgh Seamless Tube Co., Beaver Falls, Pa.  
Pittsburgh Steel Products Co., Stockdale, Pa.  
Ross Gear & Tool Co., Lafayette, Ind.  
Simonds Mfg. Co., Lockport, N. Y.  
Union Carbide Co., Welland, Ont., Can.  
Union Switch & Signal Co., Swissvale, Pa.  
U. S. Government, all shop buildings, Balboa, Panama Canal Zone  
Walden Knife Co., Walden, N. Y.  
Westinghouse Elec. & Mfg. Co., Essington, Pa.  
Worth Steel Co., Claymont, Pa.

MACHINE SHOPS  
Adamson Machine Co., Akron, O.  
American Locomotive Co., Schenectady, N. Y.  
B. R. & P. Ry., Salamanca, N. Y.  
Bullard Mach. Tool Co., Bridgeport, Conn.  
Camden Forge Co., Camden, N. J.  
Gould & Eberhardt, Newark, N. J.  
Heppenstall Forge & Knife Co., Pittsburgh, Pa.

Hubbard & Co., Pittsburgh, Pa.  
N. Y. Air Brake Co., Watertown, N. Y.  
Park Drop Forge Co., Cleveland, O.  
Pressed Steel Car Co., Pittsburgh, Pa.  
Star Drilling Machine Co., Akron, O.  
United Eng. & Fdry. Co., Youngstown, O.  
Wm. Wharton, Jr., & Co., Easton, Pa.

FOUNDRIES  
American Steel Fdries., Pittsburgh and Chester, Pa.  
Barlow Fdry. Co., Newark, N. J.  
Bridgeport Brass Co., Bridgeport, Conn.  
Erie Fdry. Co., Erie, Pa.  
International Harvester Co., Auburn, N. Y.  
Massillon Fdry. & Mach. Co., Massillon, O.  
Natl. Malleable Castings Co., Sharon, Pa.  
Strong Steel Fdry. Co., Buffalo, N. Y.  
Warren Fdry. & Mach. Co., Phillipsburg, N. J.

BLACKSMITH AND FORGE SHOPS  
American Fork & Hoe Co., Ashtabula, O.  
American Vanadium Co., Bridgeville, Pa.  
Baldwin Locomotive Co., Eddystone, Pa.  
Bethlehem Fdry. & Mach. Co., So. Bethlehem, Pa.  
Link Belt Co., Indianapolis, Ind.  
James H. Mann Axe Co., Lewiston, Pa.  
Treadwell Eng. Co., Easton, Pa.

STEAM AND ELECTRIC POWER PLANTS  
Edison Electric Illuminating Co., Cumberland, Md., and Brooklyn, N. Y.  
Goodyear Tire & Rubber Co., Akron, O.  
Gulf Refining Co., Somerville, Mass.; Port Arthur, Tex.  
Morris & Bailey Steel Co., Wilson, Pa.  
Ohio Steel Fdries., Lima, O.  
Parish & Bingham Co., Cleveland, O.  
Southern Power Co. (10 plants), Charlotte, N. C.  
Tide Water Pipe Co., 22 Pumping Stations

MISCELLANEOUS  
Algoma Central Ry. Co., Sault Ste. Marie, Mich.  
Alpha Portland Cement Co., Easton, Pa.; Manheim, W. Va.; Alsen, N. Y.  
Anheuser-Busch Co., St. Louis, Mo.  
Atlantic Refining Co., Pittsburgh, Pa., and Franklin, Pa.  
Babcock & Wilcox Co., Barberton, O.  
Belmont Iron Works, Eddystone, Pa.  
Bethlehem Steel Co., So. Bethlehem, Pa.  
E. W. Bliss Co., Brooklyn, N. Y.  
Busch-Sulzer Bros. & Diesel Eng. Co., St. Louis, Mo.  
Carnegie Steel Co., Duquesne, Pa.; Baltimore, Md.  
Chandler Motor Car Co., Cleveland, O.  
Cochrane Chemical Co., Boston, Mass.  
Crane Valve Co., Bridgeport, Conn.  
D. & C. and B. & C. Docks, Cleveland, O.  
Elyria Iron & Steel Co., Cleveland, O.  
Ford Motor Co., Detroit, Mich.; Walkerville, Ont.; Kearney, N. J.  
General Chemical Co., New York, N. Y.  
General Electric Co., Schenectady, N. Y.  
Harlan & Hollingsworth Corp., Wilmington, Del.  
Ingersoll-Rand Co., Easton, Pa.  
Lafayette College, Easton, Pa.  
N. Y. Central R. R. Freight Terminal, Cleveland, O.  
Otis Elevator Co., Harrison, N. J.  
Pennsylvania Lines, Columbus, O.; Indianapolis, Ind.; Conway, Pa.; Pittsburgh, Pa.  
Solvay Process Co., Detroit, Mich., and Syracuse, N. Y.  
Transue & Williams Co., Alliance, O.  
U. S. Cast Iron Pipe Co., Bessemer, Ala.; Addyston, O.  
U. S. Navy, Newport, Hampton, Pensacola.

# HUNTINGTON ROOFING TILE CO.

OFFICE AND FACTORY

South 16th Street  
HUNTINGTON, W. VA.

SALES OFFICES

ATLANTA, GA.  
BALTIMORE, MD.  
BOSTON, MASS.  
BUFFALO, N. Y.

CHICAGO, ILL.  
CINCINNATI, OHIO  
CLEVELAND, OHIO  
DETROIT, MICH.  
ST. PAUL, MINN.

COLUMBUS, OHIO  
DAYTON, OHIO  
EVANSVILLE, IND.  
GRAND RAPIDS, MICH.  
WASHINGTON, D. C.

LOUISVILLE, KY.  
NEW YORK, N. Y.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.

## Products.

"HUNTINGTON" SHINGLE TILE.  
"HUNTINGTON" SPANISH TILE.  
"HUNTINGTON" PROMENADE TILE.  
ROOF TRIMMINGS of all kinds to match tile.

## "Huntington" Tiles.

"Huntington" Tiles are made from a very pure quality of shale, free from any foreign matter. This shale insures a tile that is of uniform density, having little or no porosity, great strength, and free from lamination. By reason of their extended use for a long period of years architects generally are familiar with the good qualities of the "Huntington" Tiles.

## "Huntington" Shingle Tile.

"Huntington" regular shingle tile is 6 by 13½ by ¾ in., and weighs about 1100 lbs. per square. When laid 5½ ins. to the weather only 436 tiles are required for a square. "Huntington" shingle tiles are curved slightly so that they will lay closely at the butt. The edges are rounded off, forming, when laid, a groove or channel that enables any water which gets into the side joints to escape freely without spreading under the tile. This rounding of the edges also emphasizes the joints and makes a roof with more character than one of tile with square edges.



HUNTINGTON SHINGLE TILE

DIRECTIONS FOR LAYING—As is customary with all tile and slate roofs, the sheathing is first covered with a suitable asphalt or roofing felt. "Huntington" shingle tile is then secured to the sheathing by means of 2 large headed barbed nails, driven through the holes in each tile. In some cases galvanized iron nails, and in others copper nails, are used. No cement is required to lay "Huntington" shingle tile.

## "Huntington" Spanish Tile.

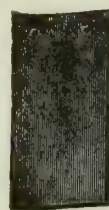
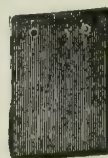
"Huntington" Spanish tiles, like "Huntington" shingle tiles, are in a class by themselves. They are made from the same superior shale, from an improved model designed by this company. This model affords much clearer lines than anything heretofore on the market. One square can be laid with 180 of these tile.

HUNTINGTON  
SPANISH  
TILE

DIRECTIONS FOR LAYING—The Spanish tile is laid in the usual manner, with which all roofers are familiar.

## Color of Tiles.

The natural color of the "Huntington" tiles is red. By reason of the different degrees of heat applied in the burning, five different shades can be produced, varying from a very light red to a very dark red, almost brown. Uniform shades can be furnished if desired, or if all shades are used a beautiful mottled effect is obtained. This mottled effect has been used by many prominent architects with satisfaction, and seems to be very much in demand.

No. 1—  
6" x 13½"  
RegularNo. 7—  
3" x 13½"  
"Split"No. 8—  
6" x 9½"  
Ridge  
CourseNo. 9—  
6" x 7½"  
Under  
Eaves

SHAPES FOR FITTING

They are also made in a beautiful matt green, in 3 to 4 shades. These varying shades relieve the monotony of the roof color, and produce an effect much desired by the leading architects.

## Advantages of "Huntington" Tiles.

"Huntington" tiles are very uniform in quality, and are made from such a high grade of shale that they are very easily and accurately cut for hips and valleys. Tiles are suitable for all classes of buildings, either in the city or country, and can be applied by any competent roofer.

## Terra Cotta Roof Trimmings.

Illustrations on following page show some of this company's standard patterns, such as ridge rolls, hip rolls, ridge saddles, etc. All rolls and saddles are made to lay 1 ft. on the roof after allowing for necessary lap.

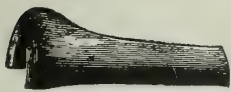
Hip and gable finials of standard pitches are carried in stock. Tower finials usually have to be made to order.

A full line of finials and trimmings of all kinds are illustrated in the regular catalogue, which can be had upon application to the factory, or any sales office.

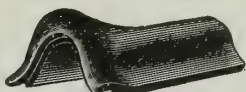
## Orders.

In all cases where graduated tiles for circular towers or circular roofs are desired, these, and all terra cotta trimmings that must fit the pitch of roofs, are

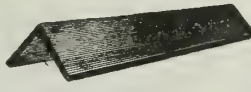




No. 11—3" x 9"  
No. 12—5" x 13"  
No. 13—7" x 13"  
No. 14—9" x 13"



No. 15—6" x 13"  
No. 16—7" x 13"



No. 20—5½" x 13"  
HIP SADDLE

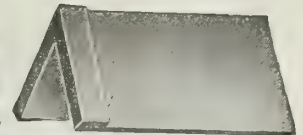


No. 18—3½" x 13"  
No. 19—4½" x 13"

HIP AND RIDGE ROLLS



No. 26—Square Lip  
Length 13"



No. 27—Square Lip  
Length 13"

RIDGE SADDLES

necessarily made to order and require from 4 to 6 weeks' time to make. It is therefore advisable to send orders promptly to avoid delays.

### Scope of Market and Directions for Shipping.

As a full stock of tiles and standard trimmings are always kept ready for shipment, orders of the largest size can be filled and delivered to any point in the United States on short notice.

### Co-operative Service.

This company is always pleased to furnish, promptly, estimates on all classes of tile roofing work, on receipt of the roof plan and the four elevations. Also, will gladly make, at any time, special designs for tile or terra cotta roof trimmings from the architect's drawings.

### References.

#### BUILDING, LOCATION AND ARCHITECT

- Chicago University, Blaine Building, Chicago, Ill., Jas. G. Rogers  
Convent Monastery of Visitation, Riverdale, N. Y., D. W. Daley  
Duquesne Club, Pittsburgh, Pa., Rutan & Russell  
Joliet Library, Joliet, Ill., D. H. Burnham & Co.  
Mrs. Francis Kinicutt's House, Dark Harbor, Me., Foster, Gade & Graham  
St. Joseph's Convent, Brentwood, L. I., Schickel & Ditmars  
U. S. Naval Academy Barracks, Annapolis, Md., James Knox Taylor, Supervising Architect  
U. S. Post Office, Helena, Mont., James Knox Taylor, Supervising Architect  
Arthur A. Carey, Residence, Cambridge, Mass., Hartley Dennett  
Powerhouse, Springfield, Ohio, Hannaford & Sons  
Epileptic Asylum, Gallipolis, Ohio, F. L. Packard  
St. Paul's Church, Savannah, Ga., Jno. Sutcliff  
A. F. Luke, Residence, West Newton, Mass., Chapman & Fraser



RESIDENCE OF W. H. WANAMAKER, JR., MERION, PA.  
THOMAS. CHURCHMAN & MOLITOR, Architects  
Roofed with "Huntington" shingle tile

# KUSHEQUA KERAMIC COMPANY

ELISHA K. KANE, LESSEE

Manufacturer of Ox-blood Floor and Roof Tiles  
KUSHEQUA, PA.

## Products.

KUSHEQUA FLOOR and ROOF TILES.

## Ox-blood Tiles.

Ox-blood tiles show superiority in clear, deep red color, high vitrification, even texture and neat finish. No artificial glaze or coloring, the color and substance being uniform throughout.

The material is a stratified mountain shale of uniform composition. It is ground very fine and highly vitrified by natural gas.

## Size and Grading.

Ox-blood tiles are made in 3 principal sizes: 1 by 6 by 9 ins. (Promenade),  $1\frac{1}{8}$  by 9 by 9 ins. (Quarry), and 1 by 6 by 6 ins. (Quarry).

The Promenade size is graded into 3 qualities: flooring quality (very choice), roofing quality (suitable for floors, excellent for roofs) and seconds (serviceable for roofs or cheap floors). The Quarry sizes, into flooring quality (choice) and seconds (slightly defective).

## Color.

Each grade and size is sorted into 3 shades of clear red color: A (dark red), B (deep red) and C (bright red). Oriental tiles, with dark red centers fading toward gray edges, are also made in 6 by 6 ins. and 6 by 9 ins.

For antique effects, second quality orientals are particularly desirable.

## Specials.

A full line of sanitary cove base, quoins, angles, wainscot caps, plinths, coping and other shapes are carried in stock. Also, key quoins, 3 ins. and  $1\frac{1}{2}$  ins., in red or black, and diagonals and fractional tile for course starters. Other special shapes are made to order on reasonable notice. See opposite page.

## Uses.

Vitrified tiles are used wherever there is need for a surface which is proof against fire, frost, water, acid, grease and dirt. If, in addition to these requirements, beauty of color and resistance to wear are required, Kushequa ox-blood tiles are best.

The choice grades are adaptable for parlors, salons, halls, dining rooms, restaurants, hospitals, operating rooms and laboratories. The cheaper grades are used on roof gardens, roofs, porches, promenades, kitchens, laundries, bridges, packing houses, etc.

## Facilities.

A monthly output of 300,000 tile and large stock carried enables prompt deliveries.

Present stock of tile exceeds \$50,000 in value. Ample stock of crate shooks also on hand.

Transportation facilities unsurpassed, factory being connected with Pennsylvania R.R., Erie R.R., Buffalo, Rochester & Pittsburgh Ry., and Baltimore & Ohio R.R.

## Direct Sale.

Although represented in principal cities by capable



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EQUITABLE BUILDING, NEW YORK, N. Y.  
GRAHAM-BURNHAM, Architects  
Roofed with Kushequa Promenade Tile

wholesale dealers, customers who so desire may buy direct at open published prices. In these, however, there is a reasonable discrimination in favor of tile setters and dealers.

## References.

Stock Yards Inn, Chicago, Ill., R. L. Lindstrom, Architect  
Engineering Laboratory, University of Michigan, Ann Arbor, Mich., Smith, Hinchman & Grylls, Architects  
Niagara Falls Bridges, Niagara Falls, N. Y.  
Canadian Pacific Hotels, Edmondton and Laggan, Alta.  
Tennessee Coal and Iron & Railroad Co., Fairfield, Ala.  
Metropolitan Museum of Art, New York, N. Y., McKim, Mead & White, Architects  
Swift & Co., Packing House, Montreal, Que.  
Giles Residence, Orlando, Fla., L. Percival Hutton, Architect  
Geological Building, Interior Department, Washington, D. C.  
Bureau of Engraving and Printing, Washington, D. C.  
J. K. Billings, Residence, Locust Valley, L. I., Guy Lowell, Architect  
Rockefeller Institute, East 64th Street, New York, N. Y., Shepley, Rutan & Coolidge, Architects  
High School, Waterbury, Conn., Griggs & Hunt, Architects  
St. Augustine's Church, Convent and School, San Juan, P. R.  
Broadmoor Hotel, Colorado Springs, Colo.  
Pennsylvania Hotel, 33d Street and 7th Avenue, New York, N. Y., McKim, Mead & White, Architects





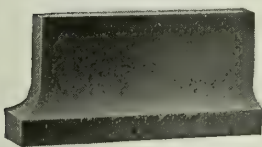
OX-BLOOD PROMENADE TILE

## Straight Sizes

Nos. 9 and 92, 9 x 9 ins.  
 Nos. 1, 10, 11, 12, 13 and 14, 6 x 9 ins.  
 Nos. 6, 60, 61 and 62, 6 x 6 ins.  
 Nos. 3 and 22, 3 x 3 ins.  
 Nos. 2 and 20, 1½ x 1½ ins.

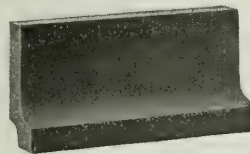
## Fractional Sizes

No. 99 Diagonal, 9 x 9 ins.  
 No. 26 Diagonal, 6 x 6 ins.  
 No. 95 Starter, 9 x 4½ ins.  
 No. 24 Starter, 6 x 4½ ins.  
 No. 23 Starter, 6 x 3 ins.



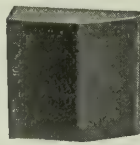
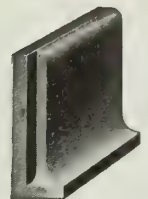
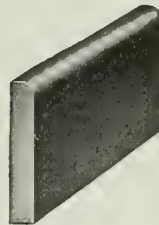
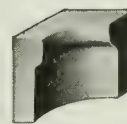
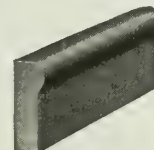
External Cove Angle, L. H.

No. 43, height, 4½ ins.  
 No. 53, height, 6 ins.  
 No. 42, height, 4½ ins., R. H.  
 No. 52, height, 6 ins., R. H.



Cove Base, 4½ ins., Square Top

No. 40, height, 4½ ins.; length, 9 ins.  
 No. 46, height, 4½ ins.; length, 6 ins.  
 No. 50, height, 6 ins.; length, 9 ins.  
 No. 56, height, 6 ins.; length, 6 ins.  
 No. 30, height, 3 ins.; length, 9 ins.  
 No. 36, height, 3 ins.; length, 6 ins.

Internal Cove Angle  
 No. 41, height, 4½ ins.  
 No. 51, height, 6 ins.Square Plinth  
 No. 57, height, 6 ins.  
 No. 47, height, 4½ ins.  
 No. 67, RoundedCove Base, 6 ins.  
 Round Top  
 No. 63, length, 9 ins.  
 No. 66, length, 6 ins.Internal Quoin  
 No. 64, height, 6 ins.  
 No. 34, height, 3 ins.  
 Square topExternal Quoin  
 No. 65, height, 6 ins.  
 No. 35, height, 3 ins.  
 Square topNo. 54, Right Stop  
 No. 55, Left Stop  
 No. 68, Right Stop  
 No. 69, Left Stop  
 No. 54, Right Stop  
 No. 55, Left StopBullnose  
 No. 80, 6 x 9 ins.  
 No. 81, 6 x 6 ins.Bullnose Stop  
 No. 82, 6 x 6 ins.Internal Radius  
 No. 76, 6 ins.  
 No. 77, 9 ins.External Radius  
 No. 78, 6 ins.  
 No. 79, 9 ins.No. 72 Cap  
 Internal QuoinWainscot Cap  
 No. 70, 4 ins. high,  
 9 ins. long  
 No. 71, 4 ins. high,  
 6 ins. longNo. 73 Cap  
 External Quoin

No. 100. Porch Coping



No. 101. Coping Corner

## KUSHEQUA SANITARY BASES AND WAINSCOTS

## NUMERICAL LIST OF ABOVE TO FACILITATE ORDERING BY NUMBER

- |    |  |     |  |
|----|--|-----|--|
| 1  | Promenade Tile, 6 by 9 by 1 ins., Flooring Quality         | 60  | Quarry, 6 by 6 ins., Oriental, Flooring Quality              |
| 2  | Key Quarry, 1½ by 1½ by 1 ins., Flooring Quality           | 61  | Quarry, 6 by 6 ins., Seconds                                 |
| 3  | Key Quarry, 3 by 3 by 1 ins., Flooring Quality             | 62  | Quarry, 6 by 6 ins., Oriental, Seconds                       |
| 4  | Key Quarry, 4 by 4 by 1 ins., Flooring Quality             | 63  | Cove Base, 6 ins. high, round top                            |
| 6  | Quarry, 6 by 6 by 1 ins., Flooring Quality                 | 64  | Cove Base, 6 ins. high, round top, Internal Quoin            |
| 9  | Quarry, 9 by 9 by 1½ ins., Flooring Quality                | 65  | Cove Base, 6 ins. high, round top, External Quoin            |
| 10 | Promenade Tile, Oriental, Flooring Quality                 | 66  | Cove Base, 6 ins. high, round top, 6 ins. long               |
| 11 | Promenade Tile, Roofing Quality                            | 67  | Cove Base, 6 ins. high, Plinth, all edges rounded            |
| 12 | Promenade Tile, Second Quality                             | 68  | Cove Base, 6 ins. high, round top, Right Stop                |
| 13 | Promenade Tile, Third Quality                              | 69  | Cove Base, 6 ins. high, round top, Left Stop                 |
| 14 | Promenade Tile, Oriental, Seconds                          | 70  | Wainscot Cap, 4 ins. high, 9 ins. long                       |
| 20 | Key Quarry, 1½ by 1½ ins., Blackish                        | 71  | Wainscot Cap, 4 ins. high, 6 ins. long                       |
| 22 | Key Quarry, 3 by 3 ins., Blackish                          | 72  | Wainscot Cap, 4 ins. high, Internal Quoin                    |
| 23 | Course Starter, 6 by 3 ins.                                | 73  | Wainscot Cap, 4 ins. high, External Quoin                    |
| 24 | Course Starter, 6 by 4½ ins.                               | 74  | Wainscot Cap, 4 ins. high, Internal Miter                    |
| 25 | Course Starter, 3 by 9 ins.                                | 75  | Wainscot Cap, 4 ins. high, External Miter                    |
| 26 | Diagonal, 6 by 6 ins.                                      | 76  | Wainscot, Internal Radius 6 ins.                             |
| 30 | Cove, 3 ins. high, square top, 9 ins. long                 | 77  | Wainscot, Internal Radius 9 ins.                             |
| 34 | Cove, 3 ins. high, square top, Internal Quoin              | 78  | Wainscot, External Radius 6 ins.                             |
| 35 | Cove, 3 ins. high, square top, External Quoin              | 79  | Wainscot, External Radius 9 ins.                             |
| 36 | Cove, 3 ins. high, square top, 6 ins. long                 | 80  | Bullnose, 6 by 9 ins.  |
| 40 | Cove Base, 4½ ins. high, square top, 9 ins. long           | 81  | Bullnose, 6 by 6 ins.  |
| 41 | Cove Base, 4½ ins. high, square top, Internal Angle        | 82  | Bullnose Stop, 6 by 6 ins.                                   |
| 42 | Cove Base, 4½ ins. high, square top, External Angle, R. H. | 83  | Bullnose, Internal Quoin, 6 ins. high                        |
| 43 | Cove Base, 4½ ins. high, square top, External Angle, L. H. | 84  | Bullnose, External Quoin, 6 ins. high                        |
| 46 | Cove Base, 4½ ins. high, square top, 6 ins. long           | 90  | Quarry, 1½ by 9 by 9 ins., Oriental                          |
| 47 | Cove Base, 4½ ins. high, square top, Plinth                | 92  | Quarry, 1½ by 9 by 9 ins., Second Quality                    |
| 50 | Cove Base, 6 ins. high, square top, 9 ins. long            | 95  | Course Starter, 9 by 4½ ins.                                 |
| 51 | Cove Base, 6 ins. high, square top, Internal Angle         | 99  | Diagonal, 9 by 9 ins.  |
| 52 | Cove Base, 6 ins. high, square top, External Angle, R. H.  | 100 | Porch Coping, 6 ins. by 9 ins. by 2 ins.                     |
| 54 | Cove Base, 6 ins. high, square top, Right Stop             | 101 | Porch Coping Corner, 9 ins. by 9 ins. by 2 ins.              |
| 55 | Cove Base, 6 ins. high, square top, Left Stop              | 102 | Step Tread Tile, 6 ins. wide, 9 ins. long                    |
| 56 | Cove Base, 6 ins. high, square top, 6 ins. long            | 120 | Quarry Tile, 12 ins. by 12 ins. by 1½ ins., Flooring Quality |
| 57 | Cove Base, 6 ins. high, square top, Plinth                 | 121 | Quarry Tile, 12 ins. by 12 ins. by 1½ ins., Second Quality   |

# UNITED STATES GYPSUM CO.

## Reinforced Gypsum Roof Tile

Williams Building, Monroe and Wells Streets  
CHICAGO, ILL.

### SALES OFFICES

CHICAGO, ILL., 205 West Monroe Street  
NEW YORK, N. Y., 1170 Broadway  
CLEVELAND, OHIO, Schofield Building

DETROIT, MICH., Penobscot Building  
KANSAS CITY, MO., 513 Railway Exchange Building  
MINNEAPOLIS, MINN., Lumber Exchange  
SAN FRANCISCO, CAL.

Mills at All Principal Gypsum Producing Centers, Affording a National Distribution of Uniform Quality Products

### Products.

Manufacturers and erectors of PYROBAR GYPSUM ROOF TILE (reinforced) for Roof Decks.

For Gypsum Floor Tile, Partition Tile, Furring Tile, and Beam and Column Covering, all kinds of Gypsum Wall Plasters and Finishes, and Plaster Board, see pages 162-68; for Wall Board, see page 175.

### Pyrobar Reinforced Gypsum Tile Roof Decks.

Pyrobar gypsum roof tile afford fireproof, light weight roof decks, rapidly erected at low cost. They are adaptable to any type of building and to either flat or steep roofs; are constructed by laying Pyrobar roof tile directly on steel purlins or trusses. The joints between the tile are filled with gypsum grout, which forms a homogeneous deck to which any kind of roof covering can be applied immediately after the tile are in place. The roof tile are moulded from Structolite, a specially prepared gypsum described on following page. The tile are steel reinforced, and are uniform in size and shape.

### Advantages.

**STRENGTH**—Pyrobar roof decks are designed to carry 50 lbs. per sq. ft., uniformly distributed load, with a factor of safety of 4. See report of flexure tests made by Professor M. S. MacGregor of Columbia University.

**FIREPROOF**—Gypsum is not only incombustible, but it also has no appreciable contraction nor expansion. Consequently Pyrobar roof deck will not warp, buckle nor spall during a fire.

**NON-CONDUCTING, NON-CONDENSING, GASPROOF AND FUMEPROOF**—Tests made by G. F. Gebhardt, Professor of Mechanical Engineering, Armour Institute of Technology, Chicago, on the comparative thermal conductivity of various roof deck materials, yield the fol-

lowing values of B.t.u.'s transmitted per hour per sq. ft. per degree Fahr. difference in temperature:

2-in. pine plank.....	0.385
3-in. solid concrete slab.....	0.75
1¼-in. solid cement tile.....	0.99
3-in. solid gypsum roof tile.....	0.25
4-in. hollow gypsum roof tile.....	0.20

Due to this low coefficient of conductivity, Pyrobar roof deck, by preventing heat losses through the roof, effects a great saving in fuel as well as in initial radiation cost.

Also the under face of the Pyrobar roof deck in the coldest weather remains at practically the same temperature as the interior of the building, so there can be no condensation of moisture to corrode trusses or drip on machinery or manufactured products. Neither gases nor chemical fumes deteriorate Pyrobar roof decks.

**LIGHT WEIGHT**—Pyrobar roof tile provide the lightest fire resistive roof deck, thereby affording great saving in steel framing.

**LIGHT DIFFUSIVE**—Pyrobar roof tile are white in color, and, besides being of pleasing appearance, reflect light into the building, thereby assisting in solving the lighting problem.

**QUICKLY ERECTED**—The large light units are very quickly installed under any weather conditions and with the use of but little, if any, forms or scaffolding. Tile are made to fit all roof conditions. Large quantities of standard sizes are carried in stock ready for shipment.

**ECONOMICAL**—Due to the saving in supporting steel and in labor, Pyrobar roof deck can usually be installed at considerably lower cost than any other type of fireproof roof deck. As Pyrobar roof deck is permanent, the maintenance expense is nil. The non-conductivity of the tile greatly reduces the equipment and fuel required to heat the building.



PLANT OF PARISH MFG. CO., DETROIT, MICH.

On account of its heat insulating properties, 30-in. tile lowers fuel cost and positively prevents condensation



CHAS. DEERE WIMAN'S SWIMMING POOL, MOLINE, ILL.

Showing adaptability of 30-in. tile for conditions requiring difficult framing. Slate, Ludowici tile, etc., can be nailed directly to this type of tile



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SWEET'S CATALOGUE



# THE UNITED STATES ROOFING TILE CO.

Manufacturers of Quarry or Promenade Tiles

Seventh Floor, Union Trust Building  
PARKERSBURG, W. VA.

FACTORIES  
PARKERSBURG, W. VA.  
EAST SPARTA, OHIO

## Products.

FLOOR TILES; QUARRY OR PROMENADE TILES; COVE BASE, WAINSCOT CAP, ANGLES, STOPS, ETC.  
Acid Tower Lining.

## U. S. Quarry Tiles.

**MATERIAL**—Made from shale by modern methods, resulting in a perfect product with low absorption.

**COLORS**—Made in rich, natural reds, and assorted into light, medium and dark shades.

## Grades and Uses of Quarry or Promenade Tiles for Floors and Flat Roofs.

**No. 1 SELECT**—Assorted to size and shade. Used for floors of terraces, porches, foyers, sun parlors, dens, rathskellers, buffets, kitchens, bathrooms, rotundas, corridors, roof gardens and waiting rooms, also for mantels and hearths.

**COMMERCIAL**—Same as No. 1 Select, assorted to size but not to shade. Used for floors.

**SECONDS**—Rejected from first and commercial grades. Imperfections consist of small spawls chipped out in handling. Not selected with as much care as to level surface and regular lines, but make a good roof, one that will stand any weather conditions.

Selected as to size, but not to shade.

**CULLS**—Same as seconds, but not assorted to size or shade.

## Specifications and Instructions.

**GENERAL**—A good foundation is always necessary and should be solid and perfectly level, free from spring or vibration. Tile must be laid upon a concrete foundation, prepared from the best quality Portland cement and clean, sharp, washed sand and gravel. Cinders, if used, should have ashes screened out and the vitrified cinder or clinker thoroughly washed (sulphur in cinders will destroy the reinforcing in concrete). Concrete should be allowed to harden thoroughly before laying floor; thoroughly brushed to remove all dust; well soaked with water, dusting on concrete thin coat of pure Portland cement before applying cement mortar for laying tile. Concrete should never be allowed to stand more than 3 or 4 days before laying tile.

**LIME MORTAR**—Lime mortar should never be mixed with concrete.

**CONCRETE**—Concrete to consist of 1 part Portland cement, 3 parts clean, washed, sharp sand, 4 parts clean gravel, clean, fine broken stone, or cinders free from ashes. Mix cement and sand thoroughly dry, add gravel or broken stone and mix, adding sufficient water to form, when laid, a hard, solid mass when well beaten to a bed. Bed should not be less than 3 ins. thick. Surface of concrete must be level and finished within 2 ins. of finished floor line (1½ ins. when ½-in. tiles are used), which will leave space of 1 in. for cement mortar.

**CEMENT MORTAR**—Cement mortar to consist of 1 part best quality Portland cement, 2 parts clean, washed, sharp sand, thoroughly mixed as directed for concrete. All mortar to be used fresh, before it has its initial setting.

**LAYING TILES**—Tiles must be soaked in water not less than ½ hour before being placed upon mortar, which must be stiff enough to hold weight of tiles and not work up between the joints. Tiles are firmly

pressed into mortar and tamped down with block and hammer to a true even jointed surface.

**GROUTING**—When cement is sufficiently set, which should be in about 1 day, floor should be well scrubbed with clean water and broom, and joints grouted flush with cement grout to consist of 2 parts best quality Portland cement and 1 part clean, washed, sharp sand. Before grouting, rub face of tiles with oily waste to facilitate cleaning. When grouting is colored, only the best mineral color should be used.

**JOINTS**—These tiles should never be laid with joints of less than ¼ in. for the smaller tiles. With larger tiles, the width of joints should be increased proportionately. Natural cement joints are preferable and more durable.

**CLEANING TILES**—A white scum sometimes appears on the surface of tiles, caused by cement. This can generally be removed by washing frequently with Wyandot (or similar cleaning powders) and water. If scum or dirt can not be removed by washing, then use a solution of muriatic acid and water (1 pt. of acid to a wooden bucket of water) applied with scrubbing brush. Allow acid to remain on floor for a few seconds only, then thoroughly wash off.

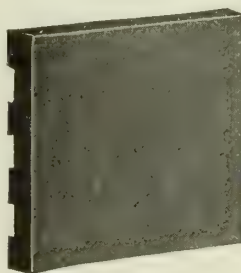
**TO BRIGHTEN FLOORS**—Saturate a clean cloth with equal parts of raw linseed oil and turpentine. Rub well over surface of tiles and wipe dry with clean cotton cloth.

## Facilities.

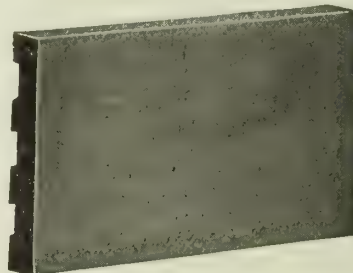
This company operates two factories and carries large stocks from which prompt shipment can be made.

## Catalogue and Samples.

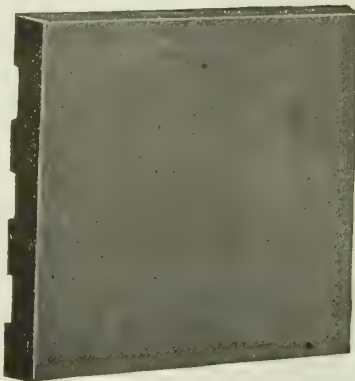
Blue print catalogue and samples will be sent on request.



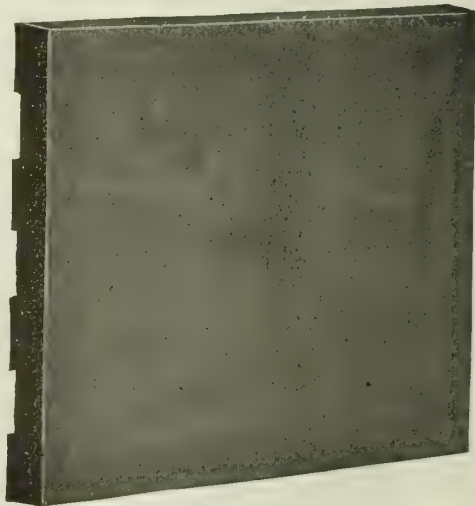
6 by 6 by 1 in.



6 by 9 by 1 in.



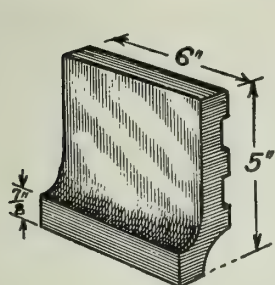
9 by 9 by 1 in.



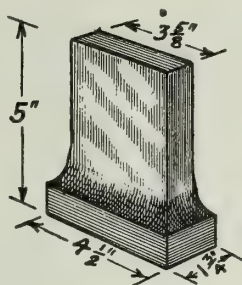
12 by 12 by 1½ in.

U. S. QUARRY TILES

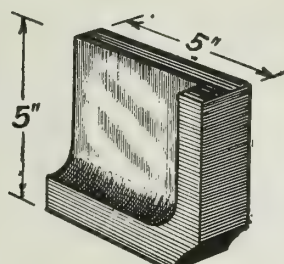




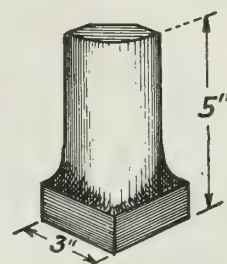
Cove Base No. 1  
Also made 3 and 9 ins. long  
No. 31. Same dimensions except 3 ins. high



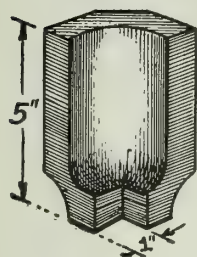
Cove Base Angle External No. 2  
No. 32. Same dimensions except 3 ins. high



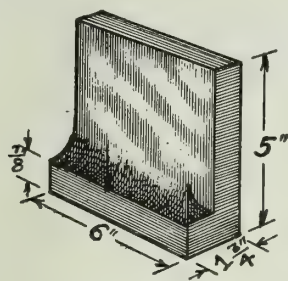
Cove Base Angle Internal No. 3  
No. 33. Same dimensions except 3 ins. high



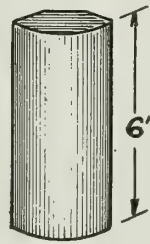
Cove Base Angle External No. 4



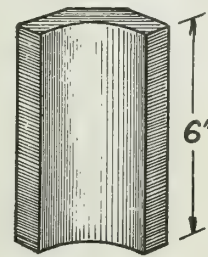
Cove Base Angle Internal No. 5



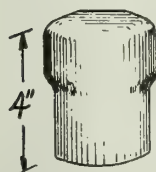
Left Door Stop Cove Base No. 1



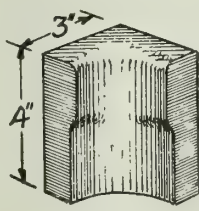
Wainscot Angle External No. 6



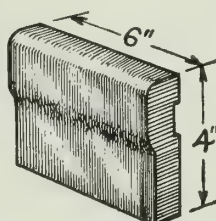
Wainscot Angle Internal No. 7



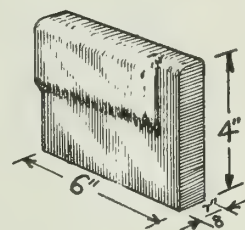
Wainscot Cap Angle  
External No. 8



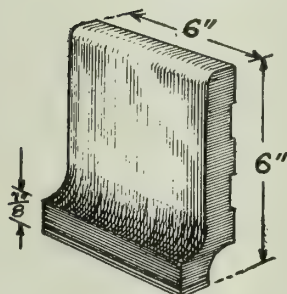
Wainscot Cap Angle  
Internal No. 9



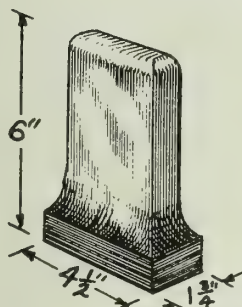
Wainscot Cap No. 10  
Also made 3 and 9 ins. long



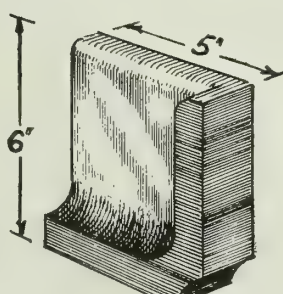
Left Stop for Wainscot  
Cap No. 10



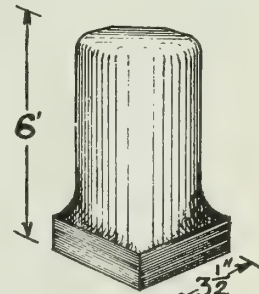
Cove Base No. 11  
Also made 3 and 9 ins. long



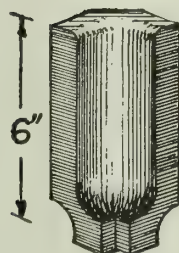
Cove Base Angle  
External No. 12



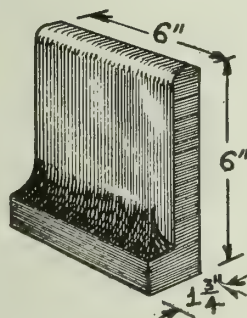
Cove Base Angle  
Internal No. 13



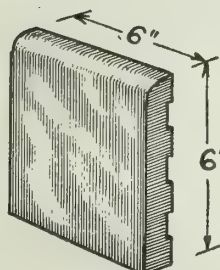
Cove Base Angle  
External No. 14



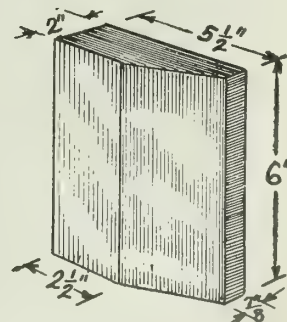
Cove Base Angle  
Internal No. 15



Left Door Stop for  
Cove Base No. 11



Bull Nose Tile  
Made in any size



Plinth Block

SPECIMENS OF U. S. QUARRY TILE TRIMMINGS

# THE BARRETT COMPANY

## Roof Leader and Roof Vent Connections

17 Battery Place  
NEW YORK, N. Y.

### Products.

HOLT ROOF LEADER and ROOF VENT CONNECTIONS (Patented).

For Roofing, Flooring and Paving Materials, Preservative Paints, etc., see pages 394-97.

### Branch Offices.

For branch offices see pages in roofing section.

### Description.

Holt Roof Connections comprise a complete line of fixtures for use where inside roof leaders or any pipe or fixture passing through roof requires a dependable flashing device.

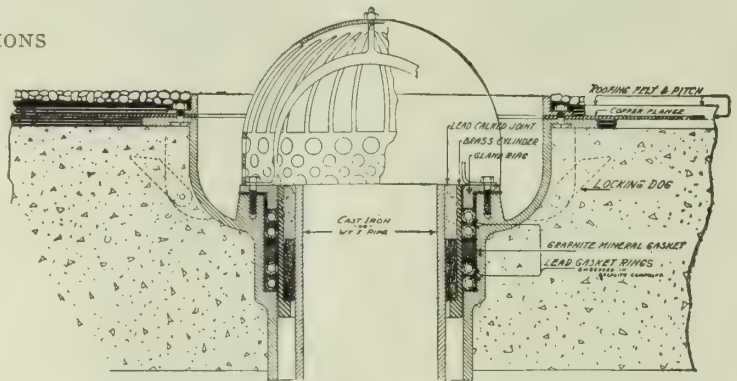
This high grade line provides, in every case, a complete fixture made up of the best obtainable material and having mechanical features entirely lacking in all other arrangements used for the same purpose.

Each type incorporates in its construction a roof locking arrangement and an expansion joint which provides a flexible connection at the point where leader or vent pipe is joined to roof connection, thereby preventing rain and breakage of roof flashing caused by shrinkage, settlement, or expansion and contraction, and at the same time insures a permanent gastight and watertight joint.

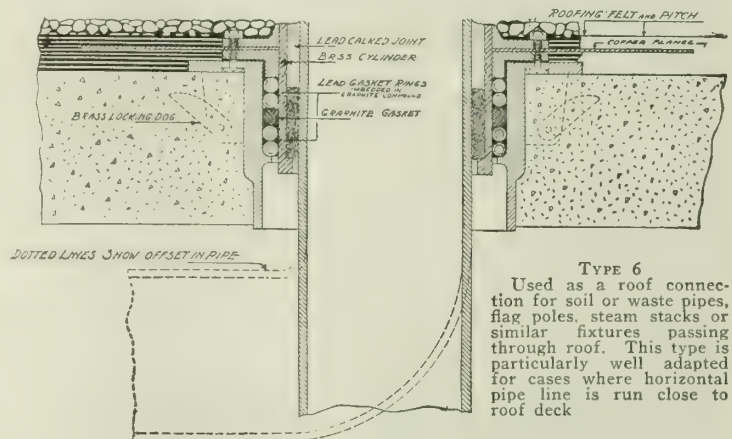
Heavy construction prevents collapse of leader head due to atmospheric pressure induced by vacuum in pipe line. Eliminates condensation troubles.

### Catalogues, etc.

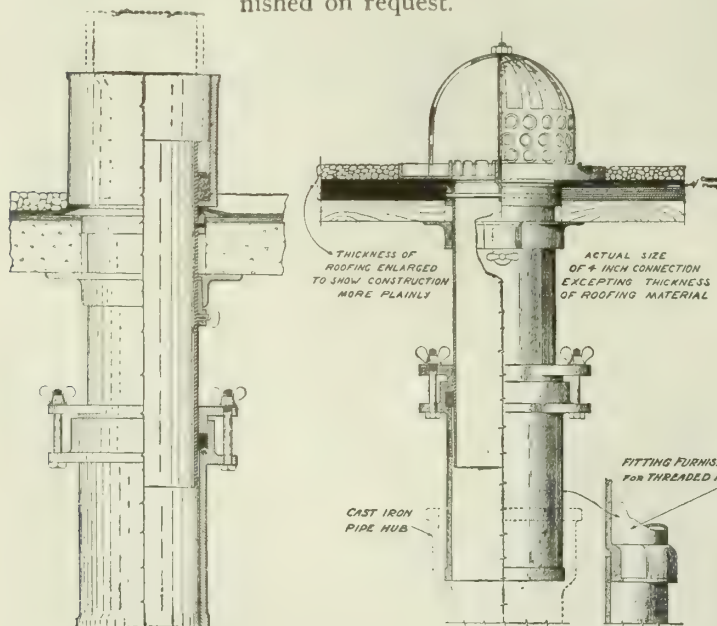
Complete catalogue and detailed drawing furnished on request.



TYPE 5  
Special form preferred by some architects, wood roof Can be used with concrete or



TYPE 6  
Used as a roof connection for soil or waste pipes, flag poles, steam stacks or similar fixtures passing through roof. This type is particularly well adapted for cases where horizontal pipe line is run close to roof deck

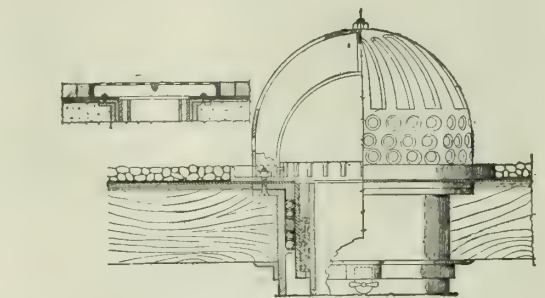


HOLT VENT CONNECTION FOR VENT STACKS (Patented) TYPE 4

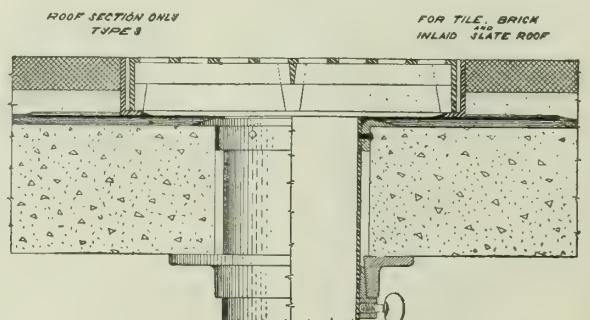
Made by THE BARRETT COMPANY. Similar to Type 1, but used as roof vent connection for soil and waste stacks. Heavy copper pipe is carried above flashing to receive cast iron roof vent sleeve furnished, and receives roof pipe extension

HOLT ROOF CONNECTION AND EXPANSION JOINT (Patented) TYPE 1

Roof leader connection—used in all cases where sufficient space is provided below roof deck to connect expansion joint fitting to leader line, the end of fitting being about 12 to 13 ins. from under side of roof deck



Cross Section View of Type 6  
As furnished when used as roof outlet. Cut shows fittings adapted for pitch and gravel or tile roofs



HOLT ROOF CONNECTION AND EXPANSION JOINT (Patented) TYPE 3

Shows roof section only; otherwise same as Type 1. Fitted with cast brass tile stop for use on tile, brick or inlaid slate roofs. Cast brass flat type strainer furnished



# ESTATE OF J. G. HETZEL

## Manufacturers of Roofing Cement and Paints

67 Maine Street  
NEWARK, N. J.

CABLE ADDRESS:

"HETZEL, NEWARK"

**Products.**

HETZEL'S ELASTIC RUBBER ROOF CEMENT for all kinds of roofs, glass skylights, coping stones, etc.

HETZEL'S "R. O. P." CEMENT COATING.

HETZEL'S PIPE JOINT COMPOUND.

HETZEL'S DAMP RESISTING PAINT for brick walls.

Hetzel's Asphalt Paints; Hetzel's "Rub-on" Roofing Paint; Hetzel's Enamel Paints (black and green) for boiler fronts and steam pipes; and Hetzel's Acidproof Paint for metal-work, and ammonia tanks and gas tanks.



TRADE-MARK

### Specifications for the Use of Hetzel's Elastic Rubber Roof Cement.

All nail-holes and joints between the slates shall be sealed with Hetzel's Elastic Rubber Roof Cement as manufactured by the ESTATE of J. G. HETZEL, Newark, N. J., in such quantities as to hold the slates in position should they break, or the nails rust away. (Fig. 1.)

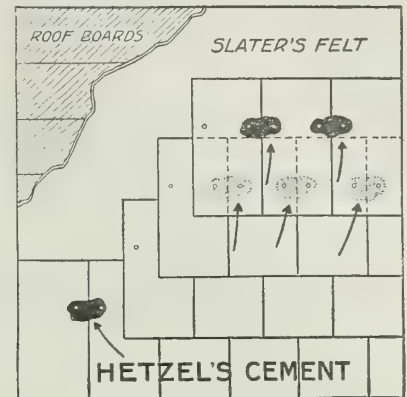


FIG. 1. For Slate Roofs

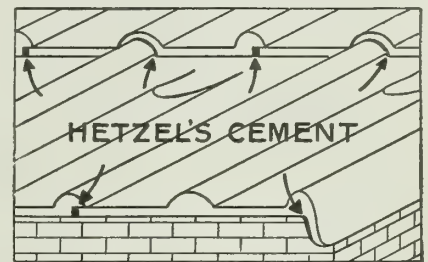


FIG. 2. For Spanish and Flat Tile Roofs

**Hetzel's Rubber Roof Cement.**

Hetzel's rubber roof cement, which has been in general use throughout the United States and Europe for many years, is especially valuable for covering and repairing all holes, cracked joints, breaks, or leaks in roofs of all kinds. It is also used for pointing around chimneys, skylights, and dormer windows; for repairing coping stones, gutters, wood and stone work which require to be made watertight; and for laying and bedding slate and tile roofs.

Supplied in the following colors: brown, gray, black, green and red. It is also made to order to suit every purpose, and is the only slaters', tinnerns' and tile roofers' cement.

Hetzel's rubber roof cement is equally well adapted for use on slate, tin, asbestos, glass, wood and metal roofs; is permanent; does not run or loosen from joints or cracks, and is not affected by any extreme of temperature or climatic changes. It does not harden, but preserves its complete elasticity even when exposed to extreme heat, cold, dryness or humidity.

**Hetzel's "R. O. P." Cement Coating.**

A specially prepared material for stucco, brick and concrete surfaces.

Impervious to moisture, and positively unaffected by any of the alkalis in cement and brick materials.

It renders these surfaces waterproof and prevents efflorescence. Adheres naturally to these surfaces, drying with a soft toned, pleasing effect; altogether unlike a paint, and will not chip or peel.

As a cement floor coating, it dries hard and is proof against oil, grease or water. Will withstand the utmost hard usage, besides preventing the disintegration of the cement and the annoyance of constant dust.

Color card sent on request.

**Pipe Joint Compound (Red and Gray).**

This compound adheres to metal, and is used for joints of gas, steam, water, and air pipes. It will not harden, and prevents joints from rusting. It will make absolutely tight joints, which can be disconnected at any time, without injury to fittings.

The joints of all tiles shall be sealed with Hetzel's Elastic Rubber Roof Cement as manufactured by the ESTATE of J. G. HETZEL, Newark, N. J. To prevent leaking, the hip and ridge rolls shall be sealed in a like manner. (Fig. 2.)

All cap flashings shall be carefully pointed up with Hetzel's Elastic Rubber Roof Cement as manufactured by the ESTATE of J. G. HETZEL, Newark, N. J. (Fig. 3.)

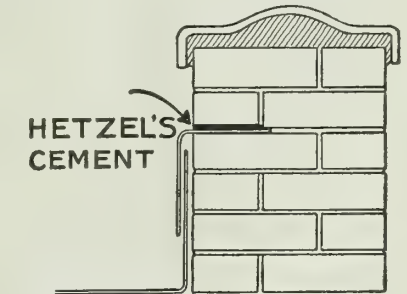
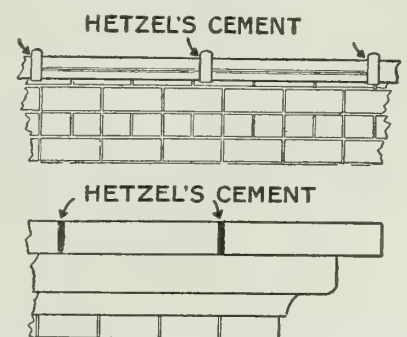


FIG. 3. For Pointing up Cap Flashings

The joints of all copings shall be set and sealed with Hetzel's Elastic Rubber Roof Cement as manufactured by the ESTATE of J. G. HETZEL, Newark, N. J. (Fig. 4.)

FIG. 4. For Tile and Stone Copings  
APPLICATIONS OF HETZEL'S ELASTIC RUBBER ROOF CEMENT**Hetzel's Damp Resisting Paint.**

A compound black paint for dampproofing foundations and walls above and below grade. When applied to inner side of exterior walls, forms a good dampproof surface for direct application of plaster, rendering plaster stainproof, and saving cost of furring and lathing.

# THE G. DROUVÉ COMPANY

Manufacturers of Puttyless Skylights and Sash Operators

TELEPHONE:  
BARNUM 540

50 Drouvé Street  
BRIDGEPORT, CONN.

Western Union Code

BRANCH OFFICE: CHICAGO, ILL., 180 North Dearborn Street

## Products.

"ANTI-PLUVIUS" (Steel, Fireproof) PUTTYLESS SKYLIGHT (trade-marked and patented); "STRAIGHT-PUSH" (patented), "LOVELL" (patented) and WORM and GEAR SASH OPERATORS.

## Service.

A skilled estimating department will give every assistance in preparing specifications.

Detail drawings of different types and conditions will be forwarded on request, if architects will indicate approximately their ideas.

Catalogues, prices, preliminary estimates or any co-operation will be gladly and promptly furnished.

## Uses.

To produce the maximum of daylight, supplied from the roof and so diffused that it does not give dense shadows.

To provide constant ventilation and easily operated devices for its control.

Skylights are used in industrial buildings of all kinds; in sawtooth, flat or pitch roofs, and made in all types whether flat, single or double pitched, or hipped.

## Advantages of Skylights.

Light to work by and enough of it to work well.

Good air; constant ventilation. Daylight costs less than artificial light. Daylight supplied from the roof is intense, yet so diffused that it does not give dense shadows. Adequate, agreeable light has a desirable effect on the output of work. Gives an element of greater cheerfulness. Daylight is an aid in avoiding accidents. Statistics show that there are less accidents during the months when there is the greatest amount of daylight.

Time saved in operations by daylight lighting.

Good ventilation means efficiency.

## "Anti-Pluvius" Puttyless Skylights.

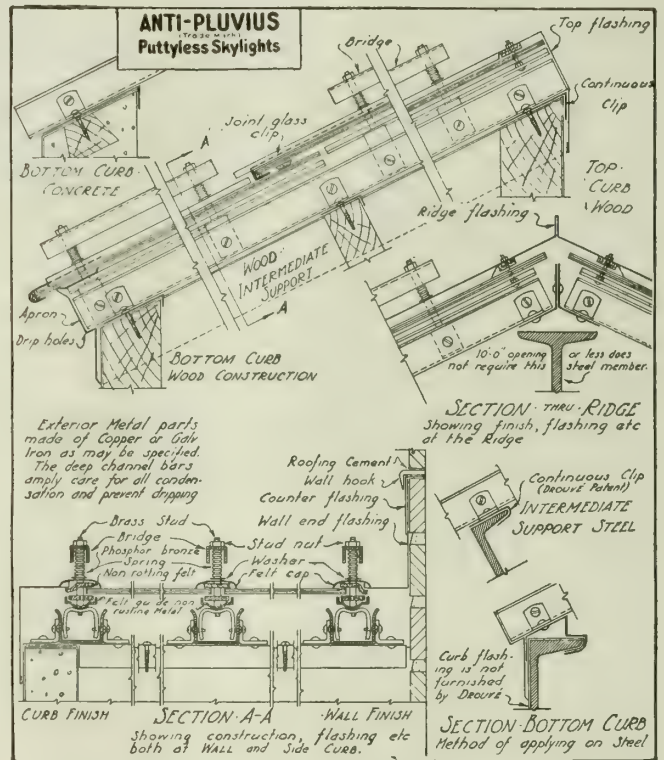
**ADVANTAGES**—A type that will satisfy the most exacting requirements of stiffness under wind and snow loads, of perfect watertightness, of freedom from condensation drip and of endurance against corrosion.

Strength of materials and of the structure are ideal; will support the weight of a man or men without danger to glass. Proper provision is made for easy cleaning of glass. Frames are flexible and full allowances are made for contraction and expansion, vibration and wind pressures. Construction permits of easy removal of glass by any man about the place.

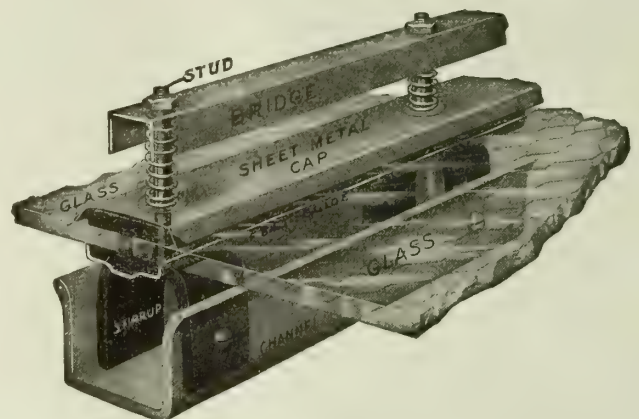
It is adaptable to all types of roofs: wood, metal, brick, tile or concrete, galvanized iron or asbestos.

Can be put up by anybody, anywhere.

Lights of glass are independent, and do not come in contact with each other, nor do they touch the channels. Skylight frames are shipped with or without glass. No sweating of steel members from chill caused by cold glass.



DETAILS OF SINGLE OR DOUBLE PITCH TYPE GENERAL SKYLIGHT CONSTRUCTION  
Scale 1½ inch=1 foot



PHANTOM CROSS SECTION OF "ANTI-PLUVIUS" PUTTYLESS SKYLIGHT

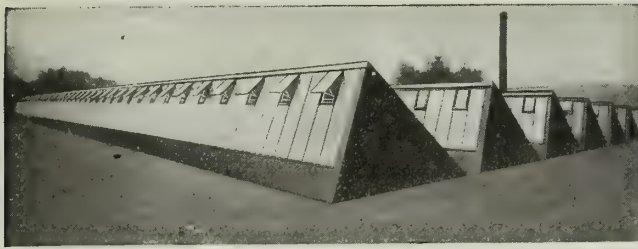
**GLASS**—Can be rough, hammered or ribbed, plain or wired.

**PAINTING**—Steel channels or skylight frame have one shop coat of metal protective paint. Galvanized portions are unpainted unless requested.

**SHIPMENTS**—Shipped knocked down. Any person of ordinary intelligence can erect them (see assembling details).

The company will install these skylights anywhere, if desired.





ANTI-PLUVIUS SAWTOOTH SKYLIGHT WITH VENTILATING SASH CONTROLLED BY CONTINUOUS MECHANICAL OPERATOR

**INFORMATION REQUIRED FOR ESTIMATING**—State type of skylight required, give size or sizes and number wanted. State trimmings desired. These cover outside exposed portions of skylight and include cap and flashings (not roofer's curb flashings) and may be of copper, or galvanized iron. Mention kind of glass wanted (see "Glass").

**ADVANTAGES**—Great power, easy operation, positive transmission, uniformly applied leverage force.

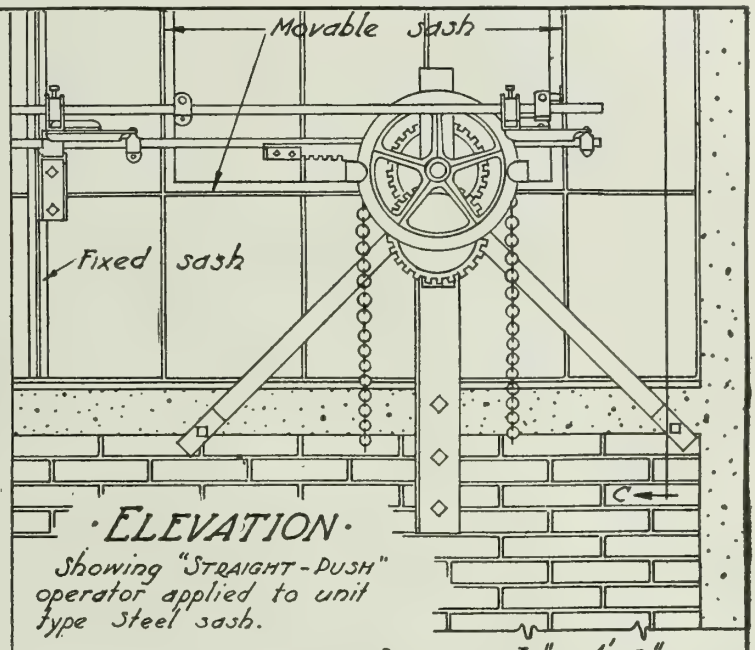
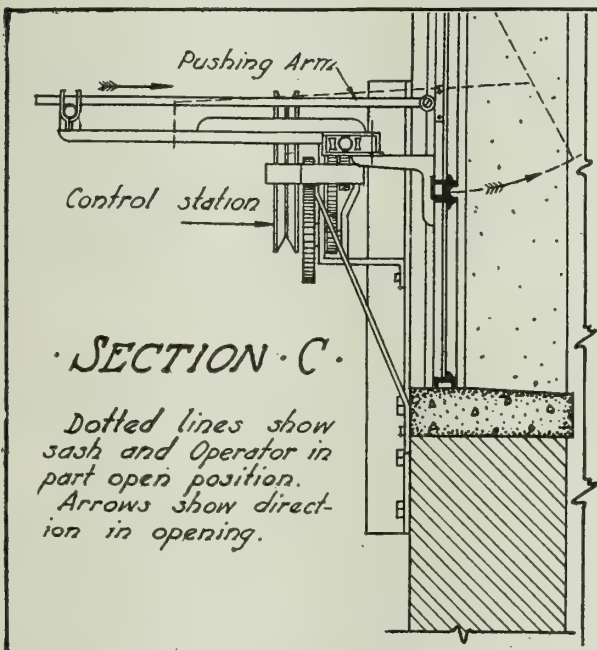
Worked from any desired point by chain or motor. Guide rolls mounted on brass pins to prevent rusting. All working parts have brass-to-iron connections. The sweep of levers is flat.

Leverage force applied is uniform throughout length of line, insuring equal opening and closing of all sash. Requires little exertion to operate long lines of sash, and it is easy to start. Tight sash, when closed, are assured.

Any workman can install operator with the directions and assembling drawings sent with shipment.

**PRICE**—"Straight-push" is sold at a standard price per lineal foot and price per operating station.

**ERECTION**—Erecting crews are maintained by the company to handle almost any job, anywhere.



### Worm and Gear Operators.

Practically all types of standard worm and gear devices are supplied as desired for operating various lines of ventilating sash in side walls, pitched roofs, saw-tooth roofs and monitors, and for pivoted or hinged sash.

Details of standard worm and gear operating devices will be forwarded on application and, when sufficient information is given of the problem in question, recommendations will be made as to efficient and economical procedure.

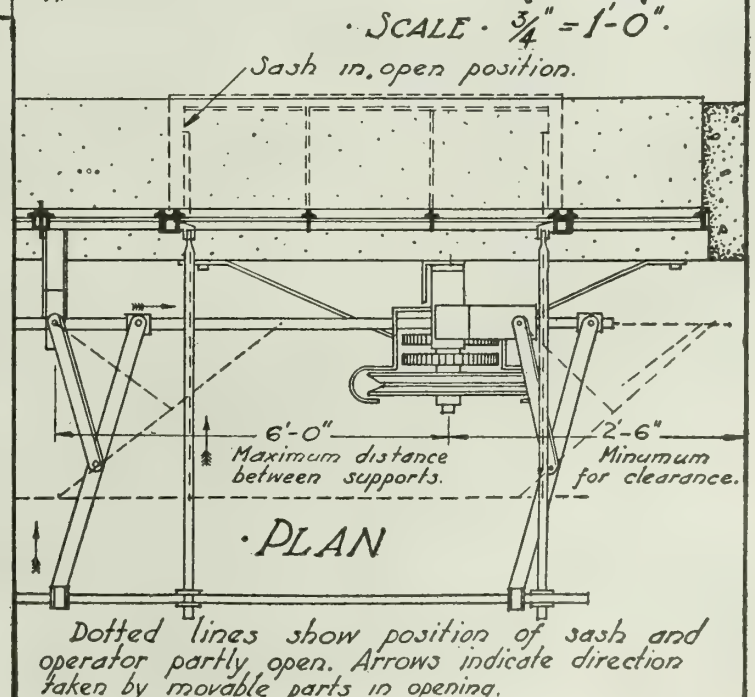
### "Improved Lovell Dreadnought" Sash Operator.

This design, with its sweeping movement, gives large openings to heavy top hung sash. All parts made extra heavy, with phosphor bronze working joints.

### "Straight-Push" Sash Operator.

**USES**—Designed for mill, factory and powerhouse service and industrial buildings generally, to withstand all manhandling, unusual and unexpected conditions.

Will operate all types and makes of sash in skylights and side walls, excepting double hung sash.



DETAILS SHOWING APPLICATION OF "STRAIGHT-PUSH" SASH OPERATOR TO SIDE PIVOTED STEEL SASH

# A. H. JETER & COMPANY, INC.

## Manufacturers of Puttyless Steel Skylights

GENERAL OFFICE AND WORKS

TELEPHONE:  
ASTORIA 1688

91-95 Webster Avenue  
LONG ISLAND CITY, N. Y.

### Products.

#### PUTTYLESS STEEL SKYLIGHTS.

Sheet Metal Skylights, Turrets and Louvers, Architectural Sheet Metal Work of every description, Metal, Tile, Slate Roofing, etc.

### Special Features of Skylights.

The sash bar of Jeter's patented (Pat. No. 1001646, Pat. No. 1119829) steel skylights is composed of an upper and a lower channel. The upper channel or glass rest is held in position by means of stirrups connected by tap bolts to the lower channel. The combination of these two channels forms the complete sash bar; and, as they are held apart by stirrups, the arrangement is such that adequate ventilating space is provided in the bar, thus drying out any condensation which might otherwise accumulate. The metal caps are held in position by means of brass bolts which go through the stirrups and also hold the top channel in position. A continuous steel angle runs along the bottom of the skylight and is punched at intervals of about 20½-in. centers to allow the sash bar to run

through. Over each piercing in this angle is provided a malleable iron housing with inverted shoulders which engage both flanges of the bottom channel of the sash bar. This arrangement of the housings at the bottom, together with the slotted holes in the ridge clip at the top, allows for free expansion and contraction. A lead ferrule is placed over each brass cap bolt, to prevent the edges of the glass plates from coming in contact with them, thus reducing to a minimum the cracking of the glass caused by vibration.

### Adaptability.

Jeter's patented system of puttyless steel glazing is adaptable for use on railroad terminals, museums, schools, factories, machinshops, etc. The very simplicity of construction enables any mechanic to readily erect this system.

### Estimates and Services.

Our estimating and drafting department is at the disposal of engineers, architects and owners, and we will gladly give estimates, suggestions, specifications and plans for our products on request.

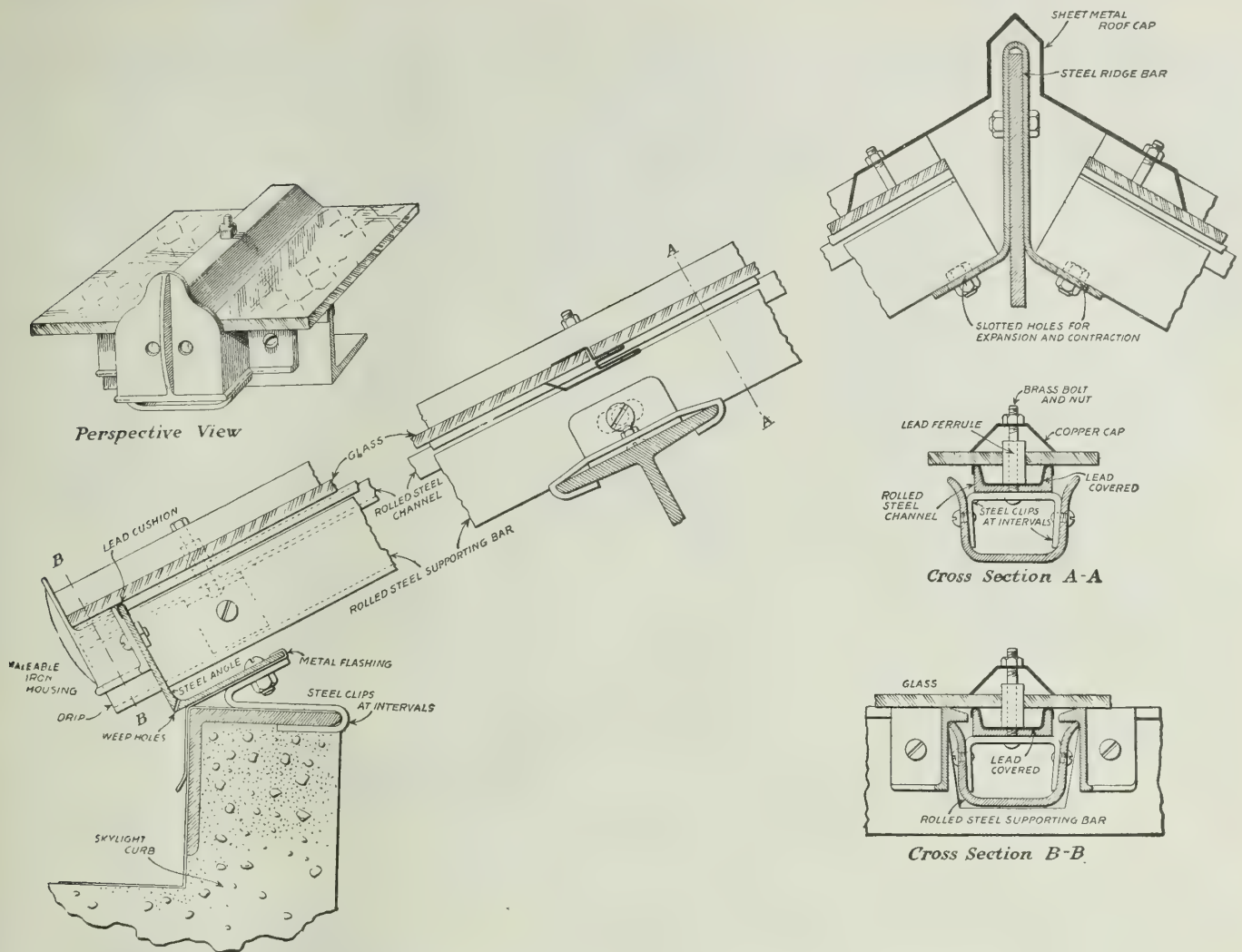


E. W. BLISS ORDNANCE FACTORY, BROOKLYN, N. Y.

WALTER PFAENDLER, Engineer

Showing about 23,000 sq. ft. of glazing out of a total area of 150,000 sq. ft in the entire operation





REDUCED CROSS SECTION DETAILS OF JETER'S PATENT PUTTYLESS STEEL SKYLIGHT CONSTRUCTION

We employ a large force of experienced men who have been carefully trained to erect our products. When we supply material only, we furnish complete instructions and drawings.

#### Facilities.

Our factory is situated in Long Island City, near the Long Island Railroad and also the Brooklyn Eastern District Terminal. This gives a direct shipping to any point in the world, either by railroad or water.

#### Special Note.

After fabrication of all material entering into the construction of the skylight and prior to the assembling of the parts, each and every part is thoroughly galvanized. This process in manufacturing produces an indestructible skylight.

#### Specifications.

All skylights shall be of rolled steel, of a type to allow for free expansion and contraction, and made tight without the use of paint, cement or putty.

The sash bar shall be composed of a combination of channels not less than  $\frac{1}{8}$  in. in thickness. These channels shall be elevated one above the other, and

firmly held apart by means of wrought iron stirrups secured by tap bolts let through sides of bottom channel. A copper bolt shall be placed through each stirrup and also through top channel of sash bar. A lead ferrule shall be placed over each cap bolt, to keep the edges of the glass plate from coming directly in contact with the rigid cap bolt, thus reducing the cracking of the glass to a minimum. A continuous steel angle shall be provided along the curb of the skylights. This angle shall be punched at intervals of  $20\frac{1}{2}$ -in. centers to allow the sash bar to run through. Over each of the holes punched in the continuous bottom angle, secure with brass bolts a malleable iron housing having inverted shoulders which will engage the side flanges of the bottom channel of sash bar, holding same firmly in position. The top edge of this continuous bottom angle shall be covered with lead, which shall act as a cushion for the glass. The flanges of the channel of sash bar shall also be covered with sheet lead. This sheet lead must fit snugly around this channel and be turned over edges of same about  $\frac{3}{8}$  in. All parts of the skylights, including sash bars, bottom angles, housings, stirrups, etc., shall be hot galvanized after fabrication and prior to assembling. Glaze all skylights with  $\frac{1}{4}$ -in. ribbed wire glass. All caps, combings, and trim shall be [specify copper, zinc, or galvanized iron].

# NATIONAL SKYLIGHT AND VENTILATOR CO.

Manufacturers of Skylights, Windows and Ventilators

ROCHESTER, N. Y.

## Products.

"NATIONAL" SYSTEM of STEEL PUTTYLESS SKYLIGHTS; FIREPROOF WINDOWS and DOORS; AUTOMATIC VENTILATORS; KALAMEIN DOORS, TRIM, MOULDINGS, etc.

Metal Sash and Sash Operating Apparatus (Patents allowed and pending).

## Special Features of the "National" System of Steel Puttyless Skylights.

**ADAPTABILITY**—The special features of the "National" system of steel puttyless skylights adapt them to be used with perfect results in factories, machinshops, foundries, warehouses, railway terminals, libraries, dormitories, halls, museums, theaters, etc., and buildings of every kind.

**SETTING OF THE GLASS**—Each light is independent of every other, and left wholly free to move whenever affected by either expansion, contraction, or vibration.

**PUTTYLESS GLAZING**—Wholly free from the use of putty, roof cement, or any other filling substance which would bind the glass, causing breakage, and which must of necessity crack and disintegrate in time, causing leakage and expensive repairs.

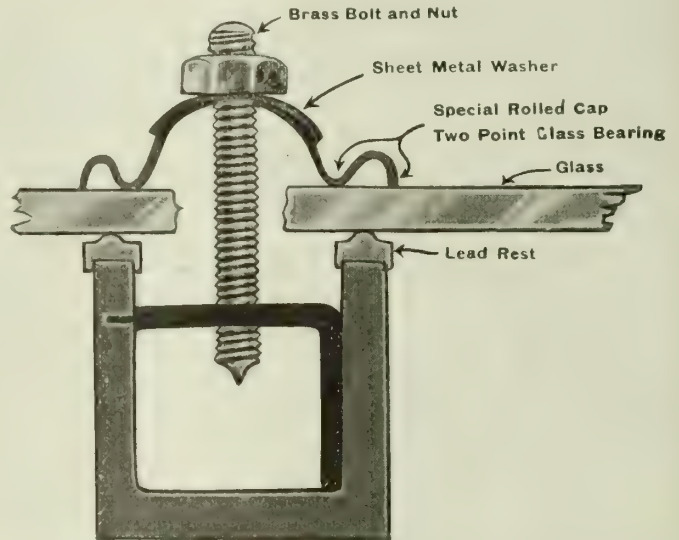
**ROLLED STEEL SUPPORTING BARS**—Combine maximum strength with minimum weight, a most desirable feature.

**EXPANSION CLIPS**—Allow the steel supporting bars to expand and contract and to move freely when affected by expansion or vibration, thus obviating the breakage of glass.

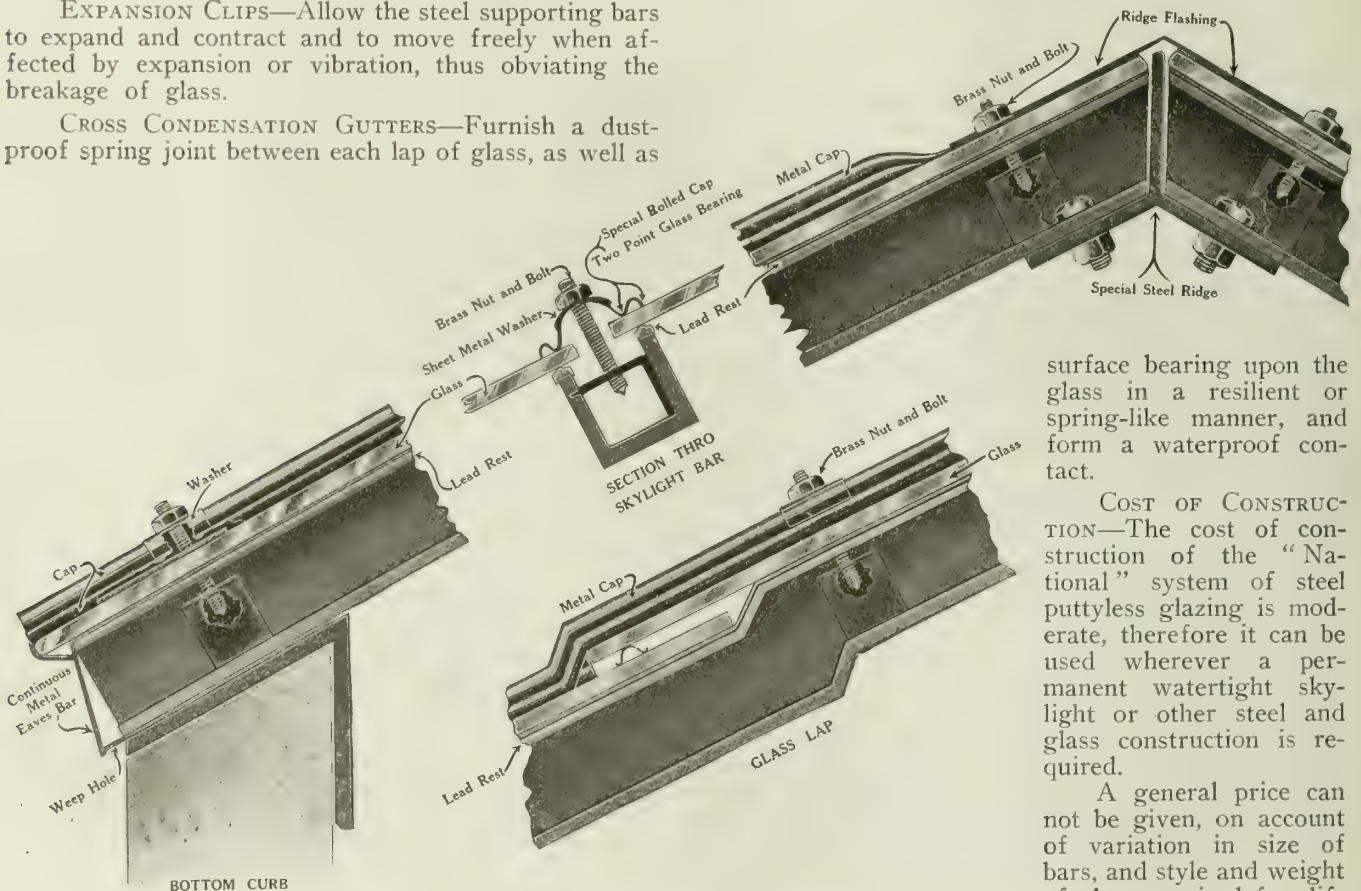
**CROSS CONDENSATION GUTTERS**—Furnish a dust-proof spring joint between each lap of glass, as well as

provide permanently flexible and yielding bearings for the glass and delivering the water of condensation into the supporting bars.

**SPRING SURFACE BEARING CAPS**—Provide a broad



SECTION SHOWING END VIEW OF THE SPECIAL ROLLED STEEL SUPPORTING BAR



SECTION OF "NATIONAL" SKYLIGHTS

The supporting bar shown is supplied in any weight required by the span

surface bearing upon the glass in a resilient or spring-like manner, and form a waterproof contact.

**COST OF CONSTRUCTION**—The cost of construction of the "National" system of steel puttyless glazing is moderate, therefore it can be used wherever a permanent watertight skylight or other steel and glass construction is required.

A general price can not be given, on account of variation in size of bars, and style and weight of glass required for different spans.



**Fireproof Windows and Doors.**

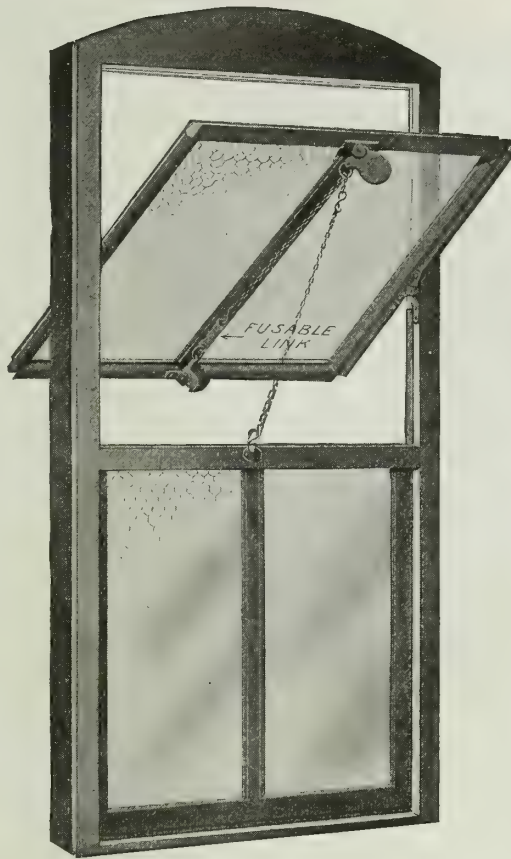
"National" fireproof windows and doors meet all the requirements of the National Fire Underwriters' Association, and are made in all styles as specified. The windows are all automatic in their action, closing in case of fire by the melting of a fusible link.

**Kalamein Construction.**

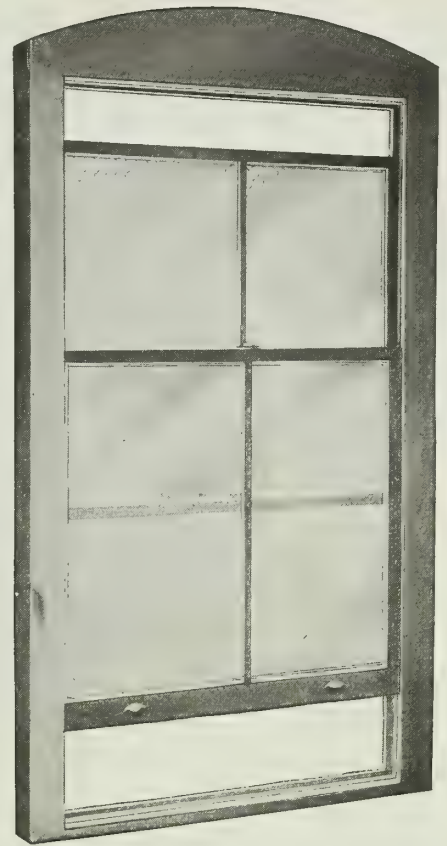
The company's equipment enables it to execute all types of kalamein work, as doors, trim, mouldings, etc.

**Automatic Ventilators.**

The "National" automatic ventilators are built in types for all purposes where ventilators are used, in the following styles: stationary and revolving roof ventilators, window ventilators, etc. They are automatic in their action and can be opened and closed at will, either in part or in their entirety. The standard sizes are built of best quality galvanized iron, gage varying with size; also to order, in copper, of any weight desired.



STANDARD AUTOMATIC PIVOTED WINDOW



STANDARD DOUBLE HUNG WINDOW

**Co-operative Service.**

Estimates and sketches are at all times furnished on request.

**References.**

The products of this company have been erected in Mexico, Canada, Japan, China, the Philippine Islands, Isthmus of Panama, Argentine Republic, England, Germany, Egypt, etc., the purchasers include the following concerns:

United States Steel Co.  
Standard Oil Co.  
Pullman Car Co.  
General Electric Co.  
International Harvester Co.  
Union Pacific Railroad Co.  
Southern Pacific Railroad Co.  
Southern Pacific of Mexico Railroad Co.  
Eastman Kodak Co.  
Newport News Shipbuilding & Dry Dock Co.  
American Woodworking Machinery Co.  
American Laundry Machinery Co.  
Central Railroad Co. of New Jersey  
Delaware, Lackawanna & Western Railroad Co.  
Cleveland, Cincinnati, Chicago & St. Louis Railroad Co.  
Buffalo, Rochester & Pittsburgh Railroad Co.  
Rochester Railroad & Light Co.  
Gleason Works  
Rome Locomotive Co.  
Mora Motor Car Co.  
Boston & Maine Repair Shops  
New York, New Haven & Hartford Railroad Repair Shops  
Boston & Albany Railroad Co.  
Field Museum, Chicago  
U. S. Government Buildings



REVOLVING TYPE, "NATIONAL" AUTOMATIC VENTILATOR

With guaranteed capacity three times as great as that of any stationary ventilator of equal size, with but a moderate additional cost.  
Sizes, 6 ins. to 6 ft.



STATIONARY TYPE, "NATIONAL" AUTOMATIC VENTILATOR

With either stationary or closing top; closed automatically in case of fire by reason of the melting of a fusible link.  
Sizes, 6 ins. to 6 ft.

# NONPAREIL SKYLIGHT CO.

Manufacturers of Puttyless Skylights

MAIN OFFICE

2609-2611 Pennsylvania Avenue, N. W.

WASHINGTON, D. C.

## Product.

The NONPAREIL PUTTYLESS SKYLIGHT (patented November 1, 1910; October 3, 1911; October 14, 1913).

## Advantages.

(1) It can not leak; lasts indefinitely; simple in construction, and not expensive. Approved by the United States Government.

The Nonpareil puttyless skylight is a decided and practical innovation in skylight construction. It solves all the difficulties of the old style, unsatisfactory putty affairs. Once erected it takes care of itself—the first cost being the only cost.

(2) LEAD GLAZING CUSHION—No materials but metal and glass enters into its construction, and of the metal parts one of the most important is the lead glazing cushion, indicated in Fig. 2, detail 5. This cushion has parallel vertical walls that will conform perfectly to the uneven surface of skylight glass and is detachable and reversible, which permits of its being applied after all of the field work except the glazing has been done. This is important to the contractor who desires to get satisfactory results and a watertight skylight, since it prevents injury to the cushion while the rest of the skylight is in process of construction. Being flexible, it is capable of being straightened by our special glazing tool and is immediately ready to conform to the irregularities of new glass.

(3) Should it happen that part of this cushion is torn or cut away, it can be removed and reversed, thus giving double service without additional cost. This cushion fits absolutely tight and permits of no space

between the glass and cushion, even when very long lights are used.

Since there are two vertical walls to each cushion and two cushions on each bar it makes an absolutely watertight joint, and it is inconceivable that the water could get by both of these walls and the *air* space between them. However, gutters have been arranged (see Fig. 2, detail 7) to take care of any water that might get through.

To test the perfection of these cushions the caps have been purposely omitted (Fig. 2, details 3 and 4), leaving the skylight exposed during several severe storms, and never in a single instance has a leak or an imperfection of any kind developed.

(4) BAR CONSTRUCTIONS—Fig. 2, detail 7, shows the principal part of the bar, the lower edges of which are bent out and up to form condensation gutters. The extreme depth and width of these bars give them great strength, but in addition they are reinforced and strengthened by the bent metal, detail 6, which supports the cushion and glass and forms extra gutters to prevent leakage. These gutters are on each side of the metal cushion and are of ample size to perform their function.

(5) These bars are made of both galvanized and lead coated steel, and when desired can be made of black steel and covered with copper. The latter, however, are not recommended, as steel under such conditions would rapidly corrode. Being cold pressed, the quality of steel in these bars is far superior to that of the hot rolled T-bar. When these skylights are made of *lead coated* steel and copper trimmed they remain 100% strong indefinitely.

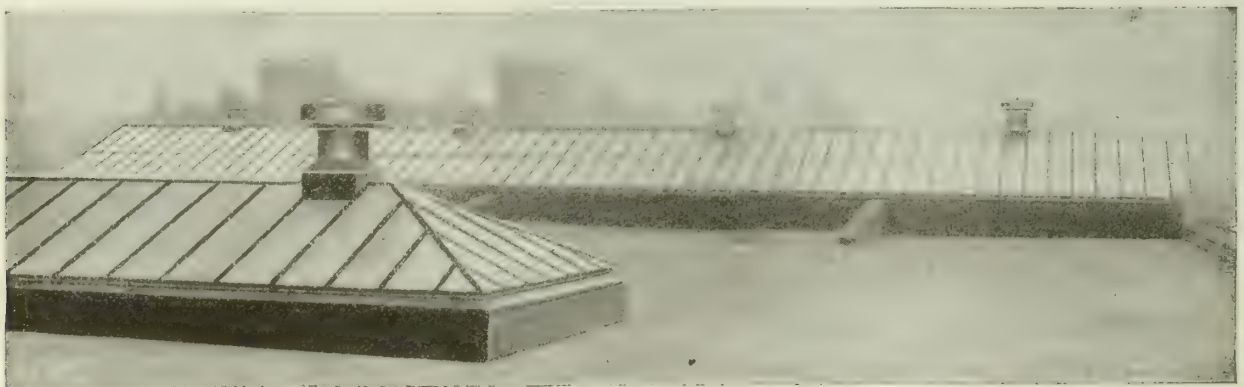


FIG. 1. NONPAREIL SKYLIGHTS ON CAPITAL TRACTION COMPANY'S NAVY YARD CAR BARN, WASHINGTON, D. C. The large light is 22 by 100 ft., of standard bar, and no superstructure supporting it. A third light on this same building does not appear in cut



(6) Hipped skylights, especially in small sizes, cost more than double pitch, without giving a corresponding benefit. Why not use double pitch?

### Nonpareil Caps.

Fig. 2, detail 3—These are made both plain and with a lead flange, as shown in detail 4. When the flanges are used they are grooved watertight to the sheet metal cap and the lead can be pressed down to conform to the uneven surface of the glass, insuring a perfectly tight and close fit. It is impossible for the flanges to get out of position, as do the loose ones.

### Cost.

The cost of this skylight is not excessive, and contractors will find it to their advantage to correspond with the company with reference to price, delivery, etc.

### Specifications.

The skylight must be of a type that can be made watertight without the use of putty, and shall not contain any material other than metal and glass in its construction.

The bearings for the glass, however, must be of such metal as will positively conform to the irregular surface of the glass,

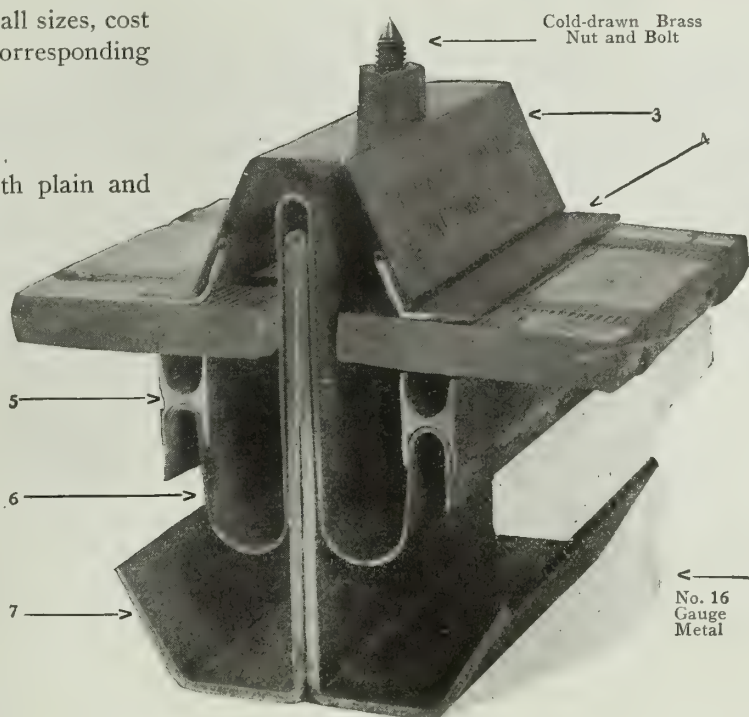


FIG. 2. COMPLETE BAR ASSEMBLED, SHOWING THE GLASS AND DETAILS OF CONSTRUCTION  
(Patented November 1, 1910; October 3, 1911; October 14, 1913)

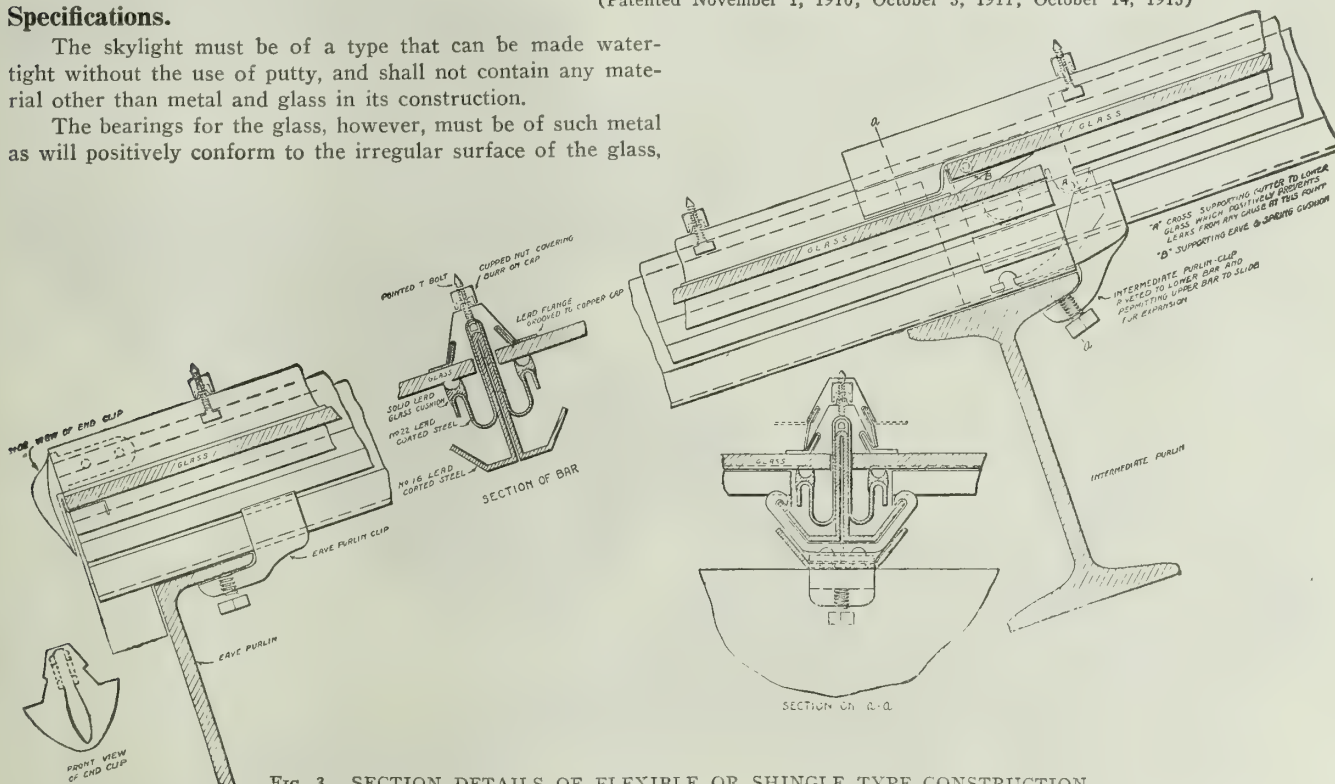


FIG. 3. SECTION DETAILS OF FLEXIBLE OR SHINGLE TYPE CONSTRUCTION

making the contact between the glass and bar perfect at all points. It shall have condensation gutters of ample size, and the ends of the caps must be closed with stormproof hoods; all parts constructed to allow for expansion and contraction. Caps to have lead flanges.

### References.

United States Hospital for the Insane (Boiler House), Washington, D. C.  
United States Navy Yard Building, No. 41, Washington, D. C.

United States Treasury Building, Washington, D. C.  
United States Post Office, St. Louis, Mo.  
Biograph Building, New York, N. Y.  
Canadian Pacific Railway, Montreal, Can.  
United States Post Office, Hot Springs, Ark.  
New York Central Terminal, New York, N. Y.  
New York Central Depot, Watertown, N. Y.  
Capital Traction Company, Powerhouse and Car Barns, Washington, D. C.  
Vitagraph Building, Brooklyn, N. Y.  
Park & Tilford Building, New York, N. Y.

ESTABLISHED 1873

**E. VAN NOORDEN & COMPANY**

## Skylights and Ventilators

TELEPHONE:

100 Magazine Street, near Massachusetts Avenue

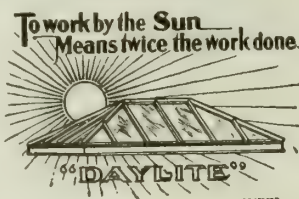
ROXBURY 3040, 3041, 3042

BOSTON, MASS.

**Products.**

Manufacturers of "ANCHOR-BAR," ROLLED STEEL, PUTTYLESS SKYLIGHTS; GALVANIZED STEEL OR COPPER VENTILATORS.

Sheet Steel and Copper Skylights of every type, Sheet Steel or Copper Windows, Kalamein Doors.



TRADE-MARK

**Rolled Steel, Puttyless Skylights. "Anchor-bar" Type (Patent No. 931638).**

The Van Noorden rolled steel, "Anchor-bar," puttyless skylight is designed particularly for large skylight areas, and is a most economical construction for skylights where the bar length exceeds 8 ft. Fewer purlins and steel supports are required than for any other skylight. This company solicits from architects an opportunity of suggesting framework for any type of glazed roof structure, and a saving in the steel framework required is assured. The structural parts of rolled steel, and the trim of sheet metal (generally copper), form a combination which can not be surpassed for weather protection.

**BAR**—The bar consists of a tee and angle combination as shown. The angle member serves as a gutter for condensation. Glass rests loosely on cushion of pure wool felt.

**CURB**—The "Anchor-bar" skylight is the only skylight of prominence which has continuous steel reinforcement at the base. The thrust of skylight bars is directly against this member, which can not give way while the curb holds.

**GENERAL FEATURES**—The distinctive feature of "Anchor-bar" skylight is the unit steel frame, consisting of bars, base and ridge, and independent self-supporting steel structure, upon which the glass is loosely embedded, after which the exposed portions, such as bars, caps, ridge caps, base and side apron of sheet metal (generally copper), are applied. Caps are secured with brass bolts.

**EXPANSION AND CONTRACTION**—Owing to the fact that sheet metal parts of "Anchor-bar" skylights are independent of rolled steel parts, expansion and contraction are amply provided for. Glass sets loosely on the cushion of wool felt, thus there is no possibility of breakage due to expansion and contraction.

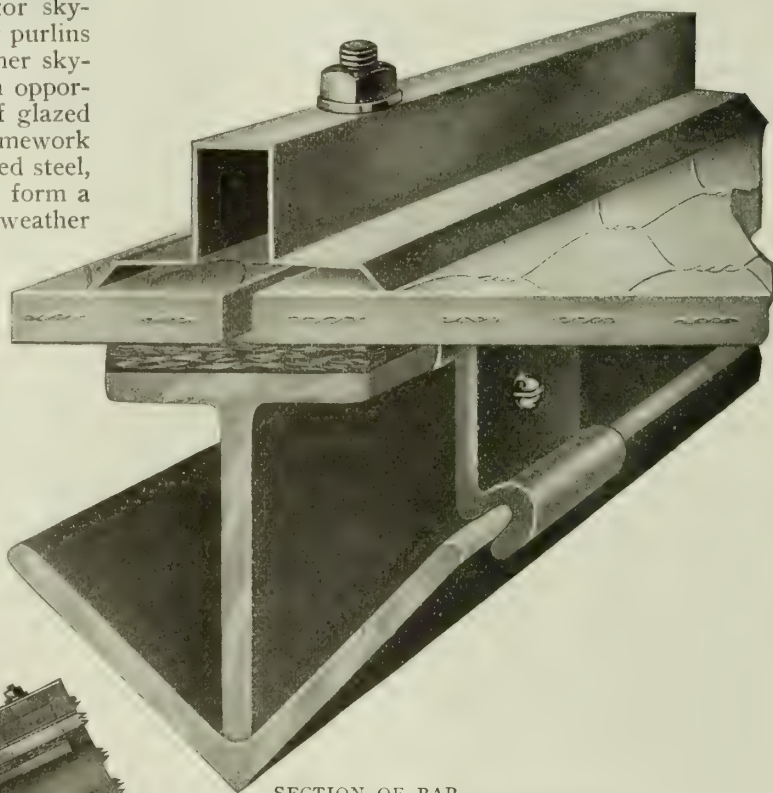
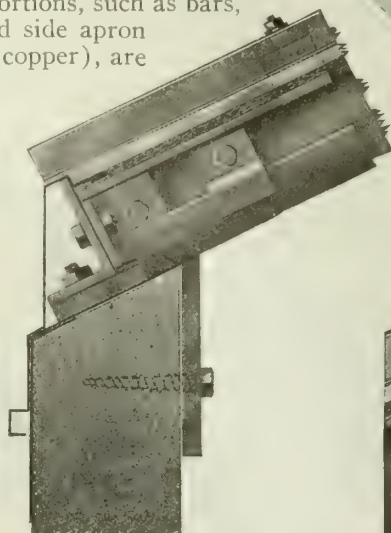
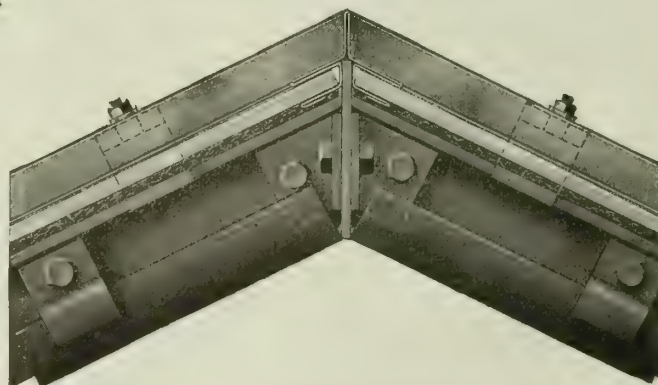
**ACCESSIBILITY FOR RE-PAINTING**—A feature to be recommended

in "Anchor-bar" skylights is their accessibility for the easy re-painting of the rolled steel portions. The sheet metal portions, being preferably of copper, are impervious to weather conditions.

**ADAPTABILITY**—"Anchor-bar" skylights are recommended wherever overhead light is desired. Inquiries should state over all length of outside of curb,

bar length, pitch of skylight (5 ins. to the foot, or more) and distance between intermediate purlins.

"ANCHOR TRUSS BAR" (Patent No. 1140909)—"Anchor truss bars" are used where bar length

SECTION OF BAR  
VAN NOORDEN "ANCHOR-BAR" SKYLIGHTSECTION THROUGH CURB,  
"ANCHOR-BAR" SKYLIGHT

SECTION THROUGH RIDGE, "ANCHOR-BAR" SKYLIGHT



is more than 11 ft., unless intermediate purlins are provided. Truss bars are self-supporting for a bar length up to 15 ft. The saving effected in the steel frame support is far greater than the excess cost of truss bar construction. Details on application.

#### NOTABLE INSTALLATIONS OF "ANCHOR-BAR" SKYLIGHTS—

Boston Elevated Railway Co., Boston, Mass.

General Electric Co., Lynn, Mass.

Gymnasium and Ball Cage, Middlesex School, Concord, Mass.

Republic Railway & Light Co., Lowellville, Ohio

Ford Service Stations, Cambridge, Mass.; Indianapolis, Ind.; Cincinnati, Ohio

El Paso Electric Co., El Paso, Tex.

Eastern States Agricultural and Industrial Exposition, Springfield, Mass.

State Capitol, Augusta, Me.

Widener Library, Cambridge, Mass.

U. S. Post Offices, New Haven, Conn.; Ashtabula, Ohio; Brazil, Ind.

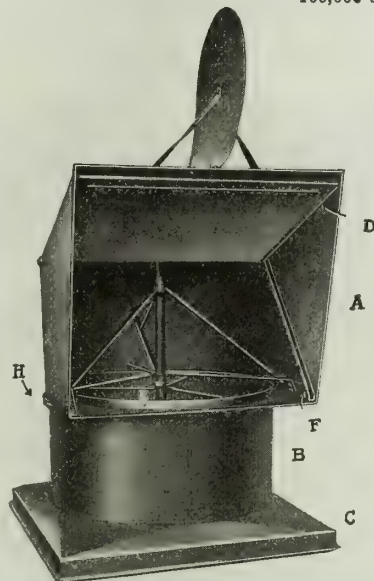
Colt Patent Fire Arms Co., Hartford, Conn.



WEAVE SHED OF NAUMKEAG STEAM COTTON CO., SALEM, MASS.  
100,000 sq. ft. of Van Noorden skylights with 250 Simplex ventilators

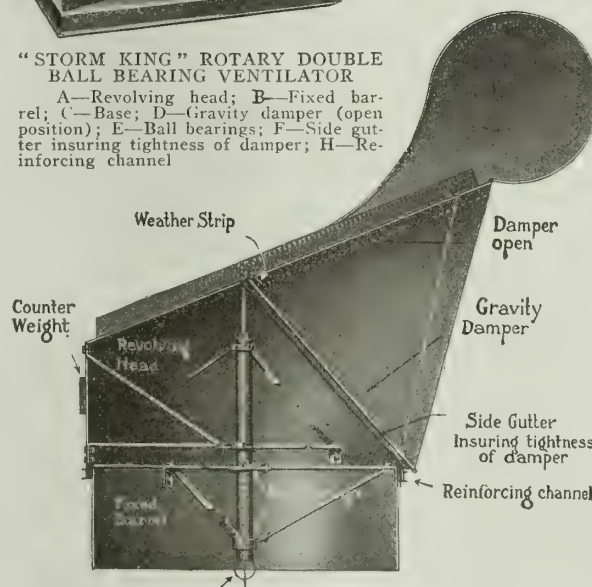
#### Storm King Ventilator.

Consists of a revolving ball bearing head on a stationary barrel. Because of the large fin on the head and free double ball bearings, head always swings into the wind. Flaring shape of head causes a powerful suction at mouth of ventilator and a free exhaust of full capacity of shaft. Damper is hinged about midway at the top, and in an open position sets against underside of head. When closed, damper completely seals mouth of ventilator and sheds any back action of snow and sleet, which can not lodge on sloping surface of damper. Gutters are provided at each side of damper, also weatherstrip at top, insuring tightness. Damper is operated with a chain running through tubular spindle, thus chain can not foul braces and supports. Owing to careful adjustment of bearings, head is very sensitive to alternating currents, and is effective even in moderate winds.



"STORM KING" ROTARY DOUBLE BALL BEARING VENTILATOR

A—Revolving head; B—Fixed barrel; C—Base; D—Gravity damper (open position); E—Ball bearings; F—Side gutter insuring tightness of damper; H—Reinforcing channel



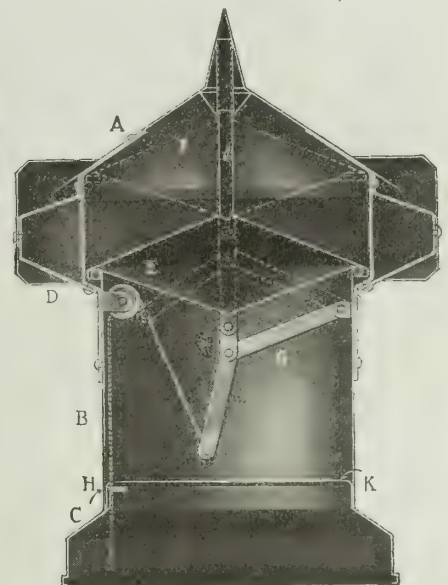
Chainlock for locking damper in open position  
"STORM KING" ROTARY DOUBLE BALL BEARING VENTILATOR

#### Simplex Ventilator with "Suretite" Damper.

The Van Noorden leading type of fixed ventilator. In addition to the band shield (for weather protection when ventilator is open), damper is constructed to completely close top of shaft, insuring an absolutely weather-proof ventilator when up-draught is cut off. Damper is of a double cone form. With damper closed, upper cone will shed filtration of fine snow. With damper open, lower cone or deflector accelerates up-draught in shaft and at the same time prevents "pocketing" or back-draught.

Vent heads without deflectors mean uncertainty of air movement and ineffective exhaust.

The "Suretite" damper is of a sliding type, easy to operate, and can be locked in varying positions.



"SIMPLEX" VENTILATOR WITH "SURETITE" SLIDING DAMPER

A—Head; B—Barrel; C—Base; D—Weather shield; E—"Suretite" gravity sliding damper (closed); F—Damper (open); G—Operating arm; H—Chain lock (locking damper in open position); J—Telescopic damper guide; K—Gutter (for condensation)



# NATIONAL VENTILATING COMPANY

Manufacturers of Puttyless Skylights

GENERAL OFFICE AND FACTORY

337-339 East 26th Street

NEW YORK, N. Y.

TELEPHONE:

MADISON SQUARE, 387-388

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## Products.

MULTIUNIT PUTTYLESS SKYLIGHTS.

Side Lights, Operating Sash, and National Ventilating Devices.

## Adaptability.

Skylights for railway terminals, power stations, machinshops, factories, foundries, libraries, museums, art galleries, and all other buildings whereon permanent watertight skylights of large area are required.

## Advantages and Distinctive Features.

Referring to Fig. 3, following page, the bar and

upper lights are supported in a fixed manner by the purlin thereunder, while the lower bar, supporting the lower lights, is secured by the same purlin in a loose manner, permitting it to expand freely.

This construction, being repeated at each purlin, permits movement, all in same direction, due to expansion, contraction, or vibration (along the slope of the skylight) of the cap, glass and bar of each unit or tier of glass, independently of every other unit or tier.

Along the longitudinal line of the skylight the steel frame of the building and the entire length of the glass are each taken as separate units, and the difference,



GROUP OF MULTIUNIT SKYLIGHTS OVER CONCOURSE OF PENNSYLVANIA TERMINAL, NEW YORK, N. Y.

Area of this group, about 50,000 sq. ft. Total area on the Terminal, 83,000 sq. ft.



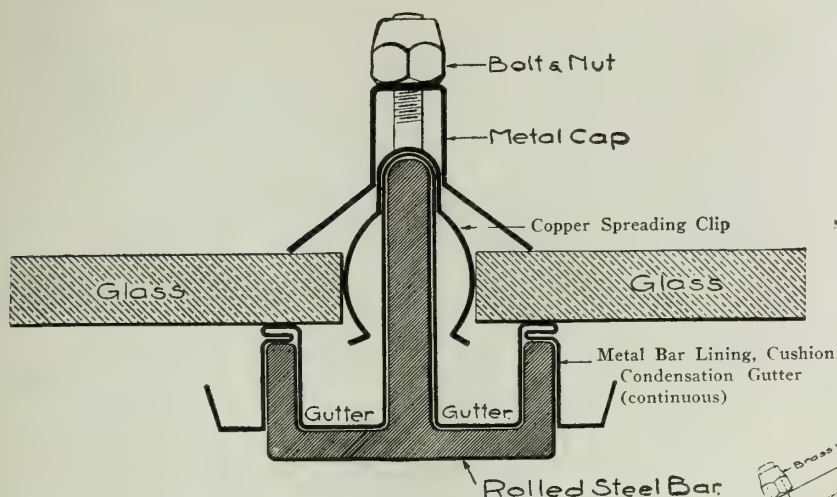


FIG. 1. FULL SIZED TRANSVERSE SECTION AT SKYLIGHT SUPPORTING BAR  
(Patents applied for)

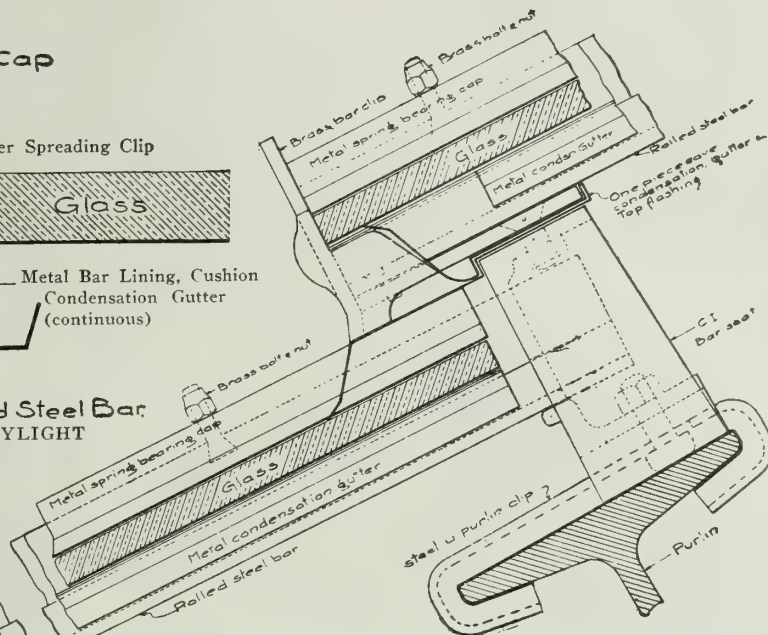


FIG. 2. REDUCED SCALE CROSS SECTION FROM EAVE TO NEXT PURLIN ABOVE  
(Patents applied for)

Construction shown on the right side is repeated at each purlin between the eave and the ridge

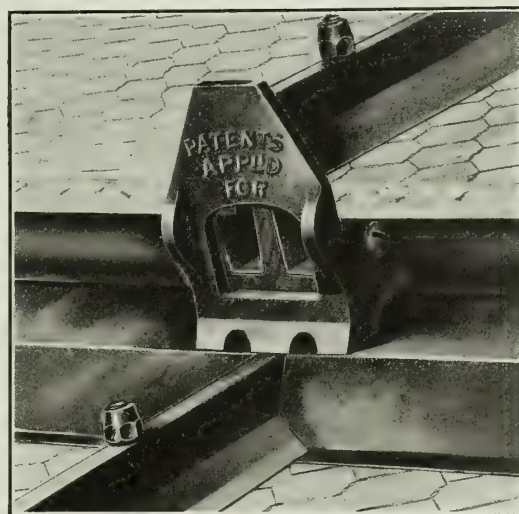
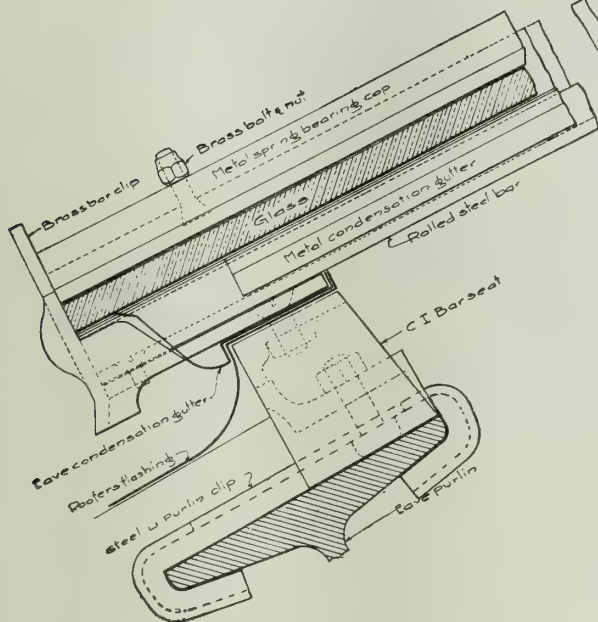


FIG. 3. HALF SIZED PERSPECTIVE  
Showing exterior view over each purlin between the eave and the ridge

nearly 100%, in the expansion and contraction of these materials (glass and steel) is likewise thoroughly taken care of by the copper spreader clips shown in transverse section at supporting bar (Fig. 1). These spreader clips are placed over each cap bolt, spaced about 12 ins. along each skylight bar, and incidentally they serve also to better secure in place the brass bolts for holding the caps.

The cap is strong and yet resilient. Its upper half is of an inverted "U" shape, which provides strength and rigidity, while the lower half, especially at the lower extremities, is resilient, so as to conform thoroughly, when secured in position, to the surface of the glass.

All gutters and parts that are non-accessible without removing the glass, are of non-corrosive material. The entire top of the bar is covered with 8-oz. copper, the same being applied while the last coat of bar-paint is still wet; and a flexible bearing for the glass is formed, which adjusts itself to any warps or irregularity of the glass along its bearing line.

The company is equipped to cover the bottom of the bar also. Both the top and bottom bar covers are made by special dies and both fit the bar snugly.

No packing or filling substance of any kind is required, and no material is used other than glass and metal.

#### Standard Specification, Multiunit System Puttyless Skylights.

All curb and roof flashings shall be included under heading "Sheet Metal Work." They must be well connected, ready to receive the skylight work, and must include all necessary counter flashing, well secured to roof flashings and made watertight.

The skylights shall be of the puttyless type, of a design to allow for free expansion and contraction, or movement due to vibration, of the glass and supporting bars in line with the pitch of roof, all in the same direction.

Each light of glass shall be entirely independent of every other light, so that one light can not support another; and the glass shall be held laterally in a manner to prevent its coming in contact with any rigid part.

The bearing for the glass shall be flexible, so as to adjust itself to any warps or irregularities of the glass along its bearing line.

The caps shall be spring bearing, in order to thoroughly conform along the lines of contact, when secured in position, to the surface of the glass.

All gutters shall be of copper and all exposed parts other than sheet metal shall be of brass.

The supporting bars shall be of rolled steel and shall be held in a loose manner at the upper end, and in a fixed manner at the lower end.

Packing, filling substance of whatever kind, or material other than glass and metal, shall not be used.

All skylight sheet metal work shall be [copper, zinc, or galvanized iron].

The glass shall be  $\frac{3}{8}$  in. thick [wire, plain or ribbed].

### Adopted by Leading Railroads.

The Pennsylvania Railroad Company, after carefully examining all other types of puttyless skylights in actual service, adopted the construction herein shown and described for its new New York & Long Island Railroad Passenger Station, 31st to 33d Streets and 7th and 8th Avenues, New York City, on which building this company completed, about eight years ago, the erection of 83,000 sq. ft. of skylight, embracing nearly every known variety, such as hipped, ridge, flat, barrel-roof, sawtooth with bowed ridges, circular, elliptical, etc., all constructed with flat glass.

The Central Railroad of New Jersey has also adopted this system of skylights for its new Terminal at Jersey City, N. J., where 116,000 sq. ft. of this construction has been installed.

The New York Central Railroad Co. also has this construction on its new Grand Central Terminal at 42nd Street, New York City; on its New York City Power House at 50th Street and Lexington Avenue; Power Stations at Yonkers and Port Morris, New York; Boiler Shops at West Albany, New York, Reed & Stem, Architects, and for their new Passenger Station at Utica, New York, Stem & Fellheimer, Architects.

### Result of Thorough Investigation.

The above described system of skylight construction is the result of experience and investigations made by the NATIONAL VENTILATING COMPANY in this line over a period of more than fourteen years.

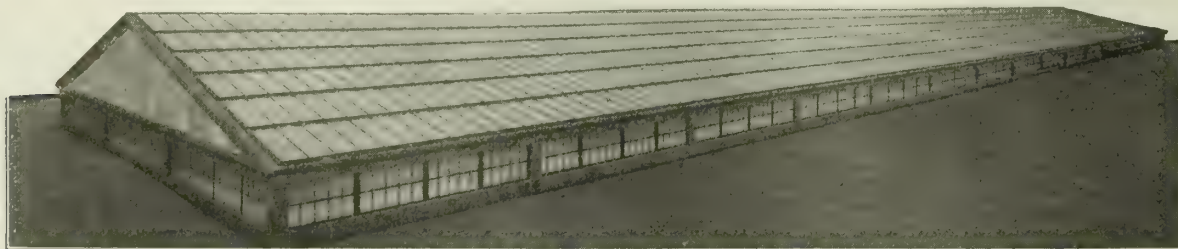
All efforts during this time have been directed to producing, not the cheapest, but the best construction. As to skylights, true economy does not consist in buying the cheapest.

### Public Buildings and Other Notable Installations.

The following are a few, among many installations made by this company during the past eleven years; in some cases replacing other work with the new and improved system above described:

#### BUILDING, LOCATION AND ARCHITECTS

New Walters Art Gallery, Baltimore, Md., Delano & Aldrich  
 New Library Building, Bar Harbor, Me., Delano & Aldrich  
 Sun Parlor for E. Parmalee Prentice, New York, N. Y., Delano & Aldrich  
 International Paper Co., Mills at Niagara Falls, Palmer, Fort Edward, N. Y., and at Rumford Falls and Chisholm, Me.  
 Sage Art Gallery, Menands, N. Y., Wm. H. Miller  
 Maryland Institute, Baltimore, Md., Pell & Corbett  
 Auditorium Building, Springfield, Mass., Pell & Corbett  
 Municipal Building, Springfield, Mass., Pell & Corbett  
 New York Edison Co., New Waterside Power Station, New York, N. Y.  
 U. S. Navy Yards at Norfolk, Va., Charlestown, Mass., and Pensacola, Fla.  
 Brooklyn Rapid Transit Co., Shops, Maspeth, L. I.  
 American Steel & Wire Co., Mill, Worcester, Mass.  
 C. K. G. Billings Residences, New York, N. Y., and Locust Valley, L. I., N. Y.  
 New York, New Haven & Hartford R. R. Locomotive and Machinshops, Readville, Mass.  
 Norfolk Terminal Passenger Station, Norfolk, Va., Reed & Stem  
 New York Stock Exchange Building, New York, N. Y.  
 New U. S. Post Office and Belt Conveyor Buildings, New York, N. Y., McKim, Mead & White  
 New Municipal Building, New York, N. Y., McKim, Mead & White  
 Munsey Building, Washington, D. C., McKim, Mead & White  
 Brockton Library, Brockton, Mass.  
 New York, Westchester & Boston R. R., Quaker Ridge Station, New Rochelle, N. Y., and 180th Street Station, Bronx, N. Y., Stem & Fellheimer.  
 Proctor Endowment Field House, Peoria, Ill., Hewitt & Emerson  
 United Electric Light & Power Co., Powerhouse, 201st Street Station, New York, N. Y.  
 Julius Kayser & Co., Loom Building, Brooklyn, N. Y., Wm. Higginson  
 Institute of Fine Arts and Sciences, Brooklyn, N. Y., McKim, Mead & White  
 Greenpoint Hospital, Brooklyn, N. Y., Frank J. Helmle  
 The Beaver Companies' Mill, Thorold, Ontario  
 Museum of Fine Arts, Minneapolis, Minn., McKim, Mead & White  
 Administration Building, Balboa, Canal Zone, Panama  
 People's National Bank, Lynchburg, Va., Stem & Fellheimer  
 Laboratory Building, Brooklyn, N. Y., McKim, Mead & White  
 Metropolitan Museum of Art Building, sections "J and K," New York, N. Y., McKim, Mead & White  
 Standard Arcade Building, New York, N. Y., Severance & Van Alen  
 Robert Brewster's Enclosed Tennis Court at Mount Kisco, New York, Walter D. Blair  
 The Enclosed Pastime Tennis Court, Long Island City, N. Y., Walter D. Blair  
 Brooklyn Rapid Transit Co. Substation, Ozone Park, L. I., N. Y.  
 Ford Motor Company, Service Building, Long Island City, N. Y.  
 Union Passenger Station, Macon, Ga., Alfred Fellheimer  
 John J. Raskob's Residence, Claymont, Del., McClure & Harper  
 Buffalo General Electric Co., 1917 River Station Extension, Black Rock, N. Y., Stone & Webster, Engineers  
 American Tobacco Co., Building, Brooklyn, N. Y., Francisco & Jacobus  
 American Can Co., Building, Brooklyn, N. Y., N. M. Loney  
 Consolidated Gas Co., Building, 57th Street, Amsterdam Avenue and Broadway, New York, N. Y., Warren & Wetmore  
 Amherst College Library Building, Amherst, Mass., McKim, Mead & White  
 U. S. Navy Yard, Extension to Sight Shop, Extension to Breech Mechanism Building, Extension to Erection Shop, Extension to Forge Shop, Washington, D. C.



MULTIUNIT SKYLIGHTS ON STANDARD OIL CAN FACTORY, DEVOE WORKS, BOROUGH OF QUEENS, NEW YORK, N. Y.  
 Area about 30,000 sq. ft.



# AREX COMPANY

J. C. KERNCHEN, PRESIDENT

Manufacturers of Siphonage Ventilators

1577 Conway Building

CHICAGO, ILL.

EASTERN BRANCH OFFICE: NEW YORK, N. Y., 132 Nassau Street

## Product.

AREX ORIGINAL SIPHONAGE ROOF VENTILATOR.  
Arix Antidraft Window Ventilators.

## Adaptability.

The Arex ventilator can be installed wherever constant, positive, uniform ventilation is required. It is ideal for mills, factories, foundries, warehouses, power plants, train sheds, railway cars, ships, etc., for completely and quickly removing foul air, warm air, fumes, gases, vapors, steam and smoke. It can be used on flat, slant or sawtooth roofs, on skylights, monitors, etc.

Arex is a scientific substitute for fans, blowers and other power operated apparatus.

## Description.

The ingenious siphonage feature of this ventilator is the result of 10 years' analysis of air elements and study of wind currents. The passing wind plays upon the siphons in such a manner as to accelerate the outflow of foul air from the interior of the building, but under no condition permitting a particle of the outside wind to enter the ventilator. Every opening is an outlet. At a wind velocity of 9 miles an hour, it produces an exhaust of 300 cu. ft. an hour per sq. in. outlet, a greater exhaust than is shown by any other ventilator.

## Construction and Operation.

The upper end of the eductor pipe is worked into 4 deflections, opposite which are 4 siphons, surrounded by a frustum, making 4 vacuo chambers. Thus are formed 8 compartments, which create the most powerful natural vacuum conceivable. The upper part consists of a double conical deflector top, surrounded by a scientifically adjusted storm guard.

The siphons are so placed that there is one for each point of the compass—north, east, south and west. They concentrate all passing wind currents into a steady, silent, pulling force. By means of the deflections opposite the siphons (see sectional view) the wind is turned into the continuous, powerful vacuum described above.



SECTIONAL VIEW OF AREX VENTILATOR  
Showing siphonage system and extraordinary outlet for escape of air



BOTTOM VIEW OF AREX VENTILATOR

Arex is *union made* of only the best grades of galvanized sheet metal and copper. No solder is used; every joint is rigidly riveted and reinforced. Has no movable parts to rattle, no shutters or louvers to break off, no fancy trimmings to impede its ventilating action.

## Advantages.

The unique combination of siphons, conical deflector top, storm guard and frustum makes Arex absolutely impenetrable to rain, snow, hail and sunrays. Down-drafts are impossible. Constant, positive ventilation is assured under the most adverse conditions.



AREX ORIGINAL SIPHONAGE VENTILATOR (PATENTED)

Because of its tremendous exhaust, half the number of ventilators or proportionately smaller sizes are required. Thus great savings are affected by eliminating unnecessary ventilators, minimizing the number of holes in the roof, and by reducing transportation and installation costs.

Arex costs nothing for maintenance, requires no attention and lasts longest. It is the most economical ventilator made.

## Official Test.

An official test of the Arex ventilator was made with anemometers inspected under various wind velocities, approved by the United States Government. The test was based on a wind velocity of 9 1/3 miles per hour, which is the gross average wind velocity of the United States. The figures, which are official and accurate, are given in the accompanying table.

## How to Specify Arex.

Simply multiply cubical contents of room by number of air changes required per hour. The capacity table will tell exactly the size and the number of Arex to use.

## Approval.

Arex has been approved by officials of the United States Government, as well as by the leading and most prominent architects and engineers in the country.

The United States Steel Corporation, Indiana Steel Co., Illinois Steel Co., Armour & Co., Morris & Co., Ford Motor Co., Chalmers Motor Co., Hupp Motor Co., Chevrolet Motor Co., American Bridge Co., Corn Products Refining Co., Continental Can Co., American Can Co., Bessemer Limestone Co., Board of Education of Chicago, and many other large concerns are satisfied users of Arex.

EXHAUST CAPACITY	
Size of Arex, ins.	Exhaust per hour, cu. ft.
4	4,189
5	6,545
6	9,425
7	12,828
8	16,755
9	21,206
10	26,180
12	37,699
14	51,313
16	67,021
18	84,823
20	104,720
22	126,711
24	140,796
26	176,976
28	205,251
30	235,619
36	339,293
42	461,813
48	603,187
54	763,407
60	942,477
66	1,140,397
72	1,357,167
84	1,847,256
96	2,412,743
108	3,053,626
120	3,769,900
132	4,561,621
144	5,428,667

# AUTO UTILITIES MANUFACTURING COMPANY

Manufacturers of Building and Car Ventilators

5 North La Salle Street  
CHICAGO, ILL.

## Products.

PEERLESS EXHAUST VENTILATORS for buildings, steam and electric railway cars.

## Description.

This ventilator differs entirely from any other type of exhaust ventilator. It is square in design with four V-shaped faces or sides. The outer openings are at the four corners, the inner outlet directly back of the V in the wind resisting face. The slightest air currents striking the V-shaped faces are forced over the corner opening at a greatly increased velocity, thus creating the vacuum.

The inner construction consists of four cylindrical parts with flat edges extending outward into the V of the face. These flat edges absolutely prevent down-draft and make positive a continuous exhaust whether the wind passes over or through the corner openings. The collar extends up into the ventilator creating a perfect drain, and making the ventilator absolutely stormproof.

The Peerless is a common sense ventilator, designed along the most advanced lines of ventilating science. It has been on the market only five years, is steadily and surely replacing the round types, and today can show an unparalleled list of well wishers in its users. It is protected by five United States and two Canadian patents.



PEERLESS VENTILATOR

## Construction.

The Peerless ventilator is union made of the best grade of galvanized steel, Ingot or Toncan metals and copper. No solder is used in its construction; all parts are double seamed or riveted; it has no movable parts, no top bands or any other parts to rust, give way, or blow off.

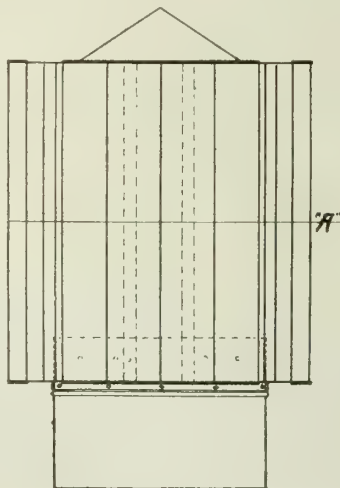
## Advantages.

The Peerless is substantially built, and therefore lasts long.

It sells at a legitimate price and delivers full value for the money.

Its exhaust capacity can be relied upon, therefore the user takes no chance of failure.

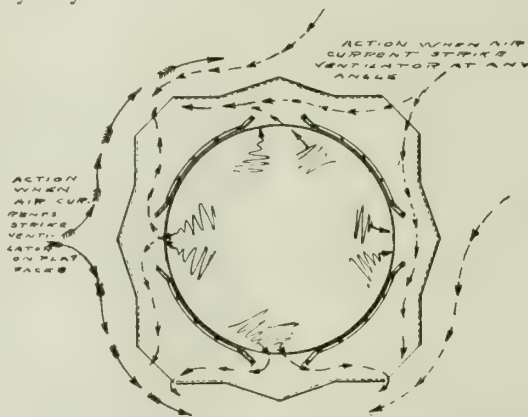
Its design is the best evidence of its merit. A



ELEVATION OF PEERLESS VENTILATOR

flat surface will give greater resistance to the wind than a round one. That is the principle of the Peerless.

It succeeds where round ventilators fail, and proves it every day.



PLAN SECTION THROUGH "A" PEERLESS VENTILATOR

## Capacities.

The exhaust capacities given here are from actual service tests at an average wind velocity of 10 miles per hour. This company has no confidence in fan or laboratory tests, because they are made under the most favorable conditions. Our tests are reliable service tests and the user can absolutely depend on them. Laboratory tests with temperature allowance will exceed these figures by approximately 40%.

### CAPACITIES

Size, ins.	Exhaust per hour, cu. ft.
6	6,284
7	8,552
8	11,170
9	14,138
10	17,454
12	25,133
14	34,209
16	44,681
18	56,549
20	69,814
22	84,474
24	93,864
26	117,984
28	136,834
30	157,070
36	226,196
42	307,876
48	402,125

Larger sizes on application.

## Where Used.

On the largest manufacturing plants of all descriptions, all of whom have had more or less experience with the old type of ventilators.

Briefly, attention is called to the following: Fulton Iron Works of St. Louis; and to Crane Co., Union Drop Forge Co., Illinois Malleable Iron Co., Chicago Bearing Metal Co., Western Foundries, Continental Can Co., Joseph T. Ryerson & Son, O. H. Obermayer Co., American Coconut Butter Co., Western Packing and Produce Co., Reder Foundries, Sheffield Foundries, all of Chicago; Northwestern Malleable Casting Co., Plankinton Packing Co., of Milwaukee, Wis.; Studebaker Corporation, South Bend, Ind.; Advance Rumely Co., LaPorte Foundry and Furnace Co., of LaPorte, Ind. The Pullman Co. has used Peerless ventilators on every sleeping car built since November, 1914. Adopted as standard by them because it gave greater pull than anything they could find and did not back up or show an intake.

On steam or electric railway cars all over the United States; more than 60,000 used as smokejacks on stove heated street cars.



# THE BURT MANUFACTURING COMPANY

## High Grade Ventilators and Skylights

600 Main Street.  
AKRON, OHIO

GEO. W. REED & CO., MONTREAL, SOLE MANUFACTURERS OF "BURT" VENTILATORS FOR CANADA

### Products.

"BURT" SLIDING SLEEVE GLASS TOP VENTILATOR, a combination Skylight and Ventilator.

"BURT" SLIDING SLEEVE METAL TOP VENTILATOR, for automatically removing impure air, hot air, smoke, steam or gas out of any building.

"BURT" FAN VENTILATOR, "BURT" SLIDING CONE DAMPER VENTILATOR, and "BURT" REVOLVING VENTILATOR designed to meet most difficult conditions.

"Burt" Double Damper Ventilator designed for use on weave sheds; "Burt" Square and Rectangular Ventilators for use on school buildings; Skylights of standard form; Oil Filters and Exhaust Heads.

### "Burt" Sliding Sleeve Ventilators.

**CONSTRUCTION**—The "Burt" sliding sleeve ventilators are made in the round, square and rectangular patterns, of galvanized iron, brass, zinc, copper, or Toncan metal.

Great care is exercised in making the air shaft round; the sliding sleeve damper being also perfectly round and fitting loosely against the pipe, slides easily up and down without friction. When the sleeve is at its highest point, it is in contact with the top and completely closes the ventilator.

The sliding sleeve damper is operated from below by means of a cord and pulley, and can be readily adjusted by the special attachment (patented), by which the rope is forced between the spring, and held permanently in place. The damper descends by gravity when the spring clutch is released, but it can be held firmly at any position wanted. It is not necessary to fasten the cord to a nail, hook, or post, as is the case where the common flat damper is installed. Also, there is nothing in the "Burt" ventilator to interfere with the operation of machinery, a frequent trouble where the flat damper method is used, from the way in which the cords require to be attached.

**EXCLUSIVE FEATURES**—The "Burt" possesses the following features not found in any other ventilator:

(1) A telescopic or sliding sleeve damper, which does not interfere with outgoing air currents, as do all flat dampers. It requires no attention after it has been installed and, having no flat movable surface set in the body of the pipe, does not collect dust or refuse to be shaken off into the building, as is the case with other dampers.

(2) A combination ventilator and skylight, in which the light is never shut out.

(3) The air shaft is unobstructed, and the air current never deflected downward.

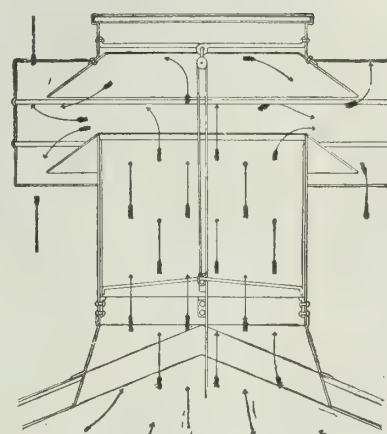
(4) The temperature and ventilation of a building can be regulated easily and exactly by the use of the sliding sleeve damper, which operates positively and is dustproof.

(5) A condensation gutter (patented) placed under the rim of the glass collects all moisture, making it impossible for water to drop down into the rooms below.

(6) An especially designed band (patented) fastens the glass so that it can be shipped separately, and easily placed in position. If glass is broken it can be replaced without taking down the ventilator. No water can remain on the glass, and the ventilator is guaranteed absolutely storm-proof.

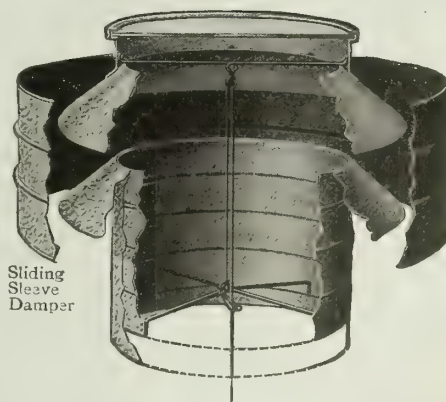
**GLASS TOP VENTILATOR**—The "Burt" glass top ventilator has a most important characteristic in that it constitutes both a skylight and ventilator. In many cases this makes the use of a regular skylight unnecessary.

At times when it is desirable to close a ventilator, the "Burt" can be entirely closed without in the slightest degree obstructing the passage of daylight through it.



"BURT" SLIDING SLEEVE VENTILATOR

Arrows showing direction of air currents



SECTIONAL VIEW "BURT" SLIDING SLEEVE GLASS TOP VENTILATOR

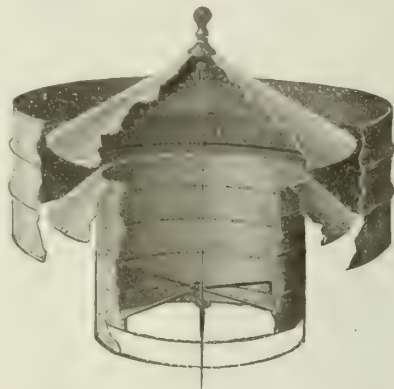
This feature is achieved by the patented damper mechanism which is, in fact, no damper at all in the ordinary acceptation of the term, but a slide sleeve which moves up and down, opening or closing to any desired degree the ventilating aperture.

The "Burt" is the only ventilator on the market having this valuable feature, which is fully protected by patents.

In every other make of ventilator in which a glass top is used the common flat damper is employed, and when that damper is closed the light is wholly shut off.

The glass top is furnished in all sizes up to and including the 72-in. size. Heavy wired glass of ample weight is used for each size.

METAL TOP VENTILATOR—The "Burt" is made with a metal top instead of a glass top, when required. With the exception of the top, both styles are precisely alike in construction and operation, but the metal top style is a ventilator solely, and does not admit light.



SECTIONAL VIEW "BURT" SLIDING SLEEVE METAL TOP VENTILATOR

The sliding sleeve damper is furnished in all metal top ventilators, the same as in the glass top style.

SPECIFICATION—"Furnish and set up 'Burt'..... (glass or metal top) Ventilators with adjustable sliding sleeve damper and clip for holding damper, of the size and number shown on plans, all to be made of ..... gage galvanized iron [or copper or Toncan] and manufactured by THE BURTT MANUFACTURING COMPANY of Akron, Ohio."

PRICES, DIMENSIONS, WEIGHTS AND GAGE OF IRON OF "BURT" SLIDING SLEEVE VENTILATORS

Diameters, ins.	Outer rim or band	Gage of iron	Height without base, ins.		Length air shaft from bottom of wind-shield, ins.	Net weight without crating, lbs.		Area of diameter in sq. ins.	Price
			Glass top	Metal top		Metal top	Glass top		
12	22	22	14	17	4 1/4	17	20	113.10	\$5.00
14	24	22	15	17 1/2	4 1/4	20	24	153.94	7.50
16	26	22	15 1/2	19	5	24	30	201.06	10.00
18	29	20	16	21	5 1/2	28	34	254.47	12.50
20	32	20	18	23	5 1/2	33	42	314.16	15.00
24	38	20	22	26	6	45	56	452.39	18.00
30	46	18	24	30	6	90	105	706.85	25.00
36	54	18	27	36	8	130	155	1017.88	37.50
40	64	18	33	40	10	175	200	1256.00	50.00
42	68	18	34	42	10	190	225	1386.00	54.00
48	78	18	36	46	11	300	320	1809.00	60.00
54	86	18	40	51	14	350	400	2390.00	70.00
60	94	16	43	54	12 1/2	430	480	2827.00	80.00
66	102	16	46	55	15 1/2	500	550	3456.00	90.00
72	110	16	51	66	15 1/2	560	610	4071.00	100.00

Prices f. o. b. Akron, Ohio, and include sliding sleeve damper. Ventilator bases are charged for extra, for which prices will be quoted on receipt of specifications. Operating rope or chain not furnished.

The "Burt" Fan Ventilator.

The attention of manufacturing concerns and mechanical engineers is directed to the "Burt" fan ventilator.

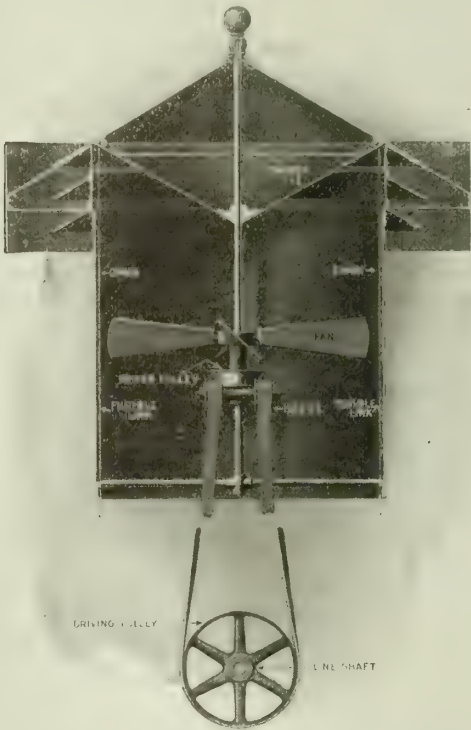
This type of ventilator is designed only for most difficult conditions, and, at slight expense, will effectively and quickly remove excessive fumes and odors from blacksmith shops, dye houses, foundries, rubber factories, theaters, laundries and similar buildings. More economical than the average blower system.

Fan has a speed of 350 to 400 r.p.m., and is operated either from line shafting or by motor pulley drive or direct connected. Power required to operate motor, about 1/4 to 1/2 h.p.

Fan can be reversed to force cold air into the building, if desired.

In case of fire, fusible links will break, causing damper to drop and shut off draft.

Three stock sizes: 30-in., 36-in. and 48-in., but can be made in any required size above 30 ins.



SECTIONAL VIEW "BURT" FAN VENTILATOR

The "Burt" Sliding Cone Damper Ventilator.

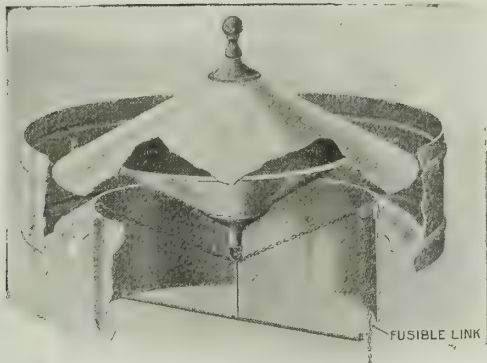
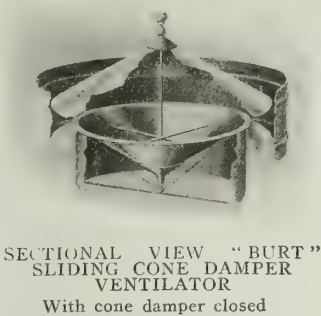
This ventilator is designed by this company to meet the demands of the trade for a strictly high grade cone damper that possesses the merits of a good ventilator and at the same time has the important feature of closing automatically in case of fire.

It is constructed with fusible link connection for automatic closing when fire occurs. Since the fusible link connection is sometimes insisted upon by the fire insurance companies, customers may rest assured that the "Burt" sliding-cone damper ventilator will meet all of the requirements of the Underwriters' Association.

RAISING AND LOWERING DEVICE—Patented. Simple in construction and positive in action. This company



guarantees that damper will not stick or bind. Cone damper moves up and down on the center rod, and can be held in any position by means of the patented clip, so that it is not necessary to fasten cord or rope to nail, hook or post. This style of ventilator is made only with metal tops. All sizes.



SECTIONAL VIEW "BURT" SLIDING CONE DAMPER VENTILATOR  
With cone damper open

**DIMENSIONS**—The gage of iron and general outside dimensions of the "Burt" sliding cone damper ventilator are the same as for the "Burt" sliding sleeve damper ventilator.

**PRICES**—The list prices of the "Burt" sliding cone damper ventilator are the same as the prices for the "Burt" sliding sleeve damper ventilator mentioned on preceding page, but take a smaller discount.

**"Burt" Revolving Ball Bearing Ventilator.**

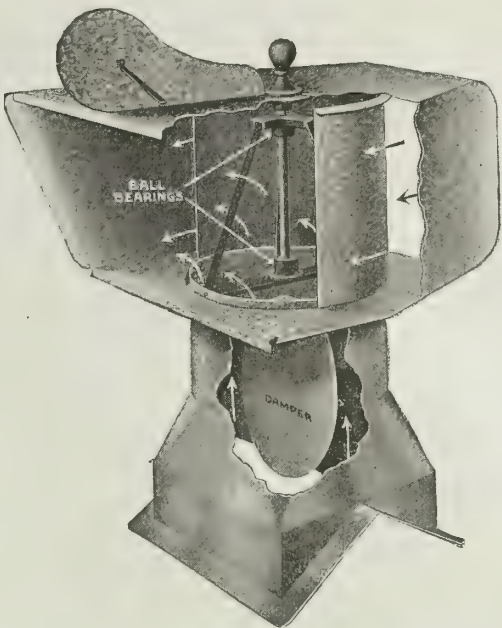
A late development in the "Burt" line of ventilators—neat, well constructed and highly effective. It is fitted with two sets of high grade ball bearings, and is positively guaranteed not to stick or bind.

Its distinctive construction causes the exterior air currents to pass not only over the top and sides of the ventilator, but directly through the ventilator. This creates a partial vacuum, and greatly increases the pulling power of the ventilator in expelling the foul air from within. This same construction also has a tendency to hold the ventilator steady with the wind, thus preventing a continuous whirling motion, which is a faulty feature to be found in some types of revolving ventilators.

Each ventilator is fully tested before shipment, thus insuring perfect balance.

If so specified, where bases are furnished by the company, they will be equipped with dampers; if desired, the dampers can be of fire retarding type which automatically close in case of fire.

Diameters of neck, weights of iron same as for "Burt" sliding sleeve ventilator, tabulated on preceding page.



SECTIONAL VIEW "BURT" REVOLVING VENTILATOR

**Ordering, etc.**

In ordering bases always furnish sketch showing pitch of roof, and location of ventilators whether on ridge or slope, and round or square.

Ventilator bases are charged for extra, for which figures will be quoted on receipt of specifications. All bases equipped with dampers without extra charge.

Prices on ventilators made of copper, Toncan, American ingot iron, or any other material desired will be furnished on application.

**Guarantee.**

This company expressly agrees to replace, free of charge, any of its ventilators which shall at any time be found to have been defective in workmanship or material.

**Co-operative Service.**

The engineering department of this organization will gladly and expeditiously co-operate with architects, contractors and others, in the selection of proper types and sizes of ventilators, to suit particular conditions and requirements. Blue prints of all types will be furnished on application.

**References.**

COMPANY	ORDERS
U. S. Steel Corporation.....	406
U. S. Government.....	77
Standard Oil Company.....	151
American Beet Sugar Company.....	23
Stone & Webster Engineering Corporation.....	46
American Steel & Wire Company, Cleveland, Ohio.....	116
American Steel & Wire Company, Waukegan, Ill.....	71
American Steel & Wire Company, Joliet, Ill.....	31
American Steel & Wire Company, De Kalb, Ill.....	28
Goodyear Tire & Rubber Company, Akron, Ohio.....	17
Firestone Tire & Rubber Company, Akron, Ohio.....	26
Canadian Pacific Railroad Company, Montreal, Canada.....	15
Sheffield Farms-Slawson-Decker Company.....	42
Imperial Tobacco Company.....	10
Union Pacific Railroad Company.....	8

## THEODORE R. N. GERDES, M. E.

Manufacturing and Contracting Engineer for Hygienic Ventilation

123 Liberty Street  
NEW YORK, N. Y.

### Products.

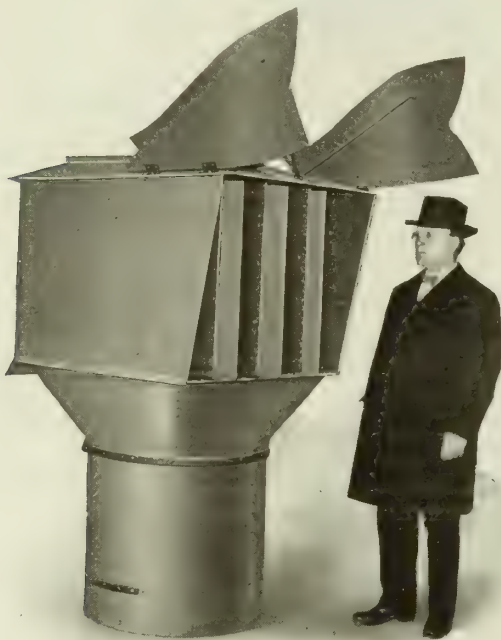
VENTILATORS: ELECTRIC WINDOW and ROOF; AIR MOISTENERS; AIR INTAKES.

Automatic Window Ventilators, Air Controlling Heads, Smoke Jacks, Blowers, Exhaust Fans, Gas and Oil Engines, Gas Producers, Weatherstrips.

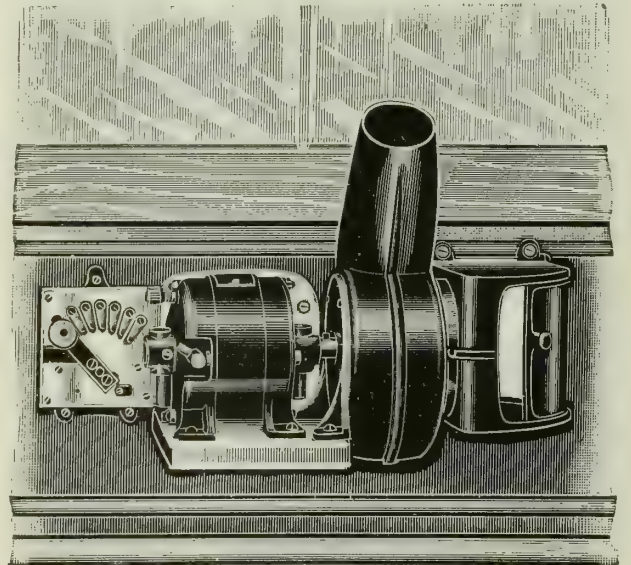
### Gerdes Roof Ventilator.

The design of the Gerdes roof ventilator is based on the fact that the passage of moving air (wind) past still air is done with great frictional effect so the still air acquires velocity from the wind. The four venting sections are separated by three wind passages. The length of the contact line between wind and air is three and one-half times the circumference of the base. Cold,

nozzle at the ceiling line, which causes uniform temperature throughout and prevents venting of warmest air, thereby conserving heat. Smaller sizes can be sent on approval.



30-IN. GERDES ROOF VENTILATOR



GERDES ELECTRIC WINDOW VENTILATOR

Air intakes for these ventilators can be inserted in walls of new buildings at any convenient point for future use. Booklet and references on request.

### Gerdes Air Moistener.

The air of steam heated rooms becomes abnormally dry. The Gerdes air moistener consists of a pan to fit the top of the steam radiator and a skirted cover to bring the hot dry air in contact with the water. The skirted cover causes an evaporation twelve times greater than for a pan alone. It also serves as a radiator shield. Made in larger units using blowers. A different design for humidifying with exhaust steam.

### References.

A few of the many users of Gerdes Ventilators:  
National Safety Council, Chicago, Ill.  
Western Efficiency Society, Chicago, Ill.  
American Museum of Safety, New York, N. Y.  
Joint Board of Sanitary Control, New York, N. Y.  
Federal Reserve Bank, New York, N. Y.  
Pennsylvania Railroad, Philadelphia, Pa., and New York, N. Y.  
Joseph T. Ryerson & Son, New York, N. Y., Chicago, Ill., and St. Louis, Mo.  
Post Graduate Hospital, New York, N. Y.  
Powers-Weightman-Rosengarten Co., Philadelphia, Pa.  
Silk Association of America, New York, N. Y.  
Rubber Association of America, New York, N. Y.  
Westinghouse Electric and Manufacturing Co., New York and Philadelphia, Pa.  
New York Edison Co., New York, N. Y.

dust laden air can be vented, and heavy gases drawn from the floor level.

The venting of costly, warmed, unvitiated air during the cold season is a disadvantage of roof ventilators as usually installed.

Correspondence is solicited regarding the conservation of fuel for heating and to simple, effectual ventilation methods applying in general and special cases.

### Gerdes Electric Window Ventilator.

Made in varying sizes, and designed to diffuse healthful, unheated, filtered (by gravity) air without draught or chill. Large sizes have a Gerdes diffusing



GLOBE VENTILATOR COMPANY

205 River Street  
TROY, N. Y.

Products.

“GLOBE” DOME TOP SUCTION VENTILATORS;  
GLASS TOP VENTILATORS; “GLOBE” CHIMNEY CAPS  
and “GLOBE” VENTILATED RIDGING.  
Barn Birdproof Ventilators; Special “Globe” Car  
Ventilator and “Globe” Lamp Jacks.

Uses.

“GLOBE” VENTILATOR—Especially adapted for  
removing excessive heat and foul air from churches,  
schoolhouses and public buildings; for exhausting steam,  
smoke and gases from mills, foundries and factories;  
and for expelling impure air, moisture and odors from  
barns and stables—in fact, it meets every requirement of  
a stationary ventilator.  
CHIMNEY CAPS—Prevent downward currents in  
chimneys and increase drafts in sluggish flues.  
“GLOBE” VENTILATED RIDGING—For use on  
buildings where it is not desired to break the skyline by  
placing ventilators.  
Description of “Globe” Ventilators.  
The “Globe” ventilator is made in all materials, of  
the proper gages to give lasting service; and this  
standard is never lowered.

It is strongly and carefully constructed by skilled  
workmen; it is symmetrical in appearance, absolutely

stormproof, and is efficient under all conditions.  
“Globe” glass top ventilators possess all the quali-  
ties of our metal top ventilators, and are designed for  
use where it is desired to secure the greatest degree of  
ventilation and the largest area of light.

DATA, “GLOBE” VENTILATORS

Diameter of ventilator, ins.	Gage of iron	Extreme outside diameter, ins.	Area, sq. ins.	Cu. ft. exhaust per hour	Price list*
2	26	4 3/4	3	540	\$1.00
3	26	6 3/4	7	1,320	1.50
4	26	7 3/4	13	2,490	1.75
5	26	10	20	3,825	2.50
6	24	11 1/4	28	5,340	3.40
7	24	12 1/2	38	7,260	4.00
8	24	14	50	9,600	4.65
10	24	17	79	15,120	5.75
12	22	18 3/4	113	21,660	6.75
14	22	25	154	29,520	13.00
15	22	26	177	33,900	16.00
16	20	27 1/2	201	38,520	20.00
18	20	32	254	48,840	27.00
20	20	36 1/2	314	60,180	33.00
22	20	38	380	72,840	36.00
24	20	43 1/2	452	86,640	40.00
26	20	44	531	101,760	50.00
28	20	50	616	118,080	56.00
30	20	50 1/2	707	135,480	65.00
32	20	54	804	154,080	80.00
36	18	68	1,018	195,120	120.00
40	18	74	1,257	240,900	180.00
48	18	84	1,810	346,920	240.00
54	18	92	2,290	438,900	300.00
60	18	99	2,827	541,800	360.00
66	18	105	3,421	655,680	420.00
72	18	111	4,072	780,480	480.00

\*Subject to liberal discounts.  
Fire retarding or regulation dampers furnished when desired.  
Bases extra.

ANEMOMETER READINGS

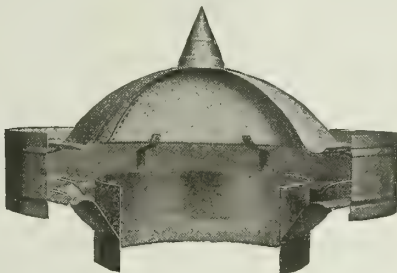
No. of reading	Wind velocity, miles per hour	Air velocity in ventilator, ft. per min.	Temper- ature difference
1	4.41	468	38°
2	4.65	457	38°
3	4.36	462	38°
4	3.74	447	37°



GLASS TOP “GLOBE” VENTILATOR



“GLOBE” BARN VENTILATOR  
For barns, stables, creameries  
and silos. Furnished with or with-  
out weathervanes



SECTIONAL VIEW OF DOME TOP  
“GLOBE” VENTILATOR



DOME TOP “GLOBE” VENTILATOR

# PAUL R. JORDAN & CO.

## Rotary Ventilators and Fresh Air Intakes

### TELEPHONES:

Automatic 25-301  
Blue-Main 535

HOME OFFICE AND FACTORY  
INDIANAPOLIS, IND.

PACIFIC COAST FACTORY  
CALIFORNIA CORNICE WORKS  
1610 Fernando Street  
LOS ANGELES, CAL.  
Telephones: A-2601, East 809

### AGENTS

ALBANY, N. Y., C. M. WARD, Jay Street  
CHATTANOOGA, TENN., THE WEBSTER Co., Chamberlain Building  
CHICAGO, ILL., J. C. BOLD, Conway Building  
CLEVELAND, OHIO, McWATERS & Co., Euclid Building  
DETROIT, MICH., DETROIT FIRE DOOR Co., Dime Bank Building  
HOUSTON, TEX., F. B. WALCOTT, Beatty Building  
KNOXVILLE, TENN., W. B. MARTIN  
LEXINGTON, KY., E. B. OLDHAM, McClellan Building  
NORFOLK, VA., J. L. BELOTE, Bank of Commerce Building  
NORWICH, CONN., C. E. WHITAKER, Water Street  
PITTSBURGH, PA., J. B. ROBERTSON, Fulton Building

PHILADELPHIA, PA., G. G. FALCONER, Jr., 220 East Mt. Pleasant Avenue  
PORTLAND, ORE., F. S. COOK Co., 103 West Park Street  
PUEBLO, COLO., SMEDLEY ROOFING & SALES Co., "C" and Pulm Streets  
ROANOKE, VA., GRAVETT & TURNER, McBain Building  
SHERIDAN, WYO., SHERIDAN IRON WORKS  
ST. LOUIS, MO., C. E. BARRELL, 800 Chestnut Street  
ST. PAUL, MINN., E. K. FLEISCHER, Endicott Building  
TACOMA, WASH., SAVAGE-SCOFIELD Co., Dock Street  
TAMPA, FLA., G. M. McDONOUGH  
UTICA, N. Y., J. E. BOWEN, Evans Building

### PACIFIC COAST REPRESENTATIVES

LOS ANGELES, CAL., W. H. STEELE, 600 Metropolitan Building—Telephones: 60871 and Broadway 502  
SAN DIEGO, CAL., J. S. SCHIRM COMMERCIAL Co., 4th and "K" Streets  
SAN FRANCISCO, CAL., ROLPH-MILLS Co., 149 California Street

### Products.

AEROPLANE ROTARY VENTILATORS: BALANCED  
AUTOMATIC FRESH AIR INTAKES.  
Wall Boxes; Ventilating Systems Complete.

### The Aeroplane Rotary Ventilator.

This ventilator is of the rotary type, consisting of a plain tight hood with a slightly flaring mouth, rotably mounted on a heavy fixed shaft. The lower part of the ventilator is fastened directly to the flue or roof opening. Curved planes on top of the hood, in a frontal leverage position, cause a readjustment of position for each slightest change in wind direction. The ventilator is accurately balanced by a tail weight. Smooth and round in appearance, without unsightly projections, it has no movable parts, and moves as a complete single unit.

### Adaptability of Ventilator.

Aeroplane ventilators will remove foul air, vapor, fumes, etc., from any building—schools, churches, libraries, hotels, factories, mills, industrial plants, power-houses, breweries, warehouses, public buildings, residences, dry houses, dairies, creameries, stores, etc.

### Construction of Ventilator.

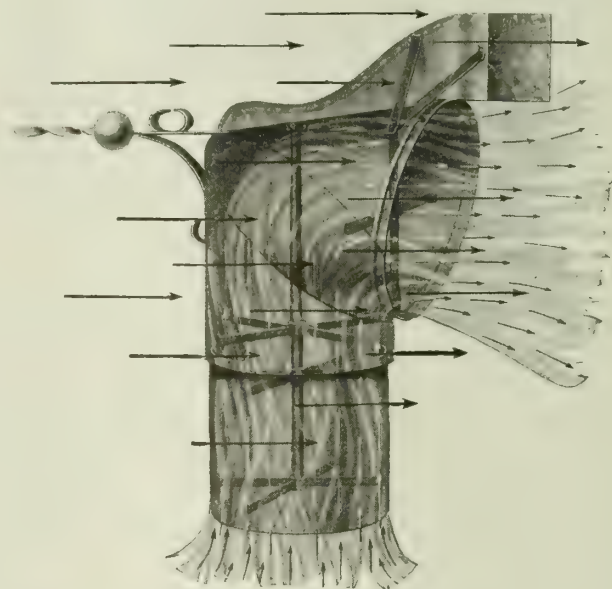
**MATERIAL**—The material used is galvanized iron, or other durable metal as ordered.

**WEIGHT**—In weight, the stator or lower part is the heaviest of any ventilator on the market, as on it depends the stability of the device. The rotor or hood is well and strongly built of good weight metal.

**MAIN BEARING**—The main bearing at top is of a special inverted type, designed and patented by us; built of bronze resting on steel, making it at once non-corrosive, durable and practically frictionless. The secondary bearing is also non-corrosive.

**BRACING**—The bracing is of steel flats set edgewise.

**CASTINGS**—No castings are used in our construction; no threads, set screws, ball or roller bearing, oil or grease cups or anything that needs attention or adjustment, or that can be changed in any way.



AEROPLANE ROTARY VENTILATOR

Diam. of throat, ins.	List price	Gage of metal used on neck	Diam. of throat, ins.	List price	Gage of metal used on neck
12	\$9.00	22	36	\$65.00	18
14	12.00	22	42	90.00	18
16	16.00	22	48	110.00	18
18	20.00	20	54	125.00	16
20	24.00	20	60	145.00	16
24	32.00	20	72	180.00	16
30	45.00	18	84	240.00	16

**JOINTS**—Joints are seamed and riveted, and are reinforced inside with riveted steel segments. No solder joints are used.

**RIVET HEADS**—All outside rivet heads are covered with solder.

**DETAIL**—Every detail in Aeroplane construction has been carefully worked out.

### Operation of Ventilator.

See accompanying view; also the diagrams and the



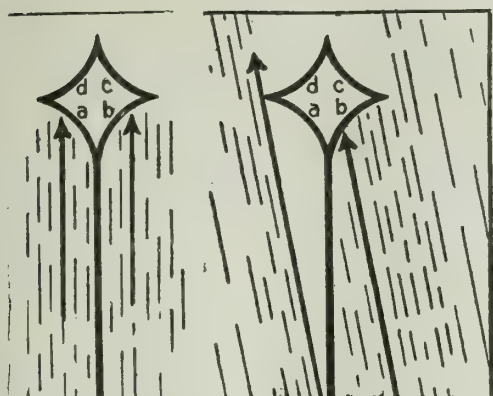


FIG. 1

FIG. 2

## DIAGRAMS SHOWING WIND ACTION ON PLANES

FIG. 1. Wind with the ventilator, exerting pressure on both planes; pressure on plane (a) tending to turn ventilator to the right, pressure on plane (b) tending to turn ventilator to the left. The two counteracting pressures holding ventilator directly and accurately away from the wind.

FIG. 2. Wind at an angle, pressure removed from plane (a) and increased on plane (b). Right angle pressure on plane (b), together with leverage position of the plane (extreme distance from main bearing), gives great turning power, causing immediate adjustment by ventilator to changed wind direction even in the lowest wind.

In case of a complete reversal in direction, the wind will act on planes "c" or "d" in the same manner, causing ventilator to turn around away from the wind.

illustration of parts. Ventilator swings around in full compliance to pressures of air directed against any of the 4 metal planes at top, causing foul air outlet to have its back *always* to the wind; therefore, the outlet is *away* from the wind. At the outlet, an area of low pressure or vacuum exists, the rushing air on both sides of the outlet exerting an enormous suction power—an operation simple, scientific, uninterrupted and effective.

## Capacity of Ventilator.

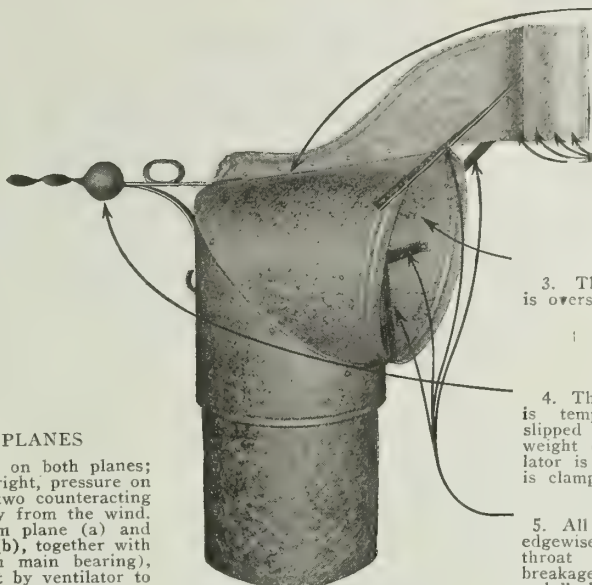
By reason of continuous suction exerted in all positions of the ventilator, its efficiency is 100% to 500% greater than that of any stationary ventilator, and 10% to 100% greater than that of any other rotary type; in fact, from the standpoint of efficiency, Aeroplane is the cheapest ventilator on the market today.

In figuring sizes, use a ventilator with 60% as much sectional area as the combined area of the flues handled.

Write us for complete data.

## Advantages of the Aeroplane.

Aeroplane is *positive in action*, being simple in design and constructed carefully. The construction throughout is permanent. No loose parts to get out of adjustment. No cost of operation or maintenance. It is *highly efficient*, because of its accuracy of adjustment to wind direction and its minimum of throat obstruction; *stormproof absolutely*, its mouth being always directly away from the wind; and, by reason of its

AEROPLANE ROTARY VENTILATOR  
Showing parts

1. The main bearing is at the top, well above the center of gravity, giving a natural and not a forced balance. Hence there is no gripping.

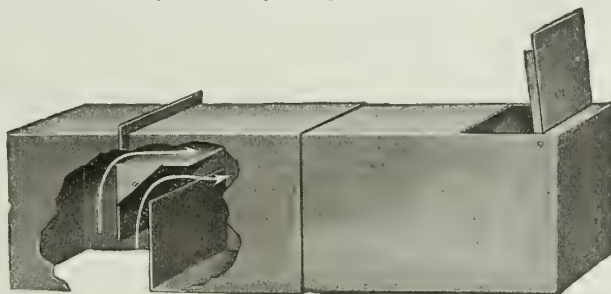
2. The special shaped planes are four in number, and form pockets to catch the wind, on the aeroplane principle, causing ventilator to respond to the lightest air movements. These metal planes keep the mouth of the ventilator directly away from the wind.

3. The foul air outlet, or mouth, is oversize.

4. The counter balancing weight is temporarily adjustable, being slipped along its brace like the weight on a scale until the ventilator is perfectly balanced; then it is clamped permanently into place.

5. All bracing is of steel flats set edgewise, giving a minimum of throat obstruction and making breakage impossible. Our "spider web" bracing is an engineering triumph, and gives great strength and rigidity.

6. *Simplicity* is our watchword, as on it depends reliability. We have attained the two most desirable features, simplicity and sensitiveness, side by side. Either one by itself is easily attained but ineffective. We have the most simple ventilator on the market, and at the same time the most sensitive. The sensitiveness does not detract from the durability or the dependability, and the simplicity is not obtained at the expense of sensitiveness. And, incidentally, the price is reasonable.



BALANCED AUTOMATIC FRESH AIR INTAKE

For furnishing fresh air to rooms. Full particulars on request

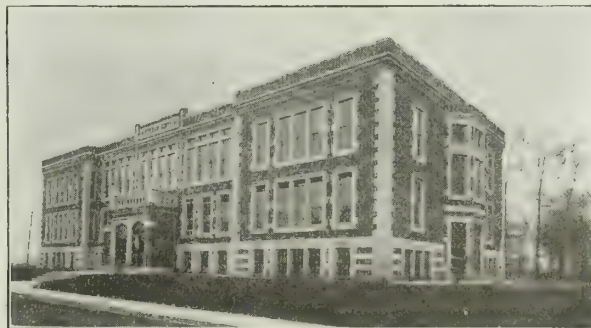
exposing a minimum of pressure area, heavy storms or high winds can not affect its operation or impair its efficiency. It is *cheaper* than any other ventilator, because of its unequaled efficiency.

On a *gravity system*, the Aeroplane insures a positive upward flue action at all times; therefore, no possibility of down-draughts.

On a *blast system*, it relieves pressure on the fan, saving current and wear while fan is on; and, when fan is off, the Aeroplane still ventilates, making the system continuously effective, and with no possibility of down-draughts.



Rear View Showing Aeroplane Ventilators



Front View

RIVERSIDE SCHOOL, INDIANAPOLIS, IND.

47 stationary ventilators on this building were replaced by 11 Aeroplanes, making flues weatherproof, eliminating back-draughting and increasing their ventilating efficiency

# KERNCHEN COMPANY

## Ventilating Engineers

McCormick Building  
CHICAGO, ILL.

TELEPHONE:  
HARRISON 3072

NEW YORK OFFICE: 1265 Broadway—Telephones, Madison Square 2769 and 9478  
AGENCIES IN ALL PRINCIPAL CITIES

### Products.

KERNCHEN SIPHONAGE VENTILATORS (K-S-V's), with or without dampers.

Fuse Link Dampers for same. 8

### Kernchen Siphonage Ventilator (K-S-V).

For any type of building or enclosure, railway and street cars; chimneys, defective drafts, etc.

The Kernchen Siphonage Ventilator (K-S-V) does the work of three others. Save this cost.

The siphon is the most powerful force known to gravity science. It not only exhausts; it actually pulls.

The siphons harness the most delicate air currents, compressing and compelling them to co-act in terrifically increasing the upward movement of air through the ventilator, and consequently increasing the pull.

The Kernchen Siphonage Ventilator (K-S-V) is in one piece and stationary. It has no mechanism to get out of order. It has no loose parts to clog up. Nothing rotary or revolving. No cost to operate or for maintenance. Nothing flopping around. No sliding sleeves—nothing to hinder the pull.

**STORMPROOF**—It is guaranteed absolutely and positively stormproof.

**CAUTION**—Beware of imitations and infringements. Protect yourself by specifying as follows: "Kernchen

Siphonage Ventilators (K-S-V's), manufactured by KERNCHEN COMPANY, McCormick Building, Chicago, Ill.," and see that KERNCHEN COMPANY brass tags are on ventilators.

### Booklet—"It Pulls."

A postal will bring our latest illustrated booklet, entitled "It Pulls," containing complete information concerning the Kernchen Siphonage Ventilators (K-S-V's), and giving prices, weights and gauge of metal, etc., of the various sizes, together with a few of our numerous testimonial letters.

Our engineers are at your service, gratis.

Send your plans to us. Let us specify for you. We keep ethical in all instances.

### Official Tests.

Note in the following two official tests (which are signed by eminent authorities) the absolute evidence of capacity and pulling power. Compare the Case School of Applied Science Official Test (which was made on the roof of a building) with the Armour Institute Official Test (which was conducted in a laboratory), for scientific corroboration and verification of our statements regarding the actual pull of "K-S-V's."

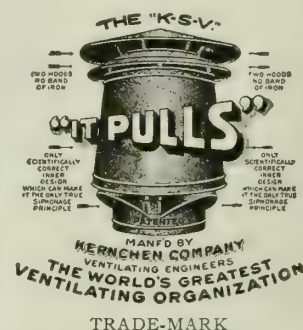
We challenge all to furnish such signed, Institutes of Technology Official Tests.

#### OFFICIAL TEST OF KERNCHEN SIPHONAGE VENTILATORS CONDUCTED BY ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

SHOWING EXHAUST UNDER DIFFERENT WIND VELOCITIES, AND WHICH SCIENTIFICALLY PROVES THE TERRIFIC PULLING POWER AND 100% TO 300% MORE EFFICIENCY THAN THAT OF OTHER VENTILATORS

Wind velocity, miles per hour	Air pulled through ventilator, ft. per min.	Size of ventilator, ins.	Cubic feet air pulled through ventilator									
			12	14	16	18	20	24	30	36	40	48
5	460	Per min.	364.0	492.2	644.0	814.2	900.0	1,444	2,250	3,247	4,000	5,776
		Per hr.	21,840	29,532	38,640	48,852	54,000	86,640	135,000	194,820	240,000	346,560
10	670	Per min.	525.0	717.0	938.0	1,186	1,460	2,103	3,280	4,730	5,830	8,412
		Per hr.	31,500	43,020	56,280	71,160	87,600	126,180	196,800	283,800	349,800	504,720
15	960	Per min.	754.0	1,027	1,344	1,699	2,100	3,014	4,700	6,777	8,350	12,056
		Per hr.	45,240	61,620	80,640	101,940	126,000	180,840	282,000	406,620	501,000	723,360
20	1,220	Per min.	957.0	1,305	1,708	2,159	2,660	3,830	5,980	8,613	10,610	15,320
		Per hr.	57,420	78,300	102,480	129,540	159,600	229,800	358,800	516,780	636,600	919,200
25	1,480	Per min.	1,161	1,584	2,072	2,619	3,230	4,647	7,250	10,448	12,870	18,588
		Per hr.	69,660	95,040	124,320	157,140	193,800	278,820	435,000	626,880	772,200	1,115,280

(Signed) G. F. GEBHARDT, A. H. ANDERSON, Mechanical Engineers, Armour Institute of Technology



CASE SCHOOL OF APPLIED SCIENCE—TEST NOV. 6, 1913  
ON ROOF OF LEADER BUILDING, CLEVELAND, OHIO

ARMOUR INSTITUTE OF TECHNOLOGY—TEST APRIL 17, 1911  
IN LABORATORY

15 inches	Diameter of Ventilator	15 inches
5.32 miles per hour, or 6 $\frac{2}{3}$ % stronger than Armour	Velocity of Outside Wind	5 miles per hour
497	Velocity of Air pulled through Ventilator per min., lin. ft.	460
610	Exhaust of Ventilator per min., cub. ft.	564
Outside Temperature, 67° Fahr.	Inside Temperature, 85.8° Fahr.	

(Signed) F. H. Vose,  
Head of Mech. Eng. Dept.,  
Case School of Applied Science.

(Signed) G. F. GEBHARDT,  
A. H. ANDERSON,  
Mech. Engrs., Armour Institute of Technology.



## THOMAS LEE

Manufacturer of Dampered Ventilators, Rotary and Stationary Types

OFFICE AND FACTORY  
128-132 West Second Street  
CINCINNATI, OHIO

### Products.

LEE DAMPERED VENTILATORS (Patented) with Metal or Glass top.

Rain Water Strainers.

For Metal Windows and Tin Clad Doors, see page 719.

### Special Features of Lee Ventilators.

Lee ventilators possess these important features:  
A simple, powerful damper operating device that will not get out of order.

A damper locking device that will permit the damper to be adjusted so that the amount of ventilation desired can be obtained.

A damper that can not bind.

ADAPTABILITY—The Lee ventilator is especially desirable for churches, schoolhouses, residences, factories, barns, or any building demanding perfect ventilation.

The glass top style should be used where the maximum amount of light and ventilation is desired, and will in many cases serve the purpose and save the expense of a skylight.

MATERIALS AND SIZES—Lee ventilators are made of heavy galvanized iron or copper, firmly braced, riveted and soldered, in sizes from 12 to 96 ins. in diameter,

with or without damper. Sizes less than 12-in. are not made with damper.

PRICES—Price list, with discount, will be furnished on application. If bases are required, they are charged extra. Prices of glass top and copper ventilators will be given on receipt of schedule of sizes required.

### Lee Rotary Ventilator.

This ventilator is strongly constructed of galvanized sheet steel, and as shown in illustration, is a combined weather vane and ventilator.

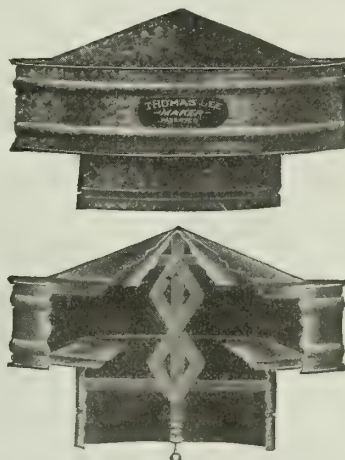
The rotary turns sensitively on glass bearings. It is equipped with outside louver dampers which are operated from within by a chain or cord. Absolutely storm-proof, no shield necessary.

The wind turns the ventilator so that the opening is leeward. The movement of air past it produces a vacuum in front of its mouth, drawing out the foul air, with which it is continually filled.

This type of the Lee rotary ventilator is also made with glass top, especially designed for buildings where light is a necessity.



GLASS TOP VENTILATOR  
(Patented)  
Damper closed



METAL TOP VENTILATOR  
(Patented)  
Damper open and locked



LEE ROTARY  
VENTILATOR

# KING VENTILATING COMPANY

## Barn and Creamery Ventilation; Aerators

1100 North Cedar Street  
OWATONNA, MINN.

### Products and Services.

Manufacturers of KING SYSTEMS of VENTILATION for Barns and Creameries; KING AERATORS.

The services of this company include the planning of the proper system of ventilation needed for any farm barn or creamery, and the supplying of the needed material for installing the system. When necessary the system can be installed by the company, but generally the plan of the system and the material is supplied with instructions for installing.

In all cases this company assumes the responsibility for the system and guarantees its ventilating the building properly, provided that the system is installed and operated according to directions. The designing of each King system is under the direction of the King Board of Engineers. This board consists of a number of men of long experience, who devote their entire time to this work.

### King System of Ventilation.

Each King system consists of 3 units: The King aerator, the foul air flues and the fresh air intakes. It is the proper application of these units that insures satisfactory ventilation. These units are made in different sizes, and their number and location vary according to the needs of the building. As there are no two buildings with conditions exactly alike, each building has its own ventilation problem. Therefore, each King system is designed for the building into which it goes.

**BARN VENTILATION**—The problem in barn ventilation is to take out the excessive moisture and bad air, and to bring in fresh air without reducing the temperature of the barn too much in cold weather. It is estimated that the animals in a farm barn require the oxygen contained in 2 lbs. of air for the proper consumption of 1 lb. of food and water. Therefore, the proper ventilation of a farm barn is a vital problem.

**CREAMERY VENTILATION**—In creameries the hot steam, wet floors and open vats put a great amount of moisture into the air. Unless this moisture is removed immediately, it condenses upon the walls, ceiling and the machinery. It makes the building a damp, unhealthy place for workers, spoils the quality of the product and shortens the life of the building and the equipment it contains.

KING VENTILATING COMPANY is equipped to answer these problems in ventilation. King systems have been installed in thousands of farm barns and creameries throughout this country. References in every locality will be furnished to customers.

### King Aerator.

This is the first unit of the King system. It is the part above the roof. It can be used with or without the King system, and be put upon any barn or creamery, new or old. Its beauty harmonizes with almost any style of architecture. Many farmers have been using King aerators on their barns for the beauty they add to the building, as well as for their work as ventilators.

The King aerator is made of highest quality galvanized steel finished in beautiful satin silver. Its operation as a ventilator is on the siphon principle. (Note illustration on the opposite page.) As the wind passes around the King aerator head it creates a draft or suction from below. The air passes out on all sides of the King aerator head. It makes no difference from which direction the wind is blowing. Being round, it presents the same face in all directions.

When used in connection with the King system, the aerator creates a suction in the foul air flues. Also, it draws the foul air out of the open space in the upper part of the building.

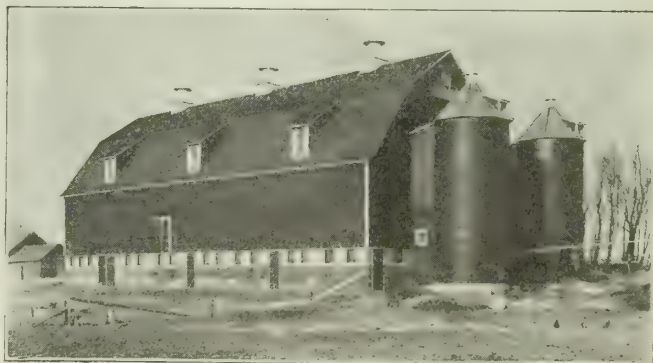
Made in 10 sizes, a size for every building, square or round base, including several sizes for silos.



**KING AERATOR**  
The part above the roof  
First part of the King system of ventilation  
SIZES AND PRICES SUBJECT TO CHANGE  
WITHOUT NOTICE

No.	Flue	Price
50	13 inches.	\$28.00
100	16 inches.	33.00
200	20 inches.	38.00
300	24 inches.	47.00
350	28 inches.	51.00
400	30 inches.	55.00
500	36 inches.	66.00
600	40 inches.	78.00
700	44 inches.	96.00
800	48 inches.	110.00

No. 400 King is used on most barns from 30 to 36 ft. wide. The number of Kings depends on the length of the building.



P. F. COGGINS' BARN, BLOOMING PRAIRIE, MINN.

**ADAPTABILITY**—The King aerator is also used on other types of buildings, or on buildings where the



complete King system may not be required. This aerator is giving complete satisfaction on grain elevators where there has been a demand for a ventilator that would keep out rain, snow and birds, and still allow the fine dust to be drawn out.

On closed lumber sheds King aerators generally save their cost in one year by preventing lumber from becoming moldy and decaying in the piles.

**LIGHTNING ROD ATTACHMENT**—Where a building is to be equipped with lightning rods, the use of the King lightning rod attachment in the King aerator is advised. A pure copper, nickel-plated point, connected to a pure copper cable running down inside the aerator and out through its base is supplied. Cost \$4.00 extra.

**VANES**—Each King aerator is mounted with a beautiful weathervane, delicately balanced to respond to the slightest breeze. Any of the following designs: Horse, cow, bull, auto, rooster, sheep and arrow.

### Foul Air Flues.

Through this unit of the King system the foul air from the stockroom below is discharged into the King aerator on the roof. The size of the flues must be adapted to the size and the construction of the building and the number of head of live stock housed. King foul air flues are made of galvanized steel, and thoroughly insulated to prevent moisture from condensing inside the flues. They are equipped with control dampers and doors.

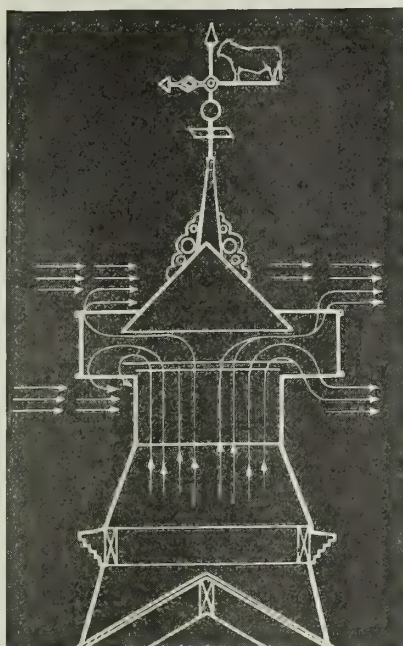
### Fresh Air Intakes.

The fresh air intakes are the supply valves for the King system. They bring in the fresh air from the outside to enter at the ceiling of the room, while the foul air is taken out from points near the floor. This is the principle of the King system. The movement of air is from the ceiling to the floor. And as heat naturally rises and cold air falls, the heat from the animals is trapped and held while fresh air is constantly moved through the room.

There are two things which create this movement of air with the King system. One is the expansion of air caused by the heat from the animals; the other is the suction created by the wind passing across the King aerator head on the roof.

### Estimates.

Upon receipt of sketch of building with actual measurements, together with general description, quotations can be made for the King system designed to ventilate it properly. But it is suggested that customers



SECTIONAL VIEW OF AERATOR  
Arrows show direction of air currents

write for catalogue and also the plan sheet on which can be given the information needed to guide the King engineers in designing the plan of ventilation to fit the actual conditions in the building. As each King system is built individually for the building it goes into, it is necessary to plan the system before quotations are made. No obligation will be assumed in sending plans or having the King representative call.

### Experience and Indorsements.

KING VENTILATING COMPANY has given many years of attention to this work and specializes in barn and creamery ventilation. Thousands of King systems have been installed under its direction in all parts of the country and ample proof of their successful operation under almost all conditions can be shown. The following letters are but a few from many thousands which have been received.

#### DAIRY BARN

H. A. BARTLETT, MANLEY, IOWA—In answer to yours of the 16th, would state that I have installed a complete King Ventilating System in my barn and I wouldn't do without it for double what it cost to install it.

When we had the coldest days this winter so far, and had everything closed up tight, there was no bad odor in the barn from the cows, not even when we fed ensilage.

GENE JOHNSON, MANAGER OF DAIRY FARM AT BIG LAKE, MINN., OWNED BY S. J. HEWSON OF MINNEAPOLIS—You could not take this system out for twice the money it cost to install it.

The ceiling was actually dripping water. I was actually sick of working under such conditions and I did as little as I could in the barn and did it in the shortest possible time. As a result my cattle were in poor shape, the barn was dirty and the foul smell was too much even for my help. There is absolutely no estimating the money value of this improvement—twice the expense would be cheap.

#### CREAMERIES

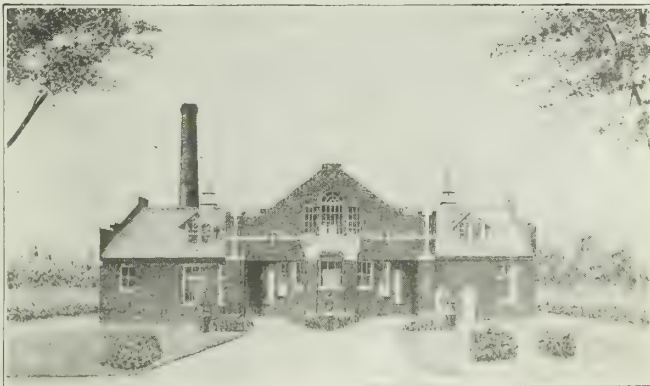
JAMES SORENSON, STATE CREAMERY, ALBERT LEA, MINN.—The ventilating system which you installed at the State Creamery three years ago has given good satisfaction.

There is no doubt that ventilation is one of the important features connected with the construction of a creamery, and it is a serious mistake for a creamery to spend money for a good building and neglect the ventilation.

JOS. HANSEN, B. M., CLARISSA, MINN.—In regard to the King system of ventilation, must say that it could not be beat. Before putting in this system, water was dripping from the ceiling all winter; now the creamery is dry and fresh the year around. It is worth its weight in gold to any butter maker's health.

### Books on Barn and Creamery Ventilation.

The company has two books: one on farm barn ventilation and one on creamery ventilation. In writing, please mention which book is wanted and either or both of them will be sent free.



GLENCOE CREAMERY, GLENCOE, MINN.

POWELL EVANS, PRESIDENT

**MERCHANT & EVANS CO.**

ESTABLISHED 52 YEARS (1866-1918)

Manufacturers of Ventilators

PHILADELPHIA, PA.

OFFICES AND WAREHOUSES

PHILADELPHIA

WHEELING

NEW YORK

CHICAGO

BALTIMORE

ST. LOUIS

ATLANTA

KANSAS CITY

WORKS  
PHILADELPHIA  
WHEELING  
CHICAGO**Products.**

The NEW STANDARD "STAR" VENTILATOR,  
NEW FIRE RETARDING "STAR" VENTILATOR,  
FIRE RETARDING SKYLIGHT "STAR" VENTILATOR.

For Fire Doors, see page 680; for Metal Roofing, see page 420.

**The Company's Claim.**

"Star" ventilators, including installation cost, will give *more cubic feet* air exhaust capacity, *per dollar invested*, under like conditions of service and of equal construction strength, than any other make of ventilator.

Obtain this company's bid.

**New Standard "Star" Ventilator.**

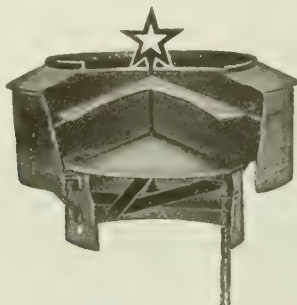
This is an improved siphonage type of ventilator. Its construction along strictly scientific lines enables the "Star" ventilator to give more cubic feet air exhaust per dollar invested than any other ventilator on the market.



NEW STANDARD "STAR" VENTILATOR  
(Patented)

**New Fire Retarding "Star" Ventilator.**

The fire retarding gravity damper of this ventilator is operated by a lever movement, controlled by a



NEW FIRE RETARDING "STAR" VENTILATOR  
With automatic gravity damper. (Patented)



chain with a fusible link. In the event of fire, the link parts and the damper drops by gravity, which closes the opening and shuts off the draft entirely.

The damper can be regulated at will by simply pulling the chain from full open to closed position.

**Fire Retarding Skylight "Star" Ventilator.**

This type is recognized as a superior combination of skylight and ventilator. Absolutely weatherproof and of ample exhaust capacity. Has a fire retarding movable damper readily controlled by a chain with a fusible link.

The damper can easily be raised or lowered and does not interfere with the passage of light.

**Multiple Control.**

Multiple control can be provided for "Star" ventilator dampers, designed to meet the needs of any case, especially long rows for mills and stations. This company also manufactures rectangular shaped "Star" ventilators to meet special conditions.

**Installations.**

"Star" ventilators have been installed in large quantities in many of the cantonments recently erected by the United States War Department, and are also installed on hundreds of the largest industrial plants throughout the country.

**Trade-marks.**

All genuine "Star" ventilators carry MERCHANT & EVANS Co.'s registered trade-marks.

Specify the "Star."



INSTALLATION OF "STAR" VENTILATORS ON PLATTSBURG BARRACKS



# MILWAUKEE CORRUGATING CO.

Manufacturers of Ventilators

MILWAUKEE, WIS.

BRANCH AT KANSAS CITY, MO.

## Products.

SIPHON REVOLVING AND "NU-AIR" VENTILATORS.

For Metal Ceilings, Shingles and Tile, see page 421; for Metal Lath and Corner Bead, see page 209.

## Siphon Revolving Ventilators.

DESCRIPTION—The position of the vane on these ventilators insures their facing away from the wind at all times, thus preventing any down-draft. *The outer air currents passing over the roof, enter the ventilator between the fins at either side and are deflected upward between the lower apron (which is stationary) and the upper apron (which revolves with the ventilator).* The air currents pass upward and out at the mouth of the ventilator, creating in their passage a vacuum which forcibly draws the impure air from the building. The mouth or air exit shows the perpendicular shaft, which has a ball race bearing at center, as shown, and is provided with grease cups, which not only permit the ventilator to adjust itself to the slightest breeze, but also insure its noiseless turning. Interior braces hold the perpendicular shaft rigidly



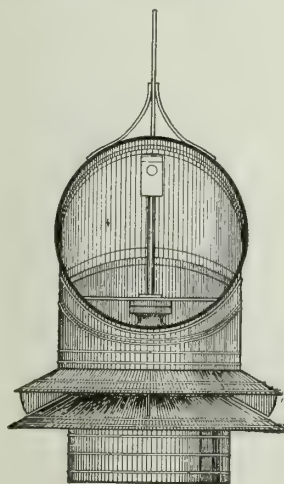
SIPHON REVOLVING VENTILATOR  
Patented October 21, 1913

upright and true in whatever direction the ventilator may be facing. Beneath the lower or stationary apron is an inverted subapron which insures a perfectly circular shape in construction and preserves its shape regardless of unusual strain or rough handling.

These siphon revolving ventilators present a broader intake for outer air than stationary or other revolving ventilators, hence have a greater capacity for removing impure air from a building.

Patented Oct. 21, 1913.

CONSTRUCTION — Siphon revolving ventilators are made of best grade galvanized steel,



FRONT VIEW  
SIPHON REVOLVING  
VENTILATOR

"copperoid metal," or sheet copper; every joint rigidly riveted. Made in following sizes: 12, 16, 18, 20, 24, 30 and 36 ins. 42-in. and 48-in. sizes also made, to order, when desired.

USES—These ventilators can be used on any building where the removal of impure air, smoke, steam, hot air or gas is desired. Especially adapted for factory buildings, roundhouses, warehouses, theaters, street cars and steamships.

## "Nu-Air" Ventilators.

DESCRIPTION—These ventilators are constructed to provide a circulation of a large volume of air, even at low velocity. Any current of outer air across the top of a "Nu-Air" ventilator creates an upward flow of air from the building.

The double deflectors create greater pulling power—air currents always deflect upward—no back draft.

"Nu-Air" ventilators are stationary—therefore never out of order, and are in a position to work properly at all times.

CONSTRUCTION—"Nu-Air" ventilators are made only of best grade galvanized sheet metal and "Copperoid" metal. Every joint is rigidly riveted. No movable parts. All braces galvanized after formed. Made in all even sizes from 10 to 48 ins. Moderate in price.

USES—"Nu-Air" ventilators successfully remove impure air, steam, gas, hot air, smoke, in fact meet every requirement of a stationary ventilator.



"NU-AIR" VENTILATOR  
Furnished with glass or steel top



INTERIOR OF "NU-AIR" VENTILATOR  
Showing course of air currents

# THE OHIO BLOWER COMPANY

## Rotary Ball Bearing Ventilators

CLEVELAND, OHIO

### BRANCH OFFICES

NEW YORK, N. Y., THE OHIO BLOWER Co., 39 Cortlandt Street  
CHICAGO, ILL., THE OHIO BLOWER Co., 318 West Washington Street  
ST. LOUIS, MO., THE OHIO BLOWER Co., Mermaid Jaccard Building

ATLANTA, GA., THE OHIO BLOWER Co., 702 Candler Building  
LOS ANGELES, CAL., WATERHOUSE-WILCOX Co., 331 East Fourth Street  
SAN FRANCISCO, CAL., WATERHOUSE-WILCOX Co., 8 Monadnock Building Arcade  
SEATTLE, WASH., D. E. FRYER & Co., Lumber Exchange

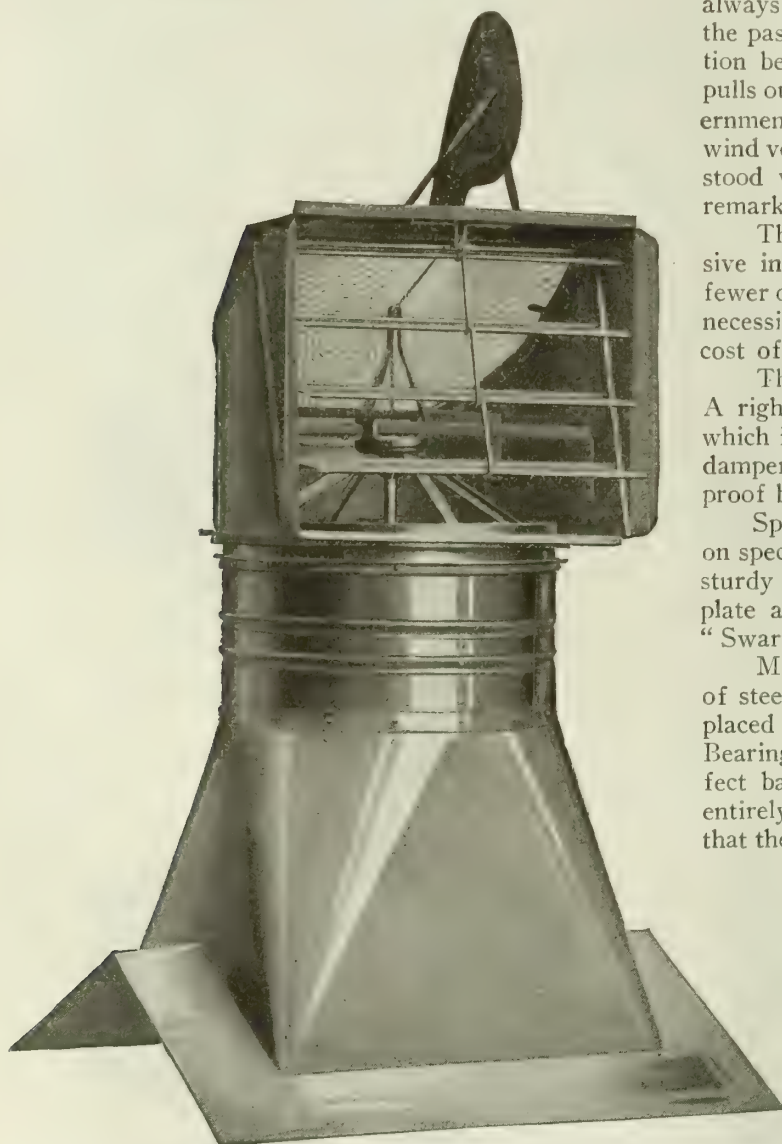
AGENTS IN ALL PRINCIPAL CITIES

### Products.

"SWARTWOUT" ROTARY BALL BEARING VENTILATORS; AIR-LIGHT VENTILATORS; BARN VENTILATORS.

"Swartwout" Helico-centrifugal Steam Specialties, Cast Iron Exhaust Heads, Steam and Oil Separators, Steam Traps, Feed Water Heaters, Water Level Control Valves, Low Pressure Boiler Feeders, Core Ovens, Gasoil Burners.

Ohio Blower Company Low Power, Slow Speed Dust Collecting Systems; Handiline Sheet Metal and Angle Iron Specialties.



"SWARTWOUT" ROTARY BALL BEARING VENTILATOR

Shows copper ventilator and base, with wire glass, sloping top. Louvers open. Base furnished only when specified. Standard ventilator is of galvanized sheet metal. Prices on request

### "Swartwout" Rotary Ball Bearing Ventilator.

The increase in knowledge on ventilating engineering has taught us that *a hole in the roof isn't ventilation*; yet perfect ventilation is necessary, if the occupants of a building are to live in comfort and work to their full efficiency. Architects can "put the wind to work" with a "Swartwout" and assure clients of steady, continuous ventilation at least cost.

The principle is surprisingly simple. Because of its large ball bearing and ample vane, the "Swartwout" always faces away from the wind. The free power of the passing breeze is continually creating an active suction before the mouth of the ventilator. This suction pulls out a steady flow of used air from below. As Government Weather Reports show us that there is rarely a wind velocity less than 5 miles an hour, it is easily understood why a "Swartwout" ventilator handles such a remarkable air volume.

The "Swartwout" is distinctly efficient and impressive in appearance. On account of its great capacity, fewer or smaller ventilators are required, eliminating the necessity of a "forest" of ventilators, and reducing the cost of adequate ventilation.

The "Swartwout" operates easily and effectively. A right angle turn only is required for the air flow, which is accurately controlled by stormproof louvers or dampers, operated simultaneously from within by rust-proof brass chains over brass pulleys.

Special rust-resisting galvanized metal (or copper, on specification) of ample gauge covers a framework of sturdy angle iron hot galvanized *after* forming on template and punching. Built for lasting resistance, the "Swartwout" is practically indestructible.

Main portion of ventilator is suspended on skeleton of steel channels and angle iron, revolving on centrally placed bronze bearings and hard composition balls. Bearings are non-corrosive, of large size to insure perfect balance. They are frictionless in operation, and entirely enclosed, the joint being machined so accurately that there is no possibility of dust reaching the bearings.

### "Swartwout Air-light" Ventilator.

On specification, a full size strong, wire glass top is substituted for the metal top, thus providing a combination skylight and ventilator. The top, being steeply pitched, forms a self-cleaning skylight. No position of dampers can obstruct direct passage of light. Snow, ice, soot, etc., fail to find a permanent hold on this smooth, sloping surface. Except for glass top, the "Swartwout" standard construction is followed throughout.



**Standard Specifications for "Swartwout" Ventilators.**

All ventilators to be of the rotary ball-bearing type [glass top, metal top], of galvanized rust resisting metal, or copper; all interior members of angle iron, hot galvanized *after* forming and punching. The ventilators to turn sensitively on accurately machined bronze bearings, employing bell metal balls, and counterweighted on outside. The ventilators to be equipped with outside louver dampers to throw accumulated dust outside of building, louver to be operated from within by brass chains over brass pulleys. Gauge of metal\* to be THE OHIO BLOWER COMPANY, Cleveland, Ohio, standard as furnished in "Swartwout" Rotary Ball Bearing Ventilators at regular prices. Top of collar and bottom of hood to be stiffened with galvanized angle iron rings.

\*If desired, give standard gauge from table below. Follow with base specification from next page.

**TABLE OF DIMENSIONS IN INCHES, GAUGES, WEIGHTS, PRICES, AND CODE WORDS**

Discounts on request. For "A," "B," "C," "D," see drawing below

A	B	C	D	Gauge iron	Weight of copper oz.	Net wgt.	Crated wgt.	List	Code word
10	9 $\frac{1}{8}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	24	18	12	32	\$10.00	Sulcicolle
12	11	5	4 $\frac{1}{2}$	24	18	16	40	10.00	Sulciforme
14	12 $\frac{7}{8}$	5 $\frac{3}{4}$	5 $\frac{1}{2}$	24	18	32	53	15.00	Sulciperme
16	14 $\frac{3}{4}$	6	5 $\frac{3}{8}$	24	18	48	75	20.00	Suleiman
18	16 $\frac{1}{2}$	6 $\frac{5}{8}$	7	24	18	55	80	25.00	Sulfacide
20	18 $\frac{1}{2}$	7 $\frac{5}{8}$	5 $\frac{3}{4}$	24	18	65	95	30.00	Sulfatable
24	22	9	6 $\frac{5}{8}$	24	18	90	125	35.00	Sulfatado
30	27 $\frac{1}{2}$	11 $\frac{5}{8}$	9 $\frac{1}{4}$	22	20	125	175	50.00	Sulfatage
36	33	13 $\frac{1}{2}$	11 $\frac{1}{4}$	22	24	196	270	75.00	Sulfatamos
42	33 $\frac{1}{2}$	15 $\frac{3}{4}$	11	20	26	248	345	105.00	Sulfataria
48	44	18 $\frac{3}{8}$	11	20	26	337	430	120.00	Sulfataron
54	49 $\frac{1}{2}$	20 $\frac{1}{4}$	13 $\frac{3}{4}$	20	28	452	580	140.00	Sulfateur
60	55	22 $\frac{1}{2}$	17	20	28	667	735	160.00	Sulfatique
66	60 $\frac{1}{2}$	24 $\frac{3}{4}$	16 $\frac{3}{4}$	20	28	710	825	180.00	Sulfato
72	66	27	22 $\frac{1}{2}$	20	28	800	960	200.00	Sulfazote

**CODE**

Ship by fast freight—Inceptor      Quote price f. a. s. New York City  
Ship by express—Incepting      —Gooseberry  
Price f. o. b. Cleveland—Goorkha      How soon can you ship?—Incarnat  
Quote lowest price, cost and freight  
—Goorder

Collar 2 gauges heavier than top. All ventilators supplied with chain through ventilator with swivel at end. Additional chain furnished at nominal cost. In ordering, only dimension "A" is required.

**FRESH AIR REQUIREMENTS**

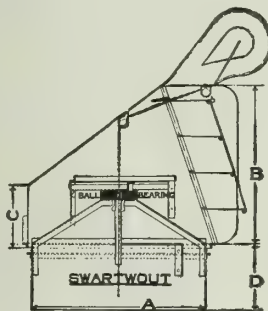
Figures in cubic feet per person per hour from table prepared by Prof. John R. Allen, Dept. of Mechanical Engineering, University of Michigan.

Workshops and barracks.....	3,000
Office rooms.....	1,800
Schools.....	2,400
Hospitals.....	3,600
Churches, theaters.....	2,000
Dining rooms.....	1,800
Toilets and bathrooms.....	2,400

**CAPACITIES BY ANEMOMETER TEST**

Wind velocity 5 miles per hour

Vent size, ins.	Cu. ft. per min.	Vent size, ins.	Cu. ft. per min.
12	275	36	2550
14	370	42	3400
16	490	48	4450
18	650	54	5500
20	800	60	6850
24	1100	66	8250
30	1700	72	9850



SECTIONAL DRAWING OF "SWARTWOUT" ROTARY BALL BEARING VENTILATOR

**Tests.**

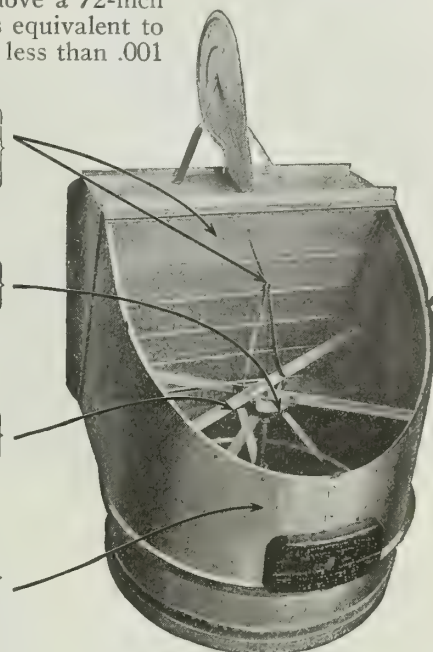
On a test of a ventilator made for Hollingsworth & Whitney Co., Waterville, Me., it required only 2 oz. on a postal scale to move a 72-inch ventilator. This is equivalent to a wind pressure of less than .001 oz. per sq. in.

Adjustable stormproof louvers and brass chain operating over rustproof pulley  
Wire screen substituted for louvers in barn type

Accurately machined bronze bearings revolving on hard composition balls centrally balanced

All inside members of angle iron hot galvanized after forming on template and punching

"Swartwout" standard is heavy gauge, highest grade rust resisting, galvanized sheet metal. Made in copper when specified. Rim runs absolutely free around collar of base



VENTILATOR WITH TOP REMOVED TO SHOW INTERIOR MEMBERS

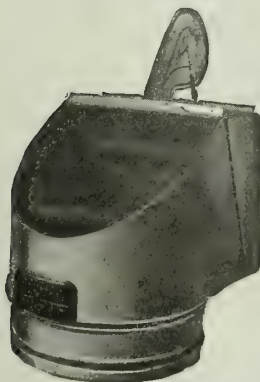
In a competitive test made by a famous food plant, it was found that a 10 h.p. motor driven fan, costing \$960.00 per year to operate, exhausted 12,816 cu. ft. of air per minute. Four 48-in. "Swartwout" ventilators installed on the same building removed 19,248 cu. ft. per minute, at far less first cost and no operating expense.

**Installation.**

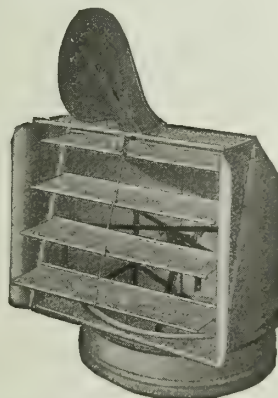
To insure proper installation and immediate satisfaction, complete directions for mounting are supplied on each ventilator.

**"Swartwout" Barn Ventilator.**

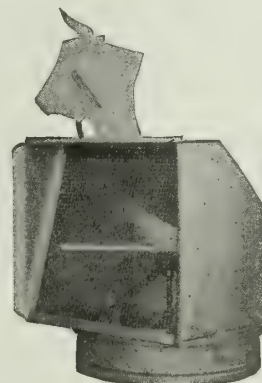
The "Swartwout" barn ventilator is a modification of the standard "Swartwout" ventilator especially adapted to stable and dairy barn ventilation. The distinctive features are the use of a screen in place of the adapted to stable and dairy barn ventilation. The distinctive features are the use of a screen in place of the adapted to stable and dairy barn ventilation. The distinctive features are the use of a screen in place of the adapted to stable and dairy barn ventilation.



COPPER VENTILATOR GLASS TOP TYPE  
Back view



GALVANIZED VENTILATOR  
Front view



GALVANIZED METAL BARN VENTILATOR  
Showing screen. Front view



240 POUNDS ON SMALLEST "SWARTWOUT"  
No distortion





**A FEW SWARTWOUT INSTALLATIONS**

1. Delaware & Hudson River R. R. Terminal, Albany, N. Y.  
Marcus T. Reynolds, Architect
2. Minneapolis Museum of Fine Arts  
McKim, Mead & White, Architects
3. Farm Barn at Gates Mills, Ohio, showing "Swartwout" barn ventilators (see preceding page)
4. U. S. Treasury Building, Washington, D. C.  
—three glass-top copper "Swartwouts"
5. High School, Hot Springs, Ark.  
Sanguinett & Staats, Architects

### Specifications for Bases.

*Build each base individually for its job.*

Ventilator bases to be of galvanized, rust-resisting metal, two gauges heavier than ventilator, according to THE OHIO BLOWER COMPANY standard for ventilator bases, and of size corresponding to nominal size of ventilators. Collars to be 5 ins. high, grooved and riveted to body of base with 1-in. lap and 5-in. spacing. Body of base to be a square-to-round section with opening of the square 4 ins. larger than the collar. Bases 18 ins. and smaller to be 23 ins. high over all, and larger sizes 27 ins. high. All bases to fit roof dimensions accurately with 5-in. flange, bent out, not sharp (if concrete roof, to fit detail shown) and must form an absolutely watertight juncture with the roofing material and be left so on completion. Seams at roofing line can not be allowed, except to fill in corners of base. Top of base to be absolutely level and round.

NOTE—For capacity, rigidity, tightness, economy, use square bases only.

#### DATA FOR VENTILATOR BASES

A, ins. ....	10	12	14	16	18	20	24	30
Gauge. ....	22	22	22	20	20	20	20	18
Av'g. net wt., lbs. ....	16	20	26	35	38	45	55	80
Wt. crated, lbs. ....	20	25	30	40	45	55	65	95

A, ins. ....	36	42	48	54	60	66	72
Gauge. ....	18	18	18	18	18	18	18
Av'g. net wt., lbs. ....	95	105	115	125	140	155	170
Wt. crated, lbs. ....	110	125	135	150	165	185	200

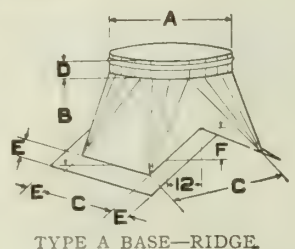
NOTE—When specifying, inquiring or ordering, refer to type of base by letter. State type and pitch of roof, and whether ventilator will rest on peak or slope.

### Draughting Room and Specification Helps.

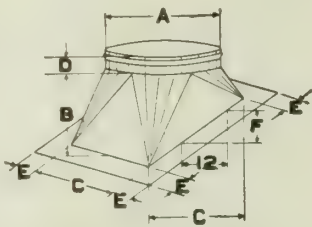
"The Gospel of Fresh Air," a 24-page ventilation handbook with air-requirement tables, ventilator capacities, complete drawings, specifications, photographs, etc.

Ventilation Data Card, 8½ by 11 ins.; heavy card reference. Covers air requirements, capacities, ventilator and base specifications and drawings. Widely used for instant reference.

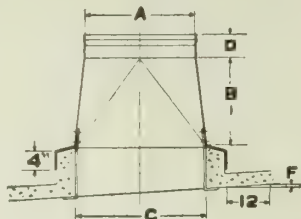
Ventilator Specification File Card, sizes 3 by 5 ins. or 4 by 6 ins. Same for bases. Any of above helps free on request.



TYPE A BASE—RIDGE



TYPE B BASE—SLOPE



TYPE C BASE—CONCRETE

#### DIMENSIONS OF STANDARD BASES, INCHES

A	10	12	14	16	18	20	24	30
B	18	18	18	18	18	22	22	22
C	14	16	18	20	22	24	28	34
D	5	5	5	5	5	5	5	5
E	5	5	5	5	5	5	5	5
F	Required dimensions, slope per foot							

A	36	42	48	54	60	66	72
B	22	22	22	22	22	22	22
C	40	46	52	58	64	70	76
D	5	5	5	5	5	5	5
E	5	5	5	5	5	5	5
F	Required dimensions, slope per foot						

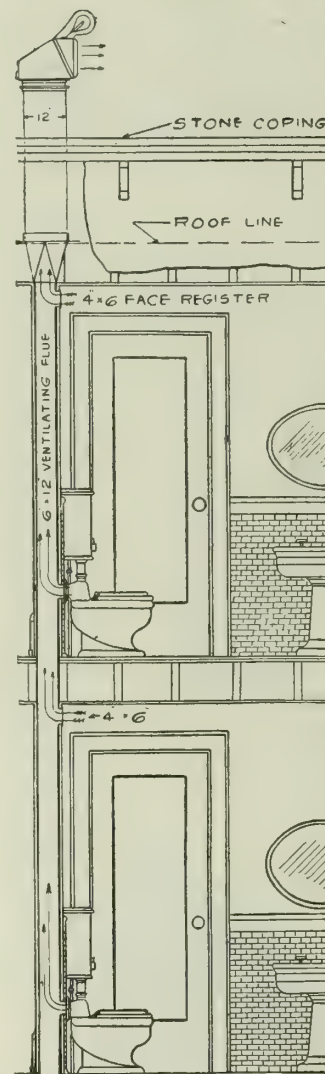
### Toilet Ventilation.

Effective ventilation of toilets has always been a difficult problem to handle economically. The accompanying plan has proved successful both for series of toilets, one above the other, and for single units.

Note particularly that there are two passages for air into the vertical flue in each room: one connected directly to the bowl, the other a register close under the ceiling. This double inlet, connected to a vertical flue of proper area and a "Swartwout" rotary ball bearing ventilator, gives a continuous, uniform air-flow sufficient to keep the room atmosphere clean and sweet.

This type of ventilation, to be sufficient and satisfactory, must be used in conjunction with some device for creating a draught, without regard to the comparative temperatures within and without the building.

The plan, therefore, requires a semi-mechanical ventilator, such as "Swartwout" rotary ball bearing ventilator.



PLAN SHOWING IDEAL METHOD OF TOILET VENTILATION

### Co-operative Planning Service.

Our engineering department, with 26 years' practical experience in mechanical ventilation, will gladly study ventilation problems and make suggestions absolutely without obligation. Write them to-day.



ROYAL VENTILATOR COMPANY

412 Locust Street  
PHILADELPHIA, PA.

Products.

Manufacturers of "ROYAL VENTILATORS" of Galvanized Steel, Pure Iron, Copper, etc.

Glass Top Ventilators; Rectangular and Square Ventilators with fire retarding dampers; Smoke Jack and Combination Ventilators; Insectproof and Bird-proof Ventilators.

Double Cone Ventilators.

The double cone is designed to withdraw smoke, fumes, and impure air without any resistance being offered to the outward flow. The lower cone is placed directly in the center of ascending air, which, upon striking it, is deflected directly upward and outward. There are no obstructions. Only an upward draft is obtained. The "Royal" ventilates continuously, regardless of wind or temperature conditions. The tapered frustrums force outside air currents over top and down sides, providing a constant strong upward draft.

Construction.

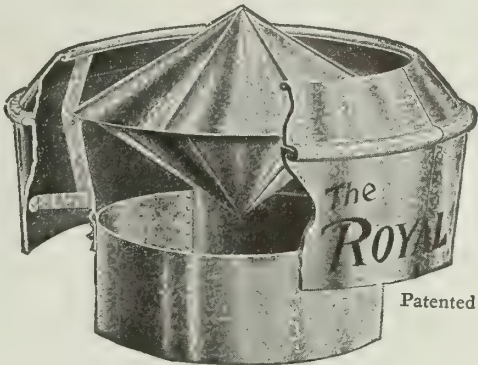
If the construction of the "Royal" ventilator is examined critically, the "Royal" will be specified.

The double cone has two thicknesses of metal, doubling the life of the ventilator. Every known mechanical improvement is embodied in the "Royal"; all sections are built with lapped seams, giving three thicknesses of metal at joints; all edges are wired for rigidity and weather resistance; all bracing is accomplished with malleable iron stays, so arranged as not to impede passage of air. Absolutely weatherproof.

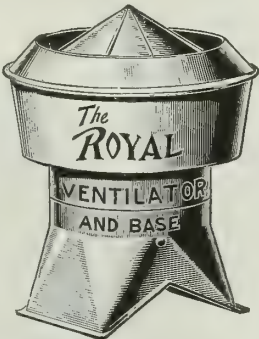
The "Royal" is especially adapted for foundries and chemical plants.

Specification.

"Royal Double Cone or Glass Top Ventilators, manufactured by ROYAL VENTILATOR COMPANY, Philadelphia, Pa."



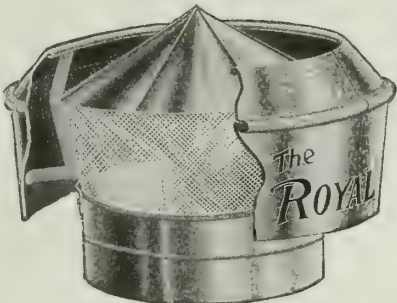
"ROYAL" DOUBLE CONE VENTILATOR



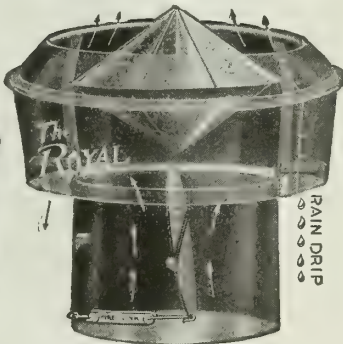
BASES MADE TO FIT ANY TYPE OF ROOF



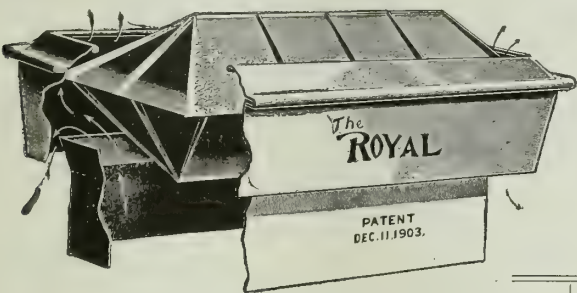
"ROYAL" GLASS TOP VENTILATOR  
Gives more light and ventilation



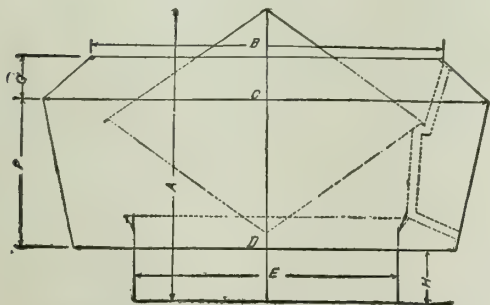
INSECTPROOF VENTILATOR  
For hospitals, barns, powder mills, etc.



"ROYAL" VENTILATOR  
With fire damper



RECTANGULAR "ROYAL" VENTILATOR  
Metal or glass top



SECTIONAL DRAWING "ROYAL" DOUBLE CONE VENTILATOR  
Send for catalogue and model

DATA WITH REFERENCE TO SECTIONAL DRAWING

Size, in ins.	A	B	C	D	E	F	G	H	Area, sq. in.	Gauge of iron	Ounces of copper	List price	Cu. ft. exhaust per min., wind 7 miles
10	12	13	16	14	10	5	2	3	78	24	16	\$5.75	141
12	13	15	19	16	12	6	2	3	113	24	16	6.75	159
16	17	20	26	23	16	8	3	3	201	24	16	20.00	388
18	18	23	29	26	18	8	3	3	255	24	16	27.00	490
20	21	25	31	28	20	10	4	5	314	24	16	33.00	606
22	24	26	34	32	22	11	4	5	380	24	16	36.00	729
24	24	30	39	34	24	11	5	5	453	22	16	40.00	874
26	24	33	42	36	26	13	4	3	527	22	16	50.00	1005
28	26	35	45	40	28	13	5	3	615	20	16	56.00	1186
30	26	35	45	41	30	14	5	4	707	20	18	65.00	1364
32	25	37	47	44	32	14	5	4	804	20	18	80.00	1551
34	28	40	50	48	34	15	5	4	908	20	18	100.00	1765
36	28	44	56	51	36	15	6	4	1017	20	18	120.00	1961
40	34	47	61	55	40	16	7	5	1257	18 and 20	18	180.00	2424
42	32	52	68	63	42	17	7	3	1386	18 and 20	18	190.00	2673
44	35	54	70	64	44	18	7	5	1620	18 and 20	18	200.00	3124
48	39	59	75	70	48	19	8	4	1809	18 and 20	20	240.00	3489
54	42	68	84	77	54	22	9	4	2390	18 and 20	20	300.00	5414
60	47	76	94	82	60	23	8	8	2807	18	24	360.00	6665
66	52	81	103	94	66	26	9	6	3504	18	24	420.00	7851
72	50	86	108	98	72	26	10	6	4071	18	24	480.00	10682

# B. F. STURTEVANT COMPANY

AUTOFORCE VENTILATOR DEPARTMENT

HYDE PARK, BOSTON, MASS.

FOR LIST OF BRANCH OFFICES SEE PAGE 1006

REPRESENTATIVES EVERYWHERE

## Product.

AUTOFORCE VENTILATOR.

For Fans, Motors and Generators,  
see pages 1006-07.

## Patents.

We hold the following patents in connection with ventilators: 634215 Oct. 3, 1899; 697125 Apr. 8, 1902; 702581 June 17, 1902.

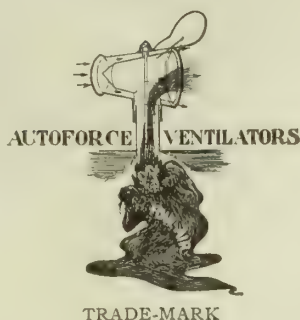
## Uses.

Autoforce ventilators are of special value in factories, foundries, theaters, hotels, churches, schools, residences, stables, garages, mills, tanneries, kitchens, etc.

## Description and Advantages.

The Autoforce ventilator is superior to any other natural ventilator as it effectively utilizes the force of the wind to create a suction, which suction always pulls inside air through ventilator to the outside. Ventilators are built of galvanized iron, but can also be furnished of toncan metal or of copper. Butterfly dampers with a fusible link designed to meet fire insurance requirements can be furnished as an extra. All ventilators have eyes riveted to sides, so that guy wires furnished by others may be readily attached.

If Autoforce air pumps are used, fewer of them will be required to perform the work than with other types of ventilators.



AUTOFORCE VENTILATOR

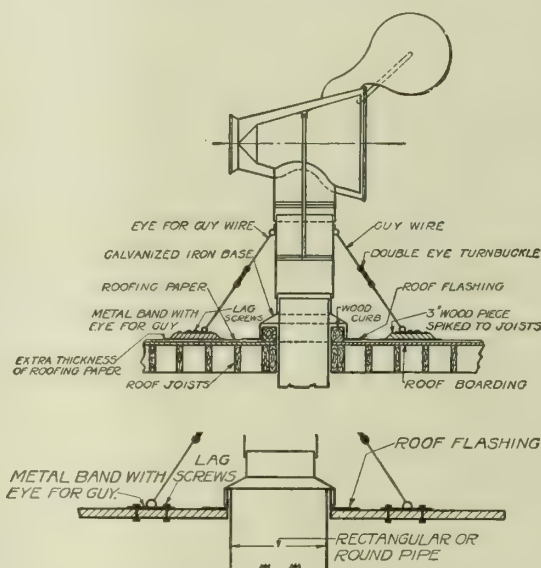
## Specifications.

Specifications should read as follows:

The natural draft ventilation shall be... No... Autoforce, made by the B. F. STURTEVANT COMPANY, each ventilator to remove... cu. ft. air per hour.

## Installation.

Erect plumb and firm, and guy in 4 directions with double galvanized iron wires, taking up the slack in each with a double eye turnbuckle.



SECTIONS OF AUTOFORCE VENTILATOR GIVING METHOD OF ANCHORING TO BOTH WOOD AND CONCRETE ROOFS

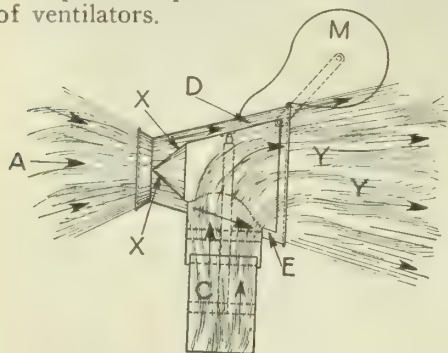
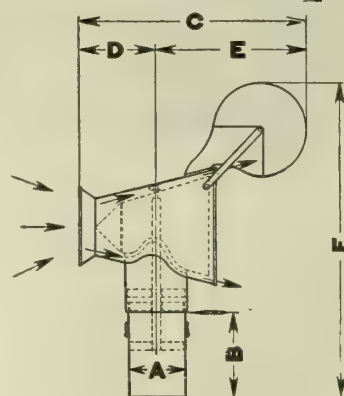


DIAGRAM SHOWING ACTION OF VENTILATOR

Size No.	Weight lbs., not packed	All dimensions are in inches						Cu. ft. of air displaced per hour with wind vel. 8 miles per hour
		A	B	C	D	E	F	
4	6	4	5	15	5 1/2	9 1/2	22	5,000
6	16	6	7	22 1/2	8	14 1/2	30	11,300
8	30	8	8 1/2	30	10 3/4	19 1/4	39	20,100
10	40	10	10	37 1/2	13 1/2	24	46	31,400
12	52	12	12	45	16 1/2	28 1/2	54	45,200
14	85	14	14	52 1/2	19	33 1/2	63	61,500
16	114	16	16	60	21 1/2	38 1/2	71	75,900
18	173	18	18	67 1/2	24	43 1/2	80	90,700
20	240	20	20	75	26 1/2	48 1/2	90	101,700
24	315	24	24	90	32 1/2	57 1/2	106	156,000
30	512	30	30	112 1/2	40	72 1/2	132	300,000



DIMENSION DIAGRAM

Air entering at A is spread out by nose of inner cone X; since the ring of air emerges at increased speed, it tends to decrease pressure in front of exit YY; suction thus created draws air up connecting flue C; tailpiece M keeps pump at all times headed to wind, so that continuous satisfactory operation is secured.

Note that operation is on same successful principle as the steam injector or Hancock inspirator.



STANDARD BASES FOR AUTOFORCE VENTILATORS  
Order specially, if desired



# DETROIT SHOW CASE COMPANY

Makers of Metal Store Front Construction

DETROIT, MICH.

## Products.

"DESCO" METAL STORE FRONT CONSTRUCTION.

"Petz" Store Front Construction.

## Description.

"DESCO" store front construction is made and

*Desco*  
METAL  
STORE FRONTS  
TRADE-MARK

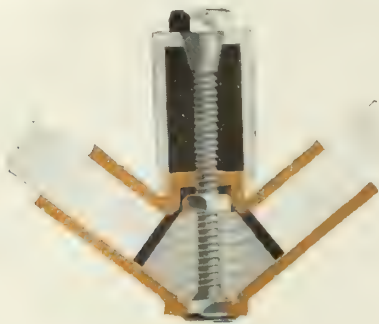
"DESCO" LINE COMPLETE — The "DESCO" line of store front construction is complete in every detail, including ventilated sash, glass stops, division bars, corner bars, 3-way bars, reverse corner bars, sill coverings, transom bar coverings, bulkhead constructions, copper panel work, kick plates, thresholds, etc.



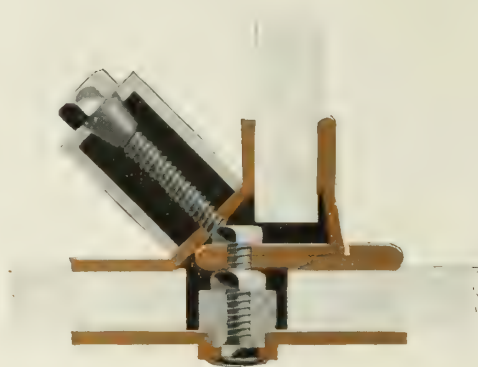
A TYPICAL "DESCO" STORE FRONT

designed along the most approved architectural lines. The several shapes harmonize perfectly with the modern styles of store front construction. All glass bearing members are of solid, heavy gauge copper, reinforced at the back by steel channels, which have been treated by the universally used Parker Rust-Proof Process. This makes for greater strength, safety to the glass, and permanency.

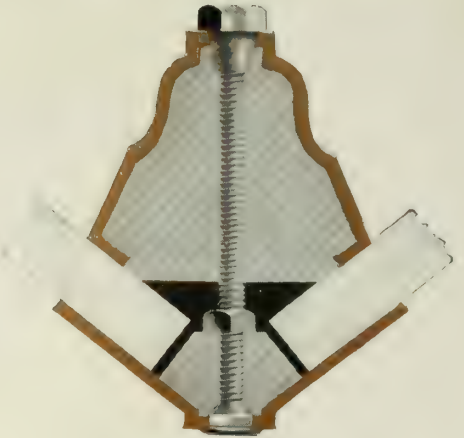
**SIMPLICITY**—The simplicity of "DESCO" store front construction is one of its strongest points. The ordinary mechanic without previous experience can properly and hastily install "DESCO" construction. The division and corner bars are easy to handle and the sash resembles, in principle, the long used wood stops. This construction, however, is far more attractive.



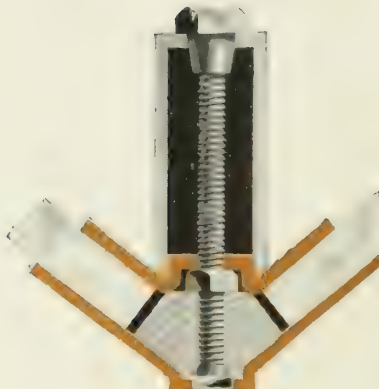
No. 200



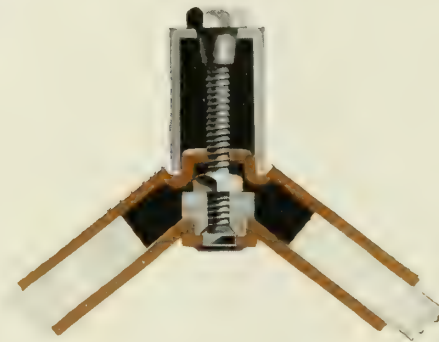
No. 225



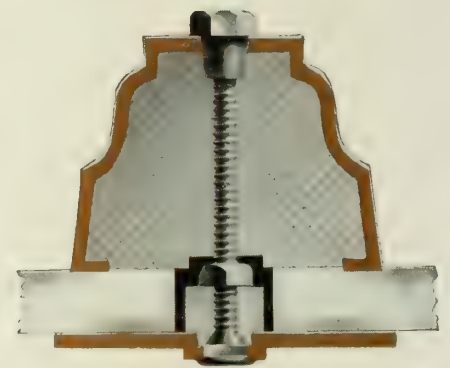
No. 201



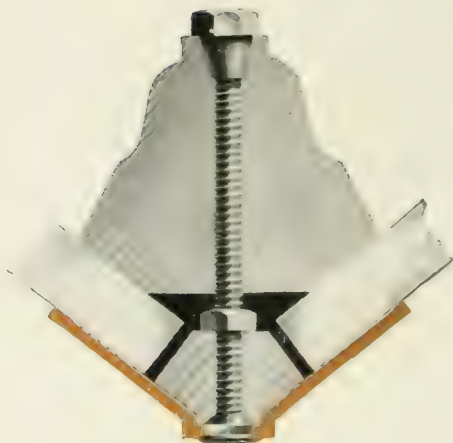
No. 200 H



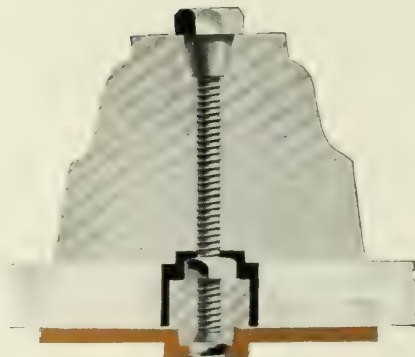
No. 220



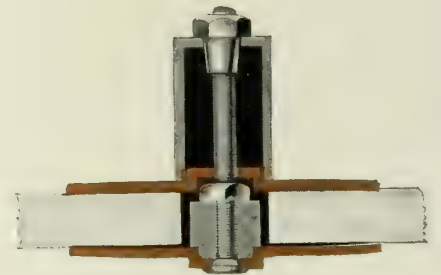
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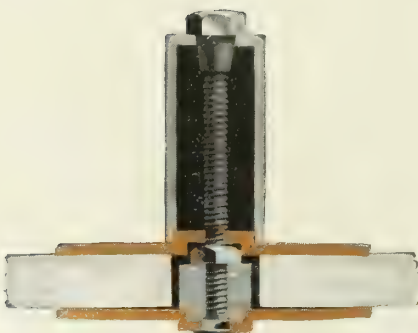
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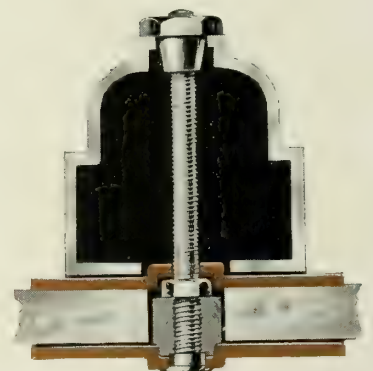
No. 212



No. 210



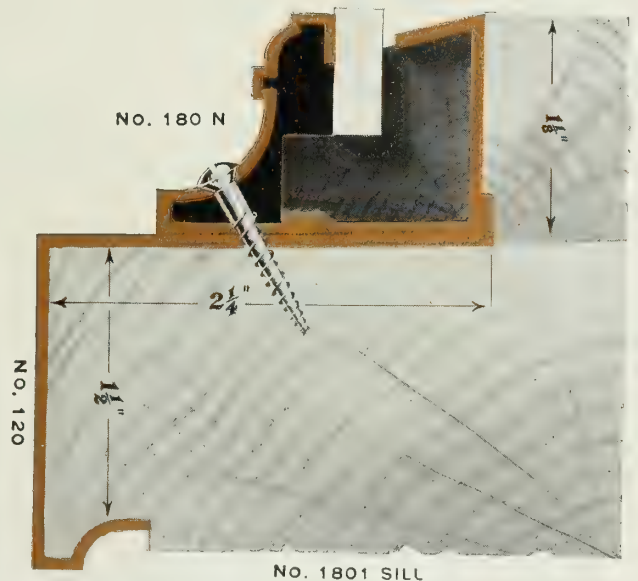
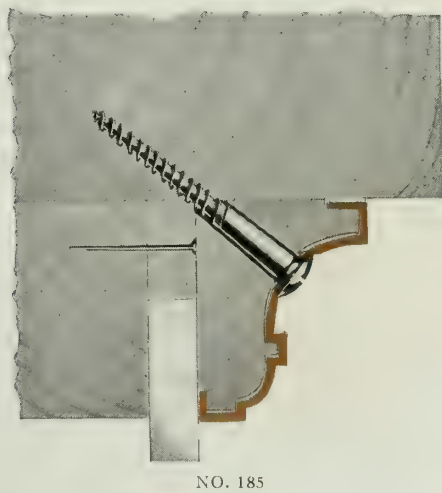
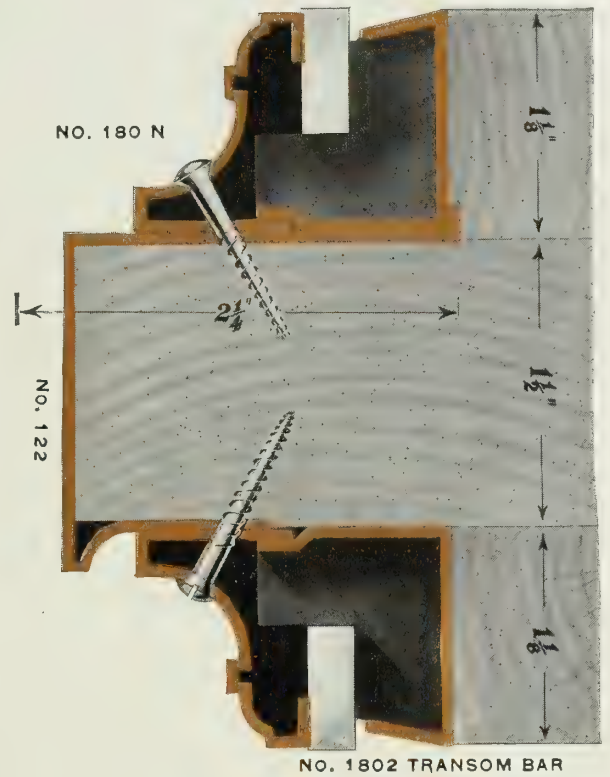
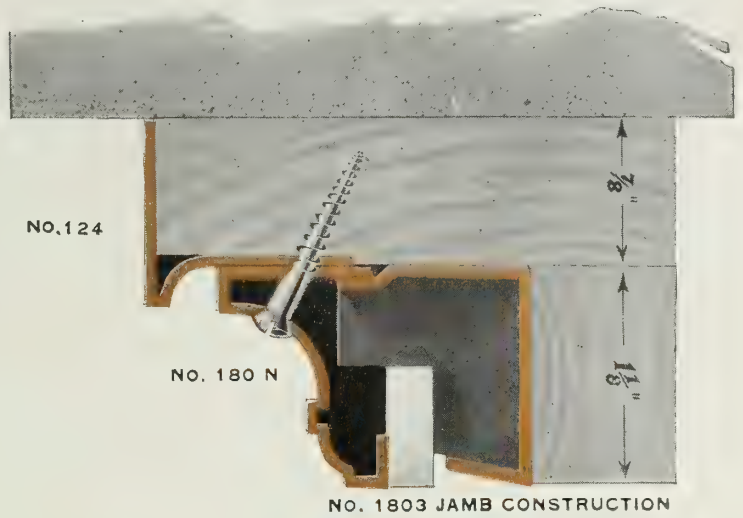
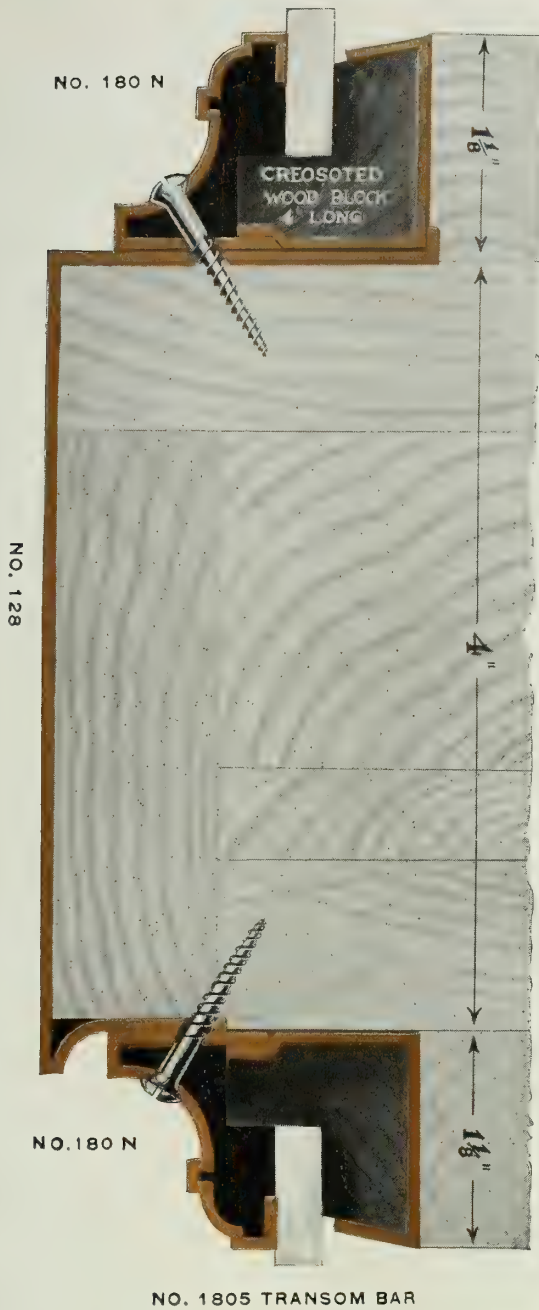
No. 210 H



No. 210 XH

FULL SIZE DETAILS "DESCO" STORE FRONT CONSTRUCTION





**VENTILATED SASH CONSTRUCTION**—The ventilated sash is made to hold the glass firmly in a deep rabbet and to take care of any expansion or contraction of the glass. The glass setting blocks are of creosoted cypress, about 6 ins. long, and are set well apart so as to give ample freedom to ventilation and drainage. Air has free access through the "Desco" sash and materially facilitates proper show window ventilation. Particular emphasis is given to the simplicity of "Desco" sash.

**CORNER BARS**—All glass bearing members are of solid copper, reinforced by rust-proofed steel channels. Ease of installation is a particular feature of "Desco" construction.

**DIVISION BARS**—In construction and installation "Desco" division bars are exactly the same as the corner bars. Ample reinforcement for large plates of glass is provided.

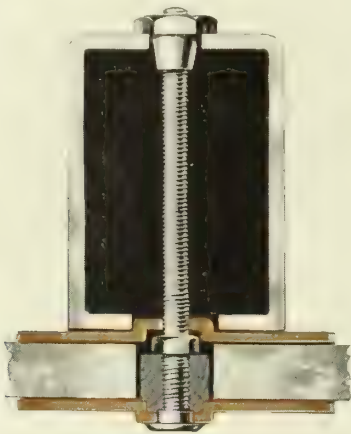
By virtue of the development of the Parker Rust-Proof Process "Desco" sash, division and corner bars are furnished in steel. This makes possible a substantial decrease in cost.



"DESCO" SILL CONSTRUCTION

Showing No. 280 Sash and No. 120 Sill Covering

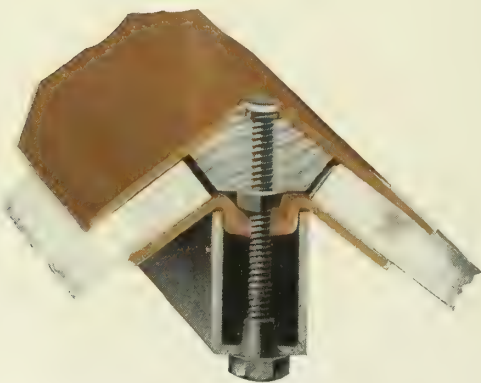
**DETAIL SHEETS**—Detail sheets showing awning bar covers and other shapes furnished on request.



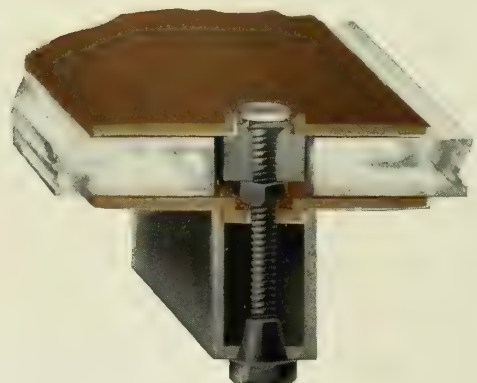
No. 210 XXH DETAIL



No. 285 DETAIL



No. 200 CORNER BAR



No. 210 DIVISION BAR



# BRASCO MANUFACTURING COMPANY

## Metal Store Fronts

5025-5035 So. Wabash Avenue  
CHICAGO, ILL.

### Products.

BRASCO SYSTEM COPPER STORE FRONTS; Distributors of HESTER SYSTEM COPPER STORE FRONTS.

Drawn Metal Moulding; Drawn Metal Covered Mouldings; Metal Store Front Ventilators and Metal Showcase Doors; Brass Thresholds, Railings, Push and Pull Plates, and other Brass, Bronze and Copper Architectural Products.

### Brasco and Hester Systems Copper Store Fronts.

Both systems are safe, durable, beautiful and simple; eliminate constant painting, repairing, glass breakage, high glass insurance. Afford maximum daylight, drainage and ventilation facilities, and the requisite artistic exterior touch. No direct screw pressure. The angle of the screw in outer retaining strip creates an even, flexible grip against the glass.

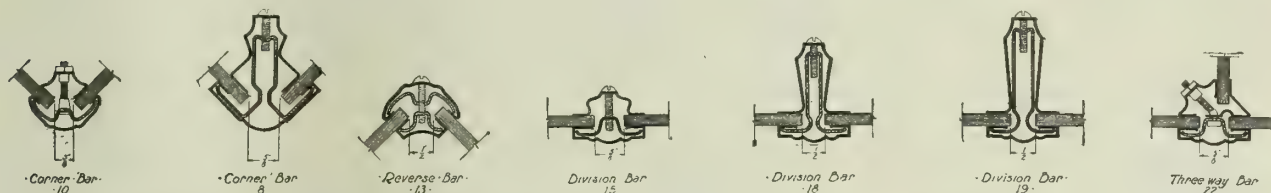
In the Brasco, a specially treated hardwood mould-

ing has been adopted as the basis for glass setting, because insurance records show less glass breakage for the old-fashioned wood stop than for any other setting. In addition to the protective chemical treatment, pure lake copper is tightly drawn over every portion of the material exposed to the weather.

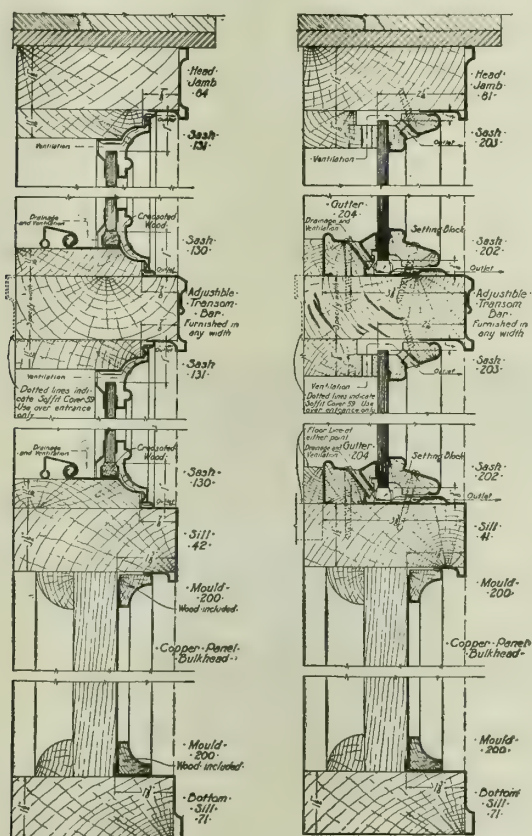
The Hester sash is made of heavy gauge solid copper. No unsightly gutter holes show on inside of glass; no holes are punched in outer retaining strip to weaken sash and catch lint and dirt.

### Co-operative Service.

Our complete detail portfolio is available on request, for architects' files. Full sized details, prices and catalogues cheerfully furnished. We will gladly help architects solve any special store front problem they may encounter, and place our years of experience entirely at their service.

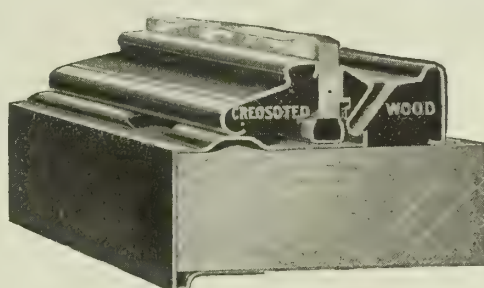


CORNER AND DIVISION BARS, BRASCO AND HESTER SYSTEMS

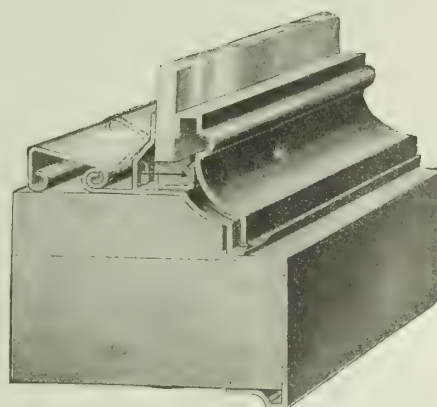


SECTIONAL DETAILS  
HESTER STORE FRONT  
CONSTRUCTION

SECTIONAL DETAILS  
BRASCO STORE FRONT  
CONSTRUCTION



DETAILS BRASCO COPPER COVERED  
CREOSOTED SASH



DETAILS HESTER HOLLOW TYPE  
COPPER SASH

# J. W. COULSON & CO.

Store Front Construction

95-107 West Spring Street  
COLUMBUS, OHIO

## Products.

Sole owners and manufacturers of the COULSON PATENT STORE FRONT CONSTRUCTION.  
Drawn Copper Moulding.

## Description.

This construction is complete and adaptable to any store front, large or small, expensive or inexpensive. Is furnished ready to set in place and easily installed. Makes an attractive, substantial and durable store front and provides a safe and practical setting for the glass. The corner posts, division bars, transom bars and stops include the wood, and all but the last named are reinforced with steel tees having lugs at either end by which they are secured to the base, jamb and lintel casing and door posts, and where they intersect are bolted together. This makes a strong steel framework. The wood that incases them is treated with creosote to prevent decay.

## Finish.

The entire outer surface is covered with copper. Finish is polished copper, statuary bronze, nickelplated, gunmetal and spotted oxidized copper.

## Ventilating System.

Proper and effective ventilation of show windows is accomplished by using Coulson ventilating transom bar at the top of the lower glass and Coulson ventilating and drainage sill at the bottom.

The transom bar includes the creosoted wood reinforced with steel tee, to which an angle is attached when a support is required for the canopy ceiling and metal covering, and stops.

The ventilating openings provide an outlet for air that has passed through tubes in the sill and circulates over the inside surface of the glass and through enclosed show windows. It also provides for ventilation and drainage for transom glass.

## Awning Provisions.

The Coulson awning hood is of copper metal, supported on copper covered steel brackets, and provides a protection for the awning when rolled up. With it is furnished a complete metal covered awning transom bar, of creosoted wood 8 and 10 ins. wide, reinforced by a 2 by 2-in. steel tee with lugs at either end to secure it to the jamb casing. The part over the vestibule is covered with metal underneath. With spring roller or chain awnings, supports are necessary. For this purpose lugs are secured to steel tees in the corner posts and division bars, to which these awning fixtures are attached.

## Metal Coverings.

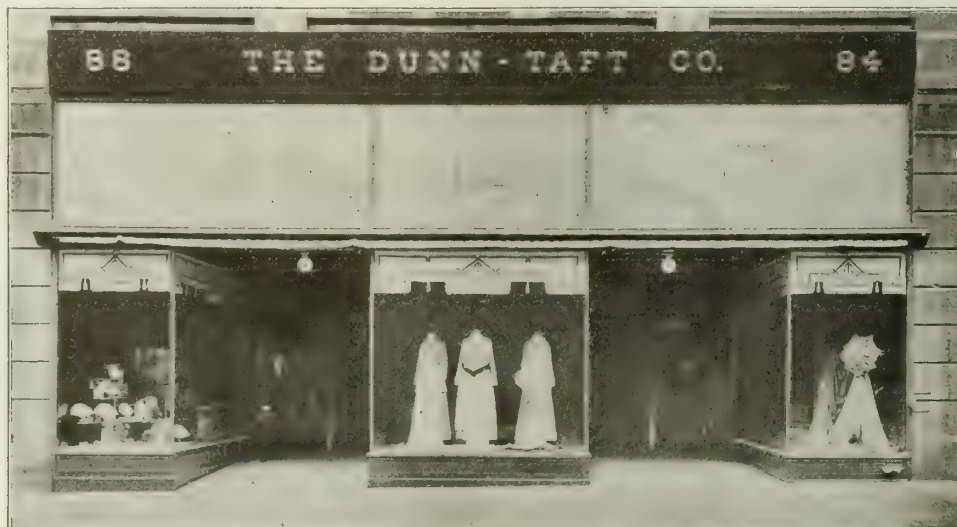
When specified, metal coverings are furnished for jamb and base or bulkheads, of several stock designs; also for door posts and other parts of store fronts of shapes and designs required, together with metal covered sash doors with door posts for showcases, polished brass kick plates, and polished brass thresholds.

## Specification Data.

The frames for the store fronts shall consist of the Coulson patent store front construction as manufactured by J. W. COULSON & Co., Columbus, Ohio.

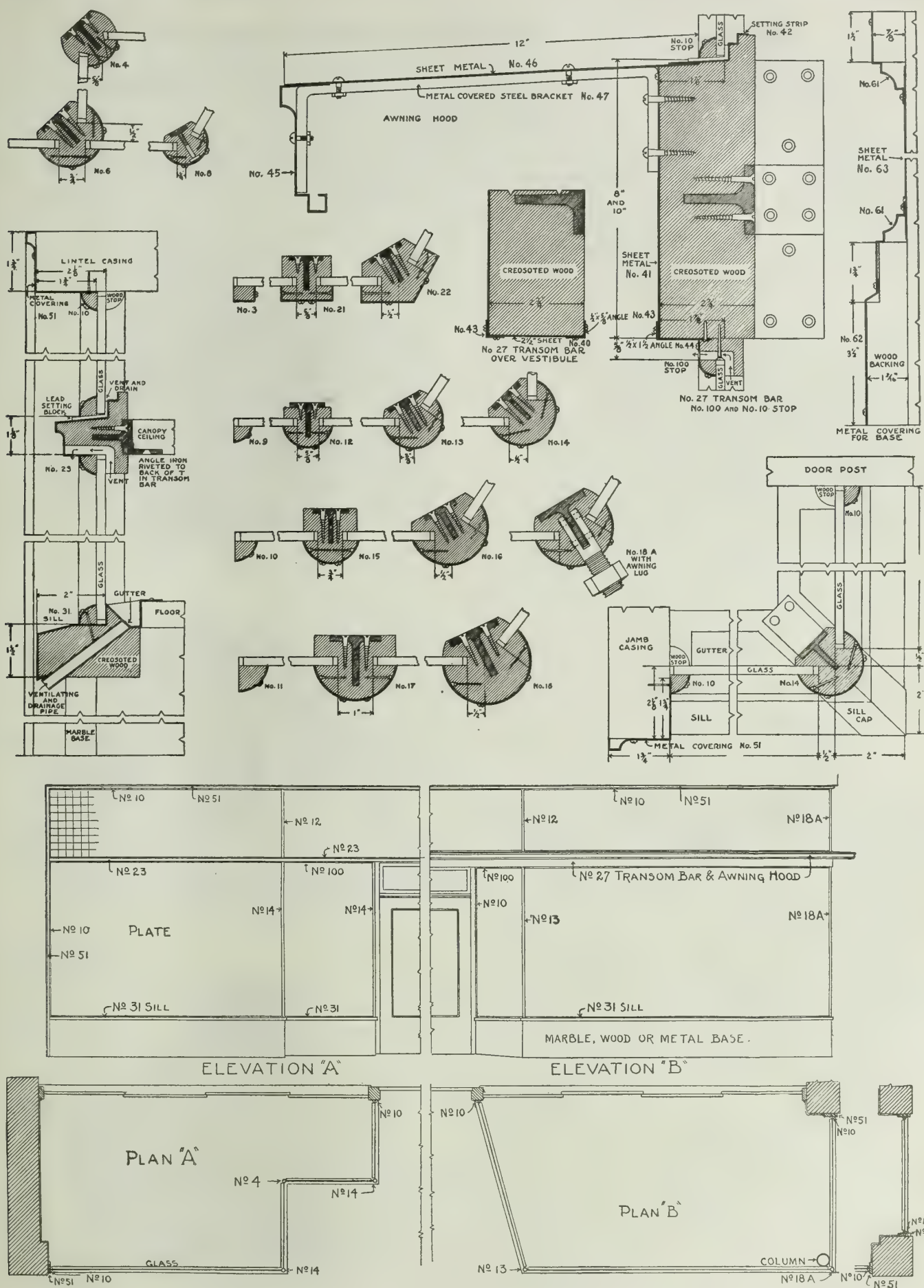
Lintel and jamb casing to be No. 51; sills to be No. 31; stops, division bars and corner posts to be [here give numbers] (see opposite page for sizes and numbers); transom bars to be No. 23; transom bar over vestibule to be No. 27. (If awning hood is desired, specify transom bar No. 27 with metal covered awning hood No. 45.)

If metal covering for base is desired, specify the required members by numbers as shown on opposite page. If metal covering is desired for doors, hinged or pivoted sash, door posts, showcases, etc., this should be specified in detail.



TYPICAL INSTALLATION OF COULSON PATENT STORE FRONT CONSTRUCTION





PLANS, ELEVATIONS AND 3-INCH SCALE DETAILS OF COULSON PATENT STORE FRONT CONSTRUCTION

# PITTSBURGH PLATE GLASS COMPANY

Distributers of the "Easyset" System of Store Front Construction

## WAREHOUSES

ATLANTA, GA.  
BALTIMORE, MD.  
BIRMINGHAM, ALA.  
BOSTON, MASS.  
BROOKLYN, N. Y.  
BUFFALO, N. Y.  
CHICAGO, ILL.  
CINCINNATI, OHIO  
CLEVELAND, OHIO

COLUMBUS, OHIO  
DALLAS, TEX.  
DAVENPORT, IOWA  
DENVER, COLO.  
DES MOINES, IOWA  
DETROIT, MICH.  
GRAND RAPIDS, MICH.  
GREAT FALLS, MONT.  
HIGH POINT, N. C.

HOUSTON, TEX.  
KANSAS CITY, MO.  
MEMPHIS, TENN.  
MILWAUKEE, WIS.  
MINNEAPOLIS, MINN.  
NEWARK, N. J.  
NEW ORLEANS, LA.  
NEW YORK, N. Y.  
OKLAHOMA CITY, OKLA.

OMAHA, NEBR.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.  
ROCHESTER, N. Y.  
ST. LOUIS, MO.  
ST. PAUL, MINN.  
SAN ANTONIO, TEX.  
SAVANNAH, GA.  
TOLEDO, OHIO

## Products.

Selling agents for the "EASYSET" SYSTEM of METAL STORE FRONT CONSTRUCTION.

Disappearing Awnings, Awning Covers, Kick Plates and Thresholds.

## "Easyset" System of Store Fronts.

The "Easyset" system, as the name implies, is easily and readily installed, and is substantial and durable. It does not require skilled men or special framing to prepare store front openings for the metal sash.

The system does not depend wholly for strength upon the outer covering, the inner reinforcement providing much additional strength. Besides this, the outer covering is drawn up to the glass under tension, thus providing a uniform and permanent bearing. This principle is employed in the corner and division bar, also the metal sash. While the glass is set from the outside, it is locked on the inside; only by loosening the tension screw (Fig. 6) can the glass be removed. This protects valuable goods in the show window, for even though the outer covering is removed the reinforcement still holds the glass securely in place.

The simplicity, strength and elegance of the "Easyset" system appeals to all who wish an all-metal store front, thoroughly up to date. It does away entirely with the periodical repairing or renovating of the store front, thus in a short time more than saving the first cost. In many cases a lower rate of insurance is obtained because of the all-metal construction. On account of the superior appearance and advertising feature, the tenant in most cases will gladly pay an additional rent.

## Corner and Division Bars.

In corner bars Nos. 4A and 4C, note how the reinforcement fits inside the outer covering; thus, when the bar is installed and the nut is tightened, it draws the outside of the bar to the glass instead of forcing it away, as is the case with most bars. The glass is gripped some distance from the edge, thus preventing breakage from "pinching," and a small piece of wood fitted over the screw protects the edge of the glass. This bar is designed to take care of the variation in thickness of plate glass without bending or springing the metal.

Made of heavy gauge copper or bronze; special finishes, oxidized, nickel, gunmetal. Other special finishes if desired.

No. 4C corner bar is the same as No. 4A, but is  $\frac{5}{8}$ -in. larger and steel reinforced, to be used where there is an unusual exposure to wind.

The division bar No. 15A incorporates the same principles as the corner bar and is made of the same metals and finishes.

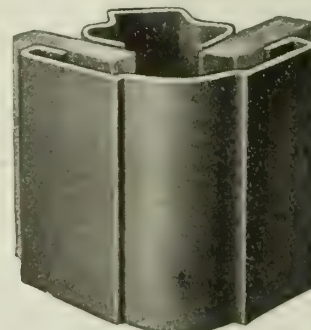


FIG. 1. CORNER BAR NO. 4A  
Full size

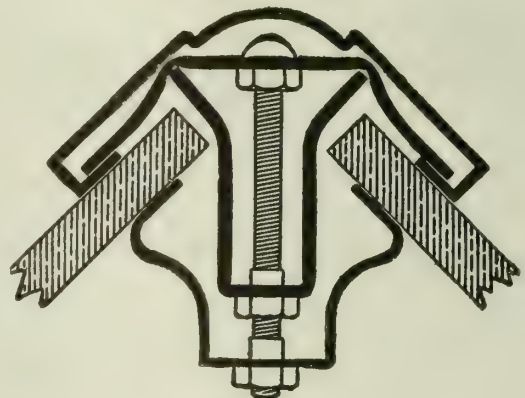


FIG. 2. CORNER BAR NO. 4C  
Sectional view full size

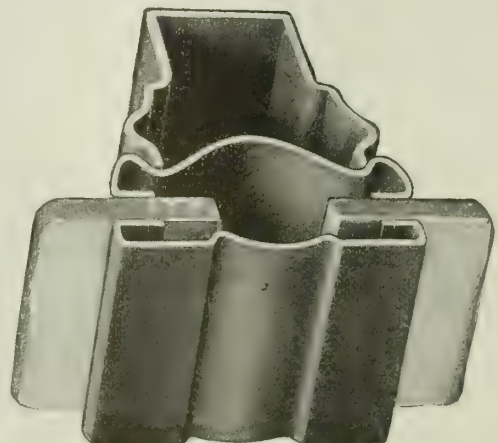


FIG. 3. DIVISION BAR NO. 15A  
Full size



**Metal Sash.**

Metal sash No. 25B has ventilating and drainage system. Glass is set from outside and tension obtained from inside screws. No outside screws to mar the face of the sash or to work loose and release the tension. Glass rests on solid metal 4-in. block, mounted with leather, which will prevent settling and avoid breakage and always keeps the glass in position shown.

It is a frost preventive when show windows are built airtight, allowing only the air entering through the metal sash to circulate.

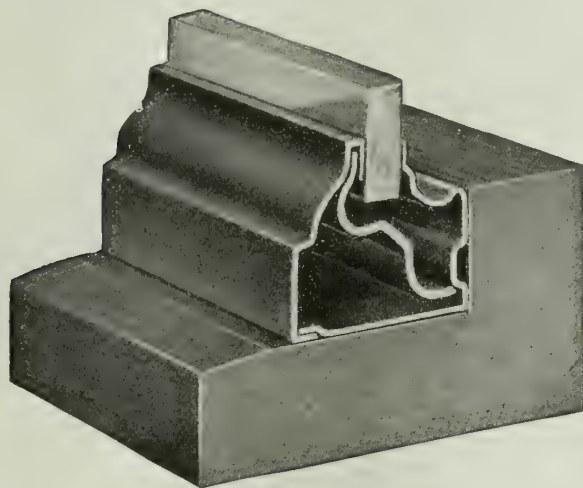


FIG. 4. METAL SASH NO. 25B  
With ventilating and drainage system. Setting block not shown. See sectional view, Fig. 6, full size

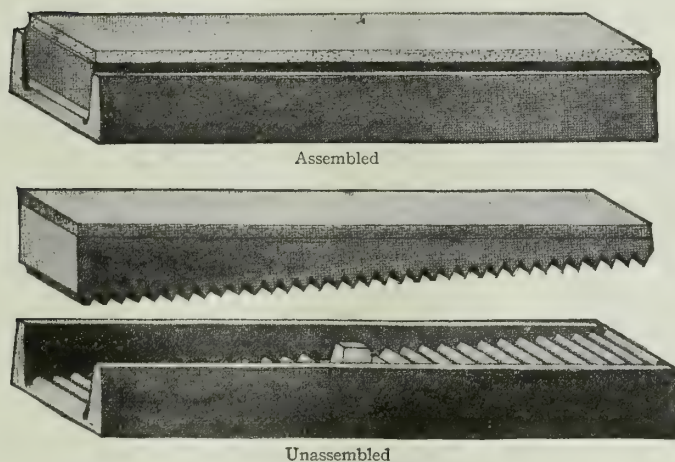


FIG. 5. SETTING BLOCK, WITH LEATHER TOP

**Application.**

Fig. 7 is a special arrangement for applying "Easysset" construction to a steel sill where no wood backing is used. This sash rail is made of heavy No. 16-gauge metal and should be used for glass of unusual size.

Note that the bottom of outside or face plate interlocks with the horizontal edge of inner member. The glass rests on a leather mounted metal setting block.

**Transom Bar.**

Fig. 8 shows our own special transom bar, which is a combination of metal sash No. 25B and moulding for transom cover No. 125. This is furnished with wood complete if desired. On lengths from 14 to 18 ft. a  $\frac{1}{8}$ -in. steel reinforcement is inserted. On lengths 18 ft. and above, the steel reinforcement is  $\frac{1}{4}$  in. thick. We furnish iron rods to suspend transom bars where the length of the bar and construction of the building render it necessary.

**Bar Coverings, Mouldings, etc.**

All transom bar, sill, head and side jamb coverings, bulkhead and special mouldings are No. 20-gauge copper or bronze, or other special finishes when desired.

**Estimates.**

Estimates will be furnished on receipt of plans and specifications.

**Co-operative Service.**

Write to the nearest warehouse of the PITTSBURGH PLATE GLASS COMPANY for any information not contained herein, also for catalogues, etc.

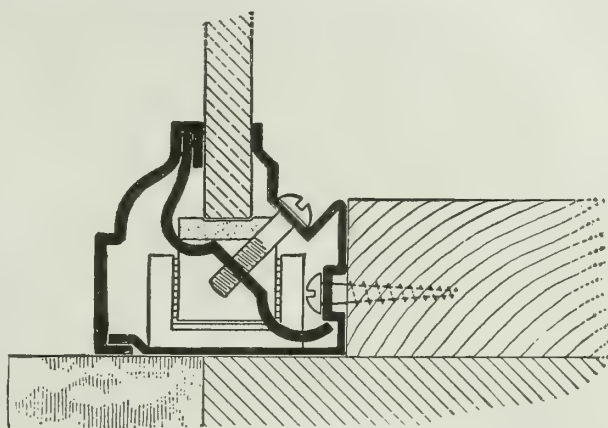


FIG. 6. METAL SASH NO. 25B  
Sectional view, full size

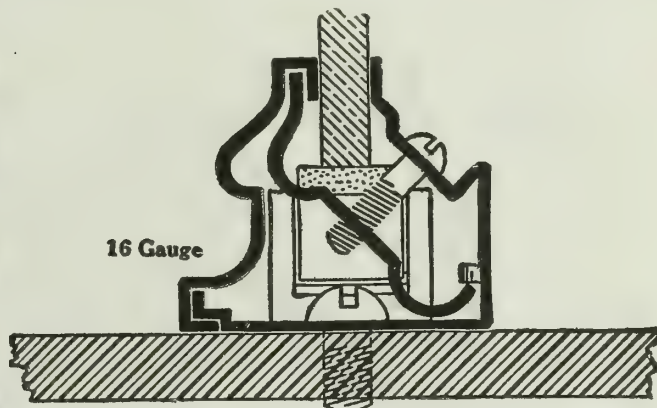


FIG. 7. APPLICATION OF "EASYSET" CONSTRUCTION TO  
STEEL SILL WITHOUT WOOD BACKING  
Full size

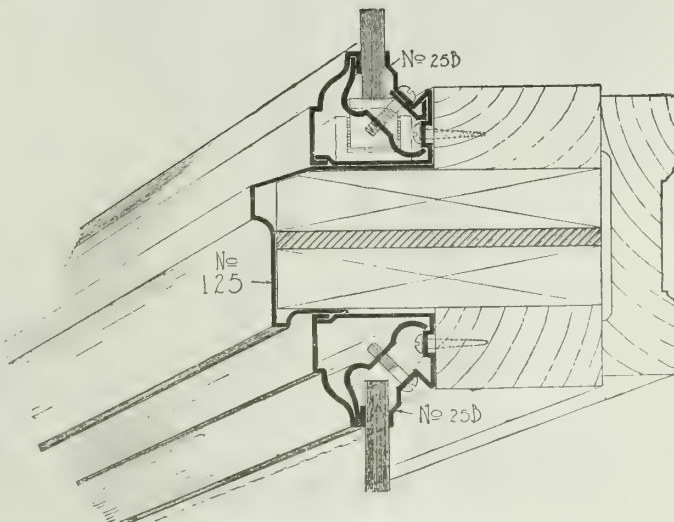


FIG. 8. TRANSOM BAR NO. 55A  
Sectional view,  $\frac{1}{2}$  full size

# ZOURI DRAWN METALS COMPANY

GENERAL OFFICES AND FACTORY

CHICAGO HEIGHTS, ILL.

AGENTS IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

## Product.

ZOURI SAFETY KEY-SET STORE FRONT CONSTRUCTION.

## Safety.

Preferential rating on plate glass is inevitable, as it is now in successful operation in every other line of insurance.

Flat rating is the arch enemy of safety. It encourages the cheapest substitutions that mechanical ingenuity can produce.

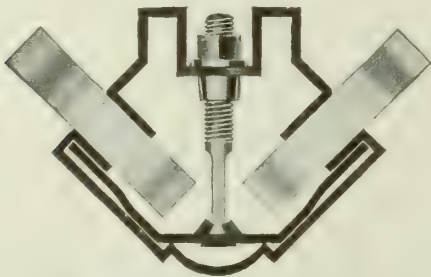
Zouri safety key-set sash, corner and division bars with self-adjusting setting blocks offer features of safety not found in any other line.

## Patents.

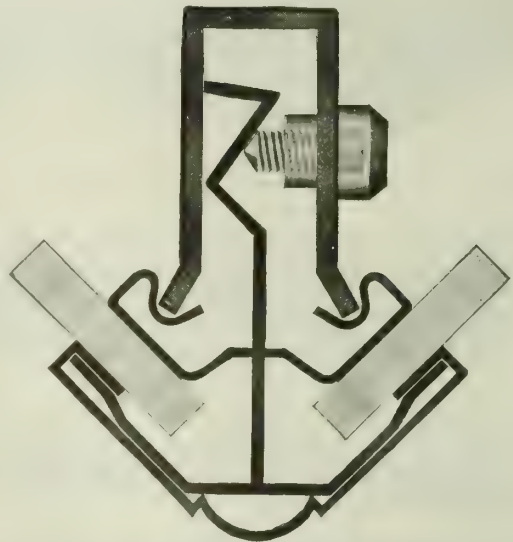
Operating under Murnane and Marr patents. Other patents pending.

## Catalogue.

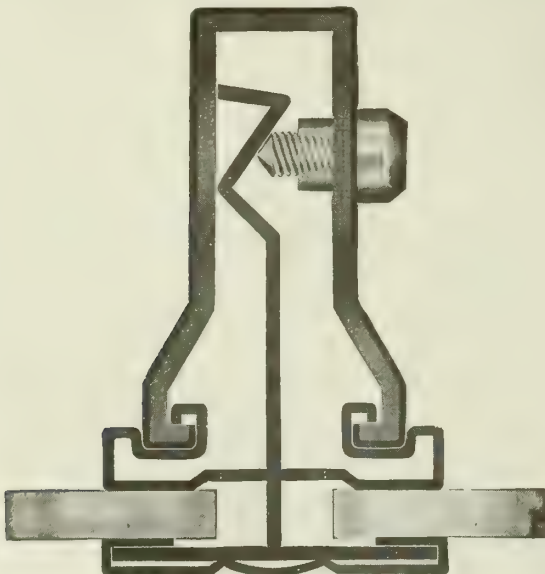
Catalogue free on application.



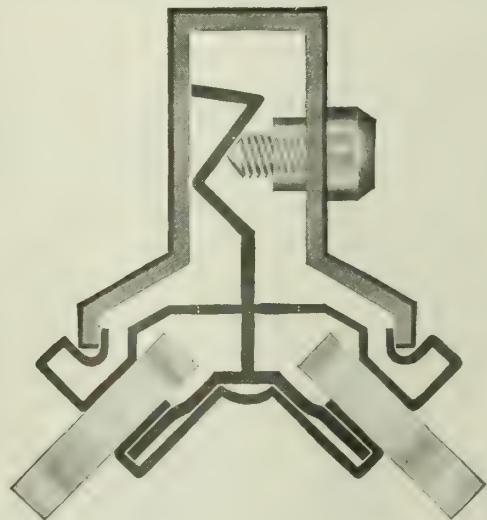
NO. 202 KEY-SET DIRECT SCREW PRESSURE CORNER BAR  
Made in angles from 85° to 145°, inclusive, for glass up to 108 ins. high



NO. 200 SAFETY KEY-SET CORNER BAR  
Made in angles from 85° to 145°, inclusive, for glass of largest size

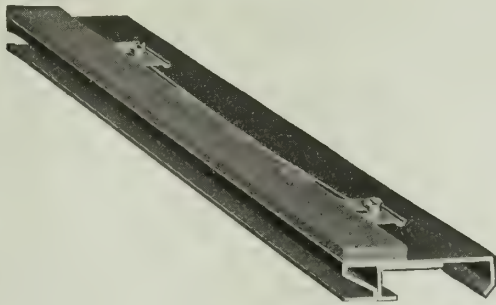


NO. 300 SAFETY KEY-SET DIVISION BAR  
For glass of largest size

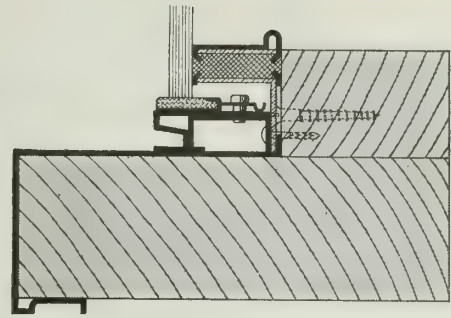


NO. 201 SAFETY KEY-SET REVERSE CORNER BAR  
Made in angles from 85° to 145°, inclusive, for glass of largest size



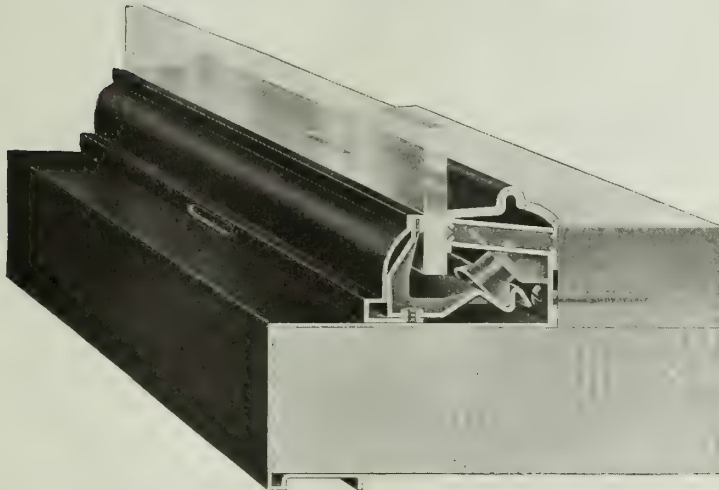


MURNANE SELF-ADJUSTING SETTING BLOCK  
One-half actual size



INNER MEMBER OF NO. 115 ZOURI  
SAFETY KEY-SET SASH

Illustrating the Murnane self-adjusting setting block in position before the outside moulding is applied



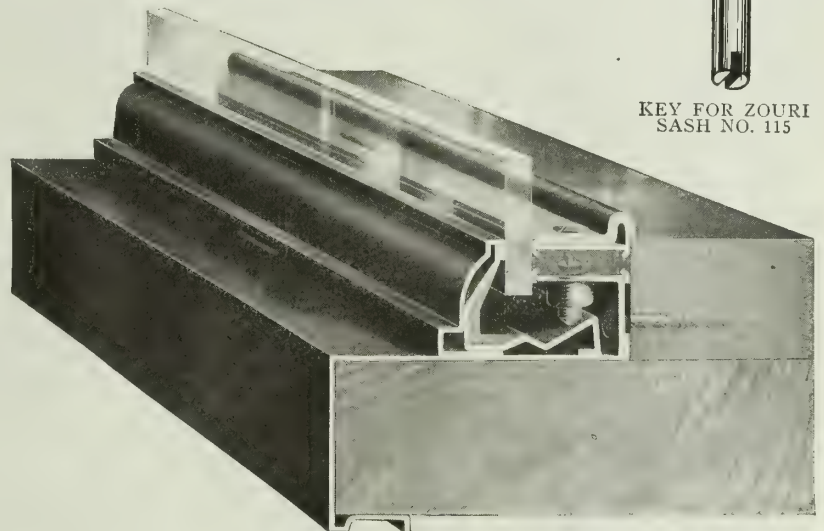
NO. 118 ZOURI SAFETY KEY-SET SASH WITH NO. 702 SILL COVERING  
Murnane self-adjusting setting blocks furnished with this sash  
One-half actual size



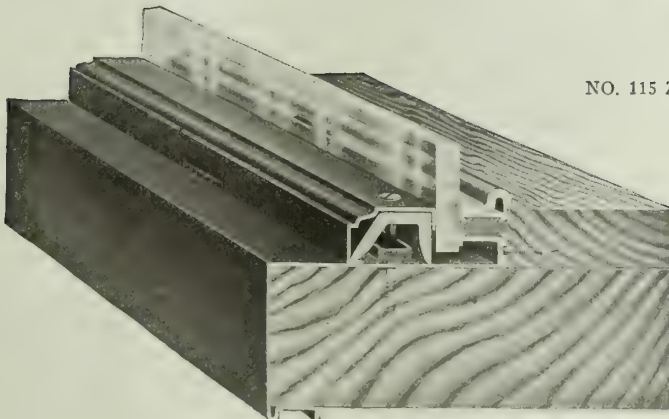
KEY FOR ZOURI SASH NO. 118



KEY FOR ZOURI  
SASH NO. 115



NO. 115 ZOURI SAFETY KEY-SET SASH WITH NO. 705 SILL COVERING  
One-half actual size



NO. 125 ZOURI INDIRECT SCREW PRESSURE SASH WITH  
NO. 707 SILL COVERING  
One-half actual size

# KAWNEER MANUFACTURING CO.

## Metal Store Fronts and Drawn Metal Mouldings

NILES, MICH.

FACTORIES: NILES, MICH., BERKELEY, CAL., GUELPH, ONT., CAN.

BRANCH OFFICES

CHICAGO, ILL.  
NEW YORK, N. Y.  
KANSAS CITY, MO.  
DETROIT, MICH.  
ST. LOUIS, MO.

BUFFALO, N. Y.  
PITTSBURGH, PA.  
ATLANTA, GA.  
PHILADELPHIA, PA.  
BOSTON, MASS.

DES MOINES, IOWA  
MINNEAPOLIS, MINN.  
INDIANAPOLIS, IND.  
CINCINNATI, OHIO  
DAVENPORT, IOWA

MILWAUKEE, WIS.  
SEATTLE, WASH.  
LOS ANGELES, CAL.  
MONTREAL, QUE.  
TORONTO, ONT.

Agencies in most large cities in the United States and Canada

### Products.

STORE FRONTS made of Solid Copper or Bronze; HOLLOW DRAWN METAL MOULDINGS of all descriptions.

Pivoted and Hinged Windows made of copper or bronze covered steel frames; Showcases, Thresholds, Metal Window Ventilators, and a number of other Metal Specialties.

### Store Fronts.

DESCRIPTION—Kawneer store front construction is designed along the *simplest* principles possible. There are no unnecessary and intricate parts to confuse a workman and hamper installation.

All members of this construction are designed along pleasing architectural lines. Each member has a certain relationship to another, thus a harmonious installation is made possible.

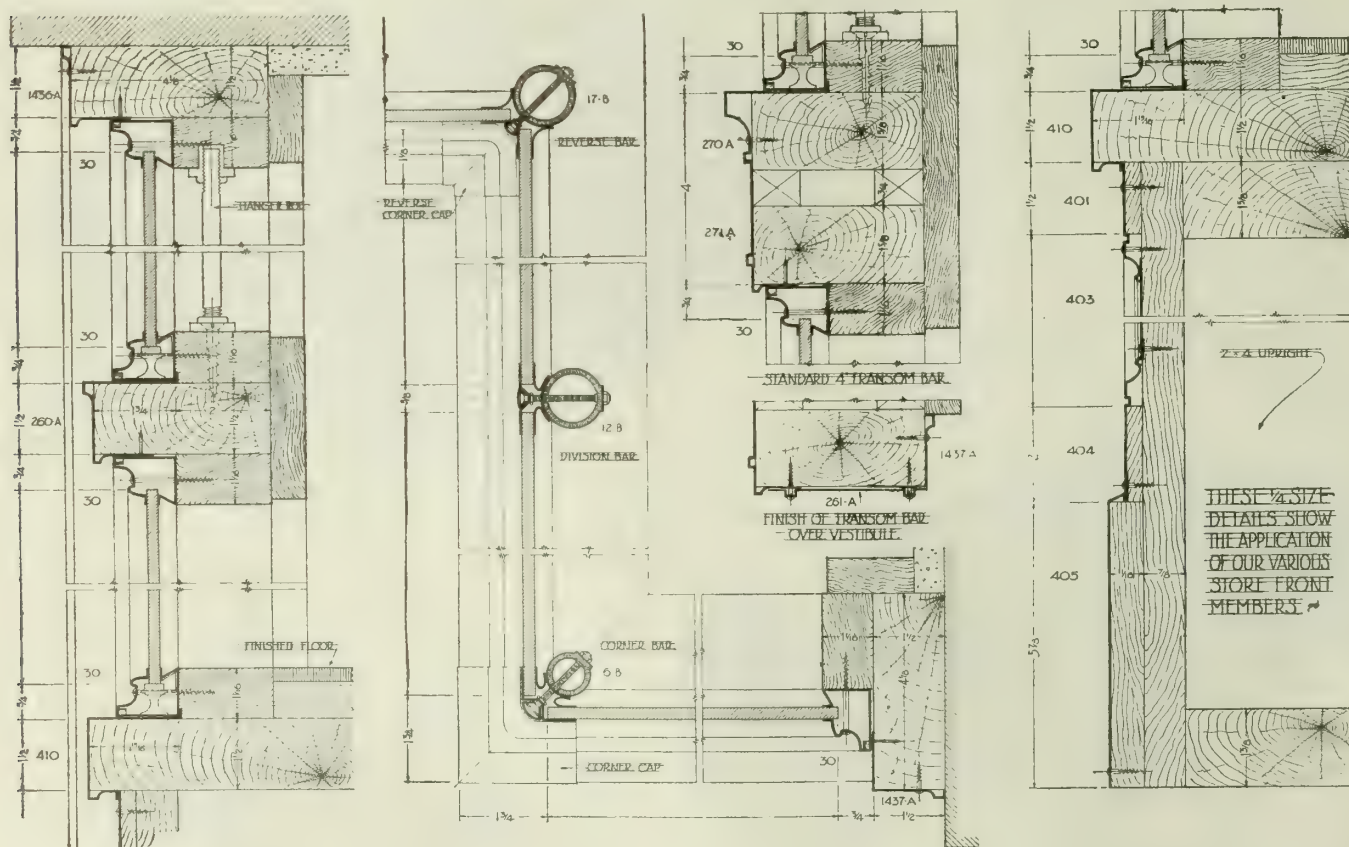
**Kawneer**  
STORE FRONTS  
TRADE-MARK

Only solid copper or bronze is used for the glass gripping parts of any member. Where strength is required, rigid tubular reinforcements are used. These are made of .0125 steel and are finished in an olive green baked enamel.

ADVANTAGES—The *resilient grip* as found in the Kawneer store front construction, applied to *both* sides of the glass, is the safest known insurance against glass breakage. The glass is held in a yielding, springlike grip, which absorbs all jars, shocks and vibrations, thus relieving the glass from undue strain.

Compare this *resilient* feature with other unyielding, viselike grips of metal or wood, as found in less up-to-date methods of glass setting.

The construction of the various sash and bars is narrow, permitting greatest possible glass surface, with minimum obstruction of vision.



Typical Vertical Section

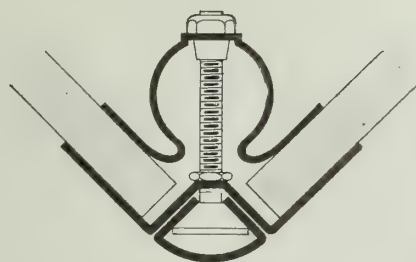
Typical Horizontal Section

Vertical Section Through Bulkhead

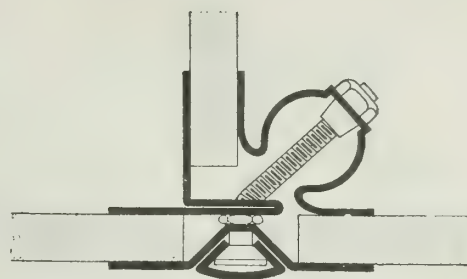
DETAIL SECTIONS OF KAWNEER STORE FRONTS



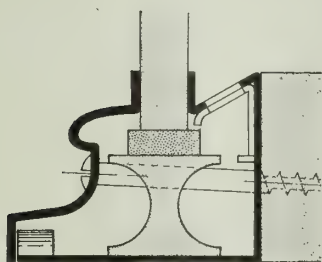
# FULL SIZE DETAILS OF KAWNEER STANDARD SASH & BARS



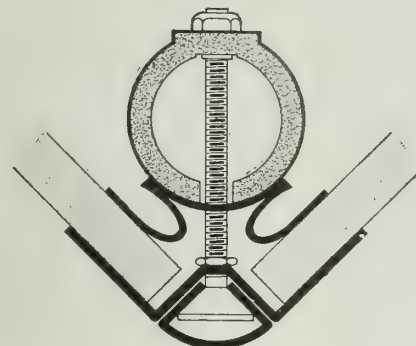
No. 4-B CORNER BAR



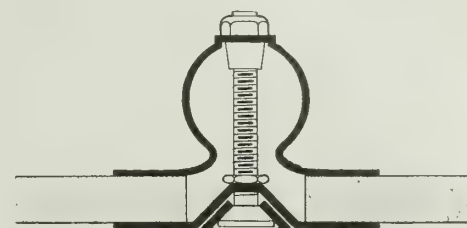
No. 19-A THREE WAY BAR



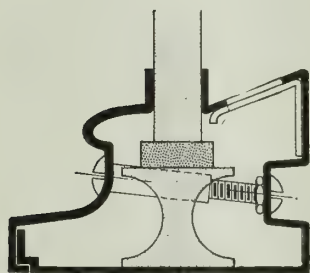
No. 30 SASH



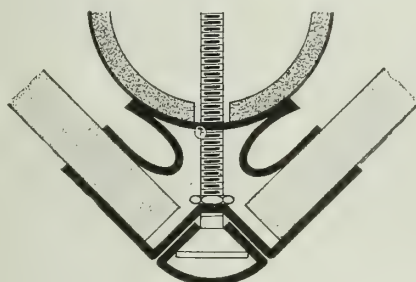
No. 6-B CORNER BAR



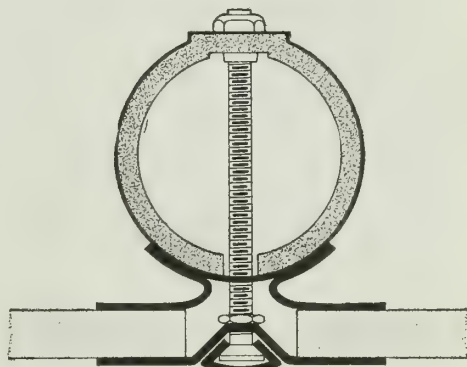
No. 11-B DIVISION BAR



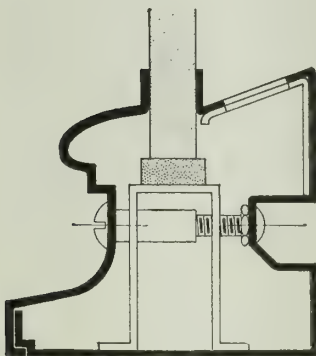
No. 36 SASH



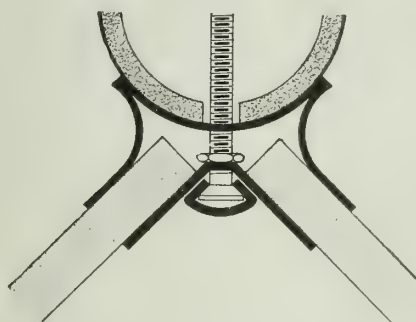
No. 9-A CORNER BAR



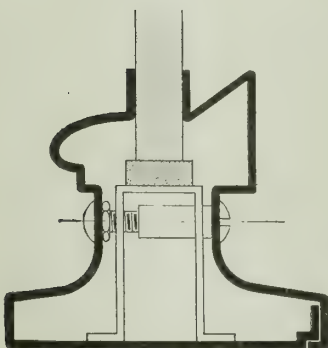
No. 12-B DIVISION BAR



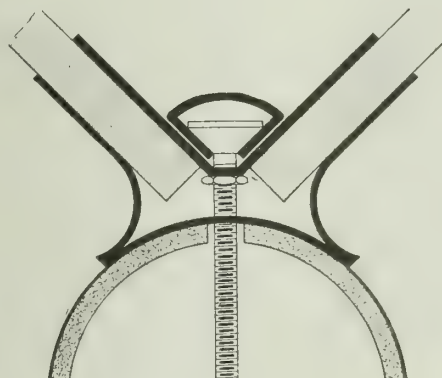
No. 31 SASH



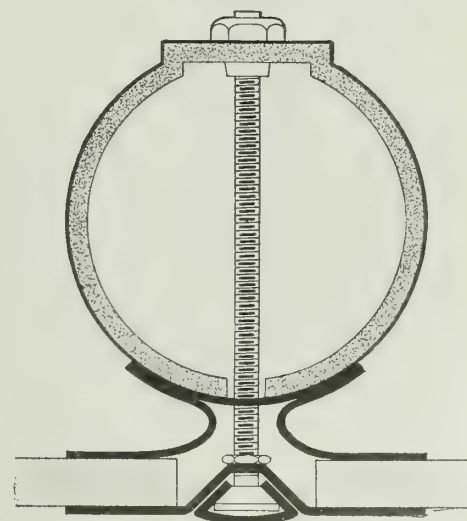
No. 17-B REVERSE BAR



No. 34 SASH

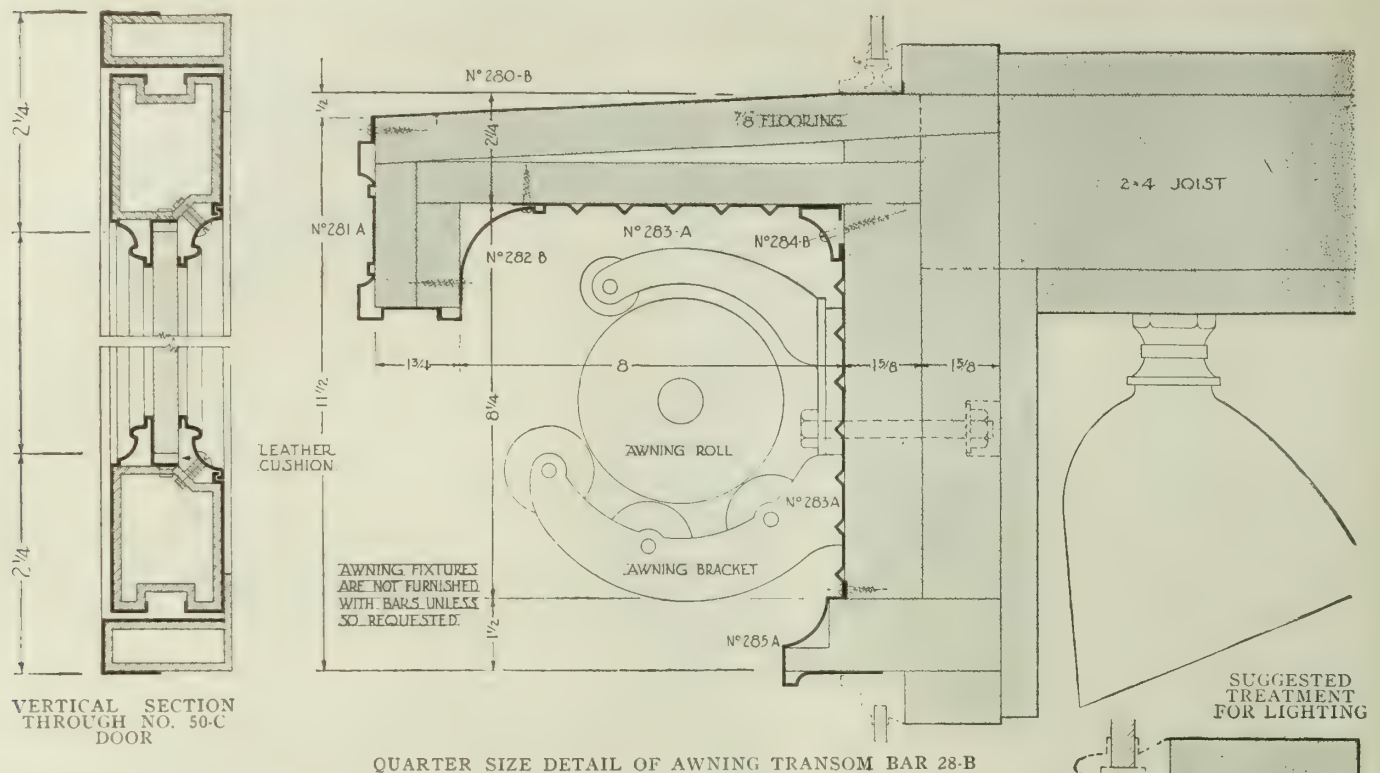


No. 18-B REVERSE BAR



No. 13-B DIVISION BAR

NOTE THE TUBULAR REINFORCEMENT FOR N°12-B DIVISION BAR IS ALSO USED FOR BARS N°9 A AND N°17-B. THE REINFORCEMENT FOR N°13-B DIVISION BAR IS LIKEWISE USED FOR BAR N°18-B.



**PERMANENCE**—Solid copper and bronze are used exclusively, except where strength is required. In such cases, steel is used, adequately protected from rusting by means of an extra good coat of baked enamel. As no wood is used, except for backing of the metal sash, no rusting or warping is possible. Kawneer store front construction is *permanent*.

**INSTALLATION**—It does not require skilled men or complicated framework to prepare an opening to receive a Kawneer store front. The construction in general is such that no confusion is possible; expensive mistakes are, therefore, eliminated to a great extent, and installation can proceed with speed and precision.

**FINISHES**—Store Front material can be had in the following finishes: burnished bronze or copper, gun-metal, black oxidized, spotted oxidized, sand blast, statuary bronze or copper and nickelplated finishes.

**CO-OPERATIVE SERVICE**—A branch office or agent is maintained in every large city of the United States and Canada for the convenience of architects.

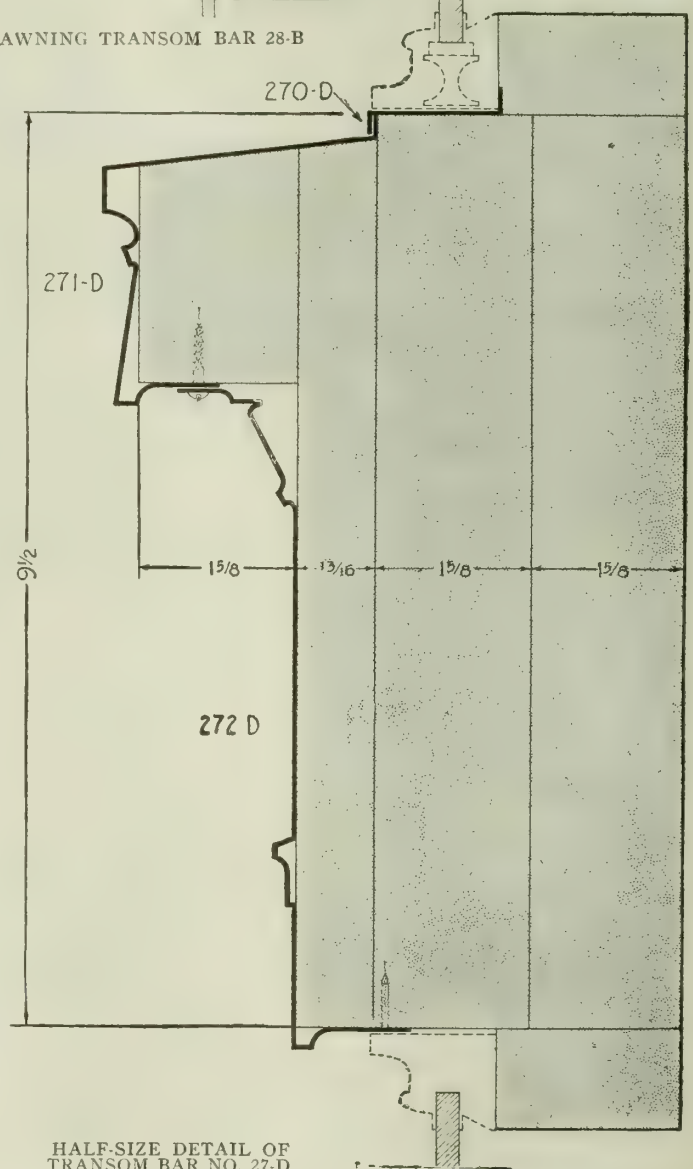
A well equipped Engineering Department is placed at the architect's service ready to suggest, recommend and help in all matters pertaining to store fronts.

The factory is in better shape than ever to deliver material on short notice.

**ARCHITECTURAL SERVICE**—A serviceable catalogue, Catalog "K," has been published by the company for the convenience of architects. This catalogue shows Kawneer standard construction and may be had on application.

### Drawn Metal Mouldings.

Drawn metal mouldings can be used advantageously for a vast variety of purposes. The company's equipment enables it to make them in any conceivable shape of copper, bronze or steel, in gauges from .012 to .125. Mouldings manufactured in this manner have sharp corners, absolutely correct curves, and are true to detail, assuring perfect alignment.



HALF-SIZE DETAIL OF TRANSOM BAR NO. 27-D



# CHENEY BIGELOW WIRE WORKS

SPRINGFIELD, MASS.

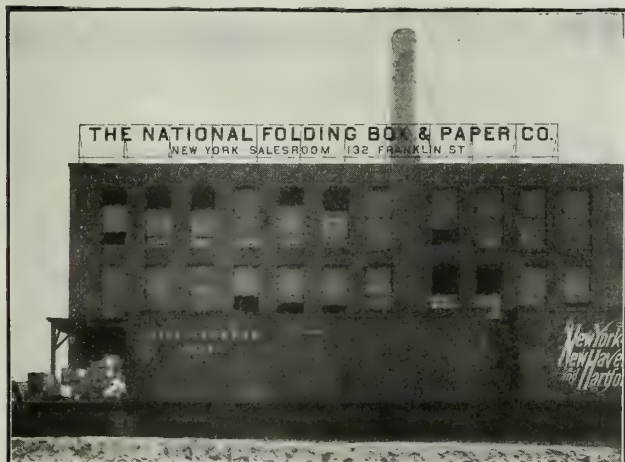
## Products.

### ORNAMENTAL WIRE WORK:

Window Guards; Folding Gates; Elevator Enclosures and Cabs; Wire Signs; Bank, Office, Heating and Ventilating Grilles; Bank and Office Screens; Brass Railings; Fire Fenders; Belt and Machinery Guards; Stockroom Partitions; Wire Partitions for all purposes.

## Designs, Estimates, Etc.

Requests for information, designs or estimates will receive prompt attention.



WIRE SIGN WITH METAL LETTERS



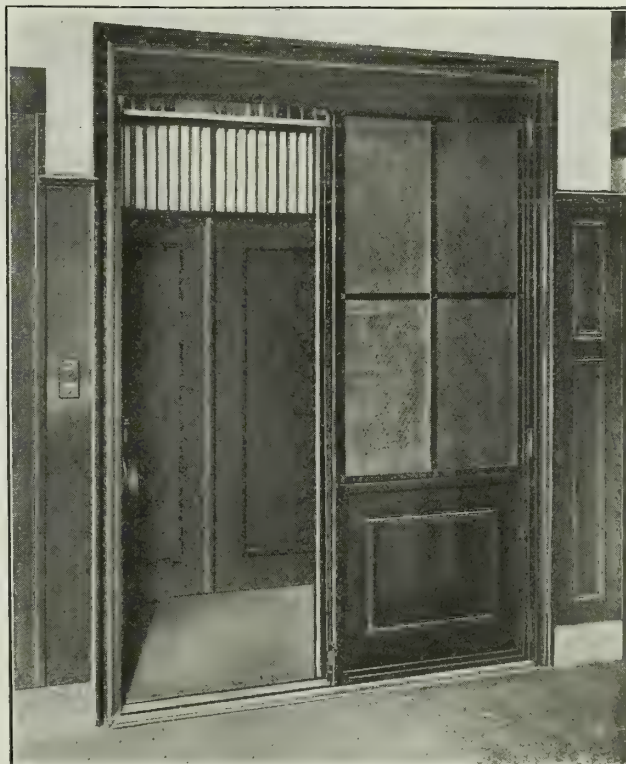
DOUBLE BOSTWICK GATE WITH STIFFENING BARS AND LIFTING BOTTOM TRACKS



DOUBLE LAZYLEVER GATE WITH LOCK BAR



DOUBLE ELEVATOR ENCLOSURE, SINGLE SLIDING DOOR AND SWING FRONTS, FISK RUBBER CO., CHICOPEE FALLS, MASS.



ELEVATOR ENCLOSURE AND CAB, SINGLE SLIDING DOOR AND SWING FRONT, VICTORIA HOTEL, SPRINGFIELD, MASS.



# THE AMERICAN BRASS COMPANY

## THE COE BRASS BRANCH

Manufacturers of Extruded Metal Mouldings

ANSONIA, CONN.

### Products.

ARCHITECTURAL BRASS and SPECIAL BRONZE MOULDINGS, ANGLES, CHANNELS, TEES, and other SPECIAL SHAPED BARS constant in section, manufactured by the Extrusion Process.

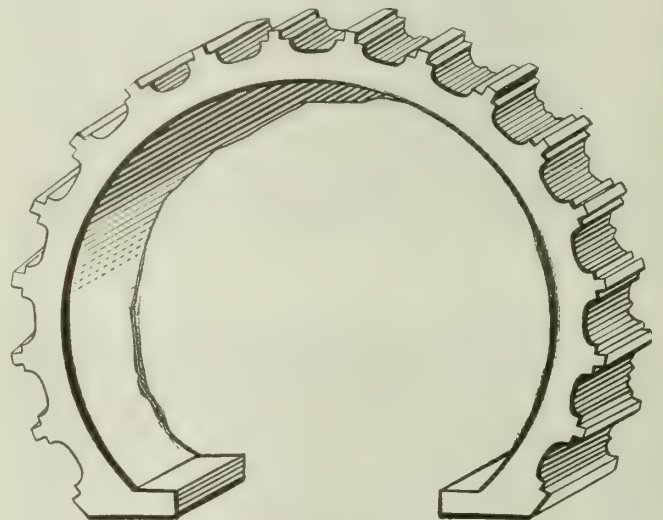
For Benedict Nickel, see page 1071.

### Extrusion Process.

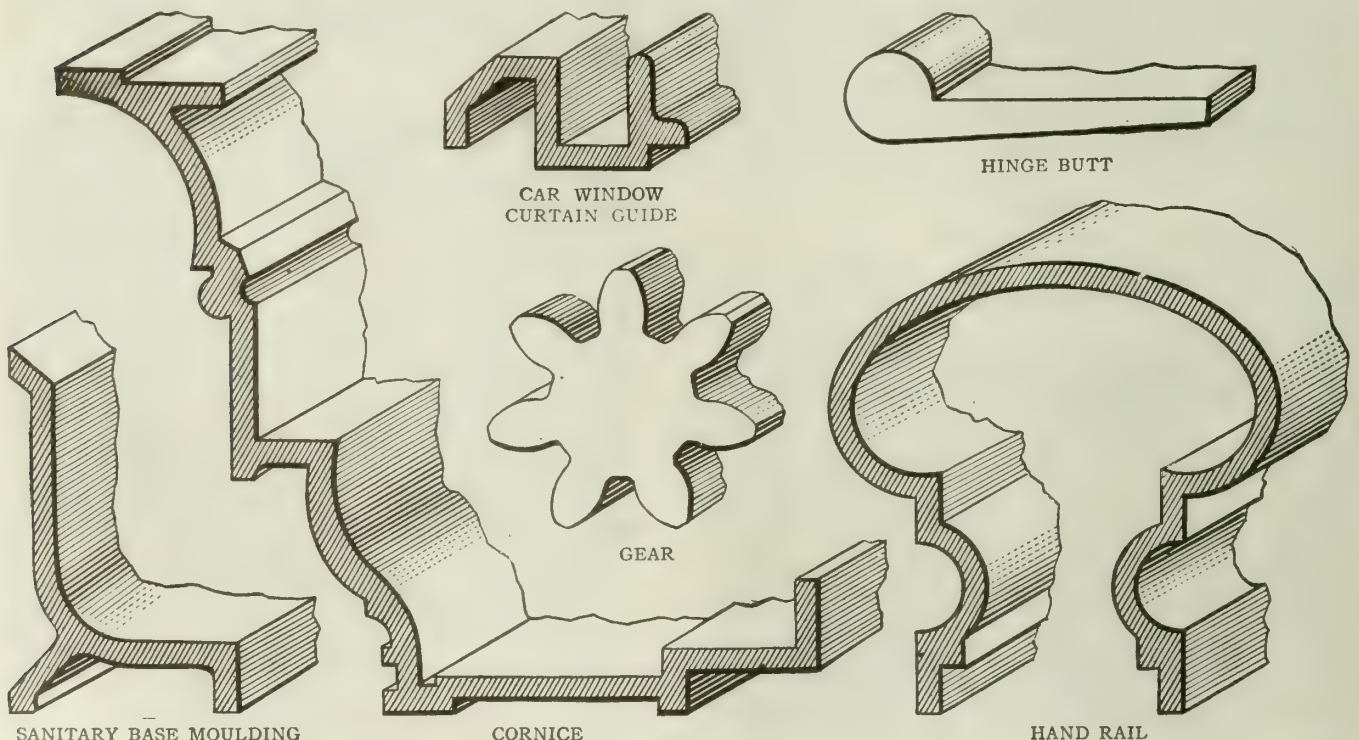
A billet is first cast of a convenient size and suitable composition for the purpose intended. This billet is re-heated until it is of plastic consistency and then is placed within a very strong cylinder, at the end of which is placed the proper die. Upon hydraulic pressure being applied, the plastic metal is forced through the die, issuing therefrom in a long bar of the cross section required.

The high pressure (frequently as high as 60,000 lbs. to the sq. in.) to which the semiplastic metal is thus subjected gives it increased density and renders it perfectly homogeneous and free from possible casting defects. The bars produced by this process have a much higher tensile strength than castings and are very

durable for wear. For special purposes, alloys are made having the requisite strength and elongation for work demanding the strength of good quality steel.



PILASTER



SANITARY BASE MOULDING

CORNICE

HAND RAIL



**Utility.**

Extruded mouldings and shapes are specially adapted for use in the construction of fireproof doors, window sash and frames, store fronts, bank counter screens, cornices, hand rail, stair nosings, sanitary base moulding, and other art metal construction.

Extruded shapes are used in various other lines of manufacture, both in bar lengths and sawed up into short pieces. The metal being perfectly smooth and accurate requires little if any machining, and therefore affords an efficient and economical means for making small, intricate parts.

**Advantages.**

Extruded mouldings and shapes cost less than machined castings and are far superior in tensile strength and stiffness. Shapes which can not be rolled or drawn can be made readily by the extrusion process.

Among the many other advantages are uniformity and clean-cut architectural lines throughout.

**Facilities.**

This company is equipped to manufacture these shapes on the most extensive scale, and guarantees the best of service. Shapes are shipped from mill with a smooth surface and in lengths required by metal workers, who can treat them to obtain any finish desired.

**Estimates and Co-operative Service.**

Practically all extruded sections are made up to order in accordance with drawings and specifications. Upon receipt of this information, detailed quotation will be given.

A representative of the company will be sent at any time to consult with architects and metal workers in

connection with propositions involving the use of extruded shapes.

**Illustrations.**

The accompanying illustrations show a few representative shapes made by the extrusion process which THE AMERICAN BRASS COMPANY has supplied on orders for various classes of work.



FRONT OF THE GORHAM COMPANY'S BUILDING, FIFTH AVENUE, NEW YORK, N. Y.

McKIM, MEAD & WHITE, Architects

Showing application of extruded mouldings for construction of store fronts



NEW YORK PUBLIC LIBRARY BUILDING

CARRÈRE & HASTINGS, Architects

The metal window frames in this building were fabricated by The Henry-Bonnard Bronze Company, Mount Vernon, N. Y., from THE AMERICAN BRASS COMPANY'S extruded metal mouldings and shapes

# BADGER WIRE & IRON WORKS

1210-1226 25th Avenue

MILWAUKEE, WIS.

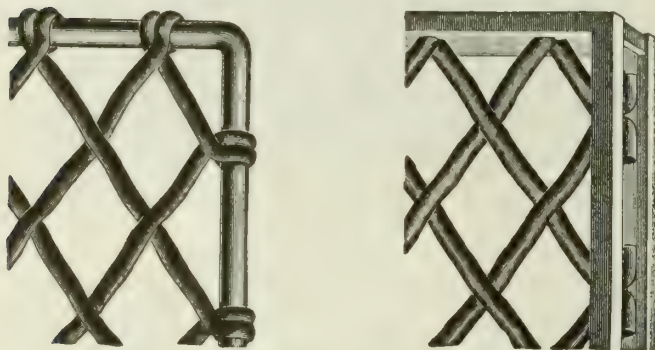
## Products.

### ORNAMENTAL WIRE and IRON WORK.

Window Guards, Railings, Wire and Iron Fences, Grilles, Panels, Wire Signs, Skylight Guards, Iron Gratings, Folding Gates, Balcony Railings, Sidewalk Doors, Marquises, Fire Escapes, Iron Stairs, Entrance Gates, Bank and Tool Room and Elevator Enclosures, Elevator Cars, Stable Fixtures, Lawn Furniture, and Lockers.

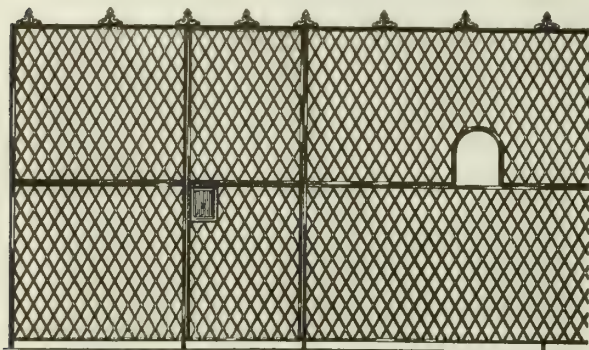
## Service.

We furnish ornamental iron and wire work of whatever nature may be required, either from your own or architects' designs. Prices will be found to compare favorably with those charged by others, for goods of equal quality.



WIRE WINDOW GUARDS

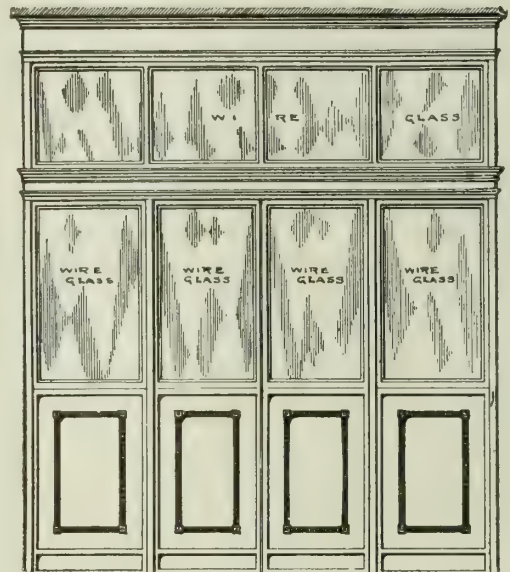
A particular specialty is made of the manufacture of wire window guards, and we are in a position to turn out this class of work at minimum prices. Inquiry should specify quantity and sizes, besides specifications covering the construction desired



WIRE PARTITION

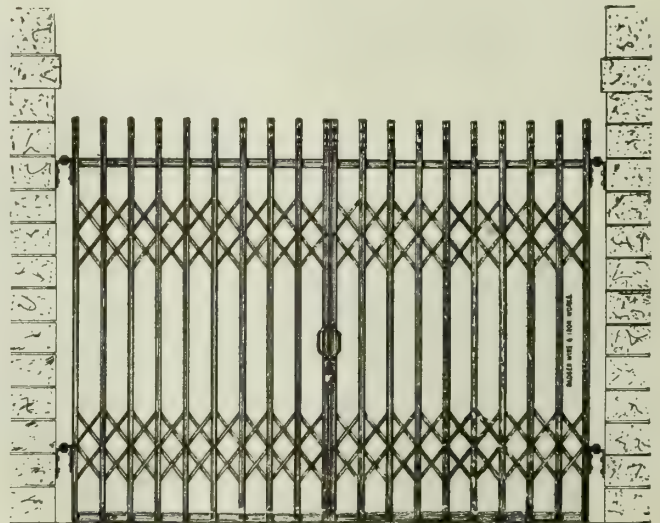
Used extensively for factory tool room and cloak room partitions, where it is desirable to effectively enclose a space without obstructing the light. Generally made of No. 10 wire, 1½-in. diamond mesh, 1 by ½-in. channel frames; cover bar and cast pickets at top as shown

We have recently removed to a new plant, where with ample space and greatly increased facilities we are in position to give better service than has been possible heretofore.



ELEVATOR ENCLOSURE

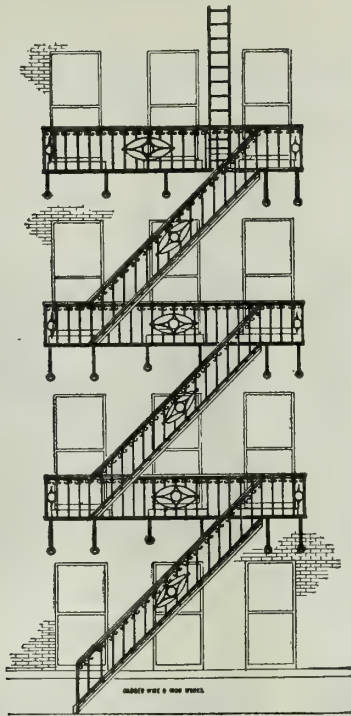
Any kind of elevator enclosure of wire, wrought iron or sheet steel can be furnished; either open work or filled with wire glass as shown above. Send drawing for quotation or we will ourselves submit sketch if the requirements are explained



FOLDING OR COLLAPSIBLE GATE

These can be furnished in a number of different designs, of which we shall be pleased to submit drawings or prints on request. In writing for price state width of the opening and height the gate is to be; also state character of the opening to be filled, so we may suggest something appropriate for the purpose





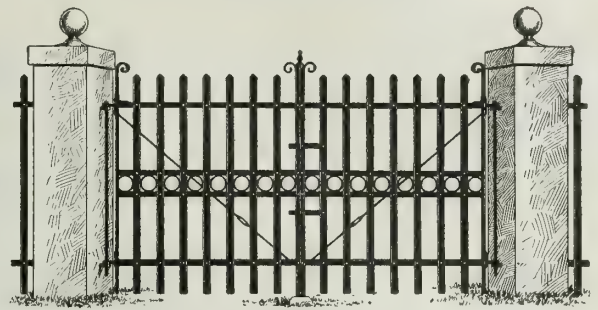
FIRE ESCAPE

Prices will be quoted on receipt of information covering the requirements. We make fire escapes according to whatever specifications may be provided for by local ordinance or state laws. Send sketch showing that part of the building where fire escape is to be placed



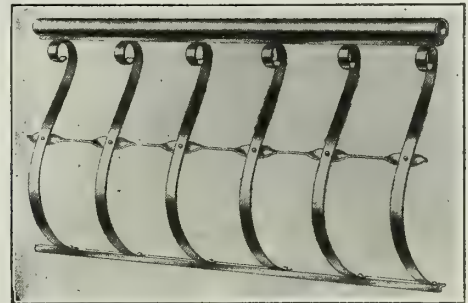
IRON STAIR

The most elaborate as well as plain stairs can be furnished. The design shown is one of the most popular. Spiral stairs can also be furnished



IRON GATE AND FENCE

In this department we are equipped to give exceptionally good service, and to quote low prices consistent with the quality of our product. Catalogue showing a number of styles will be sent on application. Special designs furnished



BALCONY RAILING

Illustration shows design No. 59—being one of the plainer patterns. This design is, however, frequently specified. We have a considerable number of other designs on file and shall be pleased to submit same for consideration



PARK SETTEE

Illustration shows No. 229 park settee. The frame is of a single piece of steel channel; the slats are of hardwood. Shipped knocked down to save freight charges. This settee can be furnished at an extremely low price and is particularly desirable where a large quantity is needed



WIRE SIGN

We make a specialty of the manufacture of wire signs and have furnished some of the largest in use. In writing for price state length, height and lettering wanted, also the position of the sign so that the proper bracing may be figured. Complete specifications will be submitted in quoting

ESTABLISHED 1866

**E. T. BARNUM**Wire and Iron Work  
DETROIT, MICH.**Products.**ORNAMENTAL IRON and WIRE  
WORK:

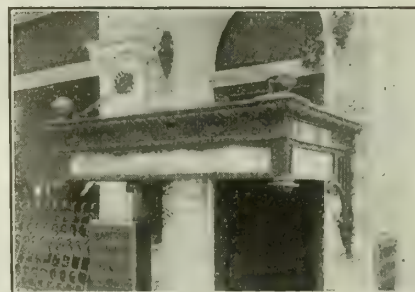
Fire Escapes; Porticos and Canopies; Window Guards; Folding Gates; Steel Shutters; Iron Stairs; Balcony Railings; Iron and Wire Fencing; Grilles, Gratings; Panels; Brass, Bronze and Wire Railings; Stable Fixtures, Stall Guards; Metal Flagpoles; Wire Signs; Mausoleum Doors, Fireproof Vault Doors; Side-walk Lights and Doors; Lawn Furniture; Ornamental Wire, Iron, Steel, Bronze and Brass Work of every description.

For Jail Equipments, see page 1487.

**Canopies, Marquises and Porticos.**

For theaters, hotels, apartments and other public and business buildings.

Constructed in cast or wrought iron, sheet copper and galvanized sheet metal.



MARQUISES



IRON FENCING, GATES AND ENTRANCES

**Iron Fencing.**

Permanent enclosures for industrial plants, covering every phase of protection. Ornamental fencing in steel and iron for country estates, town and city residences, entrance gates, arches for parks, playgrounds, cemeteries, etc.

Our engineering department will help solve fencing problems in regard to trackways, grades, railroad gates, drives, etc.

There are no obstacles which this organization can not overcome.

Special designs suitable for different conditions submitted on request.

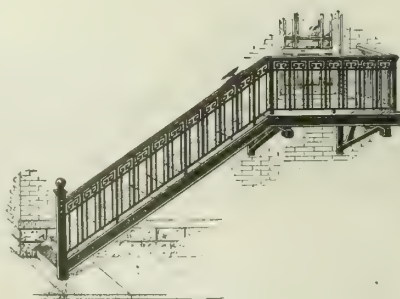
**Stairways and Stair Railings.**

The simplest or the most elaborate designs for residence or apartment use, as well as the plain type for factory purposes.

Hundreds of designs on file for approval.



IRON FENCING



STAIRWAYS AND STAIR RAILINGS



**Fire Escapes and Stairs.**

Every type of fire escape required by state laws or local ordinances.

Our engineering department will assist with any information.

Spiral stairs, runways, platforms, etc., for factory and industrial purposes, guard and area railings, door and window coverings and all other forms of iron and steel protection for mercantile buildings, manufacturing plants, etc.

**Fire Shutters and Doors.**

Interior or exterior. Furnished in single or double hung and sliding types.

These are essential for protection from fire. Any size opening and all conditions are easily covered with our construction.

Full particulars on request.

**Folding and Collapsible Gates.**

Entrance enclosures for theaters, public buildings and mercantile institutions are furnished in our own original designs to fit any conditions.

Illustrations and full specifications on request.

**Estimates and Data.**

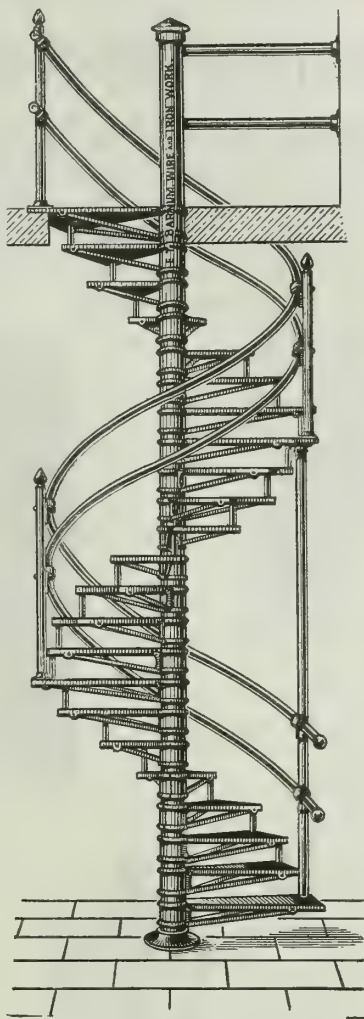
Detail drawings, specifications and proposals will be furnished promptly.

Our designers and engineers can make valuable suggestions.

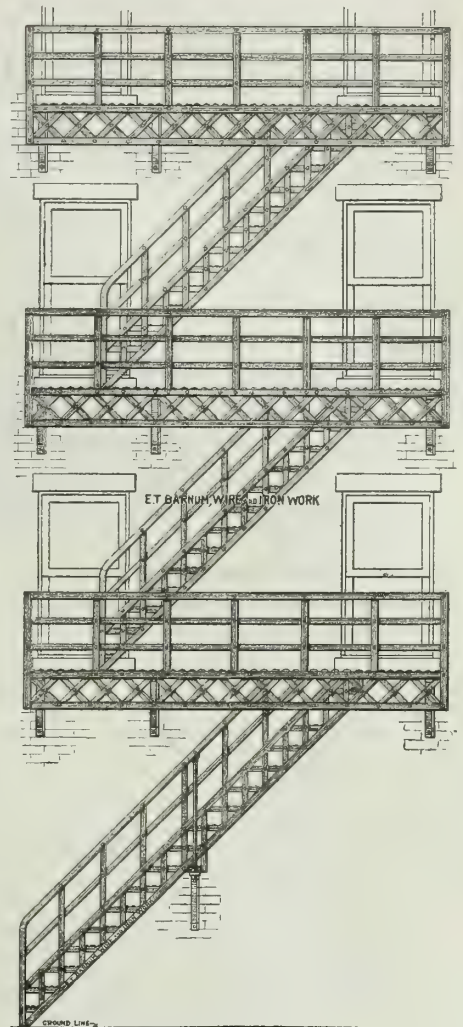
**Catalogues.**

Illustrated catalogue covering various subjects may be had on request.

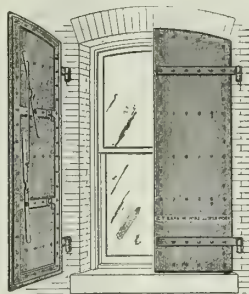
Explain requirements, and the most appropriate printed matter will be sent.



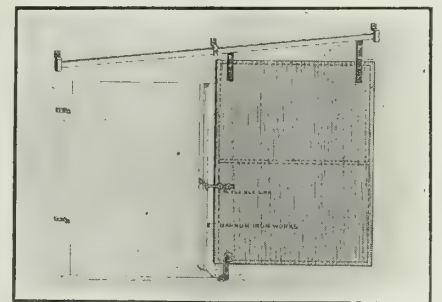
SPIRAL STAIRS



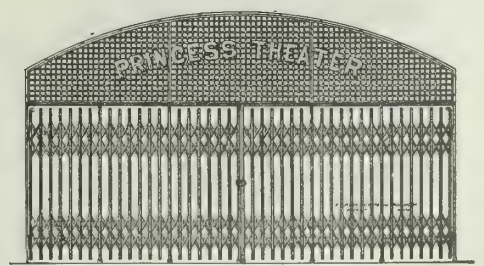
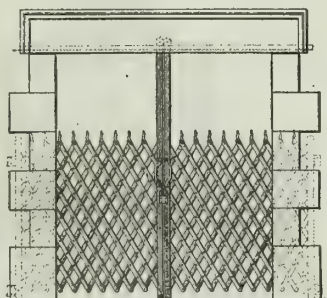
FIRE ESCAPES



FIRE SHUTTERS



FIRE DOORS



FOLDING AND COLLAPSIBLE GATES

ESTABLISHED 1864

# BUREAU BROTHERS

Founders of Architectural and Statuary Bronze and Brass

Southeast Corner 23d and Westmoreland Streets  
PHILADELPHIA, PA.

## Products.

BRONZE WORK, including Statuary, Bronze and Brass Castings; Architectural Work; Memorial and Inscription Tablets; Mausoleum Doors and Fittings; Balcony Railings; Fountains; Lamp Standards; Grilles and Gates. Everything in the line of Castings.

## Memorial and Inscription Tablets.

There is an increasing demand for Bureau memorial and inscription tablets. Our own designs are the results of the efforts of the best artists. Orders for these, however, are filled from special designs as well as from designs by architects, or from a large stock of type patterns.



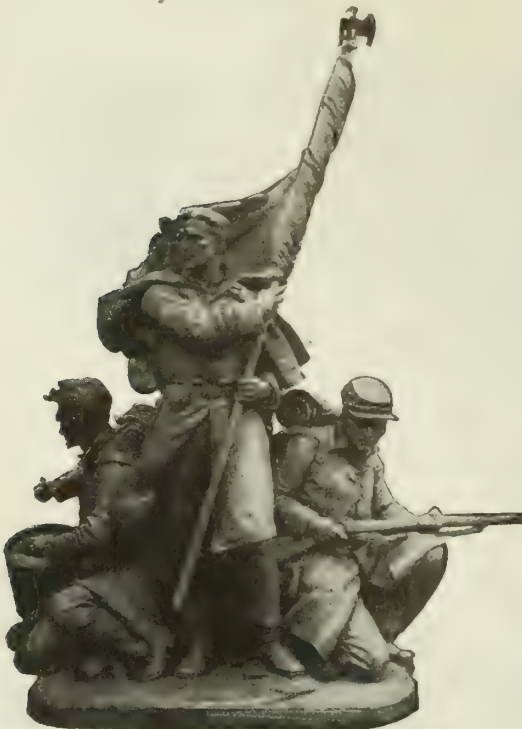
BRONZE TABLET, UNIVERSITY OF PENNSYLVANIA  
MARTIN & KILPATRICK, Architects, Philadelphia, Pa.

## Illustrations.

The accompanying illustrations will give an idea of the character of work executed by this company.

## Facilities.

Our manufacturing facilities are of the best, enabling the filling of orders of any size. There is no territory limitation.



GROUP ERECTED IN GENEVA KENT CO., ILL.  
CARL HEBER, Sculptor



LAMP STANDARD FOR BANK  
BUILDING  
FURNESS & EVANS, Architects,  
Philadelphia, Pa.



MAUSOLEUM DOORS  
Designed by Achille G. Bureau, Architect,  
Philadelphia, Pa.



# CHATTANOOGA ROOFING & FOUNDRY COMPANY

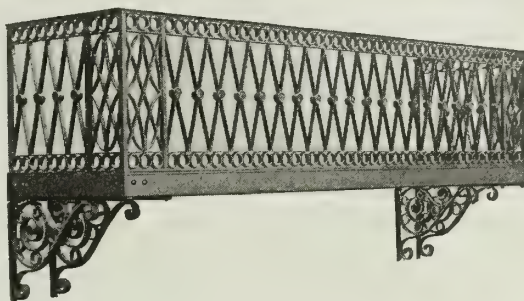
Manufacturers of Ornamental, Wrought and Cast Iron Work  
and Sheet Metal Products

CHATTANOOGA, TENN.

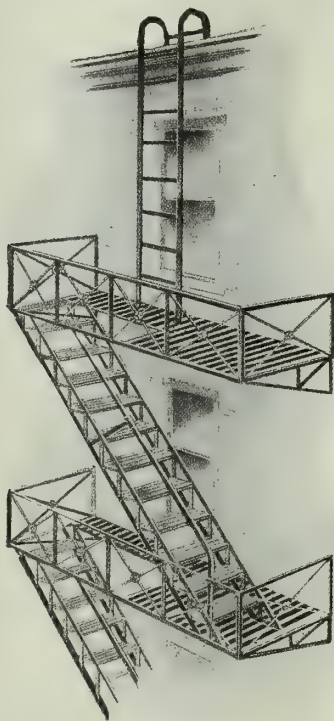
## Products.

ORNAMENTAL, WROUGHT and CAST-IRON STRUCTURAL WORK: Stairways, Marquises, Balconies, Fire Escapes, Elevator Enclosures, Railings, Entrance Gates, Grilles, Spiral Stairs, Store Fronts, Window Guards, Truss Rods, Cast Iron Columns, Post Caps, Bases for Steel Columns, Wheel Guards, Thresholds, Coal Chutes, Conductor Boots.

SHEET METAL PRODUCTS: Skylights and Ventilators, Metal Shingles, Cornices, Fireproof Portable Garages, Special Sheet Metal Work from architects' plans.



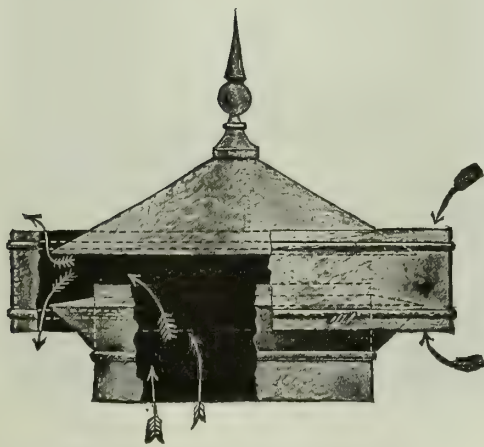
ORNAMENTAL BALCONY



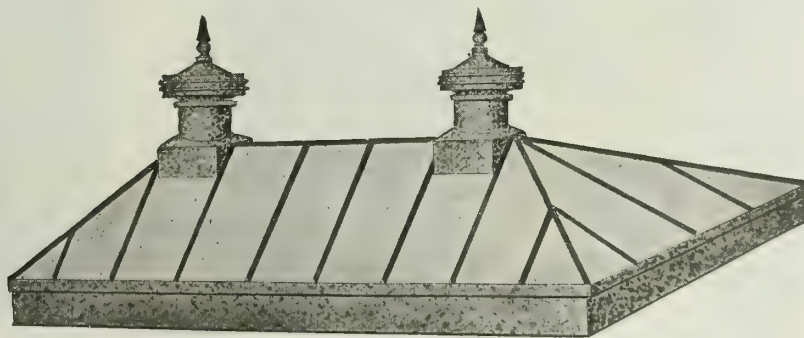
WROUGHT IRON FIRE ESCAPE



A DISTINCTIVE MARQUISE



NO. 4391. "NOOGA" VENTILATOR



NO. 4398. HIPPED "NOOGA" SKYLIGHT WITH TUBULAR VENTILATORS

# DETROIT MAUSOLEUM EQUIPMENT WORKS

CHARLES BOVENSIEP, PROPRIETOR

## Memorial Tablets, Mortuary Bronze Work

DETROIT, MICH.

### Products.

Designers and manufacturers exclusively of STANDARD BRONZE WORK for MAUSOLEUMS and MEMORIALS: Bronze Mausoleum Doors, Window Grilles, Window Frames, Ventilators, Catacomb Handles, and all Bronze Work used in and about Mausoleums; and Standard Bronze Cast Memorial Tablets.

### Construction of Doors.

The mausoleum doors are all of the "built-up" type, which consists of two heavy sheets of bronze riveted with countersunk bronze rivets to a substantial inner framework, forming doors 1 in. thick (standard), 1½ in. thick (heavy) and 1¾ in. thick (extra heavy). Can be made thicker, if desired.

These doors are absolutely rigid, plumb and level; are not affected by extremes of heat or cold, dampness or other weather conditions. They will positively endure for all time, require no care whatever, and are handsome and massive.

Doors are furnished complete with all attachments such as bronze pivotal hinges, threshold, full bronze five-tumbler dead lock, slide bolts, ready to set in place. They are made to order only, to fit any size or shape of opening. Hinging attachments are supplied of such shape and type as best adapted for each individual case. Doors can swing in or outward, but usually swing inward.

### Separate Door Frames.

Cast bronze separate frames for doors can be supplied if desired, but usually a separate cast frame is not required, as doors are hung direct to granite.

### Grilles.

The usual type of mausoleum door has open grille work window, with heavy plate glass shutters on inside, so they can be opened for ventilation.



Design No. S-600

U. S. STANDARD BRONZE CAST TABLET

### Orders.

Orders should be placed six to eight weeks before actual requirement. Always send floor plan of vault and give full particulars, so that the exact conditions can be understood and the best method of hanging suggested for that particular case. Before beginning work complete details are prepared, for the architect's approval, showing how work will be constructed.

### Prices and Catalogue.

No price list of this work has been prepared. Quotations only on receipt of particulars.

Catalogue shows many attractive designs of doors, grilles, frames, catacomb handles, fittings, etc., of interest to the mausoleum builder, and will be sent to architects on application.

### Guarantee.

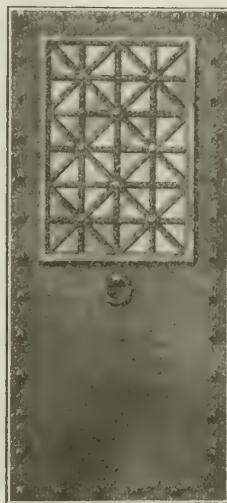
This company has furnished bronze equipment for mausoleums all over the country. All the work is absolutely guaranteed first class in material, painstaking workmanship and finish.



Design No. S-77



Design No. S-83



Design No. S-112



Design No. S-72

STANDARD BRONZE DOORS



# FRIEDLEY-VOSHARDT CO.

Manufacturers of Art Metal Work

733-737 South Halsted Street; 761-771 Mather Street

LONG DISTANCE TELEPHONE:  
HAYMARKET 4081

CHICAGO, ILL.

CABLE ADDRESS:  
"FRIEDLEY"  
A. B. C. Code, 5th Edition

## Products.

STAMPED SHEET BRONZE, COPPER and ZINC ARCHITECTURAL ORNAMENTS for cornices; SHEET-METAL STATUARY; SPUN and STAMPED METAL WORK of all kinds; METAL INDIRECT LIGHTING BOWLS, SEMI-INDIRECT LIGHTING RINGS, STAMPED SHOWER PLATES, METAL LIGHTING FIXTURE PARTS.

Embossed Steel Ceilings and Side Walls, Finials and Crestings, Zinc Ventilating Centerpieces.

## Ornaments (Stamped and Spun Metal).

All kinds of architectural ornaments used for trimming cornices and building fronts are made from sheet copper and zinc.

## Special Work.

Inquiries and plans are solicited from architects, and estimates, either on special work from their detail or stock designs, will be submitted. Architects' details will be followed with absolute accuracy and photographs of the models furnished before proceeding with the work.

## Statuary.

Manufactured by the company from sheet bronze, copper and zinc. Statuary of any description is reproduced, from either sculptor's model or architect's detail, in sheet metal, and guaranteed to be correct in detail and workmanship. Photographs of the full sized models will be submitted before the work is commenced.

The statues are made of sheets varying in size as to the position they will occupy on the finished products, and with reinforced countersunk joints which are practically invisible when finished.

## Lighting Fixtures and Parts.

FRIEDLEY-VOSHARDT Co. manufactures a complete line of metal indirect lighting bowls, semi-indirect lighting rings, stamped shower plates, canopies, wall backs and fixture parts. New designs, which are fully protected by patent rights, are constantly being designed by this company, and special designs from architects' or others' details will be made.



DESIGN No. 6111  
SHEET METAL ORNAMENT



DESIGN No. C447  
COPPER LANTERN

# THE GORHAM CO ARCHITECTURAL BRONZE

## Bronzesmiths

Fifth Avenue at Thirty-sixth Street  
NEW YORK, N. Y.

FOUNDRIES AND PLANT  
PROVIDENCE, R. I.

### BRANCH OFFICES

CHICAGO, ILL., 10 South Wabash Avenue  
DETROIT, MICH., Dime Bank Building  
PITTSBURGH, PA., 339 Second Avenue

PHILADELPHIA, PA., 1215 Filbert Street  
WASHINGTON, D. C., National Savings and Trust Building  
CLEVELAND, OHIO, 1217 Schofield Building

### Products.

GORHAM BRONZE PRODUCTS include work of every description: ART, DECORATIVE, ARCHITECTURAL, MONUMENTAL, SCULPTURAL, and COLOSSAL, and embrace a range of objects from the most delicate art handling to the largest and most extensive works that can be produced in BRONZE, BRASS, GERMAN SILVER, or the ALLOYS.

Our more strictly architectural work includes Doors, Windows, Screens, Grilles, Railings, Tablets, Signs, Fountains, Dials, Enclosures, Stairs, Lamps, Bank Work, Desks, Directory Boards, Lighting Fixtures, etc.

We specialize in the production of Mausoleum Doors, Grilles, Railings, Gates, Vases, Urns, Tripods, Sarcophagi, and Miscellaneous Fittings for Mortuary Work with a range of design and prices that meets all requirements.

### Facilities.

The facilities of this company for producing bronze are unequaled; our foundries and shops are the largest in this country devoted exclusively to bronze production. This equipment, combined with our control of various patents and processes, gives us advantages that are exceptional and unique.

We can cast (by our process), in "healthy" metal, Ornamental Bronze having "undercut" sections at a very slight advance in price over that of ordinary "flat" ornament, thus offering to the designer possi-



TRADE-MARK

bilities that have heretofore been considered prohibitive.

### The Gorham Stamp.

Bronze work bearing the trade-mark illustrated may be known to have a specific handling of the first class, that is distinctive as to workmanship and material and that assures the architect and owner of a well-defined value.

### A Standard of Construction.

Gorham Standard Monumental Construction, Gorham Standard Architectural Construction, and Gorham Standard Commercial Construction offer classifications in Architectural Bronze, in regard to construction and cost, that assure a specifically graded handling which is adapted to works of varied character and is the practical solution of this troublesome problem.

### Co-operative Service.

The services of our Directing Architect and a corps of specialists are at the disposal of architects and prospective purchasers. Requests for information, designs or estimates will receive prompt attention.

### References.

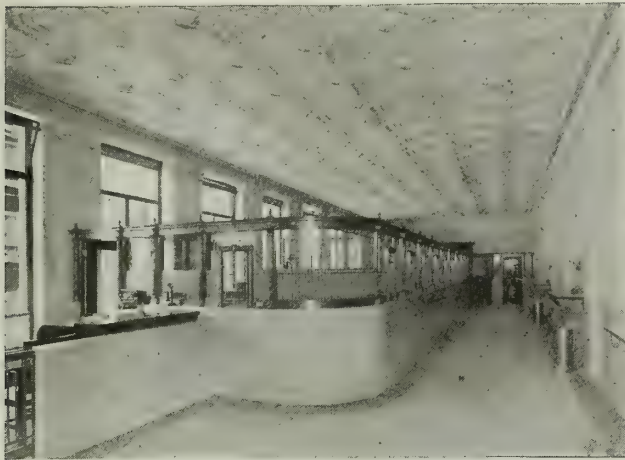
Our commissions include some of the most noted examples of American bronze production of recent years, and we number among our patrons the greatest names in the nation's art and architecture.

Among our more recent orders for Architectural Bronze we name a few of the more prominent.

### A FEW INSTANCES IN WHICH GORHAM ARCHITECTURAL BRONZE WAS RECENTLY USED

OPERATION	LOCATION	ARCHITECT
Albany County Court House	Albany, N. Y.	Hoppin & Koen
Apartment House	63rd Street and 5th Avenue, New York, N. Y.	Starrett & Van Vleck
Bank of Toronto	Toronto, Can.	Carrère & Hastings
Citizens Savings & Trust Co.	Cleveland, Ohio	Hubbell & Benes
Citizens National Bank	Charleston, W. Va.	Dennison & Hiron
Cooper Branch Free Library	Camden, N. J.	Karcher & Smith
Cleveland Post Office	Cleveland, Ohio	A. W. Brunner
Commercial National Bank	Youngstown, Ohio	Chas. F. Owsley
Commercial Trust Co.	Boston, Mass.	Peabody & Stearns
Core Mausoleum	Norfolk, Va.	H. VanBuren Magonigle
Emigrants Industrial Savings Bank	New York, N. Y.	Raymond F. Almirall
First National Bank	Denver, Colo.	Weary & Alford Co.
First National Bank	Los Angeles, Cal.	Weary & Alford Co.
First National Bank	Youngstown, Ohio	Albert H. Kahn
First National Bank	Richmond, Va.	Clinton & Russell and A. C. Bossom
Guardian Savings & Trust Co.	Cleveland, Ohio	Walker & Weeks
Hanan Shoe Stores	New York, N. Y. (2); Boston, Mass.; Pittsburgh, Pa.	Seymour & Schonewald
Hamilton County Court House	Cincinnati, Ohio	Rankin, Kellogg & Crane
Henry Ford Residence	Dearborn, Mich.	Wm. H. Van Tine
Memorial to Women of the Civil War	Washington, D. C.	Trowbridge & Livingston
Metropolitan Museum of Art	New York, N. Y.	McKim, Mead & White
Missouri State Capitol	Jefferson City, Mo.	Tracy & Swartwout
Plant Residence	New York, N. Y.	Guy Lowell
Morgan Memorial	Hartford, Conn.	B. W. Morris
New York Library Approach	New York, N. Y.	Carrère & Hastings
New York State Educational Building	Albany, N. Y.	Palmer, Hornbostel & Jones
Perry Memorial	Put-in Bay, Ohio	J. H. Freedlander and A. D. Seymour
Raskob Residence	Claymont, Del.	McClure & Harper
Standard Arcade	New York, N. Y.	Severance & Van Alen
Temple of the Scottish Rites	Washington, D. C.	John Russell Pope
Union National Bank	Cleveland, Ohio	Walker & Weeks
Wyoming National Bank	Wilkes-Barre, Pa.	McCormick & French





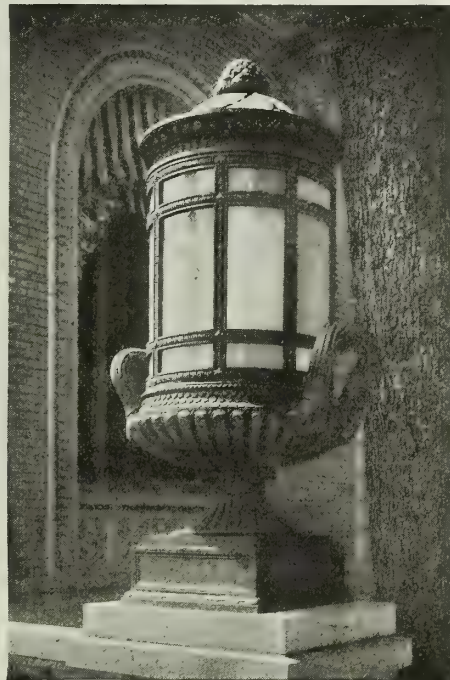
CITIZENS' NATIONAL BANK, CHARLESTON, W. VA.  
DENNISON & HIRONS, Architects



UNION NATIONAL BANK, CLEVELAND, OHIO  
WALKER & WEEKS, Architects



HANAN SHOE STORE, NEW YORK,  
N. Y.  
SEYMOUR & SCHONEWALD, Architects



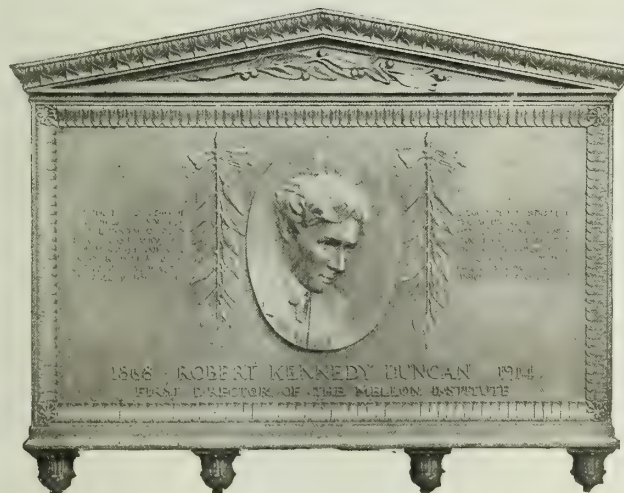
LIGHTING FIXTURE, U. S. POST OFFICE,  
STAMFORD, CONN.  
J. A. WETMORE, Supt. Architect, Washington, D. C.



BRONZE MAUSOLEUM DOOR  
PRESBRY-COYKENDALL Co., Designers



BRONZE URN



BRONZE TABLET  
J. H. GIESEY, Architect  
GEO. T. BREWSTER, Sculptor



BRONZE VASE



# THE JOHN HARSCH & SONS CO.

Manufacturers of Architectural Castings

3941-3951 St. Clair Avenue  
CLEVELAND, OHIO

## Products.

Ornamental Bronze Founders and Finishers for ARCHITECTURAL and MEMORIAL WORK: Doors, Grilles, Canopies, Candelabras, Tablets, Signs, Statuary, Bas Relief Memorials and Letters.

Everything in the line of Castings in Bronze, Brass, Aluminum and Manganese, or special mixtures to formulas.

## Co-operative Services.

This company maintains a corps of specialists whose services are at the disposal of architects in connection with information, designs or estimates.



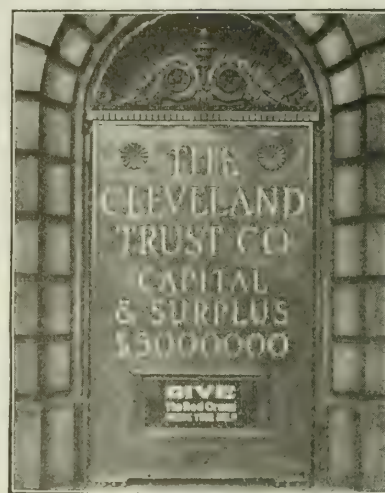
BRONZE BUST AND PEDESTAL,  
BURGOYNE MEMORIAL, DAYTONA,  
FLA.

LUELLA VARNEY SERRAS, Sculptor



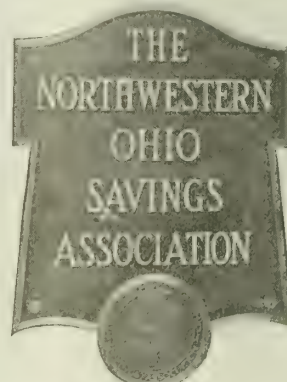
BRONZE CANDELABRUM,  
MAYFIELD CHAPEL,  
CLEVELAND, OHIO

J. MILTON DYER, Architect

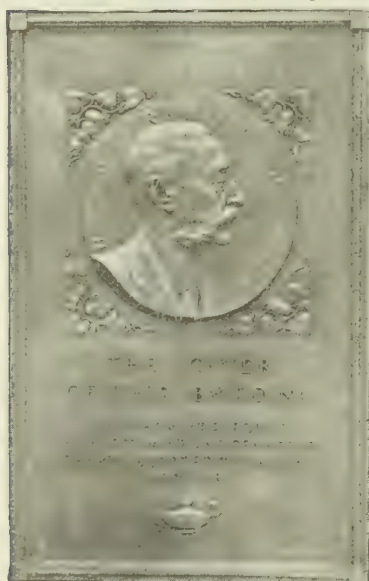


BRONZE ORNAMENTAL TABLET,  
CLEVELAND TRUST CO., CLEVELAND,  
OHIO

GEO. B. POST & SONS, Architects  
Perforated lettering to let light through  
at night. Size, 5 ft. 2 ins. by 11 ft.



BRONZE RAISED LETTER SIGN

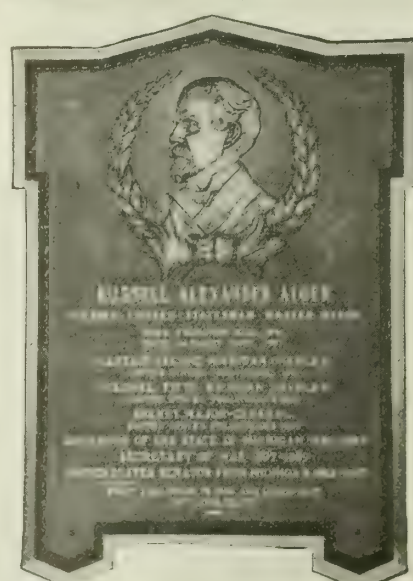


BRONZE BAS RELIEF,  
HENRY R. HATCH MEMORIAL,  
WESTERN RESERVE UNIVERSITY,  
CLEVELAND, OHIO

HERMAN N. MATZEN, Sculptor



BRONZE MEMORIAL  
PLAQUE,  
OHIO SOLDIERS' MEMO-  
RIAL, CHATTANOOGA,  
TENN.



BRONZE TABLET  
ERECTED ON THE RESIDENCE OF  
GENERAL RUSSELL A. ALGER,  
DETROIT, MICH.



# THE W. IRVING FORGE

Designers and Artificers of Hand Wrought Fitments in Metal

TELEPHONE:  
MURRAY HILL, 8536

326-328 East 38th Street  
NEW YORK, N. Y.

## Products.

Specialists in ORNAMENTAL METAL: Period Hardware; Fireplace Fixtures and Utensils; Hob Grates; Candelabras; Lighting Fixtures; Gates; Railings; Grilles, etc.



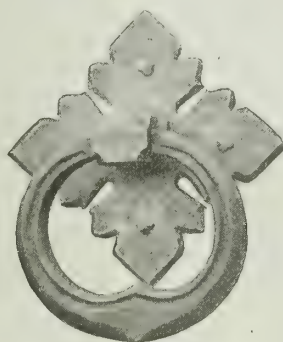
## Fitments for House and Garden.

The articles illustrated on this page are from our catalogue. Fitments for the House and Garden, G2G, and catalogue of Hardware, G3B, mailed upon request.

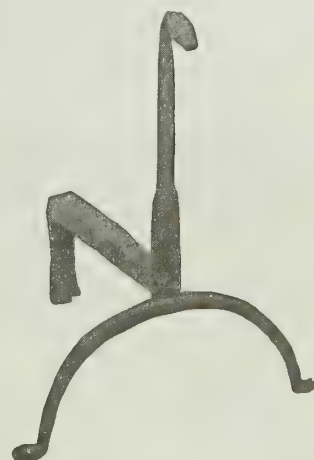
Inquiries on special work invited.



LANTERN NO. 1412  
Height, 20 ins.



DOOR KNOCKER NO. 1399  
Length, 7 ins.



ANDIRON NO. 1313  
Height, 14 ins.



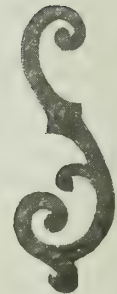
MUD SCRAPER NO. 1353  
Height, 9½ ins.



PULL RING NO. 1242  
Diameter, 2 ins.



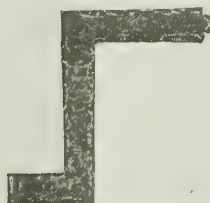
THUMB LATCH, NO. 1281  
Height, 7½ ins.



HOLDBACK NO. 1143  
Height, 8 ins.



HOLDBACK NO. 1131  
Height, 7 ins.



HINGE NO. 1239  
9 by 6 ins.



HINGE NO. 1203  
Length, 14 ins.



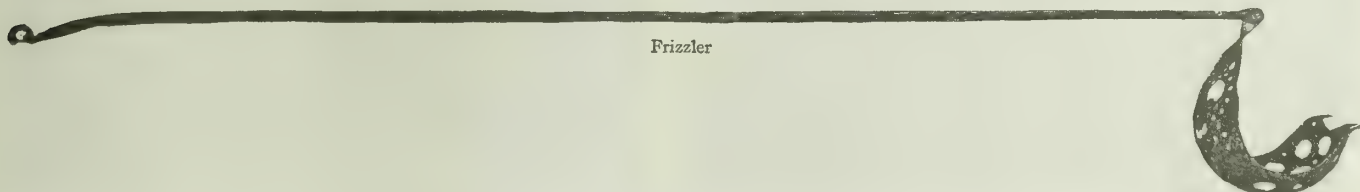
RAIL BOLT NO. 1206



Jabber



Dujab



Frizzler

THE SALEM FRIZZLER SET, NO. 1383

The new-old fireplace "fitments" of to-day, for toasting marshmallows, roasting chestnuts, or broiling frankfurters, etc., over the glowing embers on the hearth

# LASAR MFG. CO.

Manufacturers of Ornamental Bronze and Iron Work

O'Fallon and 16th Streets

ST. LOUIS, MO.

## Products.

Designing, manufacturing and executing ORNAMENTAL IRON and BRONZE for Public and Private Buildings:

Store Fronts and Entrances; Elevator Enclosures and Cars; Stairways and Railings; Marquises, Portecocheres; Memorial Tablets and Name Plates; Bank Counter Screens and Interior Fittings; Mausoleum Doors; Lamp Standards; Metal Doors; Folding Gates, Driveway Gates and Fences; Grilles; Mesh Wire Work.



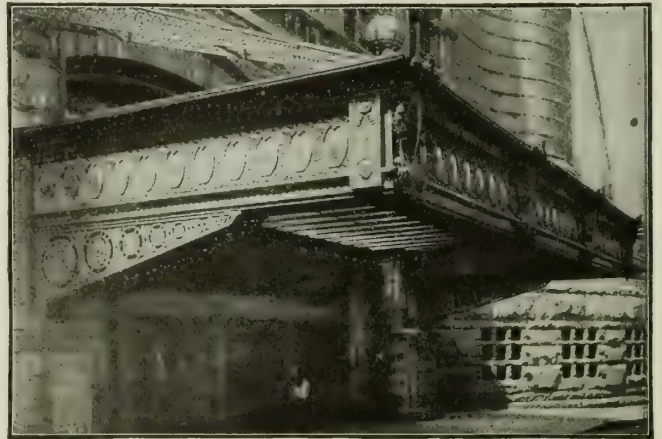
IRON STAIRS, SCOTTISH RITE CATHEDRAL, LITTLE ROCK, ARK.

CHARLES L. THOMPSON, Architect

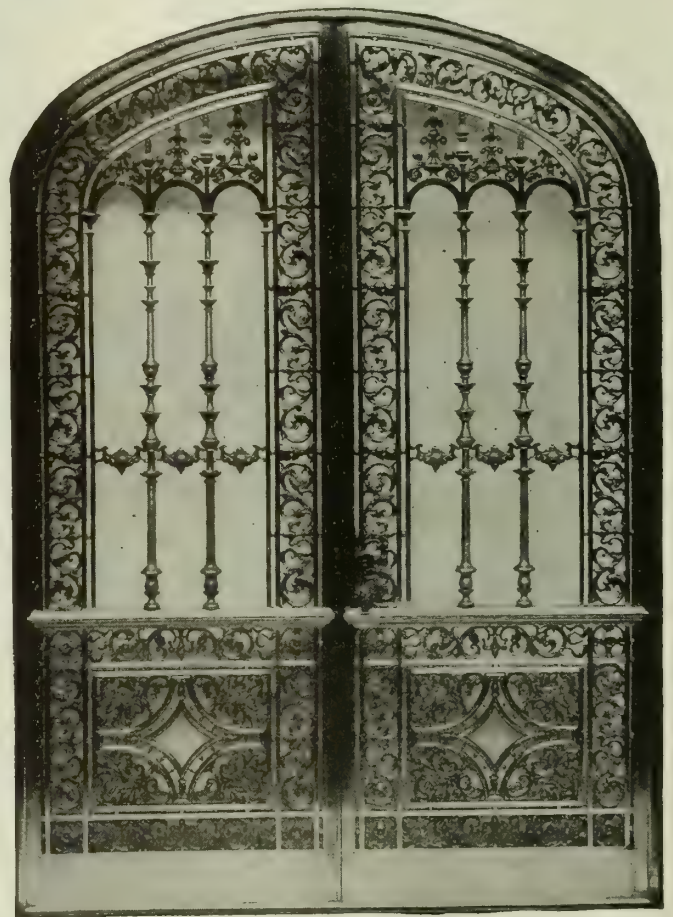


ENTRANCE GATES TO THE FRANCIS FIELD, WASHINGTON UNIVERSITY, ST. LOUIS, MO.

JAMES P. JAMIESON, Architect



MARQUISE, UNION STATION, ST. LOUIS, MO.  
T. C. LINK & SON, Architects



BRONZE ENTRANCE GATES, RESIDENCE EDWARD MALLINCKRODT, JR., ST. LOUIS, MO.

JAMES P. JAMIESON, Architect





ELEVATOR CAB



BRONZE ENTRANCE DOORS, HIPPEE BANK, DES MOINES,  
IOWA  
SAWYER & WATROUS, Architects



ELEVATOR ENCLOSURE, WALL BUILDING, ST. LOUIS, MO.  
CHARLES WRAY, Architect



BRONZE TABLET



ELEVATOR ENCLOSURE AND CAB, Y. W. C. A., ST. LOUIS, MO.



FOUNDED 1869

INCORPORATED 1902

**THE T. F. MCGANN & SONS CO.**

Ornamental Bronze and Iron

112 Portland Street  
BOSTON, MASS.

FOUNDRY AND WORKS, SOMERVILLE, MASS.

**Products.**

ORNAMENTAL BRONZE and IRON WORK for Architectural and Memorial Purposes: Grilles, Screens, Doors, Windows, Railings, Bank Work, Fountains, Dials, Balustrades, Enclosures, Lamps, Desks, Directory Boards, Signs, Miniature and Colossal Statuary, Busts, Bas-reliefs, Tablets, Ecclesiastical Brasses.

We make a specialty of Mausoleum Doors, Gates, Railings, Grilles, Urns, Vases, Tripods, Sarcophagi and other Mortuary Fittings.

**Facilities.**

Our works embrace modelling rooms and studio, complete foundry for handling plain and difficult "process" castings, finishing and chasing departments, and coloring rooms.

**Trade-Mark.**

"The Boston Brass Mongers—They Be Just."

**Catalogue.**

Sent on request.



LIFE SIZE STATUE OF GREEK  
FIGURE

HERMAN MANN, Sculptor  
Erected at Cleveland, Ohio



EIGHT-FOOT STATUE OF  
SPANISH WAR SOLDIER

ANDREW O'CONNOR, Sculptor



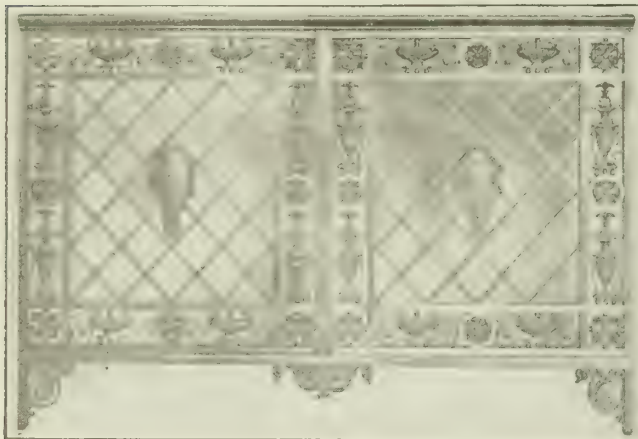
SEVEN-FOOT ANGEL  
LECTURN

St. Paul's Church, Toronto,  
Can.



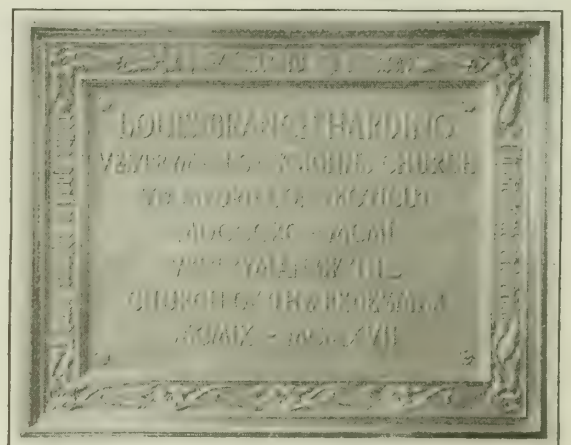
NINE-FOOT STATUE OF  
SAINT LOUIS

Erected at Montreal, Can.



ALTAR GATES

CHARLES R. GRECO, Architect



MEMORIAL TABLET

HENRY VAUGHAN, Architect





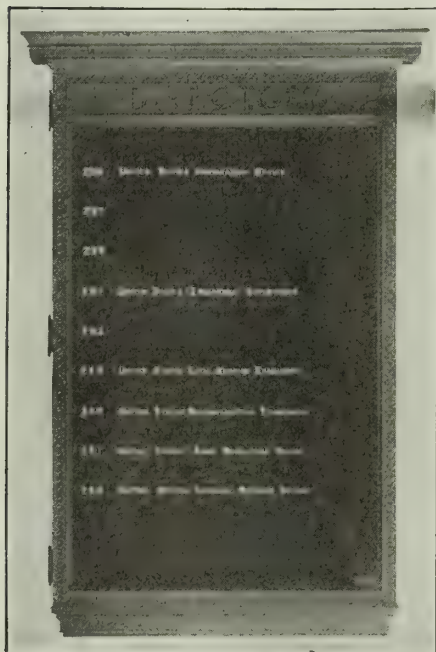
LIFE SIZE GROUP  
MARGARET W. SARGENT, Sculptor



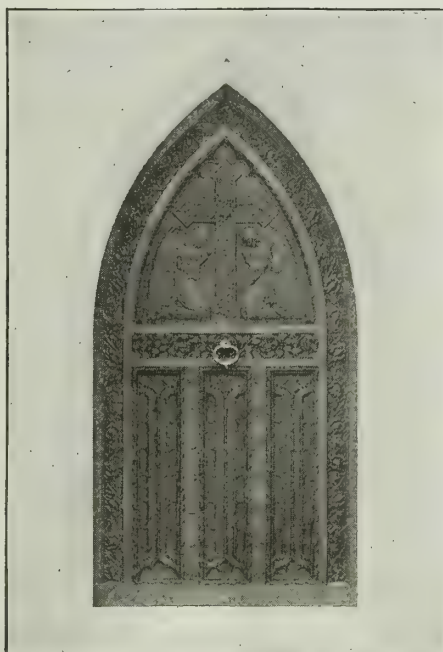
HEROIC HEAD  
OF MICHAEL  
ANGELO  
PAUL W. BARTLETT,  
Sculptor



MEMORIAL TABLET  
5 by 3 ft.  
CYRUS E. DALLIN, Sculptor



U. S. GOVERNMENT POST OFFICE  
BULLETIN



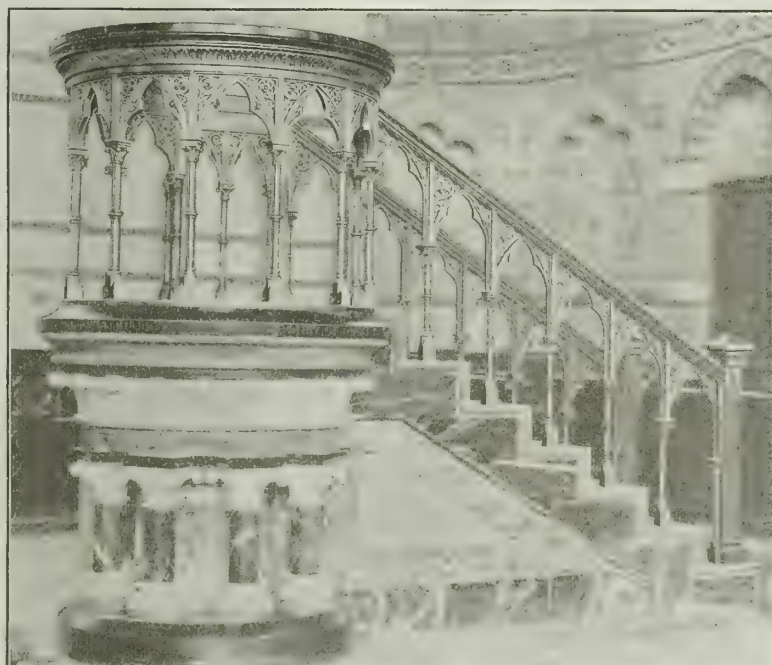
GOthic MAUSOLEUM DOOR  
HENRY VAUGHAN, Architect



BRONZE BALUSTRADE  
Erected for C. D. Parker & Co.,  
Bankers



CHURCH LAMP



BRONZE PULPIT RAIL  
G. A. AUDSLEY, Architect  
Erected at St. Edward the Confessor Church, Philadelphia, Pa.



LAMP FOR  
PUBLIC BUILDING



# THE MACK IRON AND WIRE WORKS CO.

SANDUSKY, OHIO

## REPRESENTATIVES

COLUMBUS, OHIO: W. R. EDMISTER & Co., Corner Lynn and Ludlow Streets

DAYTON, OHIO: THE J. G. POOL Co., Schwind Building

### Products.

Designers and manufacturers of IRON and WIRE WORK: Iron Stairs; Marquises and Canopies; Steel Doors and Entrances; Fire Escapes; Jail and Cell Work; Ornamental Railings, of Iron, Steel and Brass; Balcony Railings; Pipe Railings; Bridge Railings; Stable Fixtures and Fixtures; Iron Fences and Gates; Wire Window Guards and Partitions; Spiral Stairs; Steel Ladders; Sidewalk Doors; Iron and Brass Thresholds; Area Gratings; Fire Shutters; Wire Signs, etc.

### Services.

Estimates furnished on architects' plans and specifications, or special drawings will be submitted on request.

The company's literature, descriptive and illustrative of above mentioned products in greater detail, will be mailed to interested inquirers on application.

A competent engineering force is prepared to submit sketches on any required product and to advise concerning the design and installation of the same.



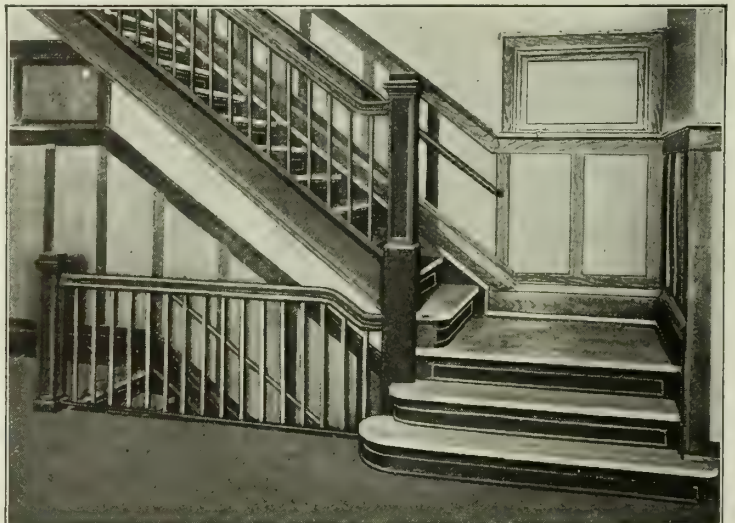
MARQUISE FOR OFFICE BUILDING, COLUMBUS, OHIO



IRON STAIRS FOR OFFICE BUILDING, COLUMBUS, OHIO



STABLE FIXTURES—STANDARD OIL CO., FINDLAY, OHIO

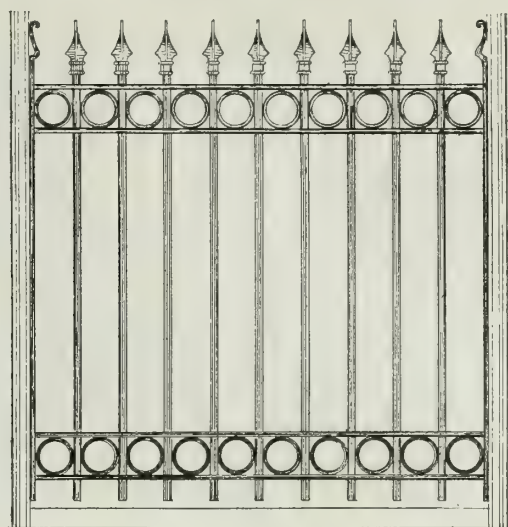


IRON STAIR IN APARTMENT BUILDING

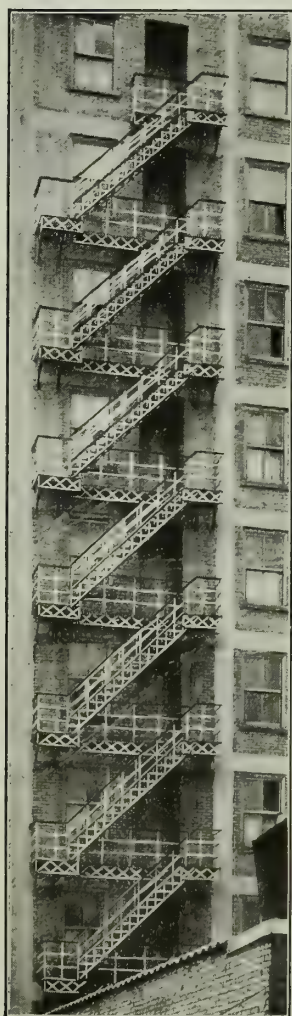




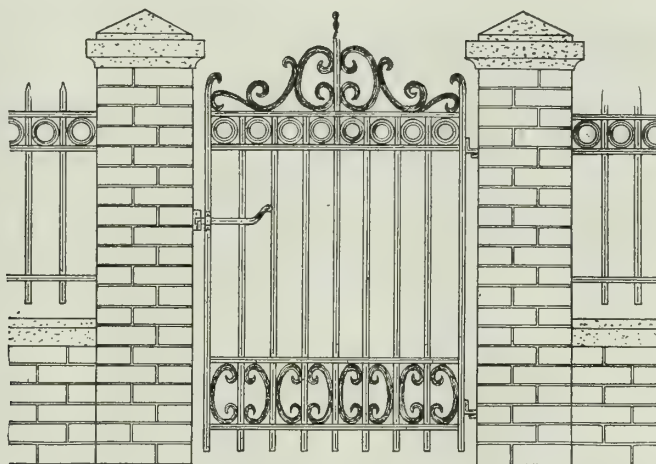
STAIR BALUSTRADE



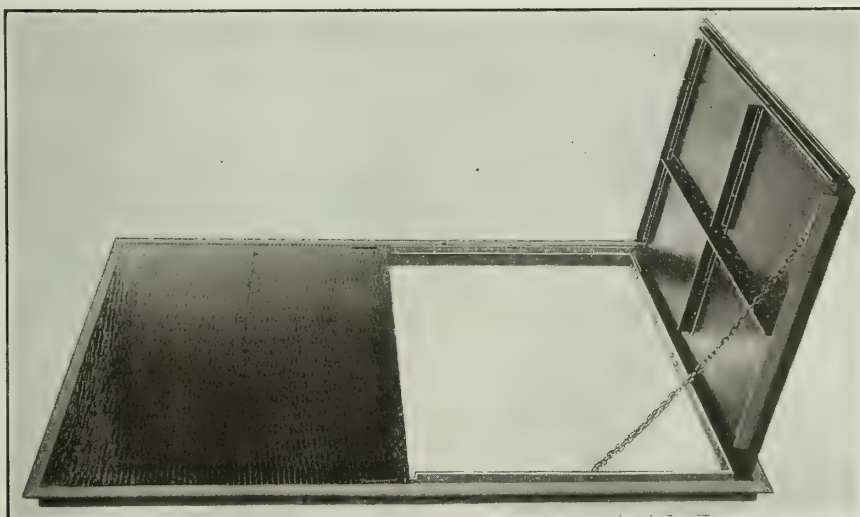
WINDOW GRILLE



FIRE ESCAPE



GATE AND FENCING



SIDEWALK DOOR

# WM. H. JACKSON COMPANY

## Ornamental Metal Work and Windows

2 West 47th Street  
NEW YORK, N. Y.

CHICAGO OFFICE, 746 South Michigan Boulevard  
FOUNDRY AND SHOPS, 325 Carroll Street, Brooklyn, N. Y.

### Products.

AIRTIGHT and WATERTIGHT METAL WINDOWS; ORNAMENTAL BRONZE or IRON WORK, which includes:

Doors, Tablets, Lamps, Bank Screens, Check Desks, Clocks, Entrance and Vestibule Doors, Driveway Gates, Stair Railings, Elevator Fronts, Marquises, Candelabras, Andirons, Fenders, Fire Screens, Fireplace Fixtures.

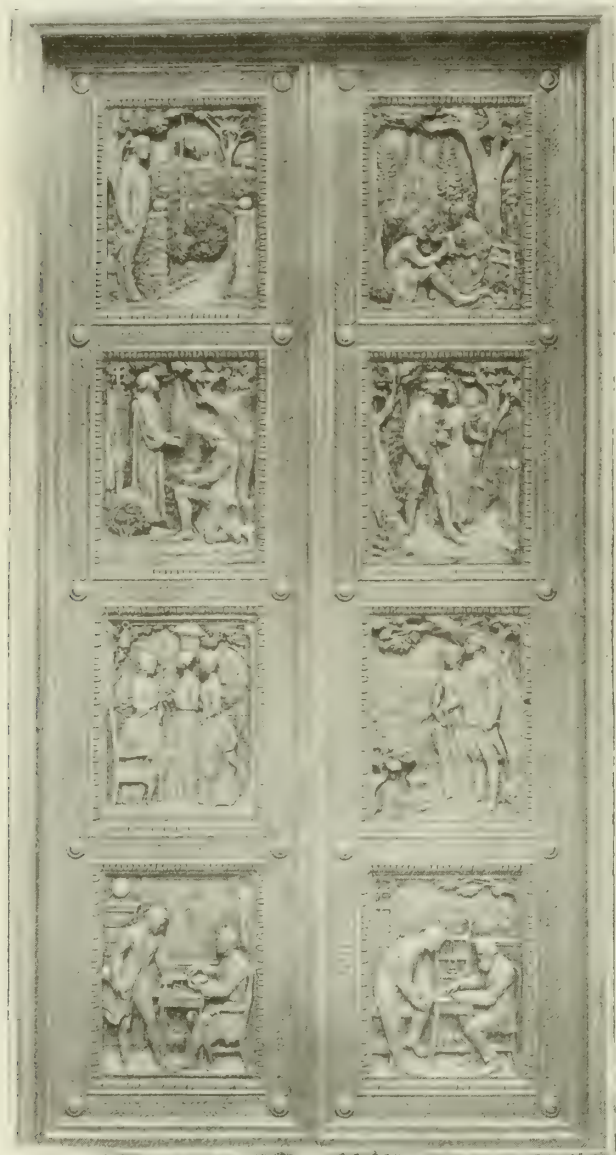
For Swimming Pools, see page 289.

### Windows.

This company has designed, patented and perfected an absolutely airtight and watertight window that meets the most exacting demands of architects and builders. Its use eliminates weatherstrips and all devices of complicated hardware.

### Facilities.

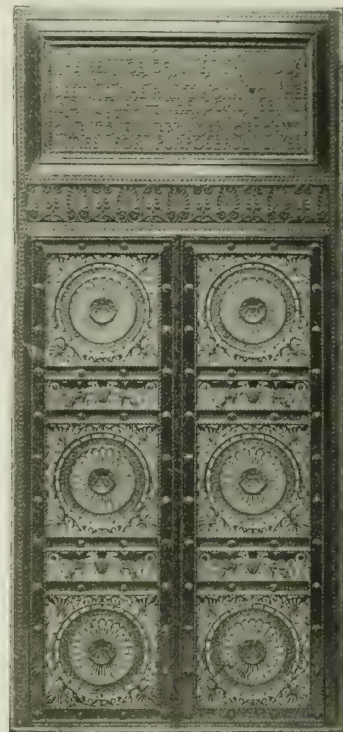
Large and well equipped foundries and shops are equipped with modern machinery and latest appliances for all special finishes.



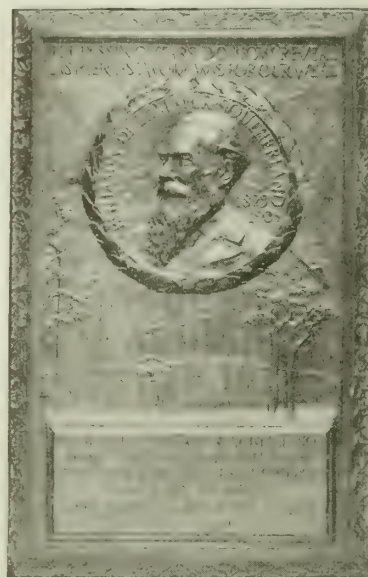
BRONZE ENTRANCE DOORS TO MUSEUM, RESIDENCE OF  
THEODORE N. VAIL, MORRISTOWN, N. J.  
WM. WELLES BOSWORTH, Architect—CHARLES KECK, Sculptor



BRONZE LAMPS, LACLEDE  
GAS COMPANY, BUILDING,  
ST. LOUIS, MO.  
MORAN, RUSSELL & CROWELL,  
Architects



BRONZE ENTRANCE GATES,  
MELLON INSTITUTE OF  
MEDICAL RESEARCH,  
PITTSBURGH, PA.  
J. H. GIESEY, Architect



BRONZE TABLET, PUBLIC SCHOOL NO. 3, NEW YORK, N. Y.  
CHARLES KECK, Sculptor  
For Southerland Association



ESTABLISHED 1865

# MANHATTAN BRASS COMPANY

Architectural Bronze and Brass Department

## TELEPHONES:

MADISON SQUARE 2243, 2244

PRIVATE BRANCH EXCHANGE

CONNECTING ALL DEPARTMENTS

332 East 28th Street

NEW YORK, N. Y.

BRONZE AND BRASS ROLLING

MILLS AND FOUNDRIES

WIRE, ROD AND TUBE WORKS

First Avenue, 27th and 28th Streets

NEW YORK, N. Y.

## Products.

Of the Architectural Bronze and Brass Department—SPECIALTIES in BRONZE and BRASS only:

Bank Screens

Candelabra

Check Desks

Coat Racks

Ecclesiastical Work

Elevator Doors

Entrance Doors

Fireplace Fittings

Folding Gates

Grilles

Gates

Hat Racks

Kick Plates

Lamp Standards

Mail Boxes

Mausoleum Doors

Marquises

Pulpits

Push Plates

Railings

Restaurant Fixtures

Sashes

Signs

Stairs

Store Fronts

Tablets

Theater Work

Umbrella Racks

Window Frames

Window Guards

Unfinished Castings made for the trade. "Hollow Bronze" Construction for Entrance Doors, Partitions, etc.

Other departments make—

Fireplace Goods

Portable Electric Lamps, Kerosene Lamps and Burners

Cuspidors

Stationers' Goods

Smokers' Brass Goods

Miscellaneous Specialties

## References.

Godde Building, New York, N. Y.

Bronze and brass window screens

Banco Anglo-Sud Americano, Buenos Ayres, Argentina, S. A.

Special directory frame

Metropolitan Museum of Art, New York, N. Y.

Bronze lamp standards, railings, etc.

Hall of Records, New York, N. Y.

Bronze entrance work, railings, etc.

U. S. Post Office, San Francisco, Cal.

Bronze entrance doors, lamps, etc.

Panama Post Office, Isthmus of Panama.

3 bronze directory frames

Franklin Trust Co., Paterson, N. J.

Bronze grilles, check desks, etc.

Library of Congress, Washington, D. C.

Bronze folding gates

Abercrombie &amp; Fitch, New York, N. Y.

Brass and bronze curtain rails, etc.

Board of Education, New York, N. Y.

Bronze tablets, etc.

Blum Mausoleum, Salem Fields, N. Y.

Bronze doors, grille, etc.



THOMPSON TEA ROOM, GRAND CENTRAL TERMINAL, NEW YORK, N. Y.

Nickelplated work made by MANHATTAN BRASS COMPANY

# THE J. L. MOTT IRON WORKS

ESTABLISHED 1828

Architectural and Ornamental Bronze and Iron Work

Fifth Avenue and 17th Street  
NEW YORK, N. Y.

BRANCH OFFICES AND SHOWROOMS IN LEADING CITIES OF THE UNITED STATES

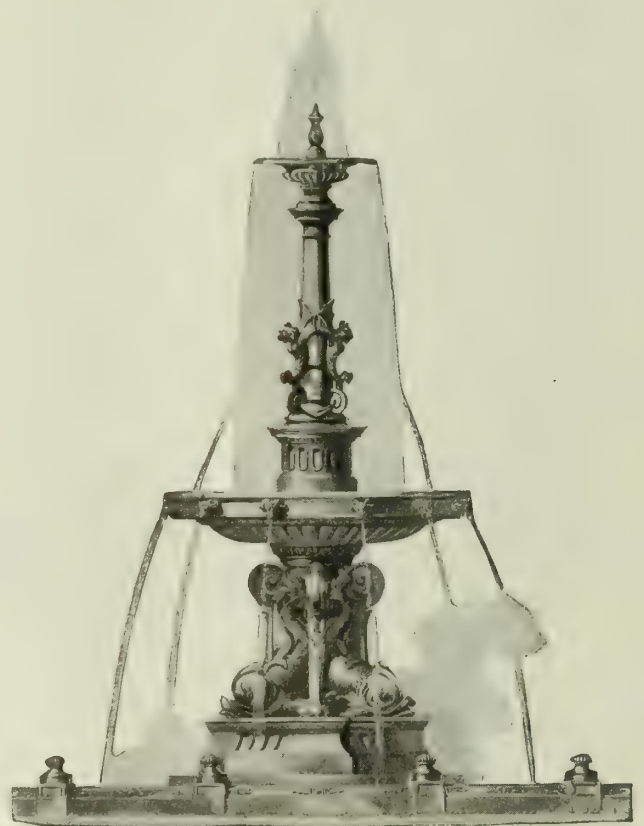
## Products.

ARCHITECTURAL and ORNAMENTAL BRONZE and  
IRON WORK, including:  
Automobile Washers (overhead)  
Brass and Bronze Railings  
Bronze Tablets  
Entrance Gates and Railings  
Fire Escapes  
Folding Gates  
Fountains: Drinking, Dis-  
play, and Lawn  
Garden Furniture

Lamp Posts and Brackets  
Leader Shoes  
Manhole Frames, Covers  
and Gratings  
Marquises  
Mausoleum Doors  
Spiral Stairs  
Stable Fittings  
Statuary  
Sundials  
Weathervanes: Silhouette  
and Dial



WROUGHT IRON VESTIBULE DOOR



BRONZE AND IRON DISPLAY FOUNTAIN



WROUGHT IRON ENTRANCE GATES AND LAMPS



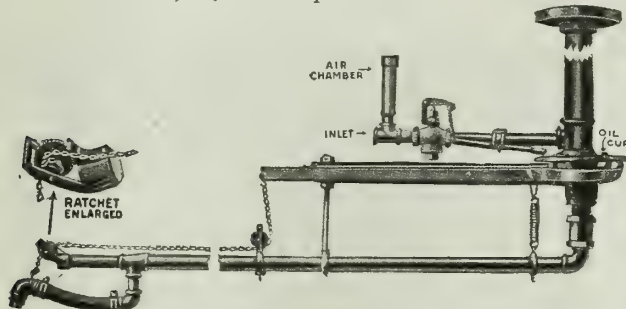
**Mott's Reliable Overhead Washer.**

This washer is in use in many large garages and stables, and always proves satisfactory in operation.

It possesses the following features, which make it most valuable:

- (1) It requires no overhead tracks.
- (2) The supply, except in Styles No. 1 and No. 8, shuts off automatically when the hose is released, thus economizing water.
- (3) When desired, an electric light attachment, located at the end of arm, follows the work around.
- (4) The fixture may be furnished with a vertical extension hanger of requisite length, to clear ceiling beams and pipes.

The washer is made in galvanized iron, polished brass or bronze, and nickelplated brass.



MOTT'S RELIABLE OVERHEAD WASHER

**Fine Stable Fittings.**

This branch of Mott work is made a specialty.

The experience gained in years devoted to the furnishing of fittings, enables the company to present the newest designs and the latest ideas for the increased comfort and safety of the horse, and the preservation of harness on brackets constructed to keep in shape the various articles for which they are intended, and to insure their perfect airing and drying.

Provision for ventilation and drainage has received much consideration, and sanitary stall floors are given

STABLE AT GLADSTONE, N. J.  
JAMES COX BRADY, Owner

especial attention. Every possible comfort is afforded for show and farm horses.

Mott fittings equip the finest stables. The following owners, all possessors of blue ribbon winners, have Mott stable fittings:

**MUNICIPAL STABLES**

City of New York, N. Y.	City of Scranton, Pa.
City of Yonkers, N. Y.	City of Newburgh, N. Y.
City of New Haven, Conn.	City of Troy, N. Y.

**PRIVATE STABLES**

E. H. Harriman	Earnest Fahnestock
Mrs. Payne Whitney	Dr. Clarence Fahnestock
Willard D. Straight	C. K. G. Billings

**PRIVATE STABLES (Continued)**

Mortimer L. Schiff	James W. Lane
L. V. Harkness	W. R. Coe
Daniel G. Reid	H. H. Timken
John Wanamaker	W. W. Cook
D. R. Hanna	F. E. Lewis, 2nd
James Cox Brady	Francis P. Garvan
Paul Moore	Geo. McKesson Brown
O. C. Barbour	Paul D. Cravath
A. H. Cosden	F. A. Burden
Arthur Williams	Otto Kahn
Walter C. White	Howard Kellogg
John Gellatly	R. Siedenbergl
F. Ambrose Clark	Geo. P. Blow
George A. Kessler	R. B. Mellon
W. J. Berg	P. A. Rockefeller
W. H. Pitkin	C. V. Rich
Morris Kinney	T. L. Chadbourne
George B. Crouch	Sam'l F. Pryor
Amos Mather	J. C. Baldwin, Jr.
Denniston M. Bell	Howard Gould

**Manufacturing Facilities.**

The works at Mott Haven were established in 1828. In 1894 our potteries were organized in Trenton, N. J., where, in 1907, the entire manufacturing plant was concentrated, comprising iron and brass foundries, ornamental works, enameling works, cabinet shops, etc.

The plant is one of the most complete and thoroughly equipped of its kind, the aim being to produce goods of highest quality in their various grades, and at reasonable cost. Manufacturing all goods in one plant insures the proper assembling and fitting of all component parts, and complete shipments.

**Co-operative Service.**

Estimates furnished from architects' plans and specifications, and our engineers and designers will co-operate with suggestions and designs. Illustrated catalogue of any of our lines of work, with price list, will be sent on request.



GATE POST AND LANTERN



ELECTROLIER

# THE FRED J. MEYERS MFG. CO.

Ornamental Wire, Iron and Bronze

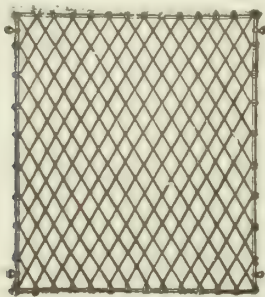
HAMILTON, OHIO

## Products.

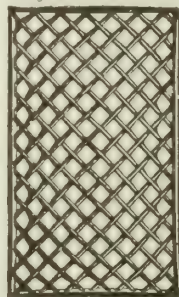
Manufacturers of ORNAMENTAL WIRE, IRON, BRONZE and BRASS WORK of every description and of superior workmanship and finish:

Elevator Cars and Enclosures, Bank and Office Railings, Wickets, Gates and Grilles; Lamp Standards,

Window Guards, Stable Fittings, Stairways, Marquises, Balconies, Balustrades, Prismatic Lights, Area Gratings, Folding Gates, Jail Work, Fire Escapes, Driveway Gates, Wire and Iron Fencing, Signs, Iron Reservoir Vases, Wire and Iron Lawn Furniture.



Round Frame

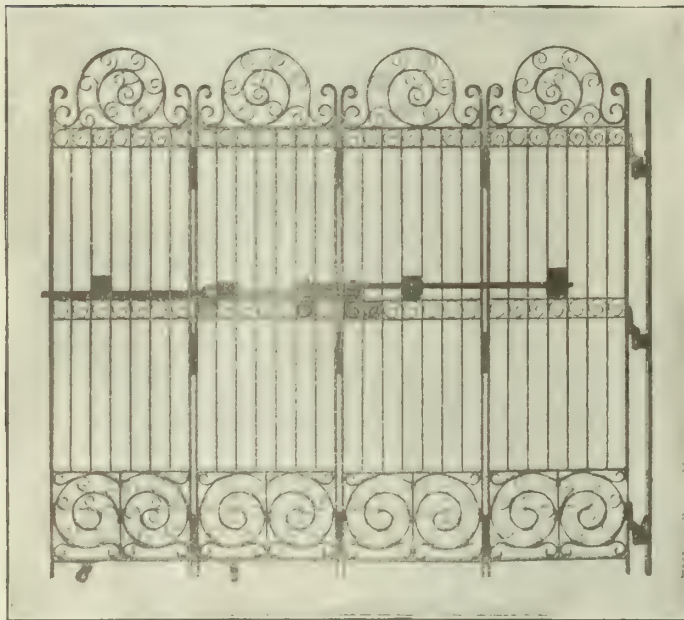


Channel Frame

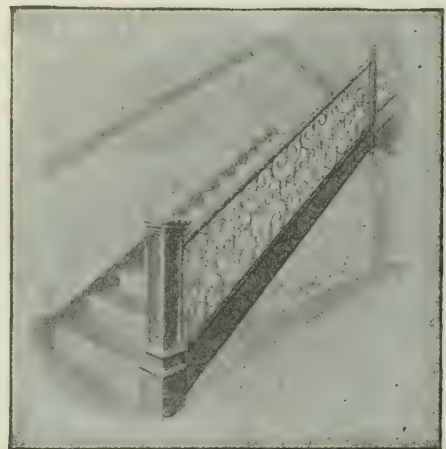
WINDOW GUARDS



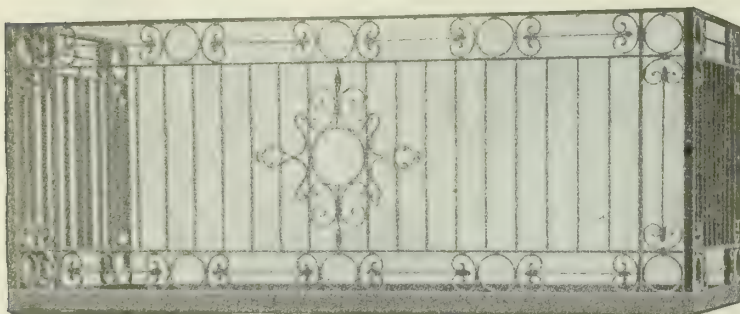
ELEVATOR CARS AND ENCLOSURES



FOUR-FOLD IRON GATE



ORNAMENTAL IRON STAIRS



PORCH OR BALCONY RAILING  
Made with square balusters



GRILLE



# PENN BRASS & BRONZE WORKS

HENRY J. LANDOLT'S SONS

Manufacturers of Architectural Brass and Bronze Work

111-117 Dobbin Street

BROOKLYN, N. Y.

## Products.

ORNAMENTAL BRONZE and BRASS WORK of every description, for private and public buildings.

Doors, Entrances, Balustrades, Newels, Stair Rails, Interlocking Windows, Grilles, Railings for theaters, etc.; Cast Bronze Letters and Signs for buildings.

Gates, Folding Gates, Marquises, Mausoleum Doors and Supplies, Bank Enclosures, Counter Screens, Check Desks, Elevator Enclosures, Fences, Balconies, Lamp Standards, Brackets, Tablets, etc.

## Facilities.

This company operates its own fully equipped foundry, pattern, modeling and finishing shops, and this, together with its corps of skilled artisans under expert supervision, insures prompt and efficient delivery of work of the highest quality.

Contracts of any magnitude are successfully executed. Architects and others placing contracts with the company will find that it has established for itself an enviable reputation for handsome execution of work to clean, sharp detail, in any style or period.

## Co-operative Service.

Estimates will be furnished in accordance with architects' designs, or special designs will be carefully executed and submitted by the company's staff of expert draftsmen.

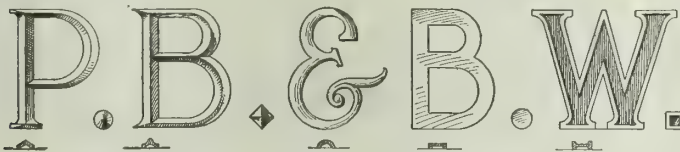
Requests for information or suggestions are given prompt attention, and correspondence is invited.



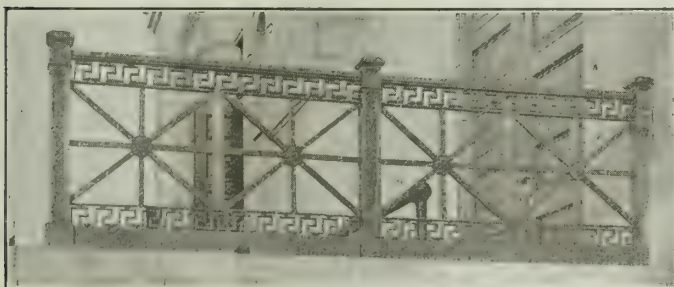
BRONZE BRACKET LAMP,  
BRONX COUNTY COURT  
HOUSE, NEW YORK, N. Y.



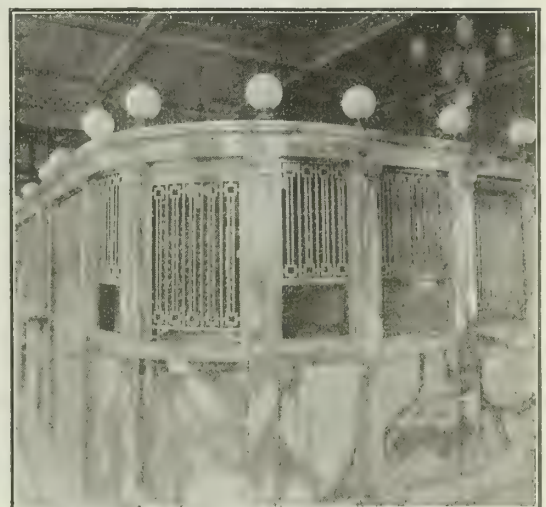
BRONZE DOORS, WILSON BUILD-  
ING, NEW YORK, N. Y.



CAST BRONZE LETTERS FOR BUILDINGS, ETC.  
Numerals and tablets also made



BRONZE RAIL, ROMAN CATHOLIC CHURCH, NEWPORT, R. I.  
Also brass and bronze railings for theaters, public buildings and similar places



BANKING SCREEN, FROSTBURG, MD.

ESTABLISHED 1887

**PRICE-EVANS FOUNDRY CO.**

Structural and Ornamental Iron and Wire Work

CHATTANOOGA, TENN.

**Products.**

**STRUCTURAL CAST IRON WORK:** Columns, Bases for Steel Columns, Lintels, Sills, Post Caps, "Goetz" System of Mill Construction, Jamb Guards, Wheel Guards, Wall Ventilators, Area Gratings, Sidewalk Lights.

**STRUCTURAL STEEL:** Truss Rods, Timber Hangers, Joist Anchors.

**ORNAMENTAL IRON WORK:** Stair Work, Elevator Enclosures, Grilles, Balcony Railings, Balcony Brackets, Window Guards, Fire Escapes, Marquises, Awnings, Steel Doors, Shutters, Folding Gates, Store Fronts.

**WIRE WORK:** Wire Window Guards, Partitions, Counter Railings, etc.

Stable Fixtures, which include Hay Racks, Oat Mangers, Stall Partitions, Hitching Posts, Hitching Weights, Water Troughs.

**Facilities.**

The plant includes a pattern shop, foundry, machine and forge shops, fully equipped to produce this line of work and devoted exclusively to it, enabling us to furnish, complete, all iron and steel work of structural or ornamental nature required in a building.

**Territory.**

We are prepared to furnish and erect our work throughout the Southern States.

**Estimates and Designs.**

Estimates from architects' plans and specifications on the complete cost of iron and steel work required for a building will be made, and suggestions and designs for the adaptation of any of our products to special requirements or unusual constructions will be submitted.



MARQUISE, WACHOVIA BANK & TRUST BUILDING,  
WINSTON-SALEM, N. C.

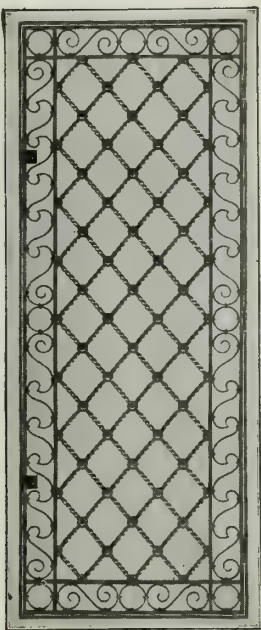


STAIRWAY, CITIZENS NATIONAL BANK BUILDING,  
RALEIGH, N

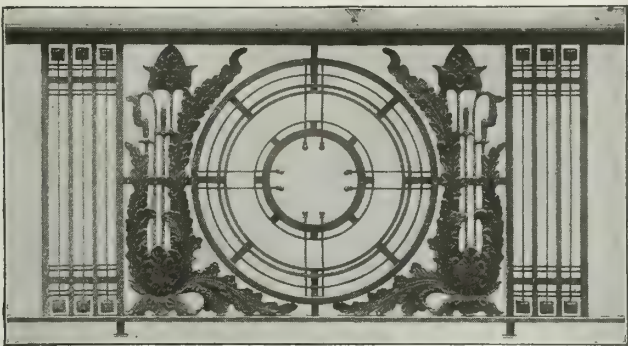




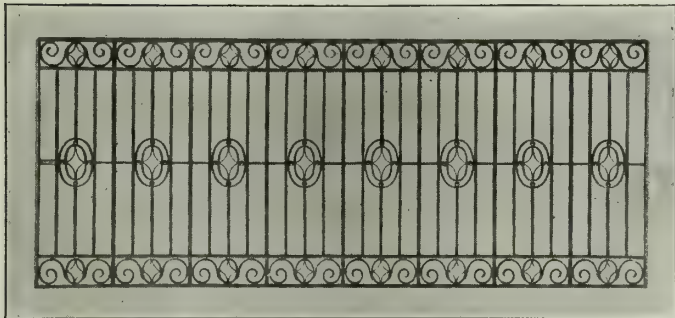
LAMP BRACKET



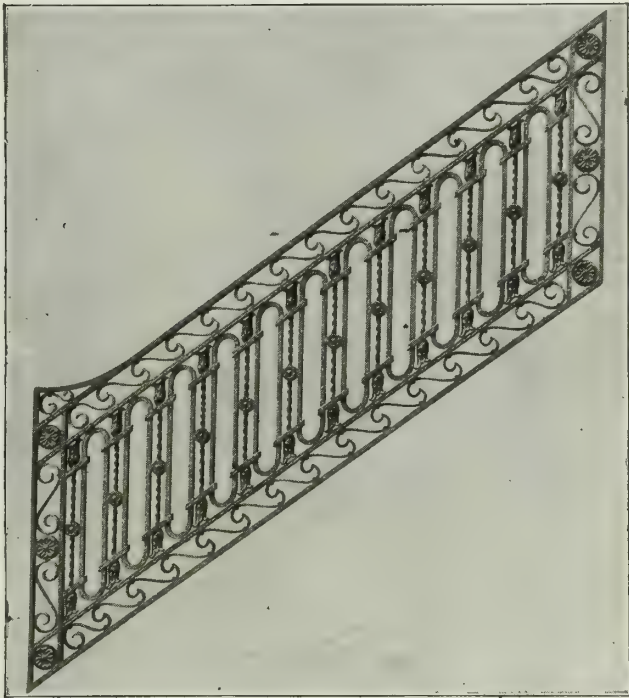
DOOR GRILLE



BALCONY RAILING



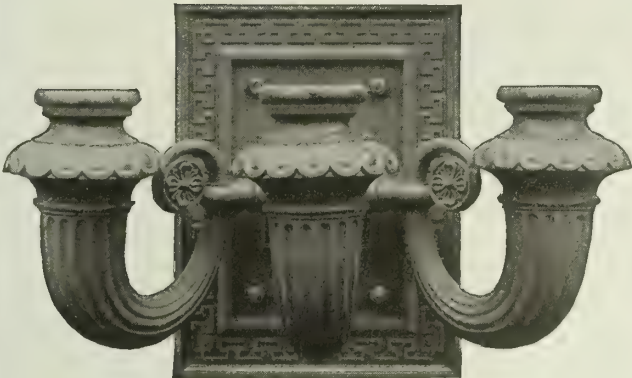
LEVEL RAILING



STAIR BALUSTRADE



STAIR WORK, RALSTON HOTEL, COLUMBUS, GA.



ELECTROLIER

ESTABLISHED 1824

INCORPORATED 1888

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Architectural and Ornamental Bronze Work  
Goldsmiths; Silversmiths

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Silver Plated Table Ware for Hotels,  
Clubs and Restaurants  
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Wickets

**Bronze Work Facilities.**

Our Bronze Department, embracing foundries,

rolling mills, designing department and assembling shops, devoted exclusively to the manufacture of architectural and ornamental metal work, is thoroughly equipped both as to modern machinery and skilled workmen to execute work of the most difficult and exacting character.

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A corps of competent designers, skilled in art and architecture, is placed at the disposal of architects and prospective customers, and we shall be pleased to submit designs, estimates and practical suggestions pertaining to mechanical and structural problems in connection with proposed work.

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Through the co-operation of our splendidly equipped silver shops, we can produce etched, plated and inlay work, etc., which heretofore has been beyond the scope of a factory engaged in the manufacture of this class of work. These facilities offer the designer exceptional opportunities for embellishment.

**Guarantees.**

Behind the products of our Bronze Department, the REED & BARTON name guarantees the same reliability and satisfaction that for nearly a century have maintained their name foremost amongst the manufacturers of products from the precious and semi-precious metals.





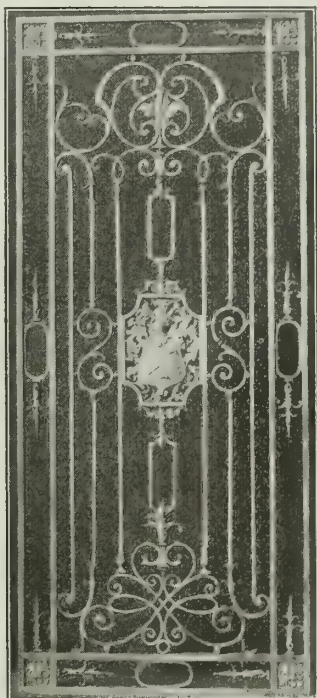
INTERIOR KANAWHA NATIONAL BANK, CHARLESTON, W. VA.  
WEBER, WERNER & ADKINS, Architects  
Bronze Work by REED & BARTON



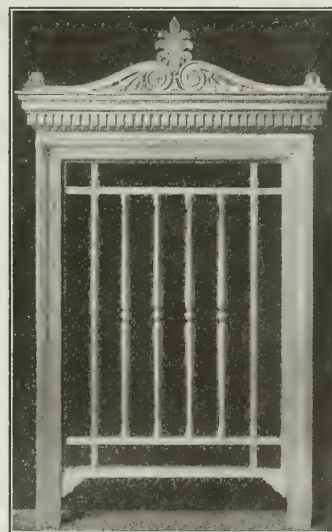
INTERIOR NEW BRUNSWICK TRUST CO., NEW BRUNSWICK, N. J.  
DENNISON & HIRONS, Architects  
German Silver Work by REED & BARTON



BRONZE FOUNTAIN  
WEBER, WERNER & ADKINS  
Architects



BRONZE GRILLE  
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Architectural bronze and iron, while utilitarian, are largely mediums for artistic expression. A modern plant and equipment are of course desirable, but if the architect's drawings are to be successfully interpreted, a highly trained organization is more essential.

This company places at the disposal of architects not only an up-to-date plant, housing all necessary departments, and a complete machine equipment, but a working force trained and directed by an executive who himself is thoroughly familiar with every detail of manufacturing and every means of obtaining the artistic touch on which the worth of the product depends. Every piece is fabricated under his personal supervision.

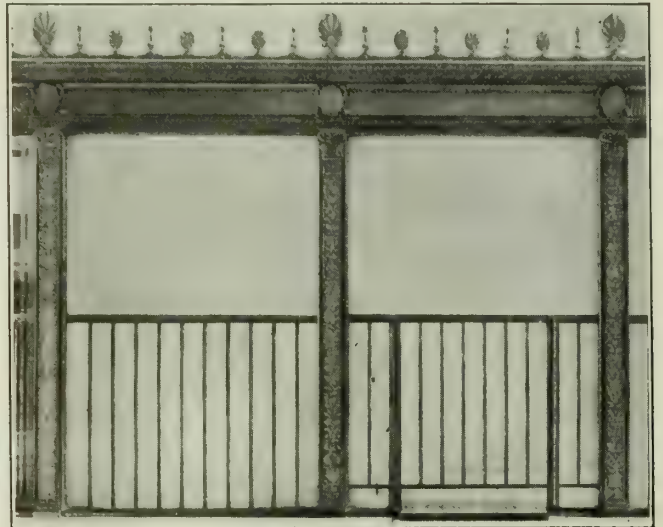
## Representative Contracts.

### BUILDINGS

Bridgeport Sav. Bank, Bridgeport, Ct.  
Bank of Hamilton, Winnipeg, Can.  
W. B. Thompson Res., Greystone, N.Y.  
Plaza, 59th St. & 5th Ave., New York  
Art Gallery, Thos. Ryan, New York  
Fayette Nat'l Bank, Lexington, Ky.  
Bankers Trust Co., New York  
First Nat'l Bank, Bridgeport, Conn.  
Billings Res., Locust Valley, L. I.  
Pan American Bldg., Washington  
Western Union Bldg., New York  
Edw. Gale Mausoleum, Troy, N. Y.  
Nat'l Bank of Commerce, Detroit  
Wayne County Bank, Detroit  
Wayne County Bank, Detroit  
Corn Exch. Bank, N. Y., 5 Branches  
Hotel Statler, St. Louis  
Lorain County Bank, Elyria, O.  
Adams Express Bldg., New York  
Dreicer Bldg., New York  
Astor Court Apartments, New York  
Union Station, Macon, Ga.  
Union Gas Co., Brooklyn, N. Y.  
American Express Bldg., New York

### ARCHITECTS

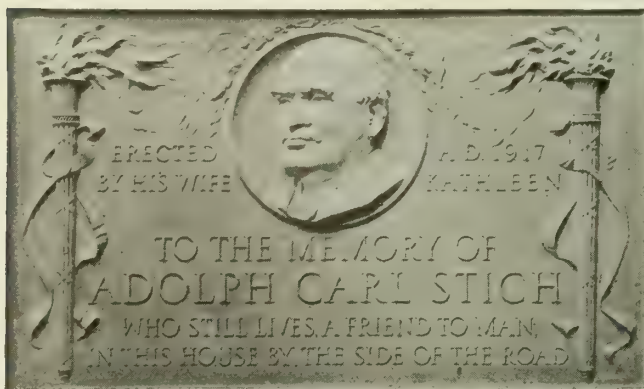
Cass Gilbert  
Ingalls & Hoffman  
Carrere & Hastings  
Carrere & Hastings  
McKim, Mead & White  
Trowbridge & Livingston  
Tracy & Swartwout  
Guy Lowell  
Kelsey & Cret, Associate  
Wm. Welles Bosworth  
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Walker & Weeks  
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Henry Otis Chapman  
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BRONZE COUNTER SCREEN, NATIONAL BANK OF COMMERCE, DETROIT, MICH.  
ALBERT KAHN, Architect



BRONZE ENTRANCE DOORS, BRIDGEPORT SAVINGS BANK, BRIDGEPORT, CONN.  
CASS GILBERT, Architect



MODELLED CAST BRONZE TABLET, STICH MEMORIAL SHELTER, INDEPENDENCE, KANS.  
CLARENCE K. BIRDSALL, Architect



ESTABLISHED 1885

INCORPORATED 1903

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Marquise

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"Lane" Joist Hangers and Post Caps

Fences (iron and wire)

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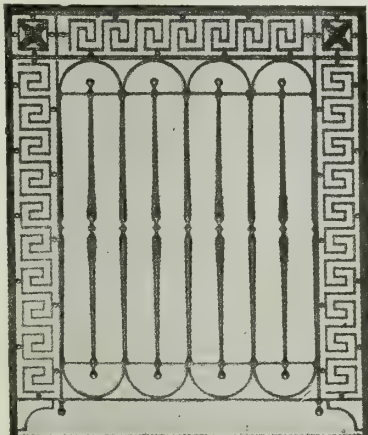
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Wire Cloth and

Mining Screens

or, when preferred, goods will be shipped with full  
directions for erection by others.**Services and Facilities.**

This organization is thoroughly equipped for the highest grade construction and installation of its products, either according to its own designs or those of the architect. Contracts, when size warrants, will be executed in any part of the United States,



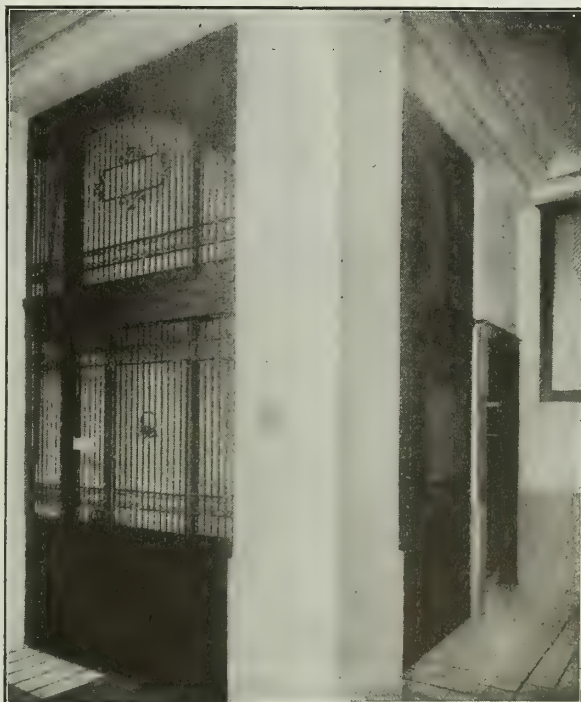
IRON WICKET, U. S. POST OFFICE,  
MURPHYSBORO, ILL.  
BRASS WICKET, U. S. POST OFFICE,  
EDWARDSVILLE, ILL.



STAIRCASE, U. S. POST OFFICE, WALLA WALLA, WASH.  
OSCAR WENDEROTH, Supervising Architect



MARQUISE, ODEON BUILDING, ST. LOUIS, MO.  
GUSTAVE P. WUEST, Architect



ELEVATOR ENCLOSURE, NICHOLAS BUILDING,  
ST. LOUIS, MO.  
N. PELLIGREEN, Architect

# F. P. SMITH WIRE AND IRON WORKS

ESTABLISHED 1884

Manufacturers of Ornamental Iron and Bronze Work

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 Balustrades  
 Bars: Corner Post, Transom  
 Castings: Iron, Brass, Bronze  
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 Coalhole Covers  
 Collapsible Hooping  
 Concrete Reinforcing Steel  
 Doors: Entrance, Ash Pit  
 Elevator: Enclosures, Cabs, Gates, Doors  
 Entrances

Fences: Iron, Wire, Wire Netting  
 Finials  
 Fire Escapes  
 Flagpoles  
 Fronts: Store, Building  
 Gates  
 Grille Work  
 Guards: Window, Stall, Wheel, Wire, Skylight  
 Hangers: Joist, Wall, I-beam  
 Hitching Posts  
 Jail Work  
 Lamp Brackets  
 Lamps  
 Lawn Furniture: Settees, Chairs, etc.

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 Marquises  
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 Pipe Railing Fixtures  
 Porte-cochères  
 Post Caps  
 Railings: Bank, Theater, Guard, Iron, Wire, Pipe  
 Roof Crestings  
 Shutters  
 Sidewalk Lights  
 Spiral Columns, Patent Wire  
 Stable Fixtures: Hay Racks, Feed Boxes, Water Troughs, Stall Posts, Gutters, Cess-

pools, Harness Brackets, Box Stall Hinges and Latches, Floors and Pans, Oats Cleaners  
 Stairs  
 Standpipes, for fire escapes  
 Tie Rods  
 Tower Ornaments  
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 Wall Ties  
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LAMP  
STANDARD



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HOLABIRD & ROCHE, Architects

All ornamental iron and bronze work furnished by us

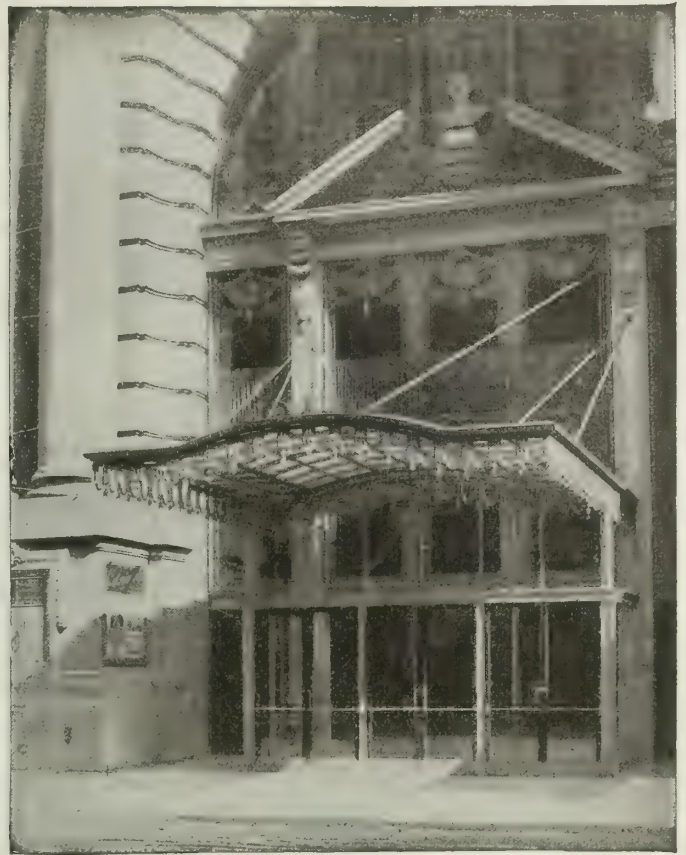


## References.

Following is a partial list of buildings in which representative installations of our work have been made:

## BUILDING, LOCATION AND ARCHITECT

Monroe Building, Chicago, Ill., Holabird & Roche  
 Chicago Savings Bank, Chicago, Ill., Holabird & Roche  
 Rand-McNally Co. Building, Chicago, Ill., Holabird & Roche  
 National Life Insurance Co., Chicago, Ill., Jenney, Mundie & Jensen  
 Transportation Building, Chicago, Ill., Wm. Strippelman  
 Advertising Building, Chicago, Ill., W. C. Zimmerman  
 Borland Building, Chicago, Ill., Charles S. Frost  
 Webster Building, Chicago, Ill., A. S. Alschuler  
 Farmers' Security Bank Building, South Bend, Ind., Perkins, Fellows & Hamilton  
 Harris Trust Building, Chicago, Ill., Shepley, Rutan & Coolidge  
 Crane Company Office Building, Chicago, Ill., Holabird & Roche  
 McKay Building, Chicago, Ill., Huehl, Schmidt & Holmes  
 Pelouze Building, Chicago, Ill., A. S. Alschuler  
 Sharpe Building, Kansas City, Mo., H. R. Wilson  
 Overland Stores Building, Kansas City, Mo., Mills, Rhines, Bellman & Nordhoff  
 The Stewart Building, Houston, Tex., Jonas & Rue  
 Cosden Building, Tulsa, Okla., Henry F. Hoit  
 Harper Memorial Building, University of Chicago, Chicago, Ill., Shepley, Rutan & Coolidge  
 Sisters of Providence, College and Music Building, St. Mary's, Ind., D. A. Bohlen & Son  
 U. S. Post Office Buildings (over 40), James Knox Taylor  
 U. S. Naval Training Station (15 buildings), Lake Bluff, Ill., Jarvis Hunt  
 City of Chicago Police Stations, Fire Engine Houses, Chicago, Ill., Chas. W. Kallal  
 City Hall and Superior Court Building, Elkhart, Ind., E. Hill Turnock  
 School Buildings—A large number for Board of Education, Chicago, Ill., D. H. Perkins and A. F. Hussander  
 Iowa State College, Central Building, Ames, Iowa, Proudfoot & Bird  
 Y. W. C. A. and Y. M. C. A., Nashville, Tenn., Shattuck & Hussey  
 Y. M. C. A. College Building, Chicago, Ill., Emery S. Hall  
 Cook County Infirmary Building, Oak Forest, Ill., Richard E. Schmidt, Garden & Martin  
 Annie W. Durand Hospital, Chicago, Ill., Charles S. Frost  
 Lying-in Hospital, Chicago, Ill., Richard E. Schmidt, Garden & Martin  
 The Commonwealth-Edison Co. (5 buildings), Chicago, Ill., Shepley, Rutan & Coolidge  
 The Commonwealth-Edison Co., N. W. Station, Chicago, Ill., Holabird & Roche  
 Kansas City Power House, Kansas City, Mo., Ford, Bacon & Davis  
 Chicago Telephone Co., Wabash Exchange, Chicago, Ill., Holabird & Roche  
 Montgomery Ward & Co., Chicago, Ill., Richard E. Schmidt, Garden & Martin  
 Chicago Daily News Building, Chicago, Ill., J. A. Rogers  
 Mishawaka Woolen Manufacturing Co., Mishawaka, Ind., Albert Kahn  
 Banco de San Luis Potosi, San Luis Potosi, Mex., Henri E. M. Guindon  
 Blackstone Hotel and Theater, Chicago, Ill., Marshall & Fox  
 Bancroft Hotel, Saginaw, Mich., Richard E. Schmidt, Garden & Martin  
 Hotel Sherman, Chicago, Ill., Holabird & Roche  
 Fort Dearborn Hotel, Chicago, Ill., Holabird & Roche  
 Gaynor Hotel, Chicago, Ill., Davis & Davis  
 Severin Hotel, Indianapolis, Ind., Vonnegut & Bohne  
 Illinois Theater, Chicago, Ill., Wilson & Marshall  
 The Star and Garter Theater, Chicago, Ill., Dodge & Morrison  
 Shubert Theater, St. Paul, Minn., Marshall & Fox  
 Hippodrome Building, Cleveland, Ohio, Knox & Elliott  
 Woods Theater and Office Building, Chicago, Ill., Marshall & Fox  
 Chicago Federal Ball Park, Chicago, Ill., Davis & Davis  
 "The Breakers" Apartments, Chicago, Ill., Marshall & Fox  
 Garden Apartments, Chicago, Ill., Richard E. Schmidt, Garden & Martin  
 McClurg Apartments, Chicago, Ill., Marshall & Fox  
 Chandler Apartment Building, Chicago, Ill., Richard E. Schmidt, Garden & Martin  
 Goodman Apartments, Chicago, Ill., Wm. Ernest Walker  
 Sisson Apartment Building, Chicago, Ill., H. R. Wilson & Co.  
 B. A. Eckhart Residence, Chicago, Ill., Marshall & Fox



MARQUISE AND VESTIBULE FOR COLONIAL THEATER.  
 CHICAGO, ILL.

MARSHALL & Fox, Architects



MAIN STAIRS, 3RD TO 15TH FLOORS, CHICAGO SAVINGS  
 BANK BUILDING, CHICAGO, ILL.

HOLABIRD & ROCHE, Architects



## TIFFANY STUDIOS

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Lighting Fixtures, Interior Decorations

13 West 57th Street

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**MOSAIC WORK:** Mantel Facings, Radiator Hoods and Inlay Work for public buildings and private residences.

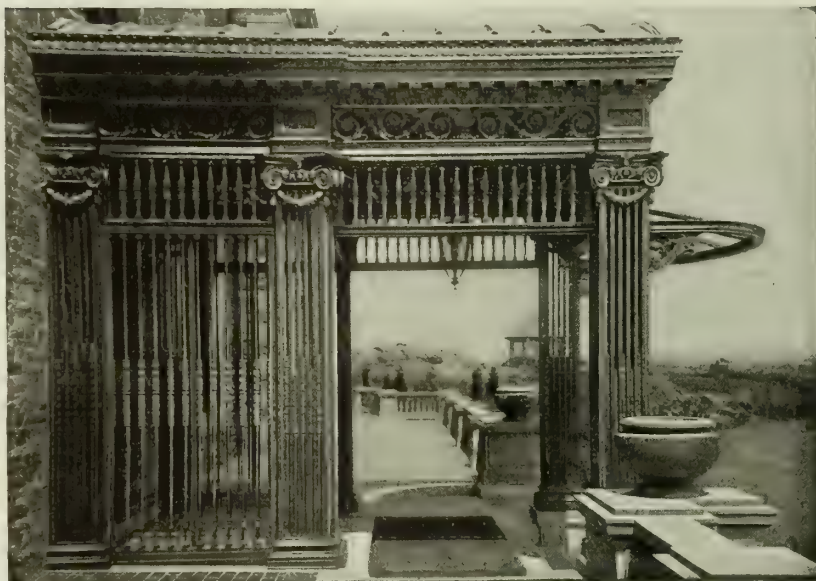
**LEADED GLASS:** Favrile Glass Windows, Lamp Shades, Domes and Globes.

**FINE WOODWORK:** Cabinet Work and trim.

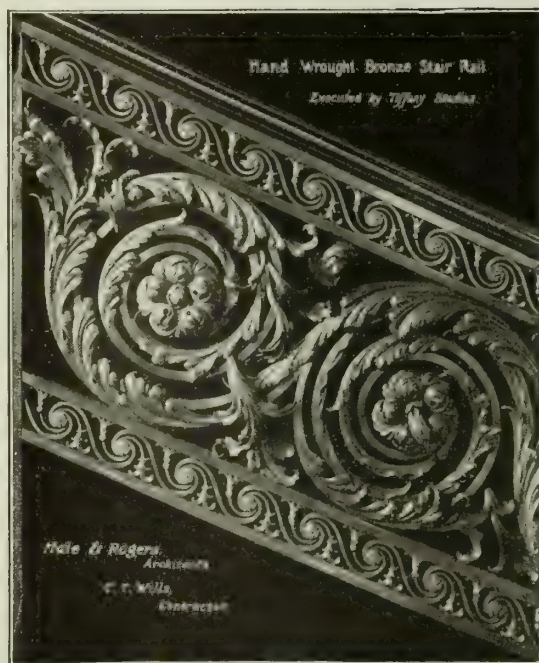
**CHURCH FURNISHINGS:** Memorial Windows, Frescoes, Altars, Fonts, Sanctuary Lamps, Lecterns, Reredos, Pulpits, Altar Crosses and Rood Screens.

**INTERIOR DECORATIONS:** Furniture, Rugs, Fabrics, Wall Papers, etc.

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BRONZE ENTRANCE



HAND WROUGHT BRONZE STAIR RAIL

### Bronze Factory.

The Tiffany bronze factory is equipped with up-to-date appliances and machinery, which, together with an organization of expert artisans, places it in a position to execute the requirements of architects and sculptors in ornamental bronze, statuary bronze, tablets and wrought iron.

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An opportunity is solicited to estimate, in proof that our prices are as reasonable as others charge for less satisfactory and artistic work.

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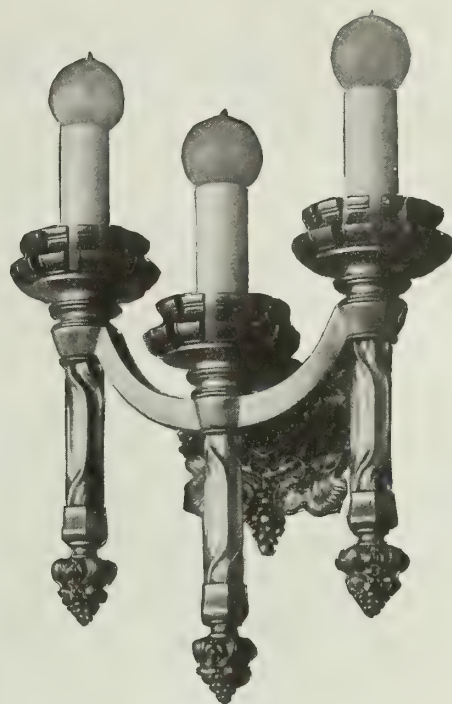
This concern is prepared to undertake contracts for the complete interior finish, decorations and furnishings of banks, hotels, churches, residences, etc.

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3-LIGHT FIXTURE

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### Estimates and Catalogues.

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Booklet D, Lamp Posts for Country Estates.

Booklet L, Arts and Crafts Lanterns.

Booklet M, Marquises.

Booklet S, Spiral Stairs.

A loose leaf catalogue of lamp posts and brackets is also issued, to which additional designs are constantly being added, thereby keeping customers always advised of new and up-to-date designs.



DESIGN No. 124



DESIGN No. 149



DESIGN No. 220



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TYPICAL SMYSER-ROYER LAMP POSTS



# THE W. S. TYLER COMPANY

Designers, Founders and Manufacturers of Ornamental Iron and Bronze  
CLEVELAND, OHIO

## BRANCH OFFICES

NEW YORK, N. Y., 200 Fifth Avenue

BOSTON, MASS., 68 Devonshire Street

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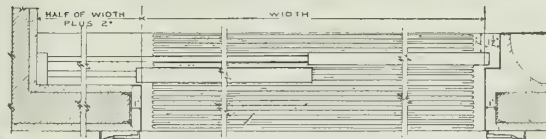
### Products.

ORNAMENTAL and ARCHITECTURAL IRON  
and BRONZE:

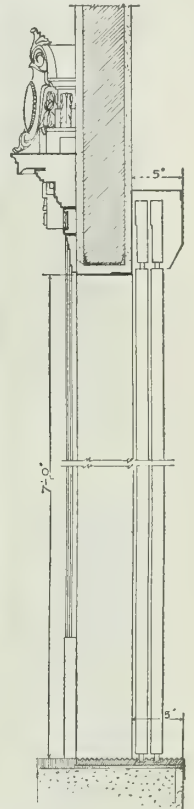
- Elevator Cars
- Elevator Enclosures
- Stairs
- Store Fronts
- Marquise
- Counter Screens
- Bronze Tablets
- Lamp Standards and Brackets
- Window Guards and Grilles
- Wire and Sheet Steel Partitions
- Fencing
- Self-closing Folding Gates



ELEVATION

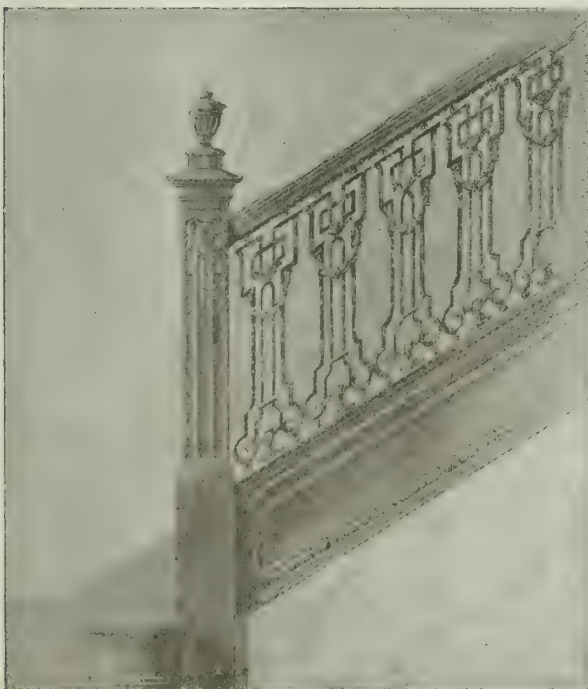


PLAN



SECTION

ILLUSTRATION OF ELEVATOR ENCLOSURE FROM CATALOGUE NO. 41



STAIR DESIGN

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This company's products are furnished in the following finishes:

Electroplated; brass, bronze, copper and nickel.

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Balustrades	Lamps and Lamp Brackets
Bank and Theater Railings	Lockers
Bronze Work	Marqueses
Cemetery Vault Doors	Metal Ladders
Coalhole Covers	Porte-cochères
Columns	Post Caps
Concrete Cement Lights	Safety Treads
Concrete Reinforcement	Shutters
Corner Posts and Transom Bars	Sidewalk Lights
Crestings	Stable Fixtures
Elevator Enclosures, Cars, Gates, Doors	Stairs
Entrance Doors	Standpipes for fire escapes
Fencing	Steel Rolling Doors and Shutters
Finials	Store Fronts
Fire Escapes	Structural Steel
Flagpoles	Tablets
Gates	Tie Rods
Gratings	Tin Clad Fire Doors
Hardware for all Fire Doors	Trap Doors
Iron, Brass and Bronze Castings	Underwriters' Iron Fire Doors
	Wall Ties
	Weather vanes
	Window Guards

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Upon receipt of plans and specifications, this company will furnish estimates, and is prepared to take contracts for iron and steel work for entire buildings.

Details of architects will be followed with absolute accuracy.

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The plant is situated on the Milwaukee River, adjoining the Chestnut Street yards of the St. Paul Railroad, covering a ground area of 150 by 154 ft.

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BRONZE COUNTER GRILLES INSTALLED IN UNION BANK, MILWAUKEE, WIS.



STAIRWAY INSTALLED IN MERRILL THEATER BUILDING, MILWAUKEE, WIS.

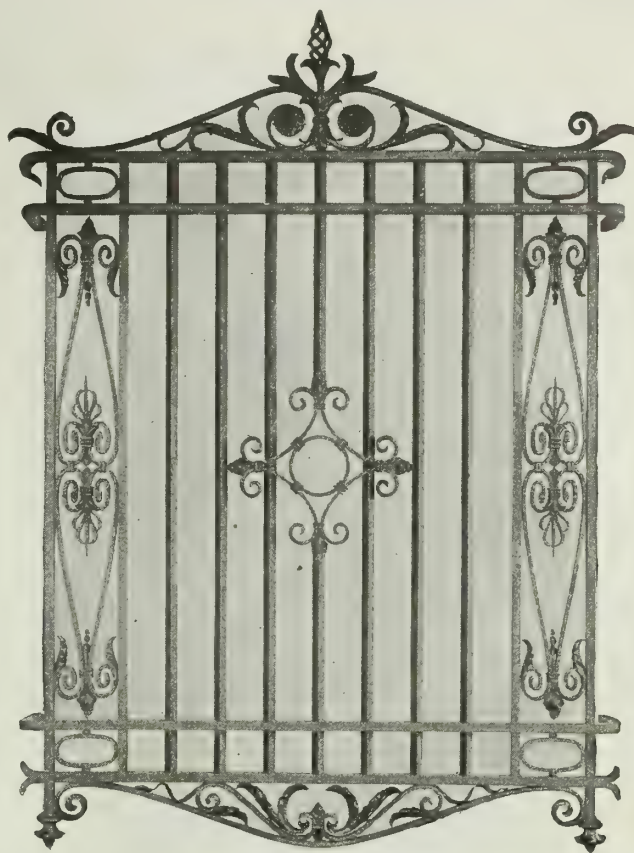
The A. F. WAGNER ARCHITECTURAL IRON WORKS is generally recognized as the oldest steel and iron works in the state of Wisconsin, having been established in 1855.

Wagner service, ability and reputation are well recognized in the iron and steel industry throughout the country.





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ORNAMENTAL GRILLE



JAIL WORK INSTALLED COMPLETE AT MILWAUKEE COUNTY HOUSE OF CORRECTION  
Also furnished for the east main cell wing of the U. S. Penitentiary, Atlanta, Ga.



# JNO. WILLIAMS, INC.

## Ornamental Bronze and Iron Work for Buildings

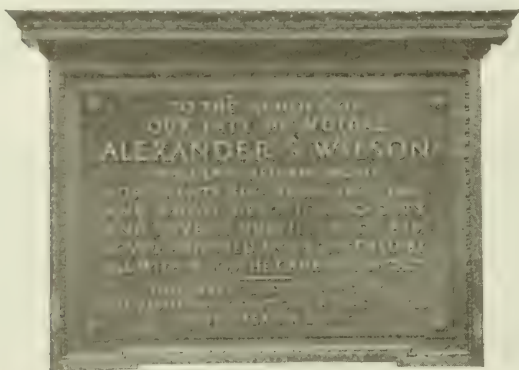
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CHELSEA 4610

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NEW YORK, N. Y.

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Manufacturers of ORNAMENTAL BRONZE and IRON WORK, including:

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Door Grilles	Letters
Window Grilles	Fine Bronze Castings
Stair Railings	Statues
Tube Railings	Figures
Lamp Standards	Portraits
Bank Fittings	Busts and Medallions
Counter Screens	Monumental Bronze Work
Wire Mesh Work	Fountains
Tellers' Enclosures	Sundials
Elevator Enclosures	Iron Driveway Gates
Mausoleum Doors and	Fencing
Fittings	Grille Work



BRONZE MEMORIAL TABLET  
ERECTED IN SCHOOL NO. 10, PATERSON, N. J.  
Designed by RICHARD FROST, Architect  
Cast by JNO. WILLIAMS, INC.



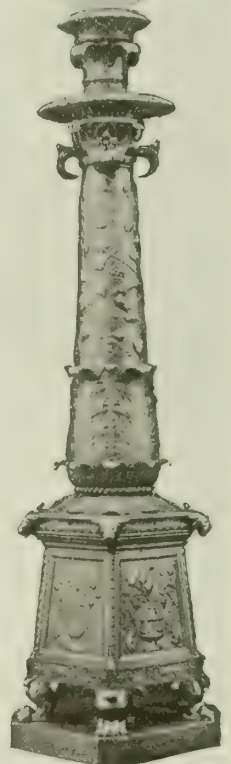
MAIN STAIRCASE  
RESIDENCE OF HON. WILLIAM A. CLARK  
Stair railing in polished wrought steel with gold ornamentation was  
made by JNO. WILLIAMS, INC., from designs by  
LORD, HEWLETT & HULL and KENNETH M. MURCHISON,  
Associate Architects



BANKING ROOM, WEST SIDE TRUST CO., NEWARK, N. J.  
CROW, LEWIS & WICKENHOEFER, Architects  
Bronze counter screen, vault guard, check desks, cage work, etc., made by  
JNO. WILLIAMS, INC.



BRONZE STATUE  
GEN. ALEXANDER  
STEWART WEBB  
ERECTED AT  
GETTYSBURG, PA.  
J. MASSEY RHIND, Sculptor  
Cast by JNO. WILLIAMS, INC.  
Duplicate erected on the  
campus, College of the City of  
New York



CAST BRONZE  
LAMP STANDARD  
ST. LOUIS MUSEUM  
OF ART, ST.  
LOUIS, MO.  
CASS GILBERT, Architect  
Made by  
JNO. WILLIAMS, INC.



ESTABLISHED 1884

# WISCONSIN IRON & WIRE WORKS

Ornamental Bronze and Iron Work

TELEPHONE:  
LINCOLN 196

1640 Booth Street  
MILWAUKEE, WIS.

## Products.

ORNAMENTAL BRONZE and IRON WORK, for buildings:

Bank Metal Work; Bulletin Boards; Cast and Wrought Iron Canopies; Elevator Cabs; Bronze Desks; Bronze Doors; Sidewalk Doors; Area Gratings; Elevator Enclosures; Building Entrances; Stable Fixtures; Electroplated Work; Iron and Wire Fencing; Bronze, Iron and Wire Gates; Collapsible Gates; Iron Gratings; Cast Iron, Wrought Iron, Bronze and Electroplated Grilles; Iron and Wire Window Guards; Wheel Guards; Ornamental Hinges; Swimming Pool Ladders; Wrought Iron Ladders; Lamp Standards and Brackets; Iron, Brass and Bronze Lanterns; Lawn Furniture; Cast and Wrought Iron Marquises; Woven Wire Partitions; Toilet Stall Partitions; Kick Plates; Flag Poles; Pipe Railings; Brass and Bronze Railings; Balcony Railings; Hand Railings and Brackets; Wire Screens; Wire Signs; Steel Shutters; Wire Specialties; Bronze Tablets; Thresholds; Crematory Urns; Crematory Retorts.

For Metal Stairs and Fire Escapes, see page 267.

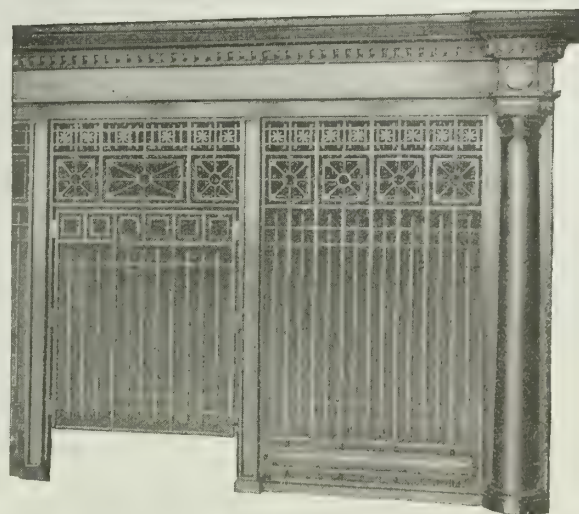
## Facilities.

This company is among the pioneers in the development of ornamental iron products, and, since 1884, has been manufacturing ornamental iron and bronze work for buildings, developing the plant organization and keeping pace with the growth of the industry. Being in a position, therefore, to offer to the trade the services of a complete, modern, ornamental iron establishment, experienced and responsible, covering 4 acres of land, the WISCONSIN IRON & WIRE WORKS are prepared to undertake the design, manufacture and complete erection of all ornamental iron and bronze entering into a building project. The equipment permits of any metal finish and color desired, whether plated, enameled, electroplated or cold galvanized.

The location in Milwaukee is regarded as a distinct advantage. Favorable labor conditions existing in that city insure excellent deliveries, while the skill and thoroughness of Milwaukee artisans are universally recognized; and in addition, the central position of the plant places the products thereof within close reach of the leading building centers of the United States.

## Estimates and Catalogues.

For estimates, etc., send sketches or drawings.



BANK COUNTER SCREEN

Write for literature descriptive of the following: Metal work, for banks and offices; grilles and wickets; lawn furniture and fence; plain and ornamental iron, for buildings; wire and metal work, for factories; elevator cabs and enclosures.



LAMP STANDARD



CAST BRONZE MEMORIAL TABLET

## References.

Names of satisfied users in each vicinity throughout the United States will be mailed on request.



# AMERICAN FENCE CONSTRUCTION CO.

TELEPHONE:  
BARCLAY 6753-4

96-102 Church Street  
NEW YORK, N. Y.

## Products.

ENTRANCE GATES and ARCHES of ORNAMENTAL IRON; IRON and WIRE FENCES of all kinds for City or Country Places; TENNIS COURT ENCLOSURES, FLYING CAGES, POULTRY and KENNEL RUNS; HEAVY UNCLIMBABLE FENCES for Mills and Factories.

Grape Arbors, Tree Guards and Window Guards.

## Preliminary Service.

The peculiar nature of fence work often presents troublesome problems. The engineering and estimating department of this organization is composed of men who have been meeting these problems for years, and who are always ready to make preliminary study and recommendations. The prospective user of fencing is urged to avail himself of this service.

If desired, blue prints of stock designs, with dimensions, can be submitted. They are suitable for many purposes, and will also be found helpful in the creation of special designs.

Because of steel mill conditions during the coming year, the prompt execution of fence orders will depend upon using the available stock sizes of materials. It is, therefore, suggested that the architect or owner confer with the manufacturer before adopting fixed specifications.

## Construction.

In the construction department a staff of men experienced in the erection of the most difficult types of fence work insures the proper execution of all contracts.

Fencing is shipped to and erected in all parts of the United States and Canada. Where erection by this company is not desired, shipments of materials will be accompanied with instruction drawings showing proper method of erecting.



ORNAMENTAL WROUGHT IRON GATEWAY

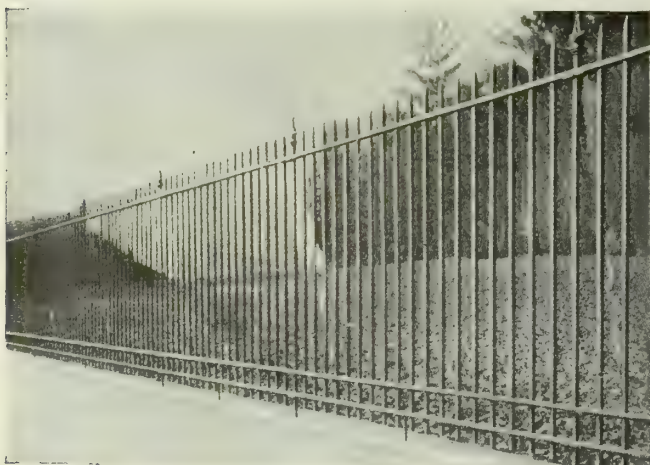
HENTZ, REID & ADLER, Architects, La Grange, Ga.

Entrance gate and grille panels installed by this company at La Grange, Ga.



GATEWAY FOR RESIDENCE AT LONG BEACH, N. Y.

Designed and erected by this company



WROUGHT IRON RAILING

Height 7 ft. Pickets  $\frac{3}{4}$  in. square on 6-in. centers. Rails 2 ins. x  $\frac{1}{2}$  in. solid. Regular picket line posts. "Jockey Club" spear heads



WROUGHT IRON ENTRANCE GATE AND FENCE

Height 5 ft. Pickets  $\frac{5}{8}$  in. square on 5-in. centers. Panel posts 12 ins. wide at gates and ends. One of many stock designs for private residence work



**Framework Specifications for American Wire Fences.**

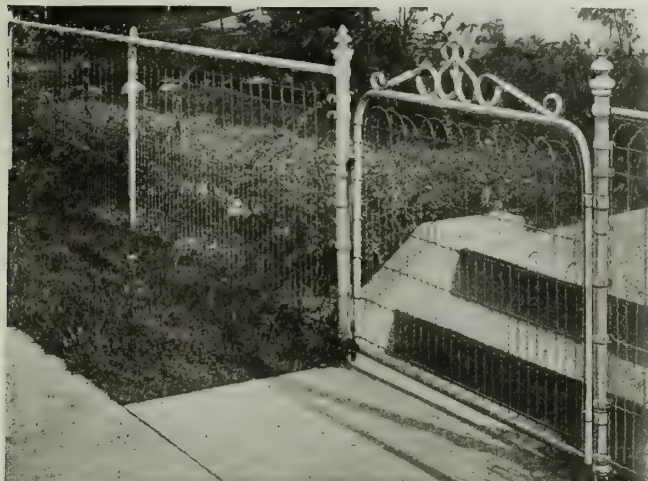
End and corner posts, heavy tubular section, size regulated by height of fence.

Line posts U-bar section of high carbon steel; spaced 8 ft. apart, anchored or set in concrete.

Top rail  $1\frac{1}{2}$  in. outside diameter pipe.

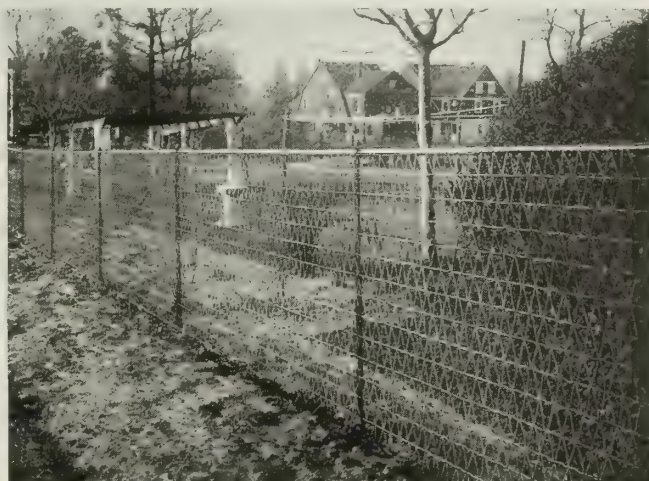
Single or double gates of any width, tubular or T-bar frames, covered with fabric to match fence.

All framework parts galvanized by hot dip process, or for cheaper work, painted one shop coat.



**STYLE E LAWN FENCE**

Heights  $2\frac{1}{2}$  to 6 ft. Crimped picket wires of No. 9 galvanized hard steel, bound by two-strand lateral cables spaced 6 ins. apart. Mesh either  $1\frac{1}{2}$ , 2 or  $2\frac{3}{4}$  ins. between verticals



**AMERICAN DIAMOND MESH FENCE**

A general utility fence of moderate cost for side or rear lines, gardens, etc. Heights 3 to 5 ft. Mesh 2-in. diamond shape with two-strand lateral cables 4 ins. apart, all of No.  $12\frac{1}{2}$  galvanized wire



**POULTRY FENCE WITH ROOF ENCLOSURE**

Heights 6 to 9 ft. Open top or roofed enclosure, as desired. Mesh dependent on type of fence. Outside of runs ratproofed, with fine mesh netting 2 ft. or more above ground and 1 ft. below



**AMERICAN STANDARD TENNIS FENCE**

Heights 8 to 12 ft. Standard fabric G & B 2-in. No. 15 hexagon mesh, galvanized after weaving. Absolutely uniform in shape and size. Reinforced with No. 9 galvanized back supporting wires spaced 24 ins. apart. Netting attached to each supporting wire at 15-in. intervals with galvanized tie wire. Bottom supporting wire runs flush with ground and balls can not go under



**CHAIN LINK LAWN FENCE ON GOVERNMENT RESERVATION**

Heights 3 to 10 ft. Standard mesh  $1\frac{1}{2}$  or 2 ins. Made of No. 9 galvanized wire. For extra heavy fences, No. 6 wire, 2-in. mesh can be furnished. Unclimbable barbed wire overhang can also be furnished



**NON-CLIMBABLE DIAMOND MESH FENCE FOR COUNTRY ESTATES, CLUBS, ATHLETIC FIELDS, ETC.**

Heights 75, 84 and 91 ins. Fabric of No.  $12\frac{1}{2}$  galvanized wire 2-in. diamond mesh. Line posts are  $1\frac{1}{2}$  x  $1\frac{1}{4}$  in. steel angles, with 15-in. top overhang



### Factory Fences.

Industrial progress eliminates every hazard that is not a logical necessity, and this fact applies with striking force to the protective service rendered by modern factory fences.

The illustrations on this page show the two leading types of Afcco protective fences in iron and wire. Afcco Chain Link is furnished in No. 9, No. 6 or No. 4 gage, in any width up to 12 ft. The usual sizes for factory purpose are 1½- or 2-in. mesh of No. 9, or 2-in. mesh of No. 6.

To cover the details of this important subject in the most comprehensive manner, a special Factory Fence Catalogue is issued by this company. The catalogue covers the entire subject in a way that will be found of much value to the prospective user, and shows how difficulties of various kinds may be overcome.

The following data on Afcco wire fences together with specifications under the photographs is sufficient for all ordinary fence quotations.

**SPECIFICATION DATA—Posts**—End and corner posts, 3 ins. outside diameter. Gate posts, 4 ins. outside diameter wrought iron pipe, with horizontal pipe braces, and 4-ply No. 9 galvanized wire truss cables. Line posts, angle or U-bar type, to be spaced 8 ft. apart, set 3 ft. below grade. Galvanized or painted.

**Top Rail**—Tubular 1½ ins. outside diameter wrought iron pipe. Galvanized or painted. Fences without top rail have two reinforcing strands of No. 7 wire.

**Fabric**—Galvanized chain link, triangle mesh, or honeycomb mesh. (Chain link 2-in. mesh No. 6 wire recommended for severer services.) Give height and size of mesh.

Barbed wire overhang, 4-point thick-set galvanized; 3 or more courses.

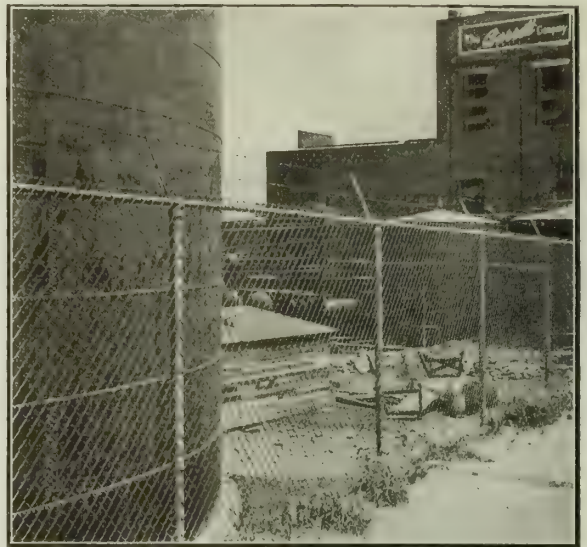
**Gates**—Single or double swinging up to 24 ft. or overhead track sliding types. Frames of 2-in. T-section, heavily braced, and corners reinforced with double gusset plates.

**Galvanizing**—All posts and their fittings to be hot dip galvanized after fabrication. Galvanized bolts to be used in assembling.

**Painting**—When galvanizing is not specified for framework, paint 1 shop coat, also 1 field coat before galvanized wire fabric is attached.

**Erecting**—Set all posts in concrete footings (ordinarily 3 ft. deep). Area for end, corner and gate posts not less than 15 ins. in diameter, and for line posts not less than 10 ins.

Owner will clear fence lines of obstructions, and provide stakes for all ends, corners and gates.



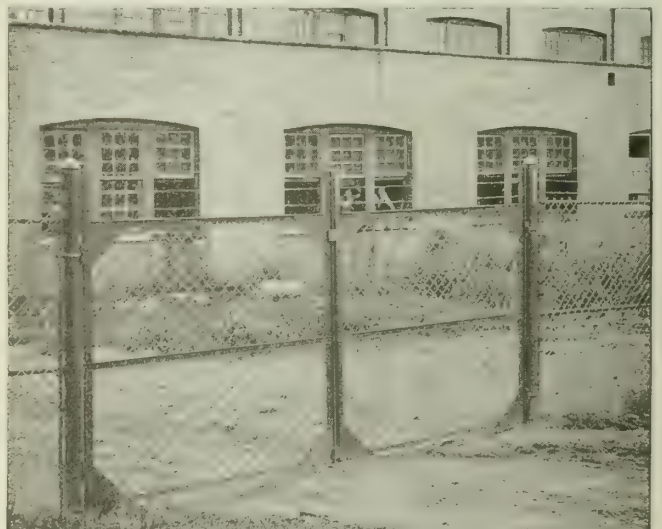
**AFCCO UNCLIMBABLE CHAIN LINK FENCE**  
8 ft. high with top rail. Posts are U-bar type fitted with extension arms for barbed wire overhang, galvanized and set in concrete. Fabric is 2-in. mesh No. 9 wire



**AFCCO CHAIN LINK FENCE 7 FT. HIGH**  
This differs from the one above in being built without a top rail, thereby, providing cheaper construction. Posts are one-piece steel angles painted, and set in concrete. Arm integral with post. Fabric is 2-in. mesh No. 6 wire.



**NO. 325 AFCCO WROUGHT IRON FENCE, 7 FT. HIGH**  
Pickets ¾, ¾ or 1 in. square.  
Rails 2 x 2 x ¼ in. angle or 2 x 1 x ¾ in. channels.  
Line posts 3-in. I-beam, 5½-lb. section for heights up to 6 ft., 7½-lb. section for greater heights.  
No back bracing required with these posts. Posts set 18 ins. into concrete footings which extend not less than 36 ins. below grade



**AFCCO CHAIN LINK GATES**  
Gates of this type either double or single can be provided in any width. Equipped with adjustable hinges providing for 180° swing. For gates more than 20 ft. wide the posts are extended above top of fence and have overhead truss rods running to center of gates. Sliding gates with overhead track can be provided where space is restricted



# ANCHOR POST IRON WORKS

Manufacturers of Wire Fences, Iron Railings, Entrance Gates, Etc.

OFFICES AND SALESROOMS

167 Broadway

NEW YORK, N. Y.

TELEPHONE:

CORTLANDT 4886-7-8-9

FACTORY  
GARWOOD, N. J.

BRANCH OFFICES

BOSTON, MASS., 79 Milk Street      PHILADELPHIA, PA., Real Estate Trust Bldg.      ATLANTA, GA., Empire Bldg.  
HARTFORD, CONN., 902 Main Street      MINEOLA, L. I., N. Y., Jericho Turnpike      STAMFORD, CONN., 11 Clinton Ave.  
CLEVELAND, OHIO, Guardian Bldg.      WASHINGTON, D. C., 1410 H St., N. W.

## Products.

ORNAMENTAL IRON ENTRANCE GATES, LAMPS, DOORS and GRILLES; RAILINGS and FENCES.

WIRE and IRON FENCES of all kinds and in any height, for country places, parks, playgrounds, institutions, factories, mills, railroads and water companies. UNCLIMBABLE FENCES.

TENNIS COURT and ATHLETIC GROUND ENCLOSURES; KENNEL YARD, POULTRY RUN and STOCK Paddock FENCES; expert designing and construction of SPECIAL WIRE ENCLOSURES for game, game birds, ornamental birds, etc.

IRON and WIRE ARBORS, ARCHES, TRELLISES and ESPALIERS.

Enclosures for clothes drying yards; Iron and Wire Window Guards; Pipe Railings; Tree, Lawn and Flower Bed Guards; Galvanized Anchor Posts, Clothes Posts and Sign Posts.

## Estimates, Price Lists and Catalogues.

This company will give estimates for its products, delivered and set complete in any part of the country.



In writing for estimates send, if possible, a diagram giving dimensions, location of gates, ends and corners. A large force of experienced men is employed, who have been trained particularly to erect our work. Where material only is supplied, full instructions and drawings are furnished, so that fences and gates can be placed in position by local mechanics.

Catalogues with complete price lists may be obtained on application. Sample sections of railings, fences with posts, gates, etc., may be seen at offices and salesrooms.

## Co-operative Service; Facilities.

The ANCHOR POST IRON WORKS is ready at all times to furnish architect, contractor, or owner, with sketches, designs and full information as to sizes and weights of material. If desired, surveys for grades and measurements will be made and entire charge taken of the work.

Shops at Garwood, N. J., on the Central Railroad of New Jersey, have every facility for handling large and small contracts at the lowest possible cost.



PLATE NO. A-4597. DOUBLE DRIVEWAY GATES, LAMPS, GRILLE AND DOOR AT ENTRANCE TO PRIVATE ESTATE, PORT WASHINGTON, N.Y.

Made and erected by ANCHOR POST IRON WORKS

There is no branch of ironwork that requires greater skill than the making and setting of iron gates. A gate, especially if it is large and massive, is always subject to strain. Unless the framework is properly proportioned and well put together it will eventually sag, causing needless trouble and expense to correct the fault.





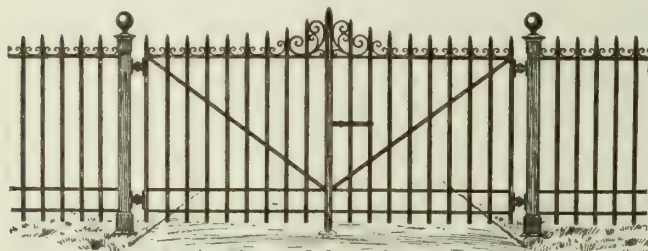
PLATE NO. A-4595. ENTRANCE GATE



PLATE NO. A-4598. ELECTRICALLY WELDED RAILING AND GATE

### Iron Railings and Entrance Gates.

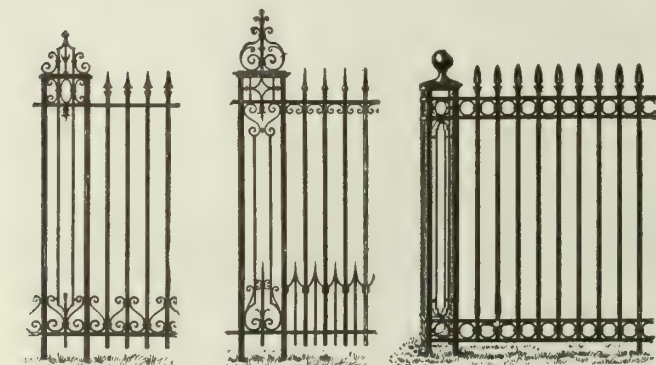
Long experience in this branch of ironwork enables the company to manufacture railings and entrance gates properly proportioned and designed, and correctly made in all mechanical details. The railings and gates illustrated are a few stock designs and can be furnished in heights from 3 ft. up to 6 ft. and of any size picket desired from  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. round or square.



POST NO. A-100 DOUBLE GATE NO. A-4498 RAILING NO. A-4497



POST NO. A-23. DOUBLE GATE NO. A-4537



POST NO. A-117 POST NO. A-115 POST NO. A-106  
 RAILING NO. A-4542 RAILING NO. A-4540 RAILING NO. A-4445

A number of other designs of both railings and gates are shown in catalogue

### Electrically Welded Railings and Gates.

A new and quite revolutionary process in the manufacture of railings and gates has recently been perfected. The ANCHOR POST IRON WORKS has secured the rights of manufacture and has installed the necessary electrical machinery for the manufacture of railings and gates of every size and weight, from those made of light iron bars of  $\frac{1}{2}$  in. square or round, up to the very heaviest forms required for any service. By this process, the rails, pickets or other members are welded together at all points of intersection under a heavy electric current, combined with a mechanical pressure of from 1 to 5 tons exerted at the moment weld is made. This insures an absolute and unbreakable union of the metal of both pickets and rails.

Railings and gates made in this way are remarkably strong and rigid; each unit, that is, each panel of railing, or each gate, being welded into practically one piece of metal, free from weak joints or rivets.

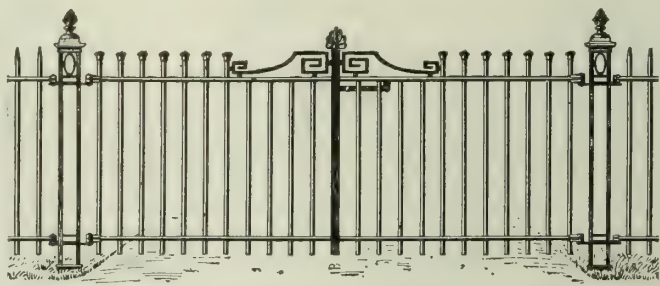


PLATE NO. A-4599. ELECTRICALLY WELDED DOUBLE GATE

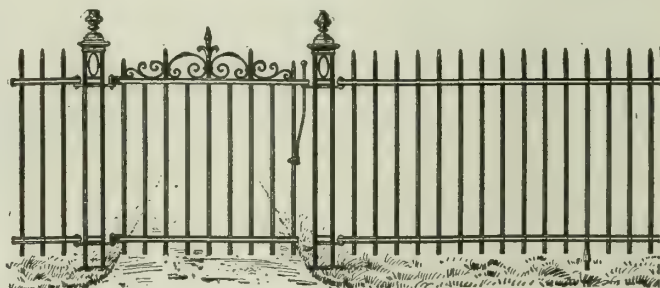


PLATE NO. A-4600. ELECTRICALLY WELDED SINGLE GATE

Electrically welded single and double gates are made in a number of attractive designs, suitable for use in connection with either wire fences or iron railings



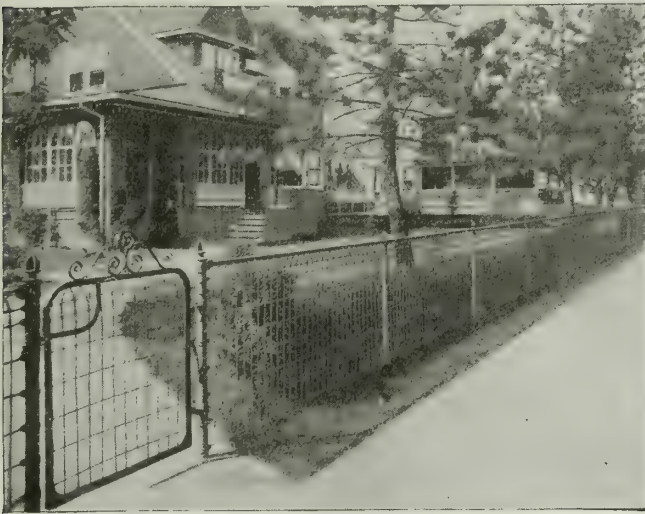


PLATE NO. A-3376. WOVEN WIRE FENCE



PLATE NO. A-3541. WIRE NETTING FENCE

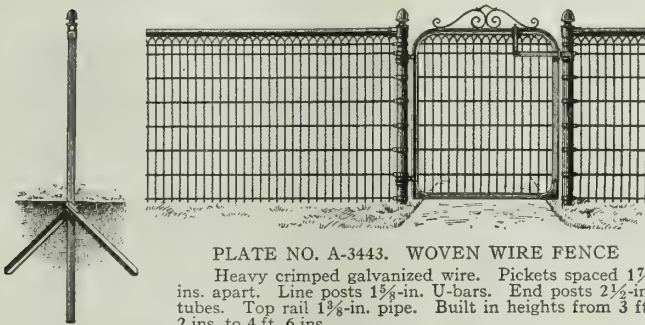


PLATE NO. A-3443. WOVEN WIRE FENCE

Heavy crimped galvanized wire. Pickets spaced  $1\frac{7}{8}$  ins. apart. Line posts  $1\frac{3}{4}$ -in. U-bars. End posts  $2\frac{1}{2}$ -in. tubes. Top rail  $1\frac{3}{8}$ -in. pipe. Built in heights from 3 ft. 2 ins. to 4 ft. 6 ins.

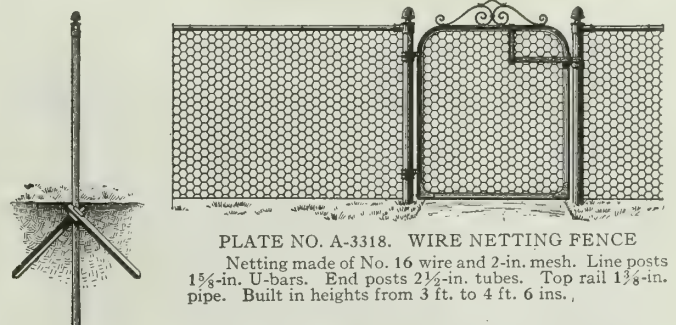


PLATE NO. A-3318. WIRE NETTING FENCE

Netting made of No. 16 wire and 2-in. mesh. Line posts  $1\frac{3}{4}$ -in. U-bars. End posts  $2\frac{1}{2}$ -in. tubes. Top rail  $1\frac{3}{8}$ -in. pipe. Built in heights from 3 ft. to 4 ft. 6 ins.

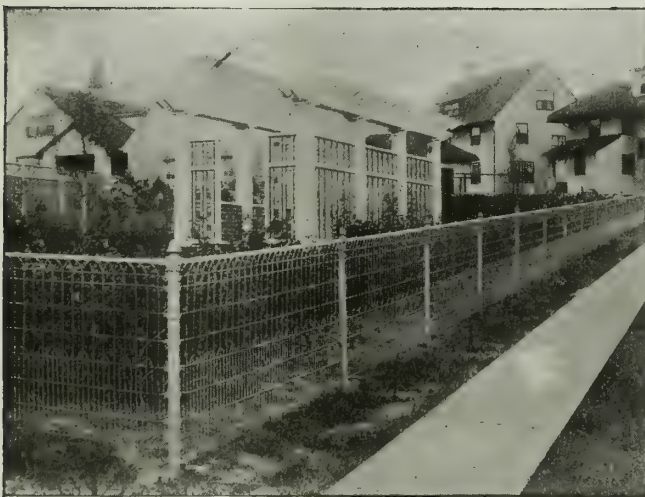


PLATE NO. A-3538. WOVEN WIRE FENCE WITH DOUBLE PICKET BORDER



PLATE NO. A-3555. CHAIN WOVEN STEEL LINK FENCE

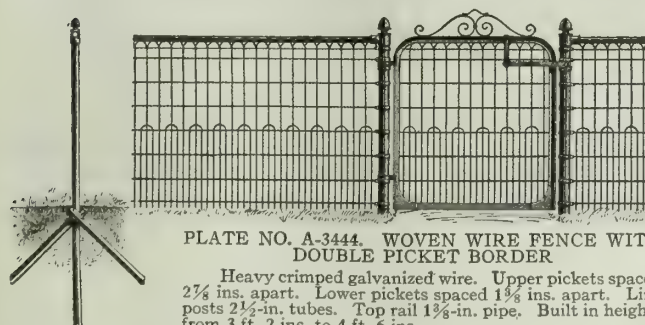


PLATE NO. A-3444. WOVEN WIRE FENCE WITH DOUBLE PICKET BORDER

Heavy crimped galvanized wire. Upper pickets spaced  $2\frac{3}{4}$  ins. apart. Lower pickets spaced  $1\frac{3}{8}$  ins. apart. Line posts  $2\frac{1}{2}$ -in. tubes. Top rail  $1\frac{3}{8}$ -in. pipe. Built in heights from 3 ft. 2 ins. to 4 ft. 6 ins.

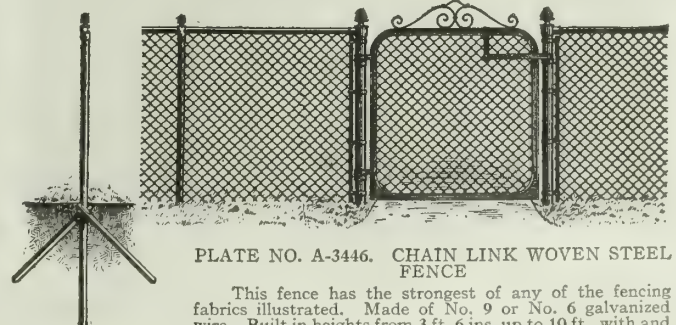


PLATE NO. A-3446. CHAIN LINK WOVEN STEEL FENCE

This fence has the strongest of any of the fencing fabrics illustrated. Made of No. 9 or No. 6 galvanized wire. Built in heights from 3 ft. 6 ins. up to 10 ft., with and without top rail





PLATE NO. A-3556. HIGH WOVEN WIRE FENCE



PLATE NO. A-3542. SQUARE MESH FENCE

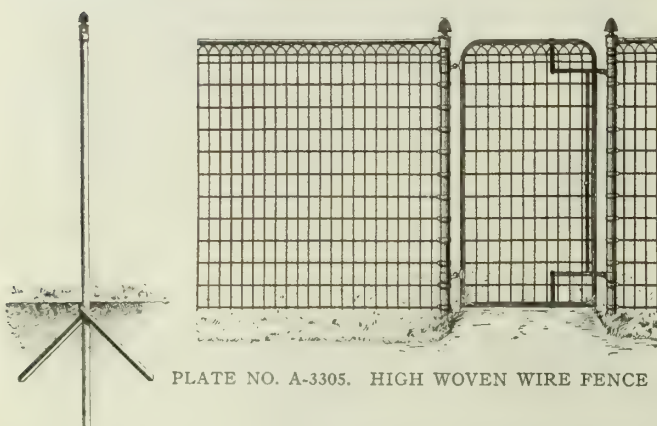


PLATE NO. A-3305. HIGH WOVEN WIRE FENCE

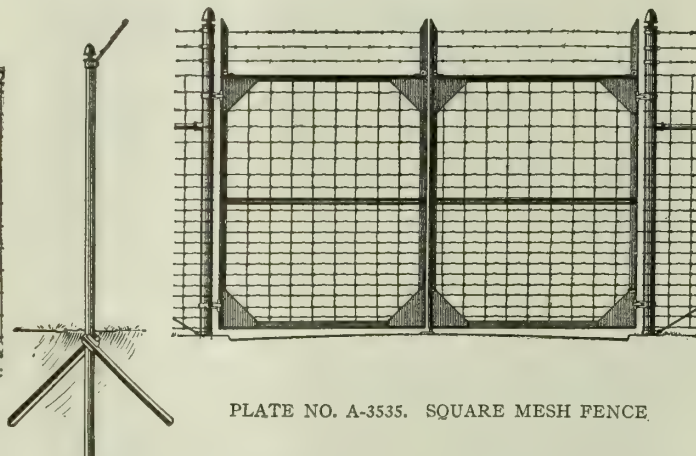


PLATE NO. A-3535. SQUARE MESH FENCE

Heavy crimped galvanized wire. Pickets spaced either  $1\frac{1}{4}$  ins. or 3 ins. apart. Line posts  $2\frac{1}{4}$ -in. U-bars. End posts  $2\frac{1}{4}$ -in. tubes. Top rail  $1\frac{3}{8}$ -in. pipe. Built in heights from 5 ft. to 8 ft. Can be furnished with or without top arms and barbed wire

Height 7 ft. and higher. Fabric is made of No. 9 galvanized wire woven into rectangular mesh. Upright wires or stays 6 ins. apart, horizontal wires graduating from 3 ins. apart at the bottom to 5 ins. apart at the top. Line posts are Anchor posts No. 2,  $2\frac{1}{4}$ -in. U-bars. End, corner and gate posts are Anchor posts No. 23, 3-in. galvanized pipe. Equipped with 3 strands of thick-set barbed wire on single arms or 6 strands where double arm is used



PLATE NO. A-3511. ANCHOR POST PLAYGROUND ENCLOSURES OF CHAIN LINK WOVEN STEEL

Being used with complete satisfaction on many public playgrounds. The chain link fabric is woven in such a manner that it provides no foothold for climbing children; it also acts as a stop for baseballs or other playthings used in children's games.

See second page following for complete details of this fence



PLATE NO. A-3315. FARM FENCE ON PRIVATE ESTATE

The posts are Anchor posts sizes No. 1 or No. 2. The straining posts at ends, corners and gates are of galvanized steel tubing. Fabric square mesh No. 9 galvanized steel wire, so woven together that no stock can get through it. Built in heights from 3 ft. 6 ins. to 7 ft. Double gates are made with a 10-ft. opening and single gates with  $3\frac{1}{2}$ -ft. opening



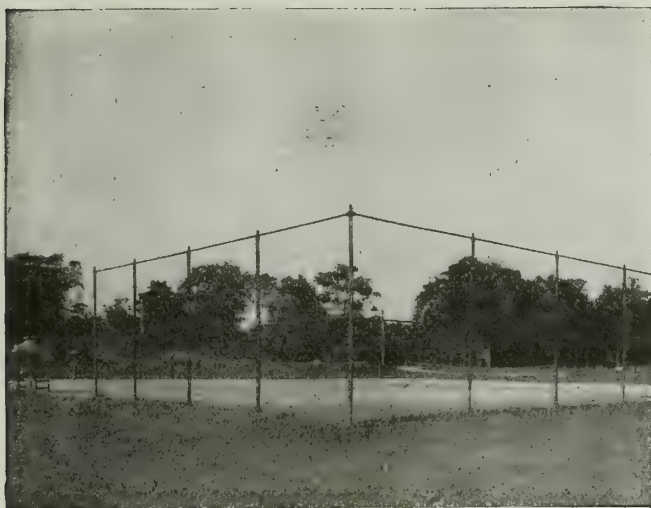


PLATE NO. A-3557. TENNIS COURT ENCLOSURE  
PUBLIC PARK, STAMFORD, CONN.

An enclosure or backstop is a necessity for every tennis court, but the ordinary kind with wood posts and cheap sagging netting is at best an unsightly makeshift, and also entails a continual expense to keep it in even approximately good condition.

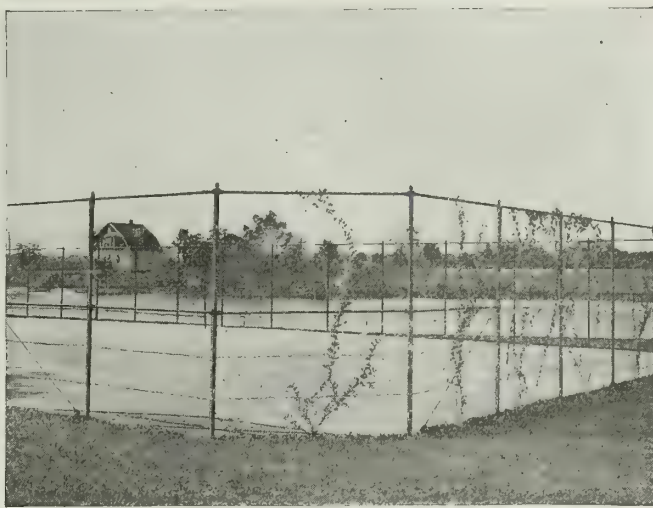


PLATE NO. A-3558. TENNIS COURT ENCLOSURE  
ON PRIVATE ESTATE

Anchor Post tennis enclosures and backstops are designed for this particular service and are permanently efficient and attractive. They are constantly growing in favor and have been installed on courts of many of the most prominent country clubs as well as private estates and public parks.

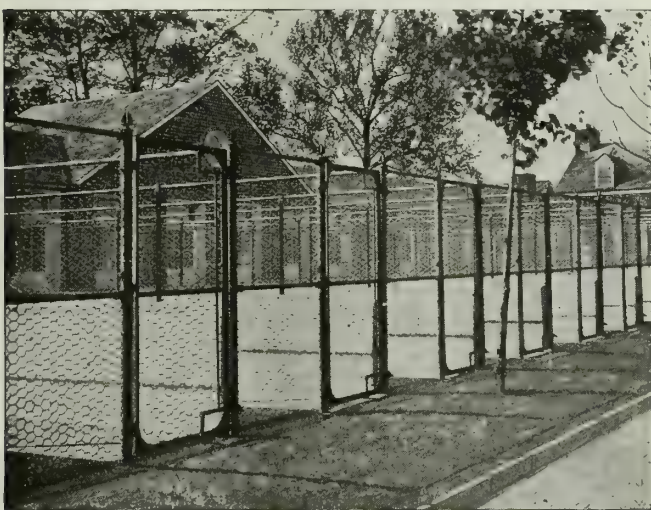


PLATE NO. A-3559. KENNEL YARD ENCLOSURE

The above installation consists of 18 runs, each 6 ft. wide by 36 ft. long and 6 ft. high. In Anchor Post kennel yard enclosures are incorporated the experience acquired in the designing and building of animal enclosures of all kinds. We have much information upon the subject, gathered from expert breeders, which is at the disposal of owners and architects.

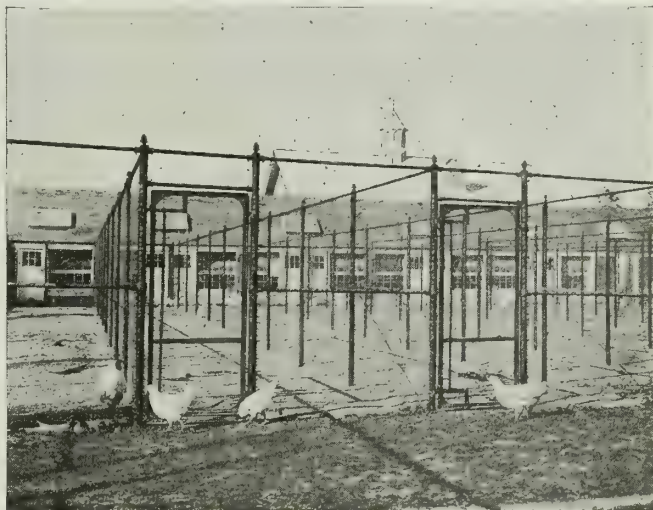


PLATE NO. A-3560. CHICKEN RUN ENCLOSURE, COLD  
SPRING HARBOR, L. I.

These runs are 7 ft. in height and have a total length of 1646 ft. The installation consists of 9 runs, 8 ft. wide by 100 ft. long; and 4 runs, 5 ft. 6 ins. wide by 60 ft. long. The outside of these runs are made ratproof by means of  $\frac{1}{2}$ -in. square mesh netting reaching 2 ft. above the ground. Plans and specifications for any size enclosure can be furnished on application.



PLATE NO. A-3472. ROSE ARBOR, AT RUMSON, N. J.

From designs by FERRUCCIO VITALE, Landscape Architect

This photograph was taken only a few months after the arbor was finished. This arbor is made entirely of galvanized iron, and is thus impervious to rust. We build all kinds of arbors, trellises and espaliers.

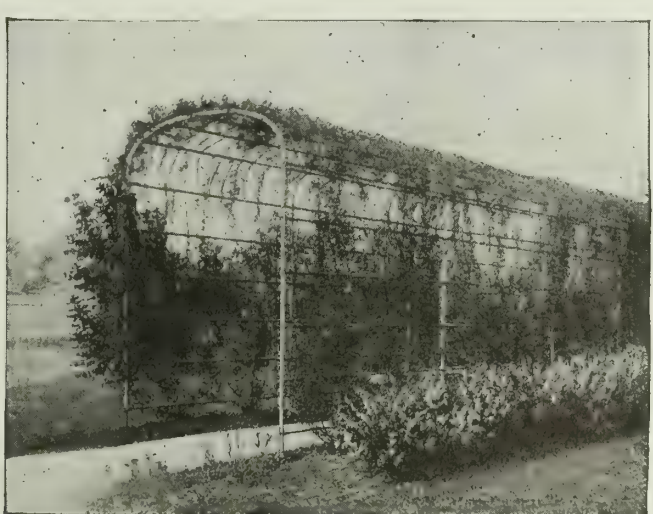


PLATE NO. A-3390. VINE ARBOR, MADISON, N. J.

Height, 10 ft.; width, 8 ft. Made with flat arches connected with round rods; made any length, height or width desired; either galvanized or painted.



### Anchor Posts.

Anchor posts are U-bars of high carbon steel and, together with all other parts, are heavily galvanized above and below ground, preventing rust and insuring long service. Posts are driven into the ground and held rigidly erect by two anchor stakes driven through slots clamped to opposite sides of the posts.

### Chain Link Woven Steel Fences.

Chain link woven steel is of the best quality galvanized steel wire of No. 9 or No. 6 gage, No. 6 being the size most used. Made in any width up to 10 ft. The mesh is so small it affords no foothold for fence climbers; and as an additional protection three or more strands of barbed wire are fastened to inwardly inclined arms attached to the tops of posts.

Fence is furnished with or without top rail of galvanized pipe. Posts and all fence parts are galvanized by hot dip spelter process. Under conditions where protection is of utmost importance, these fences are made 10 ft. in height, and diagonal arms and barbed wire are attached to both front and back of posts; the spread across the top is about 2 ft. The gates are as unclimbable as the fence.

### Triangular Mesh Fences.

To meet conditions which do not demand the heavier chain link fence, we build an unclimbable fence of moderate cost but of great strength and durability.

The posts are regular Anchor posts, size No. 2, set 8 to 10 ft. apart. Fence is made in heights from 4 ft. up to 8 ft. Triangular mesh fabric is of 2-ply cables, 4 ins. apart; the upright wires are 2 ins. on centers; No. 12½ wires are used for both. Inclined inward from the post tops are steel arms, on which are stretched two or more strands of barb wire. Posts, fittings and fabric are thickly galvanized.

### Picket Railing.

This railing is simple in design, easy to erect, and combines the essential elements of strength, maximum durability, minimum upkeep and moderate cost. The posts are of two types: (1) for concrete footings; (2) fitted with extra size drive anchors for setting in earth. The rails of deep channel are very rigid and will carry a heavy overload without deflection. Pickets are solid ¾ in. or ⅞ in. square. Railing is furnished either painted or galvanized. In the latter case each panel is assembled complete and then galvanized by the hot dip spelter process. When Anchor posts are used, the post bar is galvanized.

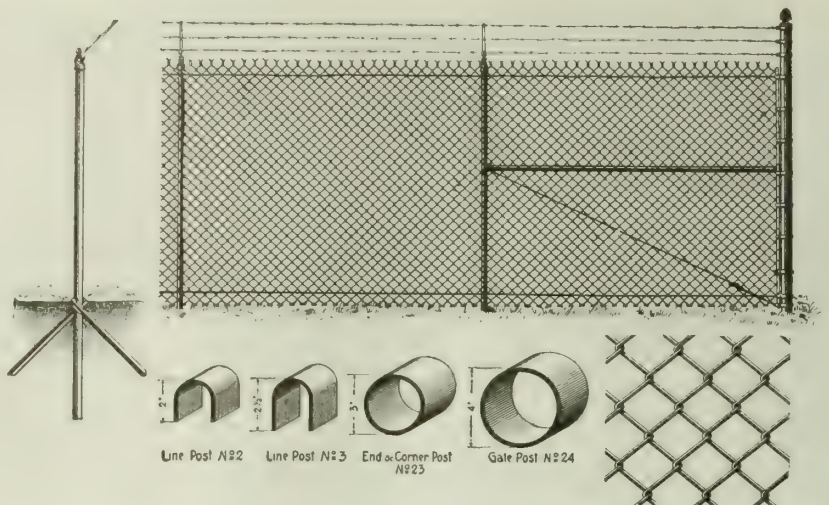


PLATE NO. A-3626. CHAIN LINK WOVEN STEEL FENCE

Fabric.....Chain link woven steel—wire No. 6 gage  
Line posts.....Galvanized anchor posts, size No. 3, 2½-in. steel U-bar, set 8 ft. on centers  
End and corner posts.....3-in. steel pipe  
Gate posts.....4-in. steel pipe

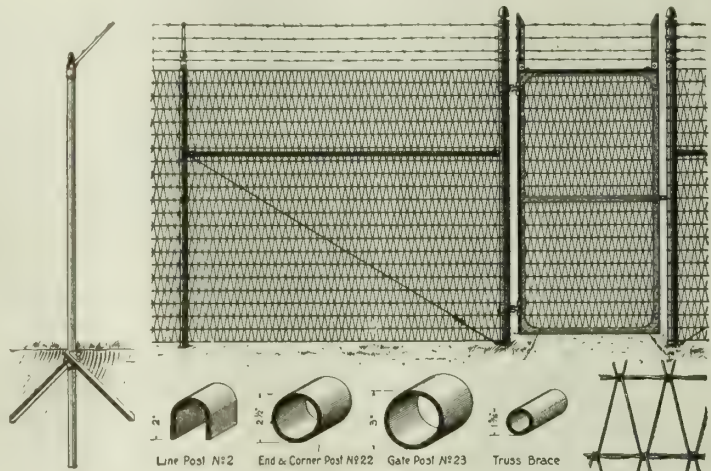


PLATE NO. A-3627. TRIANGULAR MESH FENCE

Fabric.....Triangular mesh, No. 12½ wire  
Line posts.....Galvanized anchor posts, size No. 2, 2-in. steel U-bar, set 10 ft. on centers  
End and corner posts.....2½-in. steel pipe  
Gate posts.....3-in. steel pipe

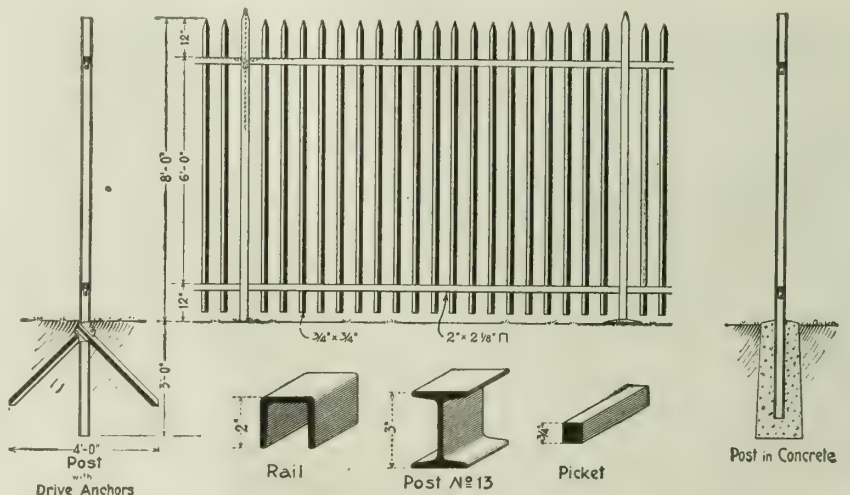


PLATE NO. A-4607. IRON PICKET RAILING

Pickets.....¾ in. square, set on 6-in. centers  
Rails.....2 x 2½-in. steel channels  
Posts.....3-in. standard I-beam, weight 5½ lbs. per ft.  
Panels.....Standard length 10 ft., special lengths to suit measurements. Height 6, 7 or 8 ft.





PLATE NO. A-3608. ANCHOR POST CHAIN LINK WOVEN STEEL FENCE

It is 8 ft. high with top rail. Erected at the plant of the Cleveland Co-operative Stove Company, Cleveland, Ohio. Complete specification on preceding page. 2,500 ft. in length.

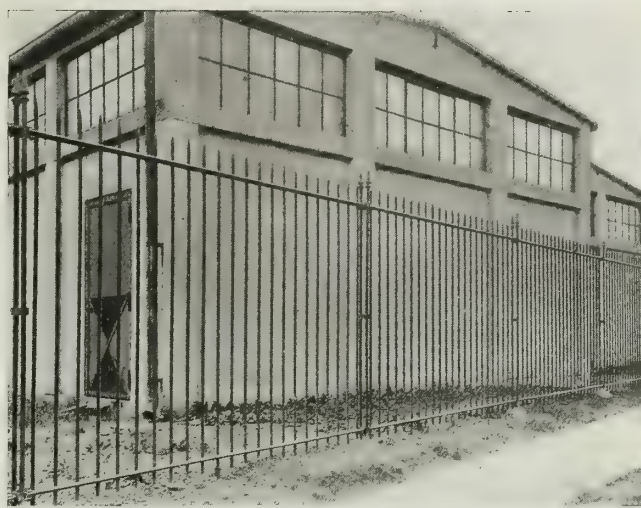


PLATE NO. A-4588. ELECTRICALLY WELDED IRON RAILING

It is 7 ft. 6 ins. in height and erected at a manufacturing plant in New Jersey

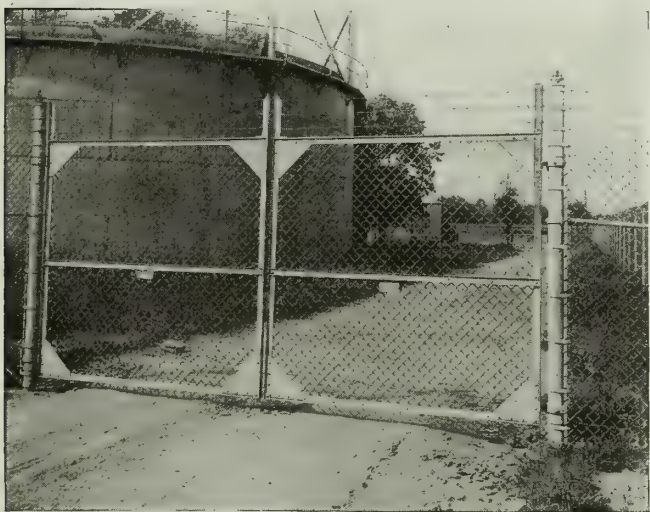


PLATE NO. A-3601. CHAIN LINK DOUBLE DRIVEWAY GATES

Built in height corresponding to height of fence and in any width from 10 to 16 ft. Single gates made from 4 to 10 ft. Sliding gates from 6 to 14 ft. wide and even wider, if desired



PLATE NO. A-4485. SPECIAL IRON RAILING

Iron railing 7 ft. 6 ins. high on concrete wall at the plant of the General Electric Company, Schenectady, N. Y.



PLATE NO. A-3440. TRIANGULAR MESH FENCE

Erected for the New York, Westchester & Boston Railroad. It is 90,000 ft. in length, 67,000 ft. of it being 5 ft. high, part of which is shown above, and 23,000 ft. is 8 ft. high



PLATE NO. A-4552. ANCHOR POST ANGLE PICKET RAILING

A section of Anchor post angle picket railing erected at a manufacturing plant in New Jersey.

Construction similar to Plate A-4571 on preceding page



# A. T. BROOK IRON WORKS

## Wire and Iron Fences and Gates

37 Barclay Street

NEW YORK, N. Y.

TELEPHONE:  
BARCLAY 6278

### Products.

#### ORNAMENTAL IRON and WIRE WORK:

Iron and Wire Fences for Cemeteries, Division Lines, Lawns, Factories (non-climbable), Farms, Gardens (proof against boy and animal), Game Enclosures, Poultry and Dog Runs, Paddock Fence, Entrance Gates, Tennis Court Enclosures, Tennis Net Posts, Rose Arches, Porch Trellises, Vine Trellises, Grape and Fruit Arbors, Flower Bed Guard, Tree Guards, Window Guards, Vases, Cesspool Covers, Wheel Guards, Gratings, Spiral Stairs, Turnstiles, Urns, Wire Railings for offices, wine rooms, factory tool and storage rooms.

### Estimates.

Will give estimates for furnishing and erecting our products in any part of the country, or will supply full instructions for setting, where we supply materials only.

### Illustrations.

Catalogue or drawings showing fence, gates, arbors, and other goods of our manufacture mailed on request. Diagrams giving dimensions are of great assistance in quoting prices.

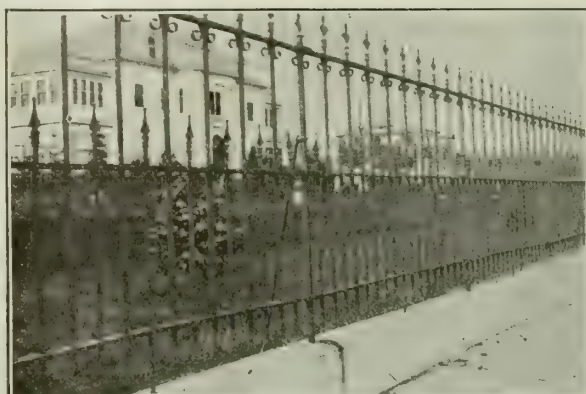


PLATE NO. S2449. A 6-FT. HIGH ORNAMENTAL RAILING Suitable for private grounds. All heights and other designs furnished on request



PLATE NO. S2471. GATE  
Specially designed for wide imposing entrances

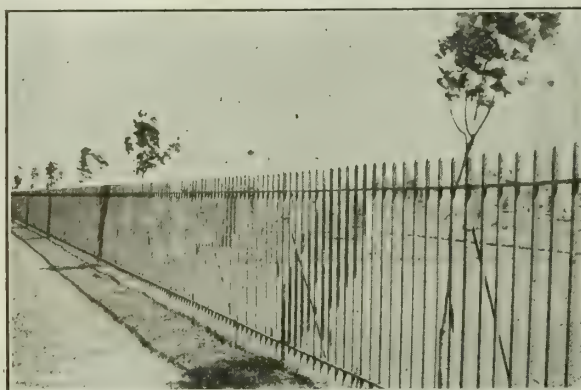


PLATE NO. S2400. A 5-FT. HIGH RAILING OF HEAVY CONSTRUCTION  
Suitable for parks and large estates. Made in any height and weight



PLATE NO. S2470. GATEWAY  
We execute architects' designs for gateways and lamps, or will design both in keeping with the surroundings



PLATE NO. S2304. EXERCISING YARD FOR DOGS  
We make a specialty of both outside and inside kennels. Designs submitted on request





PLATE NO. S2051. A HEAVY CRIMPED GALVANIZED WOVEN WIRE LAWN FENCE, ERECTED ON STEEL POSTS AND TOP RAIL



PLATE NO. S2114. HEAVY, ALL GALVANIZED, 8-FT. HIGH FENCE  
A good fence to keep intruders out and animals in



PLATE NO. S2053. WOVEN WIRE FENCE  
Similar to the above, but of closer mesh. Made in all heights.



PLATE NO. S2210. TENNIS COURT, BACK STOP AND ENCLOSURE  
Installed for many clubs and private grounds

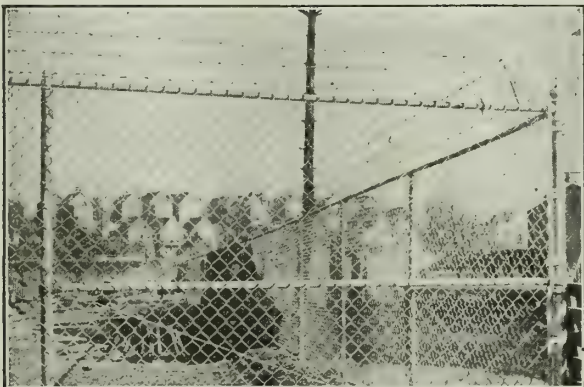


PLATE NO. S2134. NON-CLIMBABLE CHAIN LINK FENCE  
Suitable for factories and orchards. Made in heights up to 10 ft.



PLATE NO. S2314. PHEASANT RUNS  
We make a specialty of furnishing and building bird and chicken runs

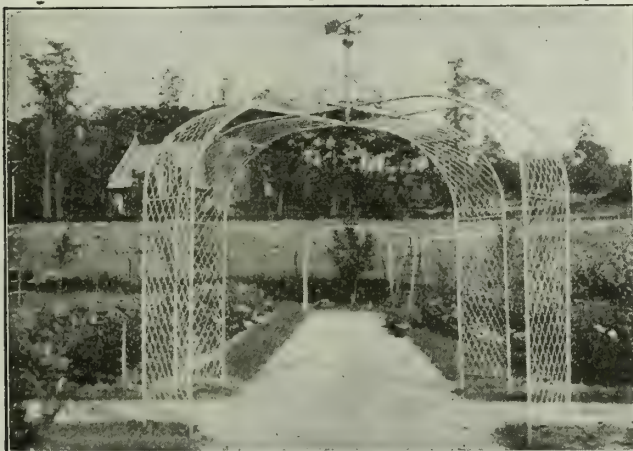


PLATE NO. S2023. DOUBLE ARCHES FOR CENTER OF GARDEN

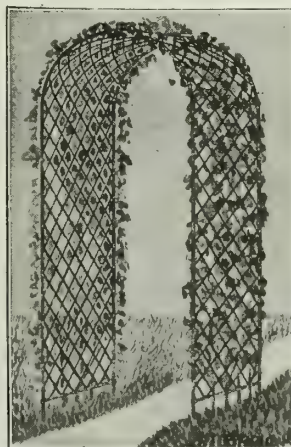


PLATE NO. S2025. ROSE AND VINE ARBOR

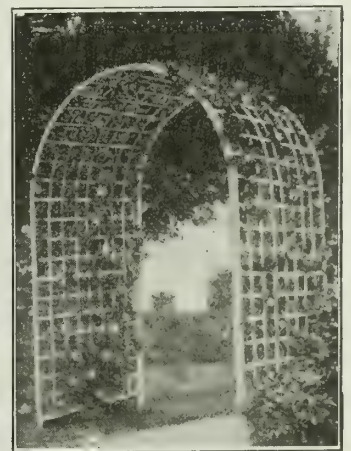


PLATE NO. S2024. GRAPE ARBOR  
Grape arbors and trellises for every requirement



# CYCLONE FENCE COMPANY

Manufacturers of Fencing and Gates

WAUKEGAN, ILL.

FACTORIES

CLEVELAND, OHIO

CHICAGO, ILL., 175 W. Jackson Boulevard  
DETROIT, MICH., Penobscot Building  
NEW YORK, N. Y., 2787-89 Woolworth Building

BRANCHES

PHILADELPHIA, PA., 403 Stock Exchange  
PORTLAND, ORE., 372-74 East Oak Street  
OAKLAND, CAL., 310 Twelfth Street

## Products.

CYCLONE PROPERTY PROTECTION STEEL FENCING and GATES for Industrial Plants of all kinds, for Country Estates, Country Clubs, Parks, Public and Private Grounds, Tennis Courts, etc. FENCING for City, County, State and National Institutions, Government Grounds, etc.

SPECIAL FENCING and ENTRANCE GATES, WIRE OR IRON, built for any purpose.

Factory, Office and Stockroom Wire Partitions, Window Guards, Belt Conveyors, Iron Railings, etc.; Poultry Yard Enclosures; Fencing for Kennels, Animal Cages, Bird Cages, etc.

## Engineering Service.

Our Engineering Department offers expert consultation service free of charge to architects and engineers. We assist in the selection of correct fencing for any requirement. Problems dealing with rolling land, steep grades, ravines, switching tracks, etc., are easily overcome.

When desired, an expert construction superintendent is furnished at nominal cost, to superintend erection of fences anywhere.

Blue print showing all details of fencing will be furnished free, or special construction salesman will call, measure property, show samples of fencing and photographs of completed jobs, and will assist in every way possible in solving any fencing problem.

## Cyclone Construction.

Cyclone fencing is built in a large variety of styles and designs, and is furnished to harmonize with any style or period of architecture. Cyclone standard construction is recommended, using standard weight tubular steel for posts and rail.

In the standard specifications listed below, posts and rail are of full weight tubular steel and the outside diameter size is listed as well as the weight per foot. These figures are taken from the full weight standard schedule adopted by manufacturers.

When Cyclone standard fence construction represents a greater investment than conditions would warrant, a lighter weight post construction is offered to suit any requirement.

## Chain Link Invincible Fence Specifications.

CHAIN LINK FABRIC—Made in all sizes of wire from Nos. 4- to 14-gauge.

Woven in different sizes of chain link diamond mesh, in any height desired.

Top selvage of fabric has a *twisted* and *barbed* finish. Bottom selvage has a *twisted* and *barbed* finish, or *knuckled* finish as desired. Barbing done by cutting wire on *bias*, thus creating sharp points (see illustration).

POSTS—Made of standard full weight tubular steel. Line posts provided to set 30 ins. in ground; end,

gate and corner posts to set 36 ins. in ground. Posts to be spaced in line of fence not over 10 ft. apart. End, corner and walk gate posts "O," 3 ins. outside diameter, weight 5.79 lbs. per lineal ft. Drive and sliding gate posts "O," 3½ ins. outside diameter, weight 7.58 lbs. per lineal foot. Line posts "P," 2½ ins. outside diameter, weight 3.65 lbs. per lineal foot.

All weights and dimensions are nominal and are taken from the full weight standard schedule adopted by manufacturers. The permissible variation in specifications is 5% either way.

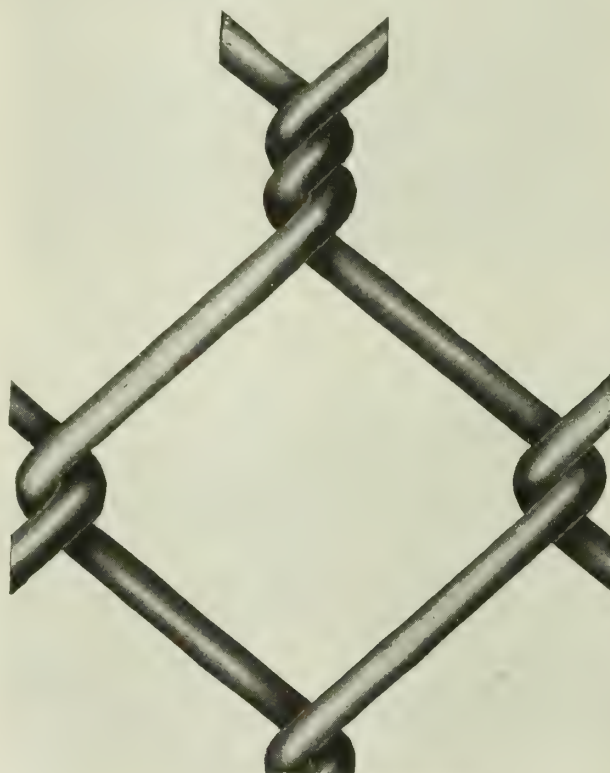
When desired, U-bar, high carbon steel line posts furnished instead of tubular steel line posts. Up to and including 7 ft. fence, U-bar line posts are 2½ ins., weight 2.73 lbs. per lineal foot. For 8-ft. fence and over, U-bar line posts are 2½ ins., weight 3.82 lbs. per lineal foot.

Top rail and braces, 1½ ins. outside diameter, tubular steel; weight, 2.27 lbs. per lineal foot.

Top rail provided with sliding expansion joints of a type approved by United States Government engineers.

Furnished all heavily galvanized, or with galvanized fabric and painted framework.

POST TOPS—Invincible post tops (patented) made of pressed steel arms securely riveted to heavy malleable iron base, and carry three 4-point barbed wires, 12 ins. in or out from fence line.



DETAIL OF CHAIN LINK FABRIC



LIST PRICE, CHAIN LINK INVINCIBLE FENCE

Height of fence...	5'	6'	7'	8'	9'	10'	11'
Height of fabric...	4'-4"	5'-4"	6'-4"	7'-4"	8'-4"	9'-4"	10'-4"
Gauge No.	Mesh	Per lineal foot					
9	2"	\$1.12	\$1.36	\$1.60	\$1.84	\$2.08	\$2.32
9	1½"	1.23	1.50	1.77	2.04	2.31	2.58
6	2½"	1.18	1.44	1.69	1.95	2.21	2.46
6	2"	1.28	1.56	1.84	2.13	2.41	2.69
4	2½"	1.38	1.69	1.99	2.30	2.61	2.91
4	2"	1.53	1.88	2.22	2.57	2.91	3.25

Chain Link Non-climbable Fence Specifications.

POST TOPS—Non-climbable post tops (patented) made of pressed steel arms securely riveted to heavy malleable iron base, and carry five 4-point barbed wires, 9½ ins. in and out from fence line.

POSTS—Made of standard, full weight tubular steel.

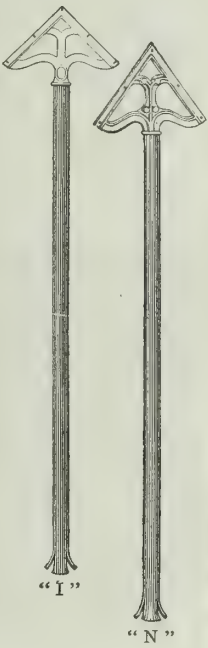
Line posts provided to set 30 ins. in ground; end, gate and corner posts to set 36 ins. in ground.

Posts to be spaced in line of fence not over 10 ft. apart.

End, corner and walk-gate posts "N," 3 ins. outside diameter, weight 5.79 lbs. per lineal ft.

Drive and sliding gate posts "N," 3½ ins. outside diameter, weight 7.58 lbs. per lineal ft.

Line posts "I," 2½ ins. outside diameter, weight 3.65 lbs. per lineal ft.



DETAIL OF POSTS

Chain Link Safeguard Fence Specifications.

Chain Link Safeguard is especially recommended for schools, playgrounds, athletic grounds, country estates, parks, etc., also industrial plants of all kinds.

A row of protecting barbs projects above top rail, or is furnished with smooth knuckled selvage in place of barbs.

POSTS—Made of standard full weight materials.

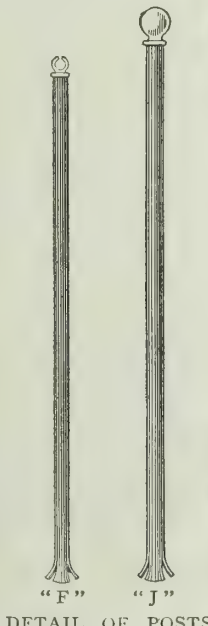
Line posts provide for setting 30 ins. in ground; end, gate and corner posts 36 ins. in ground.

Posts spaced in line of fence not over 10 ft. apart.

End, corner and walk gate posts "J," 3 ins. outside diameter, weight 5.79 lbs. per lineal ft.

Drive and sliding gate posts "J," 3½ ins. outside diameter, weight 7.58 lbs. per lineal ft.

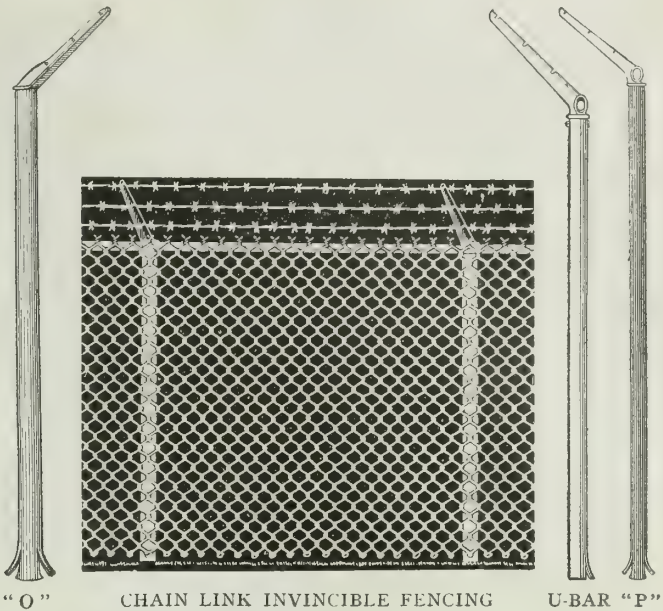
Line posts "F," 2 ins. outside diameter, weight 2.72 lbs. per lineal ft.



DETAIL OF POSTS

LIST PRICE, SAFEGUARD FENCE WITH CHAIN LINK FABRIC

Height of fence...	4'	5'	6'	7'	8'	9'	10'
Height of fabric...	4'	5'	6'	7'	8'	9'	10'
Gauge No.	Mesh	Per lineal foot					
11	2"	\$0.76	\$0.97	\$1.29	\$1.49	\$1.71	\$1.92
9	2"	.86	1.10	1.47	1.71	1.95	2.19
9	1½"	.98	1.24	1.64	1.91	2.18	2.45
6	2"	1.03	1.31	1.71	2.00	2.28	2.56



"O" CHAIN LINK INVINCIBLE FENCING U-BAR "P"



CHAIN LINK NON-CLIMBABLE FENCE

LIST PRICE, CHAIN LINK NON-CLIMBABLE FENCE

Height of fence...	5'	6'	7'	8'	9'	10'	11'
Height of fabric...	4'-4"	5'-4"	6'-4"	7'-4"	8'-4"	9'-4"	10'-4"
Gauge No.	Mesh	Per lineal foot					
9	2"	\$1.15	\$1.40	\$1.64	\$1.89	\$2.14	\$2.38
9	1½"	1.26	1.54	1.81	2.09	2.36	2.64
6	2½"	1.21	1.48	1.74	2.00	2.26	2.53
6	2"	1.31	1.60	1.89	2.18	2.46	2.75
4	2½"	1.41	1.73	2.04	2.35	2.66	2.98
4	2"	1.56	1.92	2.27	2.62	2.97	3.32



CHAIN LINK SAFEGUARD FENCE

**Tubular and U-Bar Steel Posts.**

Posts are the backbone of the fence. Cyclone standard fence construction includes tubular steel posts of full standard weight for all posts.

Weight per lineal foot of posts is furnished in all Cyclone standard specifications.

We recommend that Cyclone standard specifications be used to insure maximum of satisfactory service.

When lighter specifications are required, we can furnish a fence to suit such requirements.

When desired, line posts furnished made of U-bar, high carbon steel, 2 1/8 or 2 1/2 ins., in place of tubular steel.

We recommend that all posts be set in concrete.

**Invincible Fence With Style "S" Fabric Specifications.**

Posts—Made of standard full weight tubular steel.

Line posts provided to set 30 ins. in the ground; end, gate and corner posts to set 36 ins. in the ground. Posts to be spaced in line of fence not over 10 ft. apart.

End, corner and walk gate posts "O," 3 ins. outside diameter, weight 5.79 lbs. per lineal ft.

Drive and sliding gate posts "O," 3 1/2 ins. outside diameter, weight 7.58 lbs. per lineal ft.

Line posts "P," 2 1/2 ins. outside diameter, weight 3.65 lbs. per lineal ft.

Top rail and braces, 1 5/8 ins. outside diameter, tubular steel.

Top rail provided with sliding expansion joints of a type approved by United States Government engineers.

Furnished all heavily galvanized, or with galvanized fabric and painted framework.

Post Tops—Invincible post tops (patented) made of pressed steel arms securely riveted to heavy malleable iron base, and carry three 4-point barbed wires, 12 ins. in or out from fence line.

**Style "S" Fabric.**

Style "S" is made of heavily galvanized wire, pickets No. 7-, 8- or 9-gauge, with spacing of 1 3/8 ins. between pickets from top to bottom.

Pickets given extra deep crimps, and cable wires are firmly locked in these corrugations, forming a swinging joint lock on the pickets, and making fabric adjustable to any unevenness of ground.

Bottom of pickets is given an extra sharp crimp, alternating right and left, forming an absolute lock for bottom cable.

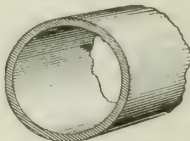
Two top cables spaced 2 3/8 ins. apart, rest of cables spaced about 6 ins. apart.

Cable wires used in either Nos. 11- or 12-gauge, and the cable twist is reversed on the pickets instead of between them, forming an absolute lock on the pickets.

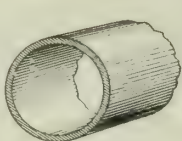
**Gates.**

Gates arranged to swing either way, to lock from either side, and, where desired, Cyclone roller bearing sliding gates are furnished running on an overhead enclosed steel track.

Gates made either single- or double-drive, or walk gates in any height to fit any opening.



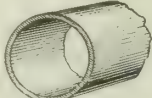
Drive Gate Post  
3 1/2-in. steel  
tubing  
7.58 lbs. per ft.



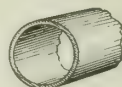
End, Corner and  
Walk Gate Post  
3-in. steel  
tubing  
5.79 lbs. per ft.



U-Bar  
2 1/8-in. steel  
2.73 lbs. per ft.



Intermediate  
Fence Post  
2 1/4-in. steel  
tubing  
3.65 lbs. per ft.

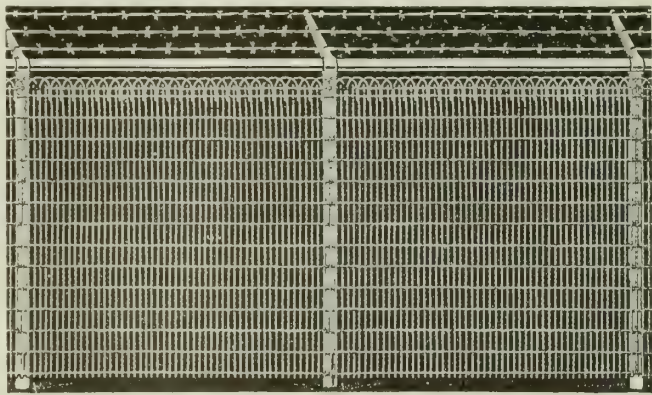


Top Rail and  
Bracing  
1 5/8-in. steel  
tubing  
2.27 lbs. per ft



U-Bar  
2 1/2-in. steel  
3.82 lbs. per ft.

SECTIONS OF POSTS, U-BARS, TOP RAIL AND BRACING



INVINCIBLE FENCE WITH STYLE "S" FABRIC  
LIST PRICE, INVINCIBLE FENCE WITH STYLE "S" FABRIC

Height of fence.....	5'	6'	7'	8'	9'	
Height of fabric.....	4'	5'	6'	7'	8'	
Size, pickets	Size, cables	Per lineal foot				
No. 9	No. 12	\$1.04	\$1.25	\$1.49	\$1.79	\$2.09
No. 9	No. 11	1.06	1.27	1.51	1.82	2.12
No. 8	No. 11	1.10	1.31	1.57	1.90	2.23
No. 7	No. 11	1.17	1.39	1.66	2.04	2.40

**Iron Fences.**

We build and erect iron fencing and iron front entrance gates for any purpose. The individual taste of purchaser can be incorporated in an attractive design that will blend with the most elaborate surroundings.

**Prices.**

Prices quoted are list prices for fence per running foot, and include fabric, posts, top rail and all necessary fittings. No extra charge for corner, end or gate posts.

Price on complete job, including erection or the services of construction superintendent, quoted on application.

**Diagram.**

When writing, send a simple diagram of proposed fence lines, giving measurements of each stretch and total measurements. Make an "O" where corner, end or gate posts are to be used. State whether single or double drive gates are wanted, and give opening size.

Quotation on the complete job will follow by return mail.



# PAGE STEEL AND WIRE COMPANY

FORMERLY  
PAGE WOVEN WIRE FENCE COMPANY

ESTABLISHED 1883

Ornamental Iron and Fencing and Woven Wire Fabrics

ADRIAN, MICH.

MONESSEN PA.

BRANCHES

NEW YORK, 30 Church Street  
DETROIT, 660 West Fort Street

CHICAGO, 175 West Jackson Boulevard  
PITTSBURGH, 644 Union Arcade

## Products.

WIRE, WOVEN WIRE and IRON PROTECTION FENCES and FABRICS for factories, mills, railroads, parks, farms, country estates, playgrounds and cemeteries, which include the following:

Tennis Court and Athletic Field Enclosures; Kennel Yards, Poultry Runs and Special Enclosures for Game and Game Birds; Stock Paddock Fences and Gates; Window and Skylight Guards; Machine and Belt Guards; Stockroom Partitions.

UNCLIMBABLE FENCES.

ORNAMENTAL IRON WORK: Iron Fences and Gates; Grilles; Doors; Elevator Enclosures; Railings; Stairways; Lamps; Marquees; Fire Escapes; Angle Picket Fencing for factory enclosures; Folding Iron Gates; Fire Doors.

Galvanized Wire, Iron and Steel Wire, Rope Wire, "Armco" and "Copperweld" Wire, High Carbon Wire, Barbed Wire, Welding Wire, Special Analysis Wire of all kinds.

## Engineering and Construction Service.

The PAGE STEEL AND WIRE COMPANY maintains an engineering department which is prepared to give expert designing, estimating and engineering service, and will furnish efficient erecting service at all times.

Besides having several groups of service men in various parts of the country, who are highly trained to erect fencing and other Page products, a number of experienced field superintendents are maintained, who



will go to any part of the country and superintend erection, using whatever labor may be furnished by the purchaser.

A complete set of blue prints is always furnished with the material lists, when erection is made outside of this organization.

Catalogues and estimates, including erection, will be furnished at any time, and a letter to either of the factories or any branch office will bring an engineer to your office at once.

## Exclusive Page Features.

All wire that goes into Page fabrics is produced in Page wire mills. For 20 years Page chemists have been studying the grades of wire suitable for different woven wire fabrics.

In the Page open hearth furnaces is produced the steel that is later drawn into wire, which this company knows through these years of experience is best suited to fence and other wire fabrics. Page products are not offered in competition with those of inferior quality.

By exclusive contract with the American Rolling Mill Company, Middletown, Ohio, any wire or rods to be produced from Armco (American Ingot) Iron must be drawn or rolled by the PAGE STEEL AND WIRE COMPANY. It is therefore possible for the Page Company to furnish any of its products in this pure rust-resisting material.

A similar contract with the Copper Clad Steel Company gives the same privilege with respect to "Copperweld" wire.

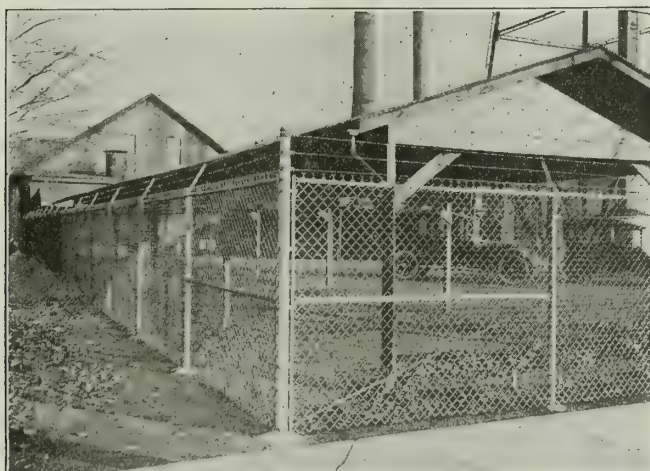


PLATE NO. C-45. PAGE "WIRE-LINK" FENCE ENCLOSING AN INDUSTRIAL PLANT

Page Standard Construction with 6-ft. fabric used



PLATE NO. 56-C 10. PAGE "WIRE-LINK" INSIDE PARTITION

Note self-supporting construction. No light is lost here



**Page "Wire-Link" Protection Fabric.**

Page "Wire-Link" Protection Fabric affords no toe hold for climbing. The twisted barbed tops on each link (as illustrated) and the barbed wire stretched on the extension arms make "Wire-Link" fence a real barrier to the would-be intruder. It is as nearly unclimbable as modern engineering practice can make it. When desired, a knuckled selvage edge can be furnished.

This fabric is supplied in any size mesh from  $\frac{3}{8}$  in. to 6 ins., and with any size wire from No. 16 to No. 4. Any height will be furnished up to 12 ft.

**Page Economy Protection Fabric.**

The need for a lighter but none the less durable protection fence is met in Page Economy Fabric. The pickets are of No. 9 wire and the horizontal cables of No. 12½. Three different meshes are used, 1½, 2¼ and 3 ins. Any height can be furnished up to 10 ft.

All Page fabrics are woven of galvanized wire and are given a dip coat of quick drying, rust-resisting liquid

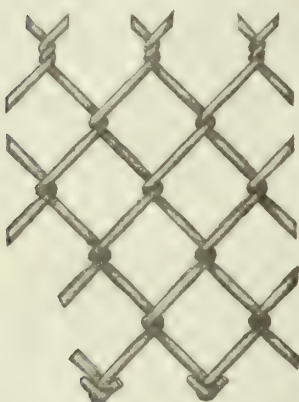


PLATE NO. C. L. PAGE  
"WIRE-LINK" PROTEC-  
TION FABRIC  
2-in. mesh, No. 6 wire

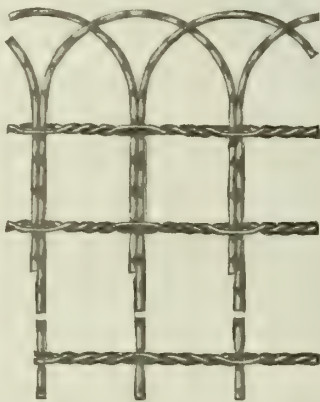


PLATE NO. E. F. PAGE ECON-  
OMY PROTECTION FABRIC  
2¼-in. mesh, No. 9 wire pickets,  
No. 12½ wire cables

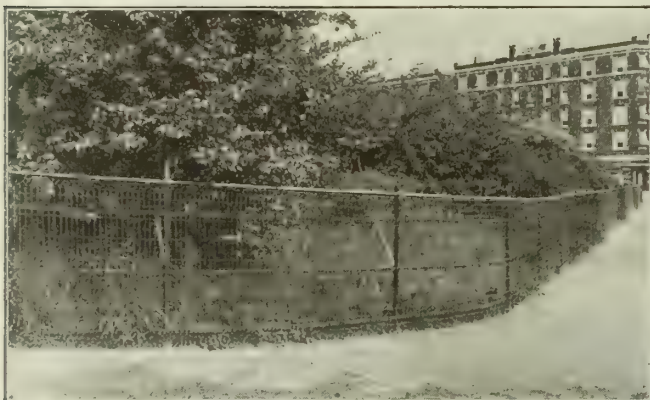


PLATE NO. 542. PAGE ECONOMY FABRIC LOW PARK FENCE  
Fittings for many other uses can be furnished

after weaving. They are often painted as well at the request of clients.

Note strength of bracing and post construction in illustrations. Post tops will be furnished with or without arm and top rail. Write for catalogues showing suitable constructions in detail for all uses.



PLATE NO. C-40. PAGE STANDARD  
CONSTRUCTION

From left to right are shown: gate post, 4 ins. o. d.; end and corner post, 2½ ins. o. d.; line post, 2¾ ins. o. d.; top rail, 1½ ins. o. d.; line post U-bar section (optional), 1½ by 2½ ins.; line post angle section (optional), 2 by 2 by ¼ in.



PLATE NO. C-39.  
PAGE STAND-  
ARD PIPE POST  
TOP WITH  
BARBED WIRE  
ARM

T-iron arm is riveted into heavy base which insures against breakage. Top fits over post, not into it, thus allowing no moisture to enter post



PLATE NO. C-37.  
PAGE STANDARD  
PIPE POST

Showing concrete base, galvanized iron bands for fastening fabric, and moisture-proof, non-breakable barbed wire arm with opening for top rail

Recommended for permanency, durability, strength and neat appearance.



PLATE NO. 56-C 23. PAGE "WIRE-LINK" FENCE ENCLOSING  
SCHOOL PROPERTY

This type of construction especially suited to parks, country estates, schools, etc.



PLATE NO. C-50. PAGE "WIRE-LINK" FENCE ENCLOSING INDUSTRIAL PLANT

Note the ready adaptability of this fence in passing a building so close to the erection line that no barbed wire arm could be used. The wrought iron top on single gate suggests possibilities for ornamentation



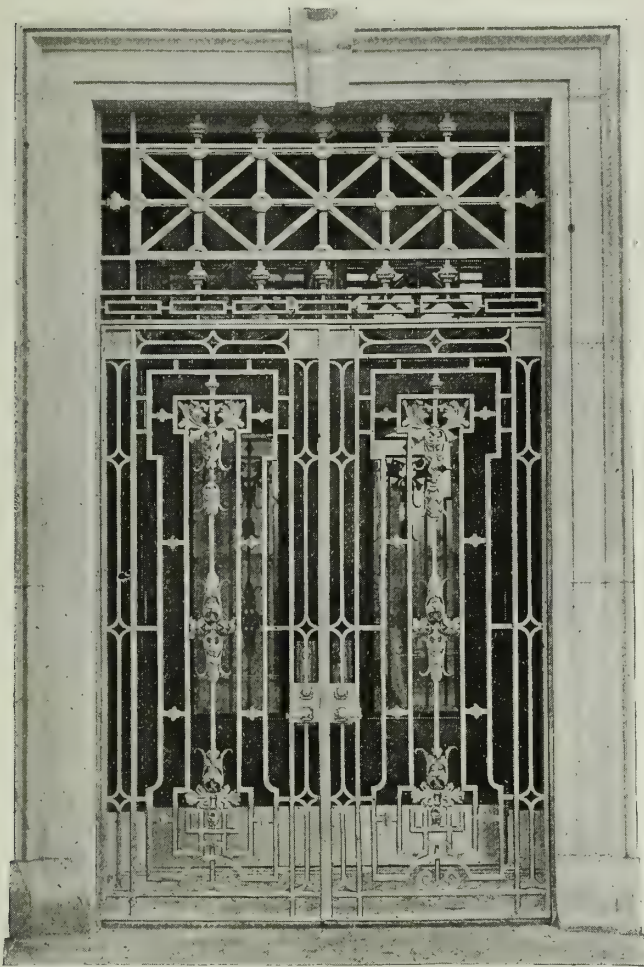


PLATE NO. 53125. DOORS FOR DETROIT SAVINGS BANK  
(BRANCH), DETROIT, MICH.  
HARRY J. RILL, Architect

#### Architectural Iron and Industrial Iron Fence.

The PAGE STEEL AND WIRE COMPANY has developed an efficient wrought iron department. A client may be assured that he will receive none but the best in workmanship and quality of materials. The ironworkers in Page shops are men of long experience, and the designers are artists of wide tastes, who are thoroughly competent to meet intelligently the demands of the architect, or suggest satisfactory designs to the man who is building for himself.

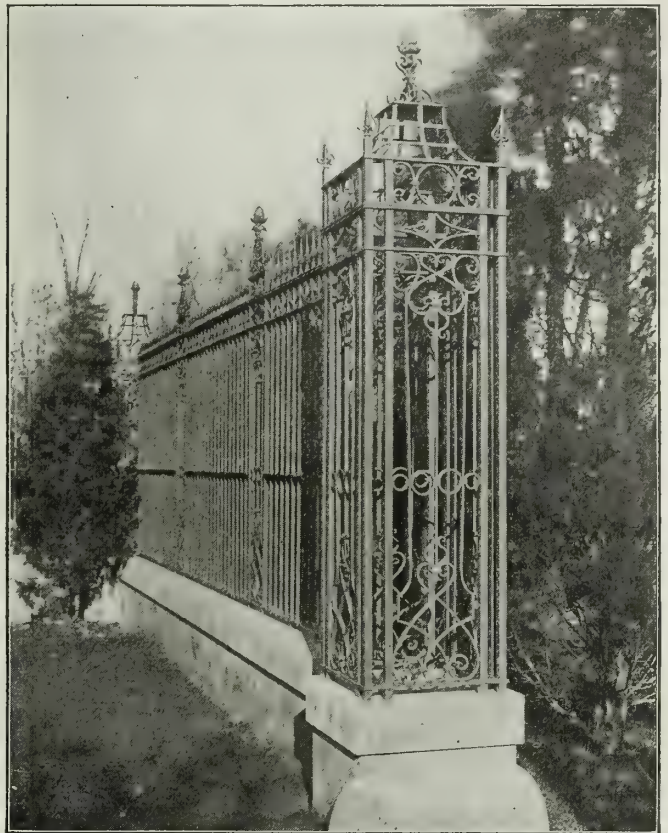


PLATE NO. 53134. DRIVEWAY POST AND FENCE, RESIDENCE  
OF MRS. HENRY STEPHENS, GROSSE POINTE, MICH.  
CHARLES A. PLATT, Architect

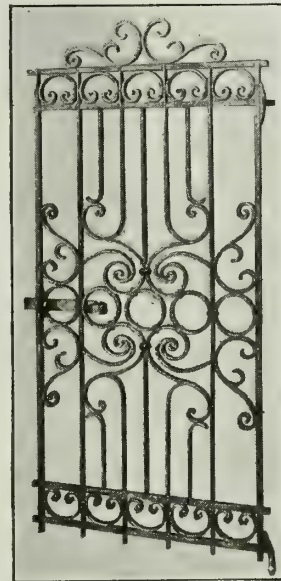


PLATE NO. 53143



PLATE NO. 53150



PLATE NO. 5323. A SIMPLE IRON FENCE, WELL SUITED TO  
THE OFFICE AND DRIVE ENTRANCE OF AN INDUSTRIAL  
PLANT



PLATE NO. 142. ANGLE IRON PICKET FENCE SHOWING  
CONCRETE POSTS IN USE. ALSO DOUBLE GATE



ESTABLISHED 1858

**J. W. FISKE IRON WORKS**

Ornamental Iron, Brass, Bronze, Wire and Zinc Work

69-71 Park Place  
NEW YORK, N. Y.**Products.**

FENCING and ORNAMENTAL METAL WORK as follows:

Andirons and Fire Sets; Aquaria; Automobile Washers; Bird Bath Fountains; Brass and Bronze Railing; Bronze Tablets; Bull Pens; Cesspool Frames and Covers; Chain Link Fencing; Clean-out Doors; Climproof Galvanized Wire Fencing; Cork Brick; Cow Stalls; Drinking Fountains; Entrance Gates; Fire Escapes; Flagpole Bases, Balls and Trucks; Folding Gates; Fountains and Jets; Game Enclosures; Iron and Pipe Railing; Iron Fencing; Kennel Yards; Lamp Posts and Brackets; Leader Shoes; Lightning Rods; Manhole Frames, Covers and Gratings; Marquises; Poultry Runs; Park Benches; Paddock Enclosures; Road Boxes (cast iron); Sanitary Stall Drains; Settees, Chairs and Tables; Spiral Stairs; Stable Fittings; Street Sign Posts; Sundials and Pedestals; Swimming Pool Equipment; Tennis Court Enclosures; Traffic Standards; Tree Guards; Trellises; Trench Covers and Curbing; Turnstiles; Vases; Vestibule Doors; Weather-vanes; Wheel Guards; Wire Office Railings and Partitions; Wire Window Guards.



PLATE 3001FS. RAILING AND GATES OF CLARK ESTATE, COOPERSTOWN, N. Y.

Height, 6 ft. 6 ins.; uprights,  $\frac{7}{8}$  in. square; rails, 2 by  $\frac{3}{4}$  ins. flat; panel posts,  $1\frac{1}{4}$  ins. square, set in stone.  
Erected by J. W. FISKE IRON WORKS 27 years ago, photograph taken in 1915. Note perfect alignment



KENNEL YARD ENCLOSURE, HAMILTON FARM, OWNED BY JAMES COX BRADY, GLADSTONE, N. J.

Height, 72 ins. "Set-in-concrete" posts, all galvanized; can be made any height, and in various sizes and designs of mesh

**Co-operative Service.**

The J. W. FISKE IRON WORKS will submit estimates for products either delivered or erected complete. A well organized engineering staff is maintained, and contracts for designing and erection complete are made when desired. Co-operation with the architect, contractor or owner in executing usual specifications is a specialty.

Where material is delivered only, instructions and drawings will be furnished to enable local mechanics to erect the work. Sketches and designs will be furnished on request, and full information as to sizes and weights of material will be given.

This has been a fixed policy with this company throughout more than half a century of successful manufacture and marketing of ornamental metal work.

**Quality.**

The quality of Fiske products is best evidenced by installations for government, states, cities and leading commercial organizations, and upon the private estates of America's most cultured and critical people.



ENTRANCE GATES, RAILING AND LAMPS, A. M. BOOTH ESTATE, GREAT NECK, L. I., N. Y.

Designed and erected by J. W. FISKE IRON WORKS



PLATE 3213FS. MAIN ENTRANCE ESTATE FREDERICK G. BOURNE, OAKDALE, L. I., N. Y.  
ERNEST FLAGG, Architect



**"Set-in-concrete" Posts.**

All fence posts are set in concrete footings and this construction is strongly recommended by this company. This method keeps the posts from being thrown out of alignment by frost and prevents them from rusting off at the ground line.

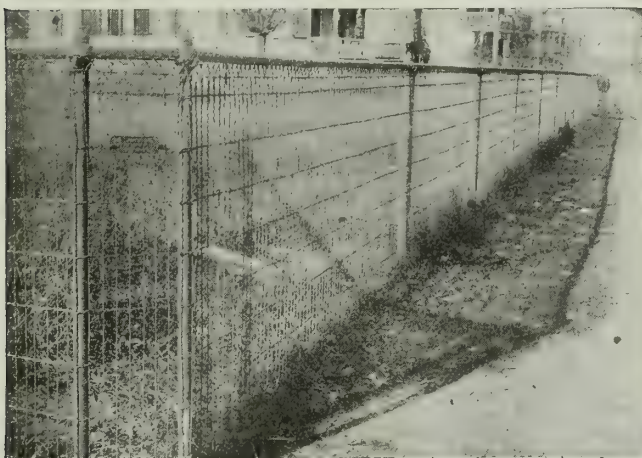


PLATE 3050FS. WOVEN WIRE LAWN FENCE, PASSAIC, N. J.

A neat and substantial wire fence, thoroughly galvanized. Can be made in heights up to 8 ft.; mesh, 1½ ins.; 2¼ or 3 ins. "Set-in-concrete" posts



CLIMBPROOF CHAIN LINK FENCE AND GATES, HANDY AND HARMON CO., BRIDGEPORT, CONN.

Height, 72 ins., mesh 2 ins., No. 6 galvanized wire. "Set-in-concrete" galvanized posts, with malleable iron tops and arms. Galvanized barbed wire above. This fence is absolutely climbproof and is made in any height, mesh and size wire



PLATE 3307FS. TENNIS COURT ENCLOSURE, NORTH HUDSON PARK, HUDSON PARK COMMISSION

CHAS. N. LOWRIE, Architect

Chain link fabric, "Set-in-concrete" posts, all galvanized



ENTRANCE GATES AND RAILING, VALE CEMETERY, SCHENECTADY, N. Y.

Designed and erected by J. W. FISKE IRON WORKS

**Stable Fittings.**

J. W. FISKE IRON WORKS make a specialty of sanitary fittings for both horses and cattle and are pleased to co-operate with architects in writing specifications.



STABLE FITTING FURNISHED AND INSTALLED IN J. V. THOMPSON'S STABLE, UNIONTOWN, PA.

**Installations, Partial List.****PROMINENT STABLES**

Samuel J. McRoberts, Mount Kisco, N. Y.  
William Ziegler, Noroton, Conn.  
A. M. Booth Estate, Great Neck, L. I., N. Y.  
Col. Oliver H. Payne, West Park, N. Y.  
Horse Exhibit Building, State Fair Grounds, Syracuse, N. Y.  
James Cox Brady, Gladstone, N. J.  
John D. Rockefeller, Pocantico Hills, N. Y.  
Bryce Wing, Roslyn, L. I., N. Y.  
T. Ashley Sparks, Syosset, L. I.  
Arthur Curtis James, Newport, R. I.  
James A. Farrell, South Norwalk, Conn.  
William R. Grace, Westbury, L. I., N. Y.  
Alfred Vanderbilt, Portsmouth, R. I.

**IRON AND WIRE FENCING, TENNIS COURTS, ETC.**

Mrs. H. McKay Twombly, Newport, R. I.  
Jos. VanVleck, Jr., Montclair, N. J.  
Col. Oliver H. Payne, West Park, N. Y.  
James Cox Brady, Gladstone, N. J.  
Hudson County Park Commission, Jersey City, N. J.  
Mathieson Alkali Works, Saltville, Va.  
Mills Woven Cartridge Belt Co., Worcester, Mass.  
New York Air Brake Co., Watertown, N. Y.  
United Piece Dye Works, Lodi, N. J.  
Bausch & Lomb Co., Rochester, N. Y.  
Dennison Mfg. Co., Framingham, Mass.  
Marconi Wireless Co., Hatteras, N. C.  
Standard Paint Co., Bound Brook, N. J.  
Public Service Corporation, Seven Substations  
Fantinkill Cemetery, Ellenville, N. Y.  
St. Elizabeth Convent, Morristown, N. J.  
Cobleskill Agricultural Society, Cobleskill, N. Y.  
New England Cotton Yarn Co., Holyoke, Mass.  
J. & W. Jolly, Inc., Holyoke, Mass.



# W. A. SNOW IRON WORKS, INC.

32 Portland Street  
BOSTON, MASS.

SHOPS: CHELSEA, MASS.

## Products.

IRON and WIRE FENCES and RAILINGS; ENTRANCE GATES; ORNAMENTAL IRON WORK; "UNCLIMBABLE CHAIN LINK FENCES" for park, cemeteries, playgrounds, factories, schools, institutions, water works and mills.

Iron Stairs, Fire Escapes, Folding Gates, Iron Spiral Stairs and Iron Balconies, Wire Partitions for Storehouses and Tool Rooms, Window Guards and Elevators.

## Estimates.

The W. A. SNOW IRON WORKS, INC., is always pleased to furnish estimates for work erected complete, all of which is done by experienced men.

Special sketches and drawings are made to meet special requirements and drawings of appropriate design are submitted at short notice.

If desired, this company can furnish, survey and do the entire work complete.



PLATE 2027. ENTRANCE GATES, ESTATE OF WILLIAM H. MOORE,  
PRIDES CROSSING, MASS.  
Width between piers 14 ft.; height at center of gates 6 ft.

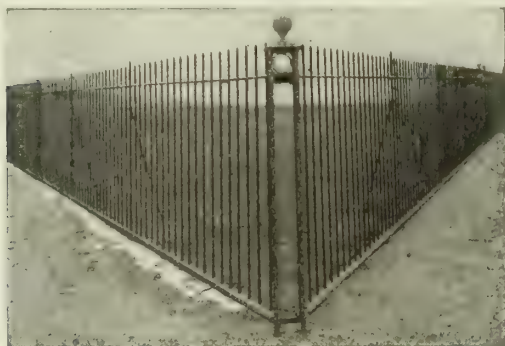


PLATE 2037. RAILING, BEACH BLUFF, SWAMPSCOTT, MASS.  
Railings made from 4 ft. to 6 ft. high. Pickets  $\frac{5}{8}$  or  $\frac{3}{4}$  in. square, rails  $2 \times 1\frac{1}{4}$  in. channel. Sections 9 ft. long and secured by cast iron anchors



PLATE 1818. ENTRANCE GATES, ESTATE OF FRANCIS SKINNER,  
DEDHAM, MASS.  
GUY LOWELL, Architect  
Width between piers 16 ft.; height at center 16 ft.



PLATE 1012. IRON RAILING, ESTATE OF LARZ ANDERSON,  
BROOKLINE, MASS.  
Height, 8 ft. 6 ins. Panel post 20 ins. wide, placed 14 ft. apart



PLATE 2009. WROUGHT IRON FENCE, CATHEDRAL OF HOLY  
CROSS, BOSTON, MASS.



**"Unclimbable Chain Link Fences."**

Made of best quality galvanized steel wire No. 6, mesh 2 ins. Absolutely unclimbable. The three strands of barbed wire which are fastened on inclined arms and attached to the top of posts together with the barbed pickets at both top and bottom adds much to the protection.

**SPECIFICATIONS**—*Line Posts*—2½ in. outside diameter galvanized pipe 8 ft. apart.

*End and Corner Posts*—3 in. outside diameter galvanized pipe.

*Top and Rail*—1⅜ in. outside diameter galvanized pipe.

*Standard Height*—6 ft. above grade with additional 1 ft. of barbed wire.

**Catalogues.**

Catalogues of any of the work done by W. A. SNOW IRON WORKS, INC. sent on application.

**Installations.****"UNCLIMBABLE CHAIN LINK FENCE"**

U. S. Government Armor Plant, Charleston, W. Va. 16,000 ft.  
U. S. Government Storage Depot, Boston, Mass. 2,000 ft.  
City of Boston, Mass. 20,000 ft.  
City of Cambridge, Mass. 7,000 ft.

**FENCES FOR PUBLIC WORKS**

Metropolitan Park Commission of Massachusetts, 20,000 ft. of heavy iron railing  
City of Boston Park and Recreation, 15,000 ft. of heavy iron railing  
City of Auburn, Me., Water Works, 750 ft. of iron fence  
City of Revere, Mass., Water Works, 900 ft. of iron fence  
Watertown Arsenal, U. S. Government, Watertown, Mass.  
Town of Westfield, Mass., 1,000 ft. iron bridge railing

**FENCES FOR CEMETERIES**

Forest Hills Cemetery, Jamaica Plain, Mass., 8,000 ft. heavy iron railing  
Harmony Grove Cemetery, Salem, Mass., 7,000 ft. fence and entrance gates  
Forest Glade Cemetery, Somersworth, N. H., 4,500 ft. heavy iron fence  
Wildwood Cemetery, Winchester, Mass., 1,000 ft. chain link fence

**FENCES FOR FACTORIES**

Edison Electric Illuminating Co., Massachusetts Avenue, Boston, Mass., 3,500 ft. wrought iron fence  
United Drug Co., Boston, Mass., 1,200 ft. of iron fence and gates  
Fairbanks Scale Co., St. Johnsbury, Vt., 4,000 ft. of chain link fence with barbed wire attachments  
Holtzer Cabot Electric Co., Boston, Mass., 3,000 ft. of iron fence  
Bates Mfg. Co., Lewiston, Me., 1,200 ft. of chain link fence  
Sharp Mills, New Bedford, Mass., 2,000 ft. of heavy iron fence  
Winchester Repeating Arms Co., New Haven, Conn., 1,500 ft. ornamental iron fence  
Bryant Electric Co., Bridgeport, Conn., 1,000 ft. ornamental fence  
Plume & Atwood Mfg. Co., Waterbury, Conn., 500 ft. heavy chain link fence

**ORNAMENTAL IRON WORK**

State House, Commonwealth of Massachusetts, Boston, Mass.  
Henry Clay Frick House, Prides, Mass.  
Widener Memorial Library, Harvard College, Cambridge, Mass.  
Harvard Music Building, Harvard College, Cambridge, Mass.  
Massachusetts State Normal School, Framingham, Mass.  
Phillips Exeter Academy, Exeter, N. H.  
Forsyth Dental Infirmary, Boston, Mass.  
Bangor Real Estate Trust Co., Bangor, Me.  
Lyman F. Gordon House, Worcester, Mass.  
Larz Anderson House, Brookline, Mass.  
Gillette Safety Razor Building, South Boston, Mass.



PLATE 2039. "UNCLIMBABLE CHAIN LINK FENCE"

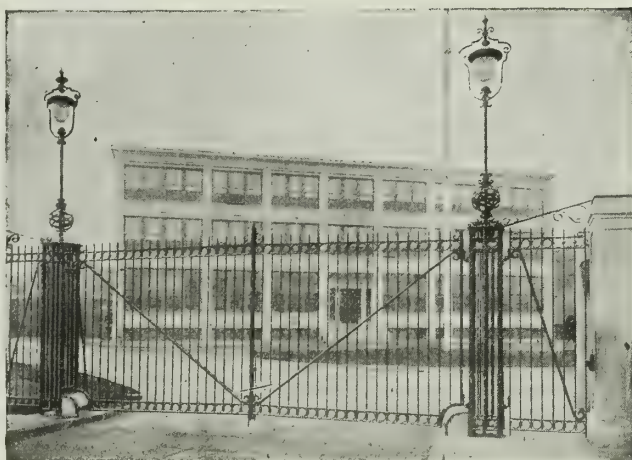


PLATE 2034. ENTRANCE GATES, EDISON ELECTRIC LIGHT CO., BOSTON, MASS.

BIGELOW & WADSWORTH, Architects  
Width between piers, 18 ft.; height, 8 ft. 6 ins.



PLATE 1017. RAILING, FOREST HILLS CEMETERY, JAMAICA PLAIN, MASS.

Height, 7 ft. from grade. Pickets, ¾ in. square made in 9-ft. sections. Panel post, 12 ins. wide and 40 ft. apart. Length of fence, 8,000 ft.



# THE STEWART IRON WORKS COMPANY

Manufacturers of Artistic Iron Fences and Gates

680 Stewart Block  
CINCINNATI, OHIO

## Products.

PLAIN and ORNAMENTAL IRON GATEWAYS and FENCES; IRON RAILINGS.

Iron Grilles, Bronze and Iron Lanterns and Lamp Standards, Lawn Furniture, General Ornamental Iron and Wire Work, etc.

## Facilities.

A factory containing 350,000 sq. ft. of floor space and covering an area of 8 acres; an equipment of the most modern machinery; an experience of more than 30 years; a complete organization of specialists in engineering and landscape architecture, and a large force of skilled mechanics and draughtsmen. This equipment insures the highest standard of work and enables THE STEWART IRON WORKS COMPANY to give prompt service at proper prices.

## Specialties.

This company specializes in high grade ornamental iron fences and entrance gates, built either from designs of its own draughtsmen or from drawings and specifications submitted by customers or their architects.

Particular study has been given to correct designs, proportion and construction for enclosures and entrances of country houses and estates, as well as for those appropriate for the simpler or more pretentious town house.

Special attention has been paid to correct enclosures of yards in rear of city and suburban dwellings, and the often overlooked advantages of simple and artistic fences for these enclosures that provide security from intrusion, and eliminate the feeling of confinement produced by solid or wooden fences; that give the best results by the greatest use of available daylight; that produce no dark, damp and germ growing corners for the dangerous concealment of rubbish; and that make community gardens in the rear of city dwellings where cold, dark, fire inviting and dangerous wood box stalls too often exist.

Specializing in this field has particularly qualified this firm to produce a high standard of product, to suggest wisely as to the types best adapted to particular conditions, and to aid in the most satisfactory and economical solution of the various fencing problems that arise.

All types of plain and ornamental fences and gates, light or heavy, for factories, etc.

## Designs.

The illustrations shown herewith are reductions from parts of the nearly 150 designs shown in the company's "Book of Views" and are presented for the assistance of prospective purchasers in the selection of a design suitable to each individual's particular purpose. Further information will be sent on application.

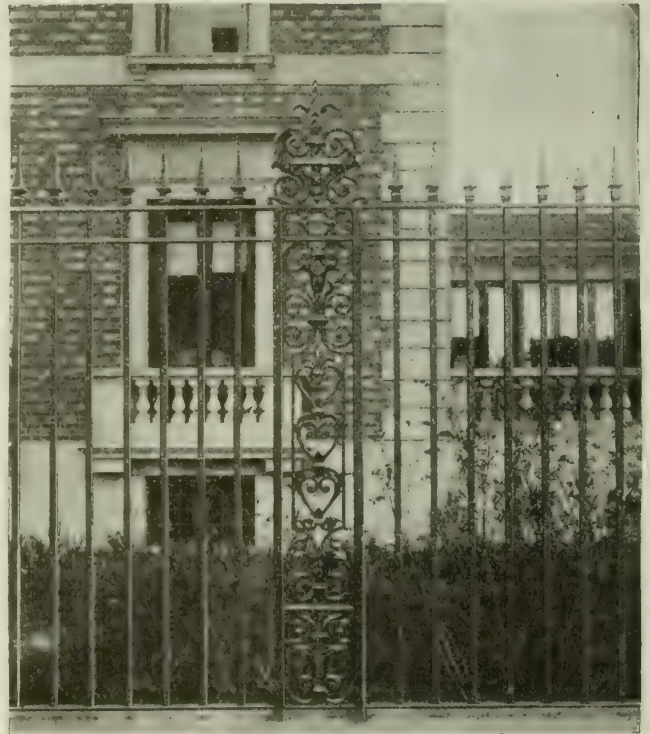


PLATE No. 7850  
DETAIL OF FENCE AND POSTS FOR THE  
MAURICE ROTHSCHILD RESIDENCE, CHICAGO, ILL.



PLATE No. 7848  
ENTRANCE GATES FOR THE  
MAURICE ROTHSCHILD RESIDENCE, CHICAGO, ILL.  
HOLABIRD & ROCHE, Chicago, Architects





PLATE No. 7053

ENTRANCE FOR THE C. D. McDOUGALL RESIDENCE,  
AUBURN, N. Y.

Gates and fence designed by THE STEWART IRON WORKS COMPANY

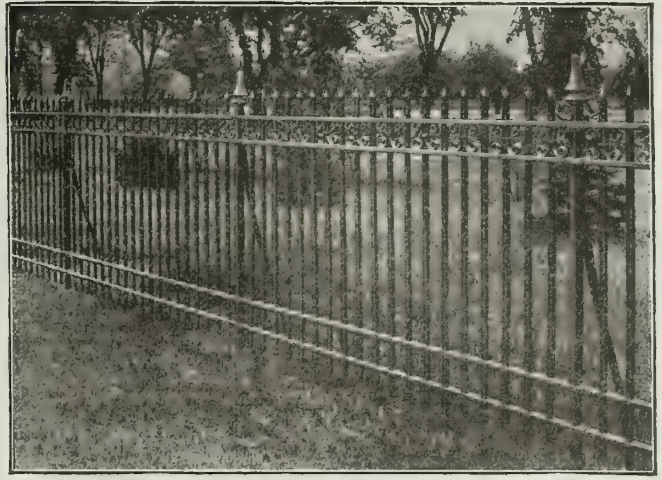


PLATE No. 8495

FENCE FOR TOWN HOUSE, COUNTRY ESTATE OR PARK  
Can be made any height or size of pickets



PLATE No. 5638

ENTRANCE TO ESTATE OF HENRY STEERS,  
PORT CHESTER, N. Y.

Gates can be made any height or width



PLATE No. 9207

ORNAMENTAL IRON FENCE SURROUNDING THE RESIDENCE  
OF C. H. WILLS, DETROIT, MICH.  
ALBERT KAHN, Detroit, Architect

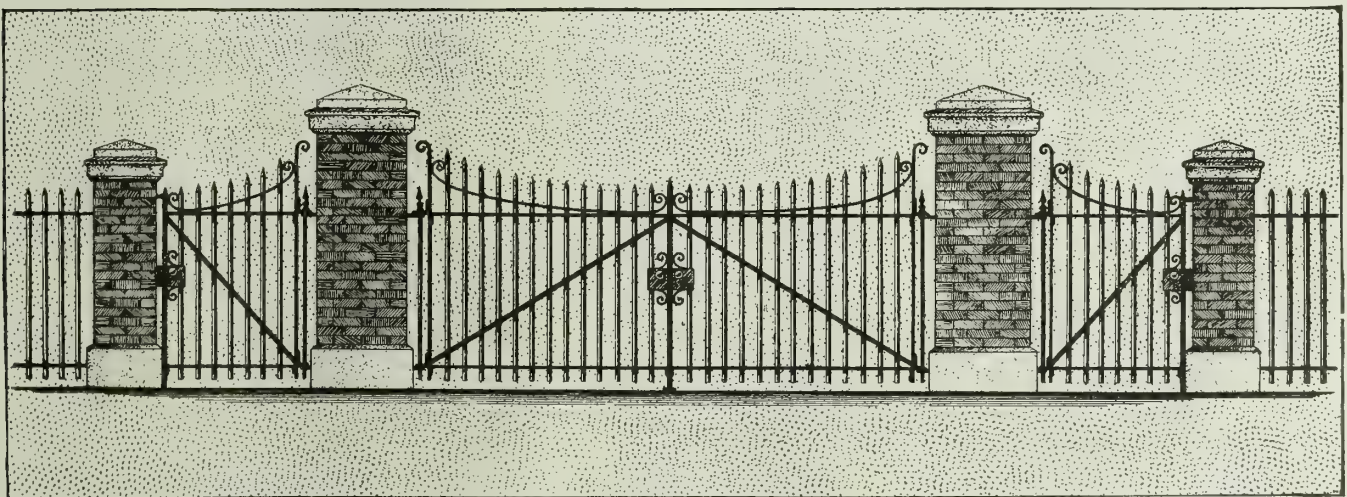


PLATE No. 50-A

ENTRANCE WITH DOUBLE DRIVE GATE AND SMALL SIDE GATES

Double Drive Gate—Standard widths, 10, 12 and 14 ft. wide between posts; constructed of  $\frac{5}{8}$ -,  $\frac{3}{4}$ - and  $\frac{7}{8}$ -in. pickets. Walk Gate—Standard widths, 3 ft. 6 in. and 4 ft. wide between posts; constructed of  $\frac{5}{8}$ -,  $\frac{3}{4}$ - and  $\frac{7}{8}$ -in. pickets

Factory fences and gates of iron (light or heavy) in many designs



# WILLIAM R. PITT COMPOSITE IRON WORKS

215-219 West 26th Street

NEW YORK, N. Y.

TELEPHONE:

CHELSEA 3100

## Products.

Manufacturers of FOLDING GATES and GUARDS for every purpose:

- "Pitt" Bostwick Folding Gates
- "Pitt" Lazy Tong Folding Gates
- "Pitt" Composite Folding Gates
- "Pitt" Self-closing Elevator Gates
- "Pitt" Driveway and Entrance Gates
- "Pitt" Car Gates and Door Operating Devices
- "Pitt" Window Guards
- "Pitt" Balance Doors and Receding Booth-door Devices

WROUGHT IRON, BRASS OR BRONZE WORK:

- Ornamental Iron Work
- Bank and Office Railings
- Artistic Grille Work
- Marquises
- Circular Stairs
- Iron and Glass Doors
- Wire Guards and Partitions, etc.

## Folding Gates and Guards a Specialty.

This company is the original manufacturer of the "Bostwick" gate, and the originators of most of the

standard folding gates, developing their uses through specialization. This department is therefore, by training, experience and facilities, prepared to meet the demands of architects, builders and the iron trade.

"Pitt" gates are internationally famous for their quality, and are found in nearly every State and many foreign countries.

## Quality of Work.

Every "Pitt" product is of the highest grade workmanship and materials, economically produced under modern conditions.

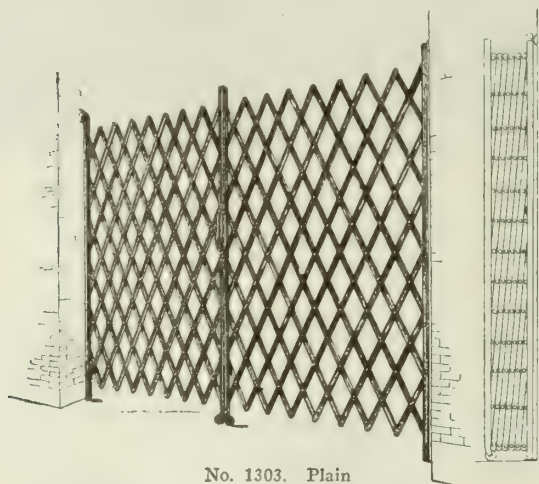
## Specifications.

Copy the number and description of gate desired from the illustrations on this and the page following, or submit requirements for our advice and special blue prints or designs.

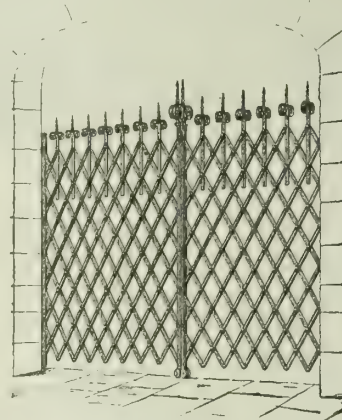
## Estimates.

FOLDING GATES—Send plans and specifications, or a sketch showing width and height, and where gate is to set. State purpose for which gate is intended.

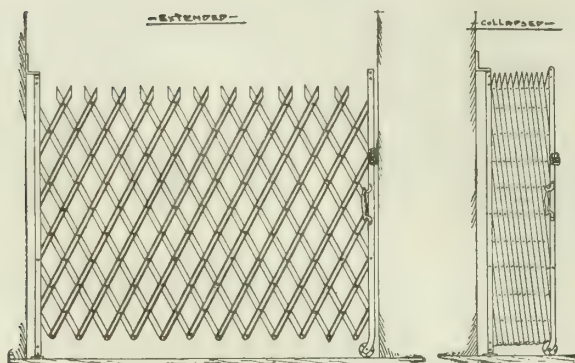
ORNAMENTAL IRON WORK—Send plans and specifications, or sketch, stating requirements.



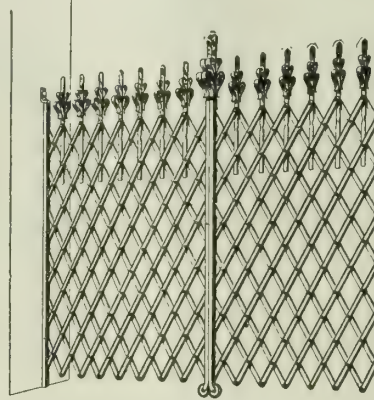
No. 1303. Plain



No. 1254. With Ornamental Pickets



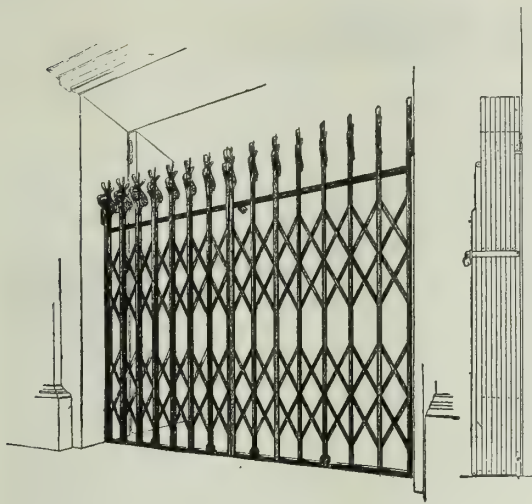
No. 1303A. With Pointed Scissors Top



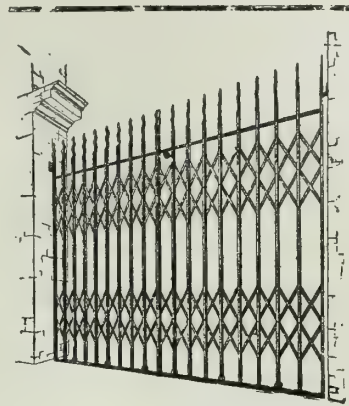
No. 1246. With Ornamental Pickets and Ball Rivets

"PITT" LAZY TONG FOLDING GATES FOR ENTRANCES, ETC.

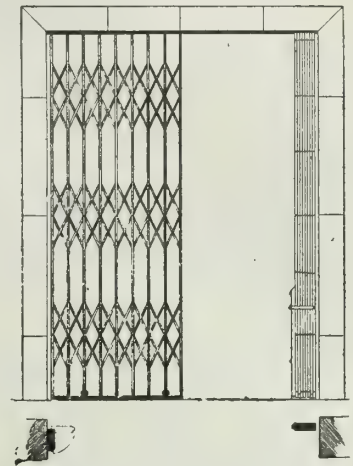




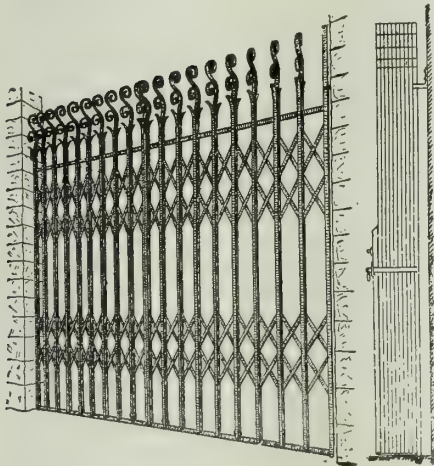
No. 1259. "Pitt" Bostwick Folding Gate  
With wrought scroll pickets



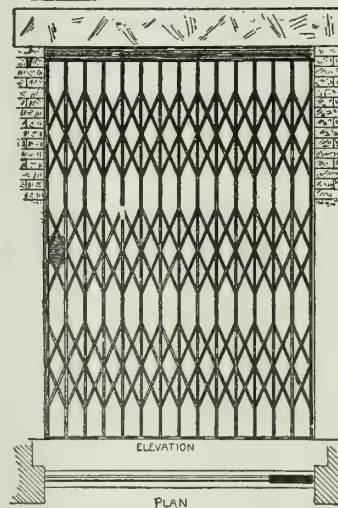
No. 1262. "Pitt" Bostwick Folding Gate  
With cast flame pickets



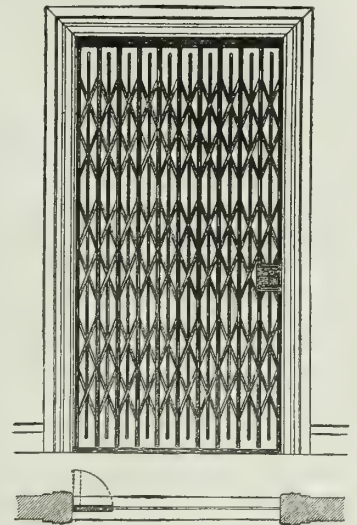
No. 1284. "Pitt" Bostwick Folding Vestibule or Window Gate  
With stationary top and hinged lifting bottom tracks



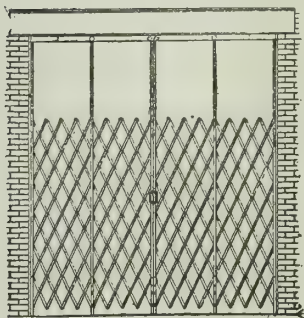
No. 1260. "Pitt" Bostwick Folding Gate  
With wrought scroll pickets



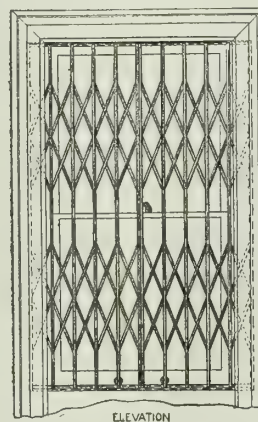
No. 1261. "Pitt" Bostwick Folding Elevator Gate



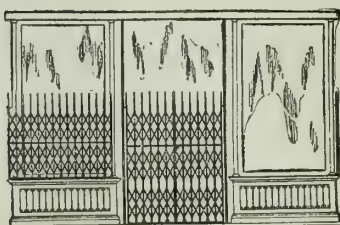
No. 1245. Close Mesh "Pitt" Bostwick Folding Elevator Gate  
For shaft openings (patented)



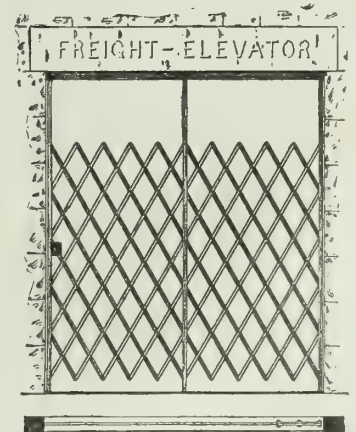
No. 1302. "Pitt" Lazy Tong Gate  
for Driveway Entrances



No. 1267. "Pitt" Bostwick Folding Window Guard  
With stationary tracks top and bottom



No. 1273. "Pitt" Bostwick Gate and Window Guard  
For store front



No. 1300. "Pitt" Lazy Tong Folding Elevator Gate

THESE ILLUSTRATIONS SHOW STANDARD TYPES OF GATES  
Dozens of other designs are shown on special blue prints. Special designs submitted on request



# ARKANSAS SOFT PINE BUREAU

LITTLE ROCK, ARK.

## Products.

ARKANSAS SOFT PINE INTERIOR FINISH, stock and special patterns; QUARTERSAWN (EDGE GRAIN) FLOORING; MOULDINGS; Soft, Non-splitting PLASTER LATH; COMMON LUMBER.



## Individual Advantages.

Arkansas Soft Pine is the highest quality short leaf yellow pine, known botanically as *Pinus Enchinata*. Because of certain definitely individual qualities—namely, freedom from excessive pitch, light weight, soft lustrous texture and fine grain—the wood has received a marked preference among architects, carpenters and builders, owing to its “workable” character. It more closely resembles the Northern White Pine than any of the southern pines. Because of its tough fibered, non-resinous make-up, it yields readily to edged tools and does not “gum” saws, knives or chisels.

## General Uses.

Arkansas Soft Pine in the common grades supplies an all round framing material for residences, stores, apartments, churches and buildings of like character.

## Specific Uses.

**DEPENDABLE WOOD LATH**—Arkansas Soft Pine lath are very light in weight and color; are strictly uniform in manufacture; may be had  $\frac{3}{8}$  in. by  $1\frac{1}{2}$  ins. by 32 ins. or 48 ins. long; and will not split, warp, buckle nor twist. They are thoroughly dried and can be relied upon to supply a dependable wall backing.

**FLOORING**—Arkansas Soft Pine flooring is manufactured in approximately 10 grades. Edge grain is especially desirable and admits of no pieces in which the angle of the grain exceeds  $45^\circ$  from vertical to any point. The most satisfactory pattern measures  $\frac{13}{16}$  in. by  $2\frac{1}{4}$  ins. face and usually runs 8 ft. to 20 ft. in length, the greatest percentage being 10 ft. to 16 ft. In the finished floor, longer lengths reduce number of end joints as compared to hardwood flooring, which in turn must be accepted as short as 18 ins. Finished floor will take any desired treatment in stain, varnish, gloss or wax and produces a hard wearing floor of attractive appearance.

**SATINLIKE INTERIOR TRIM**—It is from the thick, clear, sap wood with its fine lustrous texture and virtual absence of resinous oils, that the highest grade of interior trim is manufactured, and it is because of the large percentage of this clear material, peculiar to South Central Arkansas timber, that Arkansas Soft Pine attains its maximum of value, merit and beauty when employed as interior trim.

## Individual Treatment.

Contrary to the necessary preliminary shellacking or filling of certain pine, which is required to neutralize the rosin or inherent oily qualities, the stains or flat white coats are applied *directly* to the raw surface of Arkansas Soft Pine first. Thus the stain or white lead is evenly absorbed and a perfectly smooth base upon which to build up the final coats is established.

**PROPERLY BALANCED ABSORPTION**—Any prejudice which may have existed against soft woods as interior trim has been due in part to the tendency of some of

them to overabsorb varnishes or enamels. Arkansas Soft Pine is not of that corklike softness which literally drinks up oil and varnish. The tough fiber prevents just that possibility; moreover, the finished surface will hold its lustre permanently.

## For White Enamel.

Particular emphasis is laid on the merit of this wood as a base for white enamel. The absence of rosin or oil content insures against any possibility of staining the white surface from underneath. The close fiber takes the flat white coat with a perfectly uniform absorption, nor is any trouble experienced with raised grain, as the fine texture of the wood has no such tendency.

## Proper Sanding.

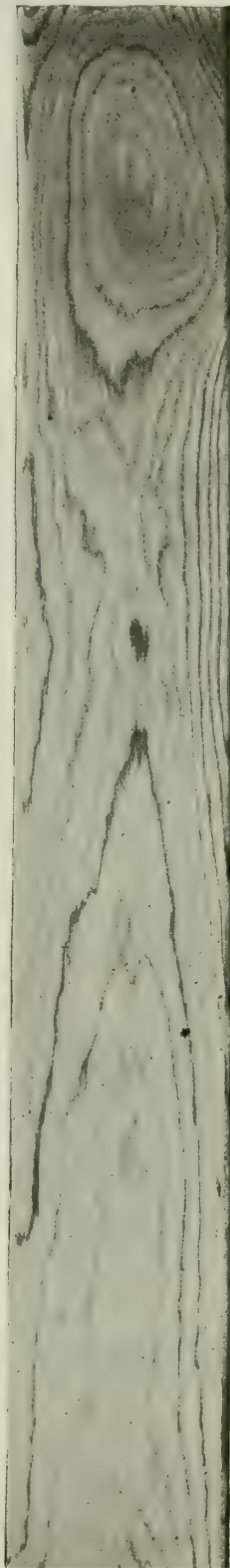
A prime prerequisite is that flat faced finish shall be machine sanded. If the local lumber yard is not equipped with such apparatus, the work may be done at a nominal charge at any first class planing mill. This method is preferable, for it insures a smooth polished surface on the natural wood and eliminates the liability of scuffing the sap sections as is so often done when worked on the bench by hand.

## Source of Supply.

Arkansas Soft Pine attains its greatest degree of perfection in the south central section of the state for which it is named. Certain favorable geological, topographical and climatic elements contribute to this condition; as for example, soil properties, rain fall and drainage. The ARKANSAS SOFT PINE BUREAU is composed exclusively of manufacturers whose plants are located in this identical region. The product of these mills bears the trade-mark appearing on this page. To be sure of genuine Arkansas Soft Pine, all stock should bear this trade-mark.

## Information.

Architects Manual containing concise facts, finishing specifications, moulding designs, grading rules. Booklet, “Arkansas Soft Pine, How to Finish and Paint It.” Finished samples.



TYPICAL GRAIN OF SLASH SAWN ARKANSAS SOFT PINE CASING  
From an actual photograph



# SOUTHERN PINE ASSOCIATION

J. E. RHODES, SECRETARY-MANAGER.

Inter-State Bank Building  
NEW ORLEANS, LA.

## Product.

SOUTHERN YELLOW PINE.

## Membership.

The SOUTHERN PINE ASSOCIATION is composed of manufacturers of Southern Yellow Pine in the States of Texas, Oklahoma, Missouri, Arkansas, Louisiana, Mississippi, Alabama, Georgia and Florida, whose product represents one-half of the entire output of yellow pine in the United States, or over six billions of feet annually.

A list showing names and addresses of subscribers and locations of their mills will be furnished on request.

## Uses.

Southern yellow pine is the backbone of the building industry. Of all the lumber consumed in America, 36% is that wood, and enormous quantities are used in Europe for every form of construction. Its distribution over the world is limited only by the restrictions of facilities for transportation. Bulletin 99 of the United States Department of Agriculture, "Uses of Commercial Woods of the United States," says of Southern yellow pine: "In a large part of the country it is so universally used that there are few places of importance it does not fill." Its good qualities are so varied, and its adaptability so universal, that it has acquired the title, "The Wood of Service." Its uses range from toys to trestles; from the most delicate interior trim and finish to the giant timbers of the heaviest construction.

The supply of yellow pine timber is adequate for many years.

## Structural Timbers.

Southern yellow pine is of the first importance in every type of heavy and mill construction. No other material possesses in such perfect proportion the qualities of cross-breaking strength, crushing strength and resistance to shear. It is universally used for trestles, beams, piling, trusses, sleepers, sills, columns, ties, rafters—wherever strength and rigidity are requirements. In character the wood is heavy, dense, strong; the grain fine, even, straight; durable, in contact with the soil.

## Light Construction.

Southern yellow pine is the "all-purpose" wood in home building and light construction, supplying framework, siding, flooring, ceiling, sheathing, lath, shingles, sash and doors, newel posts, rails, spindles; in a word, every variety of dressed or turned exterior or interior finish and trim. Its remarkable strength makes it particularly suitable for framing; durability and workability fit it especially for use as siding and all exterior trim. The texture is such that it is suited to the finest joinery, and the handsome grain makes it highly acceptable for use as interior trim.

When the materials are applied in a workmanlike manner, Southern yellow pine takes and holds perfectly paints, stains, enamels and varnishes. Special instruction as to obtaining the best results in finishing may be obtained free of charge from the Association.

## Creosoted Wood Block Paving.

Municipal engineers everywhere now are agreed that the ideal pavement is the modern pavement of



TRADE-MARK

Southern yellow pine creosoted wood blocks. It is noiseless, sanitary, smooth, dustless, resilient. In endurance it has repeatedly proved superior to granite blocks, bricks and asphalt; and its upkeep, or maintenance, is the least of any paving material known.

For floors in factories, mills, warehouses, driveways, stables, and on bridges and viaducts, Southern yellow pine creosoted wood blocks are fast growing in general use in preference to any other material at any price.

Such floors are dry, clean, sanitary, easily repaired, easy on the feet of workmen and draught animals, and because of their durability are the most economical where floors are subjected to severe usage. Send for the Association booklets, "What the Cities Say About Creosoted Wood Blocks," "Noise—the Nerve Wrecker," and "Floors of Service."

## Durability.

The durability of Southern pine is proved in hundreds of aged structures everywhere in America and particularly in the humid climate of the South, where there are scores of homes one hundred to one hundred and fifty years old still in use and in a practically perfect state of repair.

## New Grading Rules.

Southern yellow pine is manufactured to conform to the standard sizes and dressing of the SOUTHERN PINE ASSOCIATION. For the use of engineers and architects, tables of nominal and actual sizes have been prepared, and to these have been added data concerning the properties of the sections. These data are of the same nature as those used in connection with steel construction, and afford the builder with wood the same facilities for accurate work.

The Standard Specifications for Southern Yellow Pine Bridge and Trestle Timbers, adopted by the American Society for Testing Materials, September 1, 1910, are in effect identical with those of the American Railway Engineering Association. Also the specifications for the Grading of Structural Material on the basis of density of growth, as suggested by the United States Forest Service and adopted by the American Society for Testing Materials, August 21, 1915, are published, with illustrations of the application of the rules, by the SOUTHERN PINE ASSOCIATION. Under the new rules adopted by the Association, grading is reduced to an exact mathematical calculation and assures absolute dependability in quality. That means the complete elimination of future uncertainty in specifying Southern yellow pine for exacting uses in heavy construction.

## Association Literature.

Every architect should have the following SOUTHERN PINE ASSOCIATION publications. They will be sent upon request:

- "Manual of Standard Wood Construction."
- "Standard Mill Construction."
- "The Density Rule."
- "Grading Rules for Southern Pine Lumber."
- "Rules for Finishing Southern Pine."
- "List of Subscribers to the Southern Pine Association."

# NORTH CAROLINA PINE ASSOCIATION

NORFOLK, VA.

## Products.

NORTH CAROLINA PINE BUILDING LUMBER, for Interior Finish, Flooring, Frames, Sash, Wainscoting, etc., in standard and special grades.

## Advantages.

North Carolina Pine wood is of the short leaf species of pine, and is especially suited to the work of the house builder and carpenter on account of its freedom from resinous matter, its stiffness, and its ease of working.

It is widely used for flooring, and is highly recommended for its wearing qualities. It answers equally well for wainscoting and ceiling work, chair boards, baseboards, brackets, mouldings, cornices, roseblocks, ornaments, carved work, balusters, stairs, railings, panels, etc.

Also largely used for window and door frames and doors, plasterer's laths, shingles, porch columns and porch flooring.

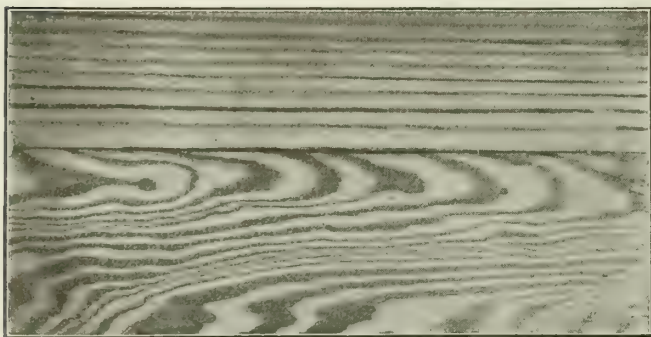
North Carolina Pine is sufficiently hard in texture to permit an exceptionally smooth mill finish. By sand-papering, the surface can be quickly reduced to an ideal base for filler or shellac.

The wood can then be finished in its natural grain, or tinted with any good stain. It is also fitted for painting and enameling, as its non-resinous base makes it particularly susceptible to such treatment without raising the grain of the wood.

The wearing quality and general worth of North Carolina Pine are attested by the many historical buildings, residences, etc., in Virginia and the Carolinas—some of which have been standing more than a century—that are constructed wholly or in part of this wood and are in first class condition today.

## Grain.

The most fastidious home builder will be satisfied with the variety of beautiful grain obtainable in this wood. There is every gradation from straight to curly.



GRAINING OF NORTH CAROLINA PINE

This wood is naturally suited to the interior finish of a house, as trim around the windows and doors, panel work, beamed ceilings, doors, and for the innumerable built-in features demanded by many home builders.

## For Exterior Work.

North Carolina Pine demands only the same selective use and protective treatment as other woods under similar conditions. Where the wood is to come in contact with the ground, or is exposed to alternate wet and dry conditions (like porch floors and steps), heart material should be used exclusively. But for such purposes as siding and weatherboarding, outside finish, etc., the regular run of wood is all that is necessary with the protection afforded by paint. Grades ordinarily used for framing contain some knots, but are free from pitch.

A modern frame building, kept up as it should be, will last as long as a structure of some of the mineral substances, and with occasional repainting will always look fresh and clean.

No architect or contractor need hesitate to use North Carolina Pine for exterior work in accordance with above suggestions, for it will be found as efficient as any other wood.

## Flooring.

North Carolina Pine flooring is strong, wears well, and has a naturally beautiful grain, which may be enhanced by the application of stain, wax or varnish. It is free from pitch or resin, and may be had both in flat and rift grain.

If the wear on the floor is to be light, or if the floor is to be carpeted or otherwise covered, the flat grain is all that is necessary. Where the wear is heavy, rift grain should be used.

North Carolina Pine, when used for flooring, is finished on the half inch, whereas most woods are worked into flooring, ceiling, etc., on a "three-quarter matching," which means that the actual face width of the flooring is  $\frac{3}{4}$  in. less than the strip width.

For instance: Buy 1,000 ft. of 3-in. flooring. In North Carolina Pine this would be finished  $2\frac{1}{2}$  ins. wide, and would cover 833 sq. ft. of floor; while the usual method of working the finished width would be only  $2\frac{1}{4}$  ins., and the covering capacity but 750 sq. ft.

## Sources of Supply.

North Carolina Pine is carried in stock by practically every lumber yard in the East, many of the larger concerns having planing mills and specializing in mill work of North Carolina Pine.

There should be no difficulty in securing doors and



sash of this wood also, as there are numbers of manufacturers who carry full lines, as well as make special patterns to order.

### Grades.

For convenience in specifying North Carolina Pine the grades are briefly epitomized here, giving a general idea of the characteristics of the several grades without going into particulars. Persons wishing the full grading rules may obtain them by writing to the Association.

No. 1 flooring, ceiling, finish, etc., is practically free of all defects on the face side.

No. 2 flooring, ceiling, finish, etc., may contain a limited number of small tight knots, not over  $\frac{1}{2}$  in. diameter.

No. 3 flooring, ceiling, finish, etc., will admit sound knots larger than are admitted in No. 2, but in no case over  $1\frac{1}{2}$  in. diameter.

No. 4 flooring and ceiling admit strips below the grade of No. 3, which can be laid without wasting more than 25% of the piece.

Roofers and factory flooring admit lumber below the grade of No. 3, and admit small knots and large reasonably sound knots which do not seriously affect the strength of the piece.

**LENGTHS**—The standard lengths of flooring are 8 to 16 ft.; of ceiling, partition and finish 6 to 16 ft.; in multiples of 1 ft.

**THICKNESS**—Flooring is finished  $\frac{13}{16}$  in. thick; ceiling  $\frac{3}{8}$ ,  $\frac{7}{16}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$  in.; partition  $\frac{3}{4}$  and  $\frac{13}{16}$  in.; finish (base and casing)  $\frac{13}{16}$  in.; siding and weatherboarding  $\frac{3}{4}$  or  $\frac{13}{16}$  in.

### Specifications for Finishing North Carolina Pine.

#### (A) NATURAL FINISH—

(A-1) *Interior Trim*—1 coat of Liquid Wood Filler; 2 coats of Interior Trim Varnish.

Left in gloss, rubbed dull or polished, as desired.

(A-2) *Floors*—3 coats of best Floor Varnish.

(A-3) *Exterior Work*—1 coat of Floor Varnish; 2 coats of Exterior Varnish.

#### (B) STAINED FINISHES WITH GLOSS VARNISH—

Oil Stains are best adapted to North Carolina Pine in the following shades: light oak, dark oak, weathered oak, cherry, rosewood, walnut, golden oak, forest green, antique, mahogany and dark mahogany.

Following are the specifications:

(B-1) *Interior Trim*—1 coat of Oil Stain; 1 coat of Liquid Wood Filler; 2 coats of Interior Trim Varnish.

Left in gloss, rubbed dull or polished, as desired.

(B-2) *Floors*—1 coat of Oil Stain; 2 or 3 coats of Floor Varnish.



WASHINGTON'S HOME, MOUNT VERNON, VA.  
Built of North Carolina Pine in 1743

(B-3) *Exterior Work*—1 coat of Oil Stain; 1 coat of Floor Varnish; 2 coats of Exterior Varnish.

#### (C) DULL VARNISH FINISH—

The following specification produces a dull, velvety finish, but applies only to interior trim, as dull varnish should not be used on floors or exterior work. The Weathered Oak Stain is almost always finished in this way.

(C-1) *Interior Trim*—1 coat of Oil Stain; 1 coat of Liquid Wood Filler; 1 coat of Dull Varnish.

#### (D) SILVER GRAY EFFECT—

The popular Silver Gray Effect is best obtained with an acid stain. Acid stains are primarily intended for hardwoods and not for soft woods such as North Carolina Pine; but for a Silver Gray effect on North Carolina Pine there is no better method than the specifications listed below. This finish is not suitable for floors nor exterior work.

(D-1) *Interior Trim—Dull Varnish Finish*—1 coat of Silver Gray Acid Stain, sandpapered when dry; 1 coat of White Paste Filler; 1 coat of Shellac; 1 coat of Dull Varnish.

#### (E) ENAMEL FINISH—

In enamel finishing particularly, it is extremely important that all knots be given a thin coat of pure white shellac before finishing. Where a dull finish is wanted without the expense of rubbing, use an "Eggshell" Enamel.

(E-1) *Interior Trim*—1 coat of Pure White Lead mixed with equal parts of Linseed Oil and Turpentine with a small amount of Dryer added; 2 coats of Enamel Undercoating; 2 coats of Enamel.

Left in gloss or rubbed dull, as desired.

**IMPORTANT**—All knots should be touched up before carrying out the above specifications with a thin coat of white shellac. Where the wood is stained touch up knots after staining.

Each coat of liquid wood filler, shellac or varnish should be sandpapered when thoroughly dry with No. 0 or No. 00 sandpaper before applying the next coat, with the exception of the last coat, which should not be sandpapered.

# NORTHERN HEMLOCK AND HARDWOOD MANUFACTURERS' ASSOCIATION

DEPARTMENT "S"  
OSHKOSH, WIS.

## Products.

BIRCH LUMBER and BIRCH ROTARY CUT VENEER made from Yellow Birch (*Betula Lutea*) also known as gray birch; and from Sweet or Cherry Birch (*Betula Lenta*).



## Description.

No distinction is made between these closely similar species, as a rule. The heartwood of both is sold as red birch, and the sapwood as yellow birch. Birch is most commonly sold as unselected birch or red birch. Red birch is not another species, but is simply the slightly reddish colored heartwood of the tree. Unselected is the run of the lumber as it comes from the log, part heartwood and part sapwood.

A beautiful variation called Curly Birch comes from selected logs, and comes either in red or unselected.

## Uses.

Out of 134 representative uses of all commercial woods of the United States, birch finds place in half. Birch is fitted for so large a variety of purposes because of its beauty and its excellent mechanical and physical properties. It is somewhat easier to work than oak or maple, yet possesses the same quality of strength as these species. It is used extensively for trim, doors, flooring, veneer and furniture.

It has won recognition in trim as being a fine hardwood, of very handsome figured grain, and capable of high finish. It is in use not only in a multitude of residences and apartments, but also in very many hotels, office buildings, etc., of the highest class, for both trim and doors. Birch rotary cut veneer is especially adaptable to panel work of all kinds and is widely used therefore in wainscoting and for fixtures, store window backing, etc.

Birch doors are usually of veneer on a soft wood backing. The veneer may be selected from a wide variety of figures, from the rather modest to the highly ornate.

Birch flooring is comparable in service value with maple flooring, having nearly the same physical properties, including hardness. It comes either in red or unselected. Selected red birch floors are very desirable in most schemes of interior decoration, especially with trim of birch or mahogany.

Birch has the qualities required of the best furniture woods, and for this use is second only to oak in the quantity used.

Birch looks equally well, whether plain, or quarter sawed. Rotary cut birch veneer usually serves all purposes which demand highly figured wood in broad surfaces, such as panels, etc.

## Finishing.

Birch lends itself perfectly to the production of any effect of finish which can be applied to a first class hardwood. To several beautiful finishes it is better adapted than any other wood, notably to gray and brown acid staining. It is also frequently and successfully used in place of red or brown stained mahogany.

Because of the small size of the pores, a filler is usually not employed. If a dark filler is used, the pores

can be made conspicuous, giving the wood additional figure. Rubbed, or rubbed and polished finishes, give fine results with birch. The user of birch should always remember that he is handling a high class hardwood, whose peculiar richness of tone and figure is worthy of painstaking treatment. It is of just the right density and texture to form a superior base for white enamel, for which the unselected grade is of course used.

## Prices.

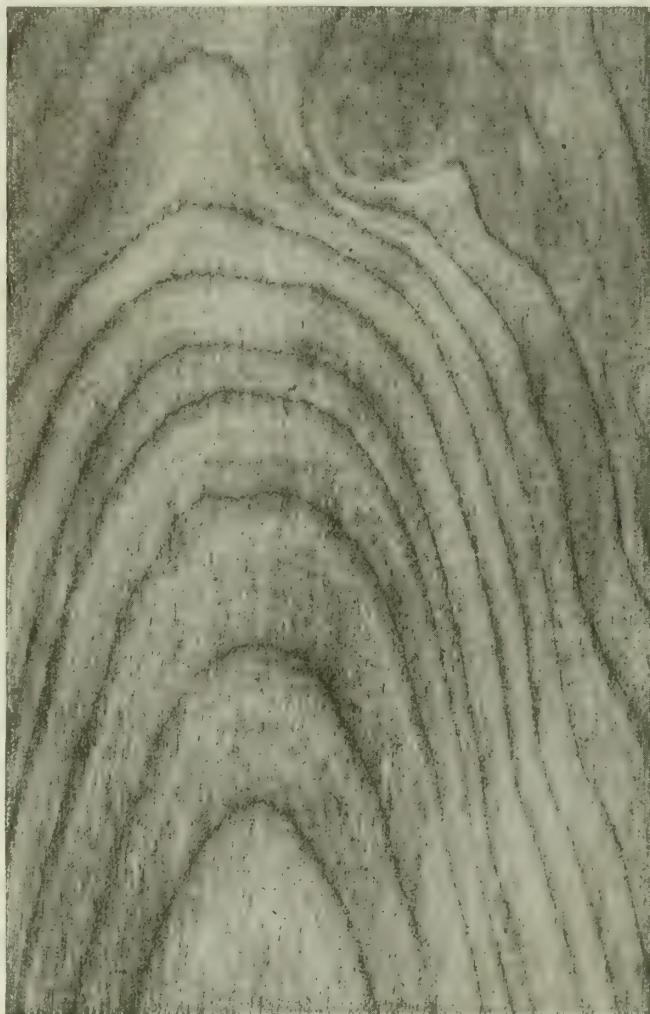
In spite of its beauty, strength and hardness, birch is not costly. It compares favorably in price in most localities with many of the other high class hardwoods.

## Information.

A handsome book on Birch and Its Uses, finished samples, and any specific information or assistance required will be gladly supplied on application to Department "S."

## Co-operation.

The NORTHERN HEMLOCK AND HARDWOOD MANUFACTURERS' ASSOCIATION will be glad to put inquirers in



TYPICAL GRAIN OF SAWED BIRCH  
Natural size

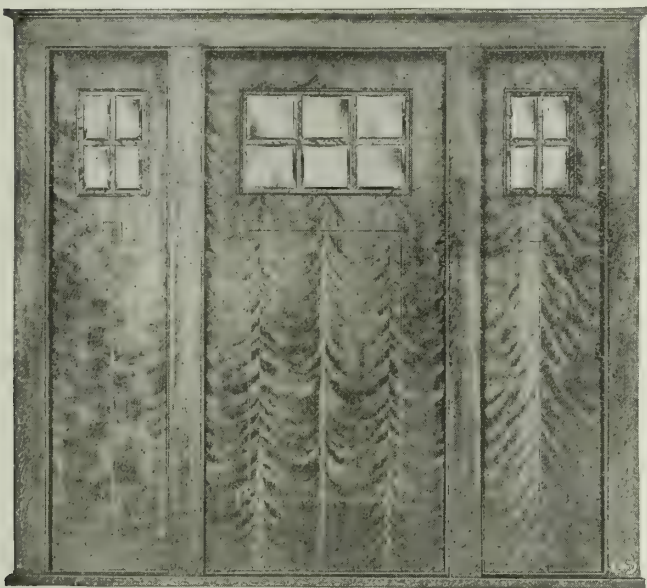




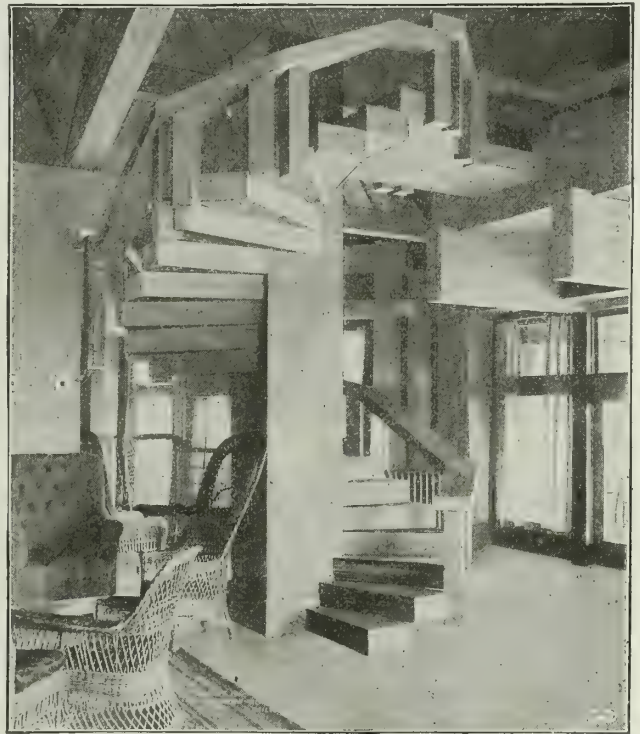
FOUR OUT OF DOZENS OF DESIGNS ALWAYS AVAILABLE IN ROTARY CUT BIRCH VENEER

touch with our members, and with manufacturers of birch doors, trim, etc.

The Rotary Birch Club, Oshkosh, Wis., will give any desired information on the use of birch veneer and will supply samples, etc., on request.

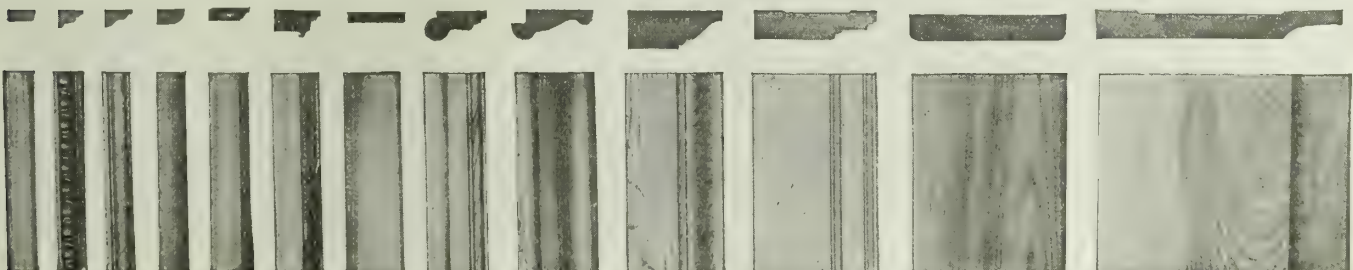


AN EFFECTIVE "ARTCRAFT" ENTRANCE OF QUARTER SAWED CURLY BIRCH



INTERIOR OF GRAND CANYON HOTEL, YELLOWSTONE NATIONAL PARK

Birch shipped from Wisconsin for this trim



A FEW OF THE MANY FORMS CONSTANTLY AVAILABLE IN BIRCH MOULDINGS, CASINGS, BASE, ETC.



# OAK BUREAU OF THE AMERICAN HARDWOOD MANUFACTURERS' ASSOCIATION

1420 Bank of Commerce & Trust Co. Building  
MEMPHIS, TENN.

## Products.

WHITE OAK and RED OAK LUMBER.

## Kinds of Oak.

There are two principal kinds of oak, red oak and white oak, each of which is botanically subdivided into several varieties. For ordinary uses no distinction is made between one species or variety and another, the practice in this regard varying somewhat according to locality. Usually there is no important distinction in price.

**WHITE OAK**—Is stronger than red oak and for uses where strength is the first consideration, such as heavy structural work, shipbuilding and the like, white oak is frequently preferred. Most engineering manuals give mechanical data of the oaks.

**RED OAK**—Has a rather more open structure and larger pores than white oak, and fillers and stains produce slightly different effects with it than with white. Its figure is rather less conspicuous than that of white oak, on the average.

On exposure to the weather white oak lasts longer than red oak, though both are extremely durable.

## Quartered Oak.

Quartered oak is lumber or veneer which is sawn or sliced approximately parallel to the medullary rays of the log. The passage of the surface plane through these rays is what produces the characteristic "flake" in the figure of quartered oak. Only large choice logs are quartered.

## Plain Sawed Oak.

Plain sawed oak is oak lumber which is sawn without reference to the medullary rays, and shows a figure quite different from that of the quartered wood, yet thoroughly characteristic of this fine and dignified wood, the name of which, *Quercus*, is derived from the Celtic words meaning "fine tree."

## Oak Veneer.

Oak veneer is most frequently of the quartered variety, either sawn or sliced. Rotary cut veneer is also used, but generally only in the cheaper grades of furniture.

Oak veneer has a natural beauty which makes it very desirable for furniture, doors and paneling. Its inconspicuous but never failing variety, taken just as it comes, prevents monotony of effect without giving rise to disturbing contrasts. In paneling it is not considered necessary, therefore, to use matched veneer as is so frequently done with woods of more symmetrical or map-like figure.

Matched veneers are, however, often used with great effectiveness.

## Scope of Use.

Growing oak is very widely distributed over the globe and oak is, and has been from time immemorial,

used practically for every use to which wood is put. Wherever the requirements are for great strength, great hardness, or great beauty of restrained and dignified type, oak is appropriate. The natural qualities of the wood itself are heavily reinforced by the peculiar and almost reverential esteem in which oak has long been held by mankind as the symbol of beauty, might and sturdiness.

In America the principal architectural uses of oak are as trim, doors, flooring and furniture, and in all these uses its stately beauty and its hardness and consequent resistance to wear are its chief advantages. The same qualities easily give oak the first place as wood for carving of all sorts.

## Refrigerators and Kitchen Woodwork.

Oak has very special fitness for the construction of refrigerators, kitchen cabinets, kitchen woodwork, and other woodwork in similar locations for the reason that it is especially resistant to alternations of heat and cold, moisture and dryness.

## Finishing.

Practically all building craftsmen have such complete familiarity with oak, that specific information on this point is scarcely necessary. It is well to say merely that oak exhibits practically all commercial finishes, light or dark. Oak well repays extra care in handling, but nevertheless tolerates abuse much better than most high class woods.

Entirely unfinished oak is excellent for certain purposes and is now used not infrequently by good architects.

Oak offers tempting opportunities for the development of new finish treatments by ingenious architects, who freely utilize them.

## Supply.

A consideration which has great weight with users is that the supply of oak is almost inexhaustible. Oak is our most abundant hardwood, and the amount of oak standing in the forests is approximately 40% of all the American hardwoods combined. It is therefore certain that the supply of oak will last indefinitely. This splendid wood will continue to be used, as the users of it may plan as far into the future as they will, with assurance that when oak is needed it will be available.

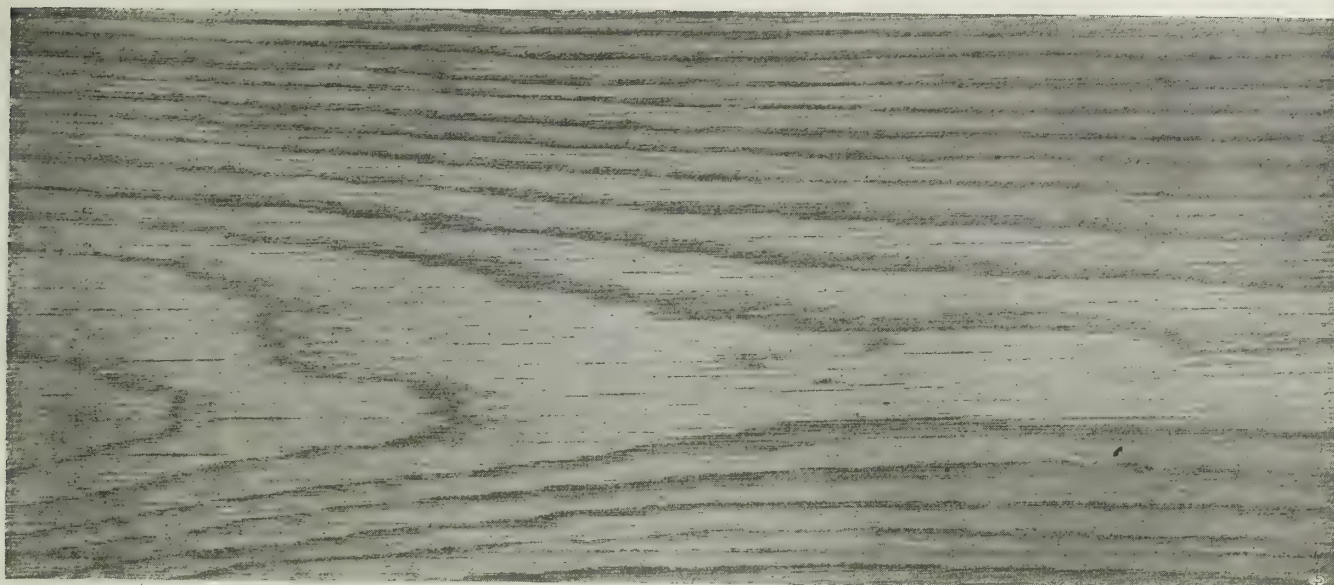
## Examples.

From the castles and cathedrals of England and the continent, and the furniture and carvings thereof, through the whole gamut of American structures and furniture, the use of oak is so widespread that it is believed all architects will agree that specific examples are unnecessary.

## Information.

Any specific queries with regard to oak or its uses will be gladly answered.





Plain Sawn White Oak



Plain Sawn Red Oak



Quartered White Oak

PHOTOGRAPHS DIRECT FROM THE WOOD, SELECTED AT RANDOM  
Average samples, one-half natural size



# RED GUM LUMBER BUREAU, AMERICAN HARDWOOD MANUFACTURERS' ASSOCIATION

1320 Bank of Commerce Building  
MEMPHIS, TENN.

## Products.

RED GUM, botanically known as *LIQUIDAMBAR STYRACIFLUA*, and called by different names in different localities, such as SWEET GUM, GUM, GUM WOOD, SATIN WALNUT, HAZELWOOD, and other local names. SAP GUM—the sap or outer part of the same tree.

## Gum Lumber—Its Nature and Uses.

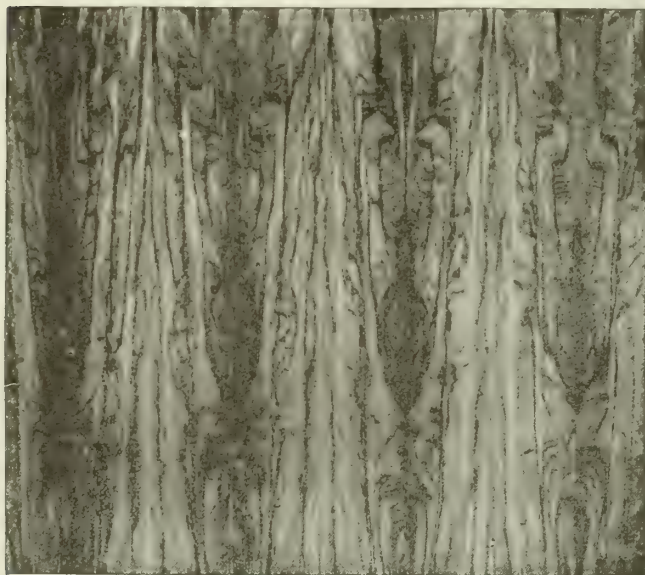
The red gum tree, a hardwood growing plentifully in the Southern States, produces both heartwood and sapwood. Commercially the term "Red Gum" applies to the heartwood of this tree. "Sap Gum," or unselected gum, may be partially heartwood and partially sapwood, or wholly sapwood.

Red Gum is adapted for trim and interior finish of every kind, special order furniture and carved detail work, cabinets, doors, flooring, siding, fixtures, etc., where the natural beauty of grain of a fine hardwood is desired. Sap Gum excels where a good, reliable wood without color or grain is desired, as in porch columns, flooring, building trim, siding, and as a basis for white enameled work.

Red Gum is America's *finest* cabinet wood.

## Effects Obtained with Red Gum.

Red Gum takes a beautiful polish, showing rich coloring, and offers a wide variety of color schemes for architectural uses. The heart of the wood shows much variety of figure. It is a few shades darker than new cut mahogany, and choice pieces are frequently more richly figured. The color closely resembles mahogany, but has a wider range. In general effect the wood most nearly resembles circassian walnut.



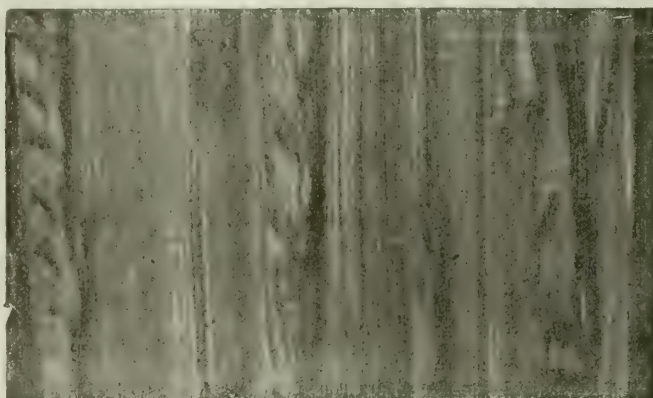
PANEL OF QUARTER SAWED RED GUM VENEER FIGURED WOOD, MATCHED

Rich reddish brown color, with great variety of markings and color tones, and a soft satin sheen

In using Red Gum for interior trim, an architect has a choice of many color schemes. Finished in the natural color, it gives a beautiful effect, as nearly all Red Gum has a pleasing figure, whose ornate richness (which still is soft and delicate in its character) is brought out with unusual effectiveness by the filler and varnish. Red Gum "finished natural" is rapidly growing in favor among people of high artistic taste. When stained and properly done, Red Gum is very handsome.

Any of the following stains may be employed with entire success: dark mahogany, Flemish brown, forest green, mission, and Dutch brown. When dark mahogany stain is used, one of the most beautiful colors is produced. The stain is not sufficiently heavy to entirely eliminate the figure, and the result is a dark mahogany finish with the original beautiful figure of the Red Gum plainly visible.

The accompanying illustrations show a few of the many effects to be obtained by various treatments of Red Gum and Sap Gum.

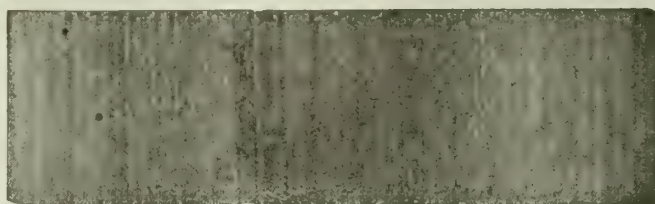


QUARTER SAWED RED GUM FIGURED WOOD

Richness of stripes and color tones peculiar to this method of manufacture, used in the best lines of furniture and architectural woodwork

## Advantages Over Other Hardwoods.

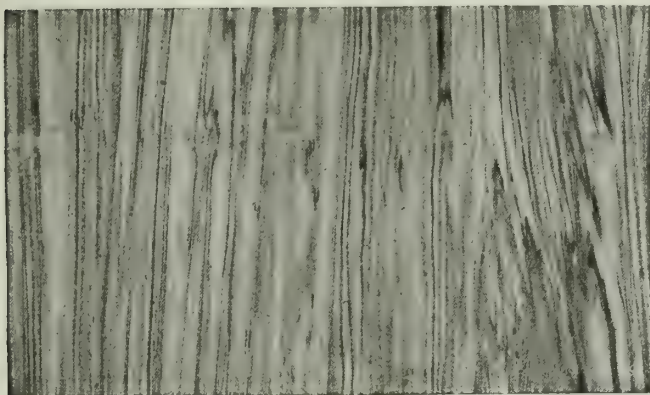
Red Gum works easier than any other hardwood and with less waste, for the reason that gum timber is large and the lumber naturally runs to better widths and lengths in firsts and seconds. Red Gum has become a leading cabinet wood, because of its beauty, adaptability, and fine workable qualities.



QUARTER SAWED RED GUM PLAIN WOOD

Finished natural or stained, is very pleasing and attractive. Stain applied light enough to show the beautiful grain of the wood





PLAIN SAWED RED GUM FIGURED WOOD  
In demand for special cabinet work of all kinds

### Specific Applications.

**DOORS**—Red Gum veneer-built doors are as rigid and free from warp as any high grade hardwood doors, and as for appearance they compare favorably with the best at a much smaller cost.

**FIXTURES**—Red Gum is eminently suitable for bank fixtures, office and store fixtures, cabinets, library fittings, etc.

**FACTORY FLOORING**—Red Gum is very well adapted for flooring factories where there is a good deal of trucking to be done. It can also be recommended for paving blocks for shops and mills; and, when so used, creosoting of the blocks is not necessary.

**ENAMEL WORK**—Sap Gum, even in the cheapest, unselected grades, makes the best basis for white enamel. It takes paint with avidity, and sets it to a hard, brilliant face that never cracks or blisters.

**PORCH COLUMNS**—Sap Gum is now very generally used in the manufacture of porch columns, possessing as it does every element of stability and strength.

**APARTMENT HOUSES**—Sap Gum trim may be put into apartment house construction at a very reasonable cost.

**GENERAL FLOORING**—Red Gum and Sap Gum are tough and durable, and selected stock can be used unhesitatingly for flooring in the most expensive buildings.

**SIDING**—Sap Gum siding contains no pronounced grain, in this respect being equal to yellow poplar. It is not streaked with pitch, nor are the cells filled with

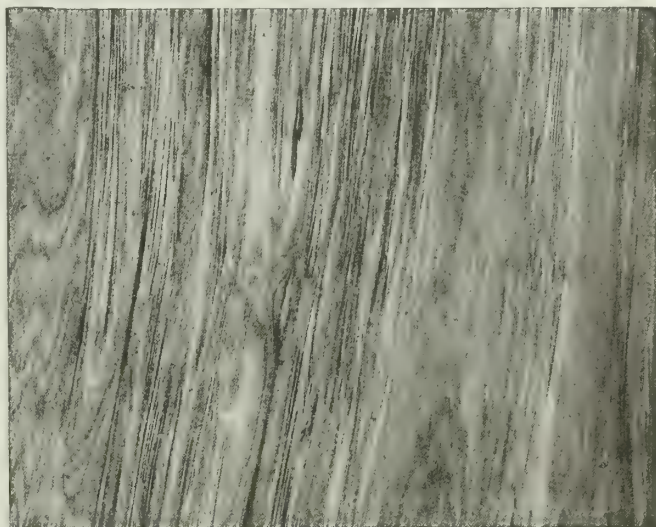
resin, preventing the absorption of paint. It contains no acid or other ingredients injurious to nails.

### Specification Notes and Service.

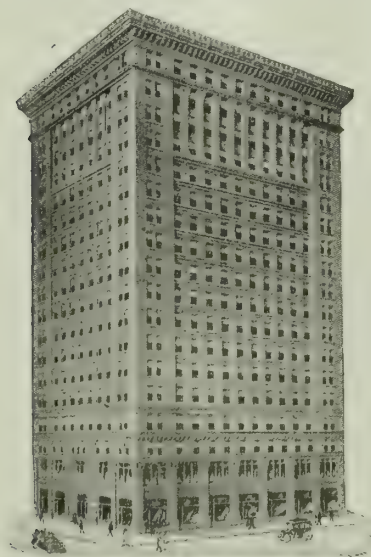
Experience has taught dry kiln men how to handle Red Gum through the dry kiln satisfactorily, and as a result no more difficulty is had in kiln drying Red Gum than any of the other fine cabinet woods. Architects can secure perfect satisfaction by specifying Red Gum, thoroughly air dried, or naming producers that guarantee this treatment.

All woods are porous, and the better seasoned they are the more readily they absorb moisture. As soon as received, all hardwood doors and trim should get one coat of filler, shellac or stain. They should not be set until the plaster is well dried out. Trim should get one heavy coat of back paint before placing.

For proper specifications and all matter pertaining to the finishing of Red Gum refer to any first class varnish house. Red Gum Lumber Bureau of the AMERICAN HARDWOOD MANUFACTURERS' ASSOCIATION will also be glad to aid in the formation of careful judgments as to individual cases, and places its entire resources at the disposal of interested persons.



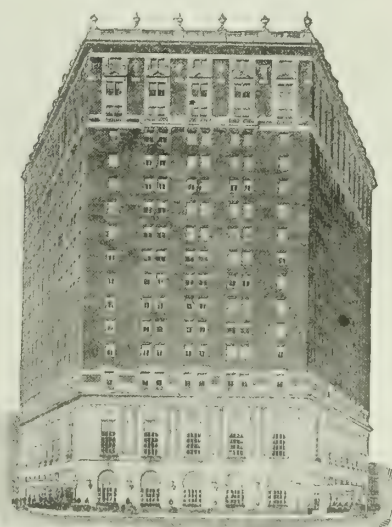
ROTARY-CUT RED GUM VENEER FIGURED WOOD  
An ideal veneer wood, because it works easily, without waste, and takes and holds glue better than most other woods



WOODMEN OF WORLD BUILDING,  
OMAHA, NEBR.  
Interior trim of Red Gum



THE MUEHLEBACH HOTEL, KANSAS  
CITY, MO.  
Interior trim of Red Gum



HOTEL STATLER, DETROIT, MICH.  
Interior trim of Red Gum



# THE SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

GEORGE E. WATSON, SECRETARY

1214 Hibernia Bank Building  
NEW ORLEANS, LA.

1214 Heard National Bank  
JACKSONVILLE, FLA.

## Products.

CYPRESS LUMBER; CYPRESS SHINGLES.

## Trade-mark Guarantee.

As a guarantee of quality, accurate grading, and responsible methods of manufacture architects should hereafter specify that every piece of cypress, "The Wood Eternal," shall bear the above trade-mark.

## Where Grown.

The cypress today is distinctly a swamp tree growing along the coasts of the Atlantic Ocean and Gulf of Mexico from Maryland to Texas, and in the Mississippi Valley as far north as southeastern Missouri.

## Varied Utility.

Cypress wood having been used for many years, the evidence of its fitness for numerous purposes is overwhelmingly large. Testimony of its peculiar qualities comes from all parts of the world.

## Durability.

Cypress stands almost unique among the woods on the American lumber market in that it has qualities not paralleled by any other wood.

Possessing certain singular antiseptic qualities which protect it where exposed to weathering, its great resisting power to the various decay influences and parasitic injuries is practically unequalled.

It is also free from the ills which affect pine and hardwoods—such as staining and decaying after being cut and placed in a pile.

## Color.

Cypress varies in color from almost white, such as found in Arkansas, Tennessee and Missouri, to almost black, such as found in many of the brakes in southern Louisiana and Florida.

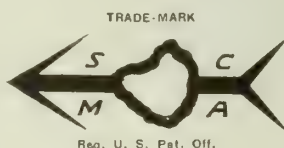
It is usually yellowish, and sometimes grayish brown, with the sapwood considerably lighter in color than the heartwood.

What is known as "tidewater" cypress is the most valuable. It is usually dark, with a very fine and even grain; frequently marked by various colored zones, which oftentimes extend for great lengths throughout the log.

## Other Advantages.

For the greatest variety of uses as a finishing lumber, cypress ranks high among the woods of today. It is rapidly supplanting all other woods for uses wherein endurance and resistance to decay are valued factors.

It is very easy to work and is easy on edged tools, as it is soft and has an even grain, sometimes with beautiful figuring, and is capable of taking an exquisite, rich finish.



Cypress has an average strength; is fine for sills and woodwork anywhere near to or in contact with the earth, but should not be used for framing. It checks and splits very little and is noted for its durability.

It is strongly favored for porch floors, but is not recommended for interior floors except in creameries and similar places.

## Interior Uses.

About one-third of the higher grades of cypress is used for fine interior trim in good houses.

For interior finish its ease of working, straightness of grain, non-resinous nature, and the fine, wide, clear sizes obtainable, make it without doubt one of the best woods for mouldings, doors, sills, panels, sash, casings, etc.

As cypress shrinks or swells imperceptibly it is especially desirable for doors, which are very beautiful when made of this wood.

## Exterior Work.

On account of its great durability and weather resisting qualities cypress excels for all exterior work, such as foundation timbers, sidings, girders, doors, jambs, facings, window blinds, porches, columns, railings, steps, weatherboarding, etc., whether on wood, brick or stone construction; and everybody knows that cypress shingles outlast all others.

## Shingles.

Cypress is peculiarly adapted to shingles. They are almost everlasting, having extraordinary durability. They possess the added virtues of having more wood in them and of weighing more than any other shingle now on the market, and the life is not roasted out of them in the dry kilns. They are sold as dimension shingles and are always full count, 4000 lin. ins. to constitute 1000 shingles.

## Country Uses.

For country use—for fencings, posts, water troughs, well boxes, silos, incubators, barns and sheds—cypress is the cheapest and best, owing to its wearing and lasting qualities.

Imparting no odor, taste or color, and being almost non-porous, it is unexcelled for water tanks, and for use in dairies. Acid manufactories, breweries, laundries, soap factories, tanneries, dye plants, etc., should be equipped with cypress tanks and vats.

## Greenhouse Construction.

In greenhouses, cypress is an invaluable wood because of its resistance to decay. The entire woodwork of some of the best greenhouses in the country—rafters, roof, girders, benches—is constructed entirely of cypress.

In consequence of its long lasting power it is well adapted for all kinds of cold frames.



**For Fireproof Buildings.**

Cypress is an excellent wood for sash and casings in otherwise fireproof buildings, and is being specified and used largely for that purpose by well-known architects and contractors.

**"Pecky" Cypress.**

In the cheap grades "Pecky" cypress is recommended for all uses where resistance to decay, and not beauty or great strength, is the chief end in view.

It is a grade of lumber which appears to be more or less honeycombed and decayed, yet in reality is one of the most decay resisting woods known in this country.

It will not decay in 100 years and is therefore adaptable for culverts, fence posts, all kinds of underground work or work in damp places; planking of small bridges, barn floors, and for foundation timbers.

**Painting.**

For both exterior and interior work cypress can be successfully painted, as the texture of the wood allows the paint to sink in and give perfect results.

**Natural Finish.**

But as the charm of modern architecture is in the use of the natural wood, cypress, on account of the beauty of its grain and variety of its rich shadings, should be varnished and finished in the natural.

**"Sugi" Finish.**

One of the most modern and interesting developments of cypress for interior finish is achieved by the Japanese treatment, known as "Sugi." It reproduces with remarkable accuracy the historic and highly artistic "driftwood effect."

"Sugi" finish imitates this famous and greatly coveted finish "without waiting for decades of erosion." It can be done by any one who can wield an ordinary gasoline torch (such as is used by plumbers), and who then has the patience (and good taste) to brush out the charred portion of this peculiar wood. The "Sugi" finish has been tried on other woods, but without success. Its cost is slight. The freedom of cypress from the resinous quality of most woods renders it adaptable to this extraordinary handling. There is practically no limit to the utilization of American cypress for this purpose.

**Staining.**

Cypress can also be stained with great success. In imitation of mahogany—becoming even more beautiful than mahogany itself—of cherry, black walnut, the different oaks; or tinted any desired shade the most fastidious fancy may suggest.

**United States Government Report on Cypress.**

The United States Agricultural Department (Forest Service Bulletin No. 95) reported on cypress under date of June 30, 1911. The following are extracts therefrom, stated with characteristic conservatism:

"As with many other woods, it is only the heartwood that shows great durability. The sapwood lasts but a few years when subjected to conditions favoring decay. On the other hand, instances have been cited, on what is apparently good authority, showing remark-

able periods of use for heart cypress shingles. A roof at Greenwich, Conn., was laid in 1640, and was said to be serving well 250 years afterwards; another in Brooklyn, N. Y., was said to have lasted 228 years, and another at Clifton, Staten Island, had 200 years to its credit when last reported, and was still in use. Many instances of use exceeding a century are cited to show the wood's lasting qualities. This is not only true when used as roofs, but for other purposes. New Orleans cypress water mains remained sound nearly a century, and a cypress headboard at a grave in South Carolina was so well preserved after 140 years that the letters on it were easily read. Marble and sandstone gravestones often decay and crumble in less time. A still longer period has been claimed for cypress coffins in Charleston, S. C. It is said they were found in fair condition at the time of the earthquake, though they had been in the ground since 1678.

"EXTERIOR AND INTERIOR FINISH—Cypress is put to almost every use as interior trim for houses. It may be finished in natural color or stained. The wood contains little resin and thus affords a good surface for paint, which it holds well. It shrinks, swells, or warps but little.

"For the parts of houses exposed to the weather it serves equally well. *As siding it practically wears out before it decays.* When made into porch and portico, columns it retains its shape, holds paint, and has sufficient strength to sustain necessary loads. It is placed as cornice, gutter, outside blinds, pilasters and railing, and is much used for porch floors and steps.

"One of the widest uses of cypress is in greenhouse construction. It is pre-eminently fitted for that trying place, where it is called upon to resist dampness, excessive heat, and all the elements that hasten decay. It is said that no other lumber approaches cypress in the quantity used for green and hot houses. It is manufactured into sash, frames, benches, boxes, and practically all else that the builder needs. Its slight tendency to warp has caused its employment by builders of incubators."

**Samples, etc.**

Samples, detailed information, "Book of Uses," references, etc., can be had upon application.

**Cypress Pocket Library.**

We believe we are rendering a real public service by extending the scope of The Cypress Pocket Library (43 vols.), convenient in size, authoritative in character, of provable value as a technical guide, and careful and scrupulous in its every statement or inference.

We do not by any means recommend the use of cypress without discrimination. Cypress is not the best wood for every use, but where it is appropriate it is so emphatically (and demonstrably) the one best wood that the many should know about it, instead of the comparatively few who hitherto have profited by their special knowledge.

Architects are invited to write for any of the 43 volumes of the Cypress Pocket Library. Volume No. 1 contains a full list of our publications.

Architects are particularly invited to write informally and in detail as to any special requirements, or for specific information. Our replies will be personal, responsive and authoritative.

# WHITE PINE BUREAU

Merchants National Bank Building  
SAINT PAUL, MINNESOTA

REPRESENTING

THE NORTHERN PINE MANUFACTURERS' ASSOCIATION OF MINNESOTA, WISCONSIN  
AND MICHIGAN AND THE ASSOCIATED WHITE PINE MANUFACTURERS OF IDAHO

## Product.

WHITE PINE LUMBER.

## Physical Properties.

The white pine (*Pinus Strobus*) of the New England States, New York, Pennsylvania and Minnesota, Wisconsin and Michigan, is alike characterized by its softness of texture and evenness of fiber, closeness of grain and absence of unruly cross grain; its freedom from resin, pitch or objectionable acids and oils.

It does not shrink, swell, check, crack, split, twist, warp or rot, even under the most exacting climatic conditions.

It is very light, but, while it does not possess the strength of some of the harder, heavier woods, weight for weight it has no equal.

Idaho white pine (*Pinus Monticola*) is a true white pine, differing so slightly from *Pinus Strobus* that authorities are not agreed that there is a botanical difference.

## Individual Advantages.

For all outside uses it is the one perfect wood. No other wood works so easily under carpenters' tools. It offers only the slightest resistance to nails and screws, then closes in and holds them fast. It takes paint, enamel and stain perfectly. For the pattern maker, wood carver and cabinetmaker it is ideal.

It is used for boxes because it does not split and carries no odor; for plastering, because white pine lath hold their place.

## Recommended Uses.

**EXTERIOR WORK**—For siding and corner boards; window sash, frames and casings; outside doors, door frames and casings; outside blinds; all exposed porch and balcony lumber; cornice boards, bracket ornaments and mouldings; and any other outside finish lumber, *not* including shingles.

**INTERIOR TRIM**—Can be depended upon to give entirely satisfactory alignments and memberings.

## Availability of White Pine.

The misapprehension as to scarcity should be corrected. It is still abundantly available in all grades and in any quantities desired. The WHITE PINE BUREAU, Merchants National Bank Building, St. Paul, Minn., will gladly help anyone experiencing any difficulty in obtaining it.

The United States Forest Service in January, 1915, estimated the stand of white pine timber in this country by groups of states as follows:

Northeastern states.....	16,400,000,000 ft.
Middle Atlantic states.....	5,900,000,000 ft.
Idaho .....	24,540,000,000 ft.
Lake states.....	12,000,000,000 ft.
Total .....	58,840,000,000 ft.

## Cost of White Pine.

The initial cost of white pine is not "cheaper" than that of its substitutes; the difference is only from 1½% to 1¾% in the total cost of a building.

## Specification Data and Grading Rules.

For complete information, refer to the book of *Classified Recommended Uses for White Pine in House Construction* and *White Pine Standard Grading Rules*, compiled for architects' use in specifying white pine lumber, a copy of which has been sent to architects' offices throughout the white pine territory. It contains authoritative information, which will enable architects to determine easily and correctly the right grade of white pine lumber to specify for use in house construction.

## White Pine Series of Architectural Monographs.

A bi-monthly publication, distributed gratuitously to the architectural profession, containing classified illustrations of beautiful examples of early American wood-built houses, applicable to present day problems.

Each issue is devoted to a particular subject with introductory text by a representative architect.

The Monographs are planned to be useful to the architect as a source of authoritative information, containing many meaty suggestions for design.



# BROWN COMPANY

FOUNDED 1852

FORMERLY BERLIN MILLS CO., AND BURGESS SULPHITE FIBRE CO.

## Manufacturers of Kyanized Lumber, Pulp, Paper and Chemicals

### PORTLAND, ME.

NEW YORK OFFICE, Woolworth Building

CHICAGO OFFICE, 110 South Dearborn Street

WORKS AT BERLIN MILLS, N. H.

#### Products.

KYANIZED LUMBER, PULP, PAPER and CHEMICALS.

Timber; Cedar Shingles; Manufactured Lumber, Doors, Window Frames, Mouldings, Posts, Columns; Sheathing and Novelty Siding, Clapboards, Laths and Gutters; Flooring of all kinds; Spruce, Pine and Fir Lumber.

Kyanized Lumber, preserved by treatment in the company's own Kyanizing plant; Sheathing and Roofing Papers, Wrapping Papers; Fibre Tubes; Bleached and Unbleached Sulphite; The "Nibroc" Line, including Kraft and Fibre Papers.

#### Kyanizing.

Wherever structural lumber is exposed to moisture, the decomposable organic matter present in the wood favors the growth of fungi, and decay follows. Kyanizing prevents the development of fungi and preserves the wood from decay. The process of Kyanizing calls for special facilities; and great care is needed to insure the best results. The BROWN COMPANY operates its own extensive Kyanizing plant, in connection with its principal works in New Hampshire and every stick of timber which it Kyanizes is branded with the company's name and the date of treatment. A generation of successful experience with this process gives further weight to the company's guarantee.

This process does not affect the strength or the general properties of the wood, nor change its color. The wood, after treatment, is less combustible than before. The surface remains clean, and will take paint if desired. The salts formed within the wood by careful

Kyanizing, being insoluble, remain there as a permanent protection.

The company's Kyanizing plant and spruce saw mills are located on the Boston & Maine and Grand Trunk Railroads and are of ample capacity to insure prompt service on all orders.

#### "Bermico" Brand, Sheathing Paper.

In connection with its extensive timber and pulp interests, the company is in a position to apply to each of its paper specialties the materials best suited to that particular service. "Bermico" sheathing paper is a case in point. It is made from fibre—pure, clean, long, rosin sized fibre, and has absolutely no filler.

It is therefore a permanent and dependable building material; tough and resistant to wear and tear. Being correctly made, from the right materials, it can be depended upon to give the longest service.

## BERMICO

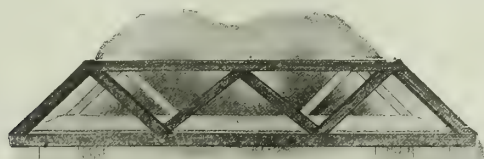
TRADE-MARK

#### Range of Products.

The company's output includes a wide range of manufactures which can not be adequately presented here; but in general these comprise the products and by-products resulting from forestry operations. The forest products are applied in a manner to conserve the natural values, merchantable timber being used as such, and pulpwood utilized in both the sulphite and sulphate processes to obtain the best possible types of pulp and paper. White pine, too rare now for reckless use, is made up into window frames; small wood is used in box shooks. Certain fibres of exceptional strength are reserved for use in a new line of fibre pipes and conduits; and important industrial chemicals are derived from the mill waste.

#### Catalogue.

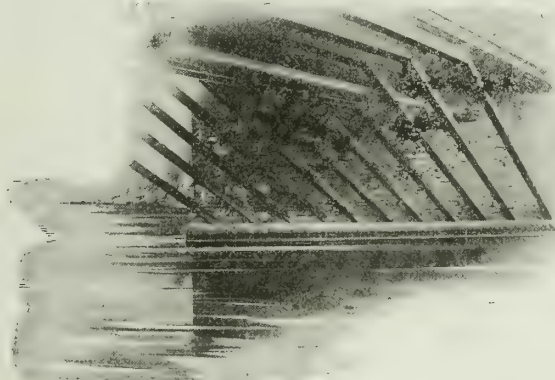
The company's principal products are covered by special catalogues or sample books, which are gladly mailed on request.



KYANIZED SPRUCE TRESTLE



KYANIZED GREENHOUSE



KYANIZED BRIDGE WORK

# "BILT-WELL" SERVICE BUREAU

Eleventh and Jackson Streets

DUBUQUE, IOWA

## REPRESENTING

ADAMS & KELLY CO., Omaha, Nebr.  
ADAMS-ROGERS CO., Indianapolis, Ind.  
CARR-CULLEN CO., Minneapolis, Minn.  
CARR & JOHNSTON CO., Peoria, Ill.

COLLIER-BARNETT CO., Toledo, Ohio  
COLLIER-ADAMS MFG. CO., St. Joseph, Mo.  
CARR & BAAL CO., Des Moines, Iowa  
CARR-TROMBLEY MFG. CO., St. Louis, Mo.  
CARR, RYDER & ADAMS CO., Dubuque, Iowa

## Manufacturers and Distributers of "Bilt-Well" Millwork

### Products.

A complete line of general MILLWORK, comprising the following:

Windows: Factory, church, plain and fancy residential designs.

Doors: Sash, French, panelled (slab or flush pattern), store, church and garage designs.

Interior Trim: Casings, base and mouldings of every description.

Cabinet Work: Paneling, colonnades, sideboards and buffets; kitchen and pantry cupboards, bookcases, mantels and mantel shelves; built-in seats; medicine, towel and kitchen cabinets, wardrobes, etc.

Fixtures: Store, bank and church fixtures of all kinds for any design.

Stairwork: A complete and comprehensive line of stock stair material in the warehouses at all times. Special stairwork executed promptly and in strict accordance with details.

Exterior Millwork: Mouldings, porch work, columns, newels, brackets, rafter ends and plain or fancy ornamental specialties.

Frames: Interior and exterior, manufactured for frame and masonry walls.

Glass: Leaded art, D. S., bevel plate and also plain polished plate and window glass.

### Materials.

All windows and sash are manufactured from strictly clear white pine. Enormous stocks on hand at all times.

Doors are made for stock in the following woods: Solid clear white pine, white pine stiles and rails with solid yellow pine panels, unselected birch and clear plain red oak. Special designs of doors in any kind of wood are also made.

Interior trim and mouldings carried in stock in yellow pine, fir and plain red oak.

Cabinet work carried in stock in only a few de-



signs manufactured from yellow pine and plain red oak. Any special or stock designs can be executed promptly in any kind of wood.

Stairwork furnished as stock in yellow pine and plain red oak, also made in special woods.

Exterior millwork: Stock designs furnished in clear white pine, clear fir and cypress.

Frames: Carried in stock in white pine.

### Manufacture.

Modern methods of manufacture, complete and up-to-date, mechanical equipment and only skilled workmen assure the architect, the contractor and the builder of satisfactory results with "Bilt-Well" millwork.

### Standardization.

When the manufacture of any one of our many commodities has reached that stage of perfection pronounced satisfactory by the Production Department, the design and method of manufacture is then standardized. The value of such standardization becomes obvious to the architect or builder when specifying millwork for large housing projects, etc.

### Estimates.

A corps of expert plan estimators and detail draftsmen is at the entire disposal of architects at all times.

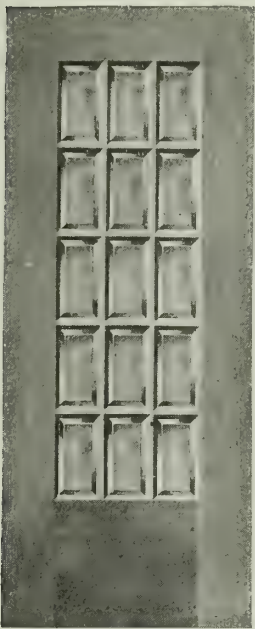
When sending plans for estimate, such plans receive excellent care and are promptly returned.

Quotations cheerfully furnished applying on millwork as specified, careful attention being given to all details.

### Service.

Each concern enumerated above, maintains and operates a large factory and warehouse. Complete stocks of "Bilt-Well" millwork are carried at all times,

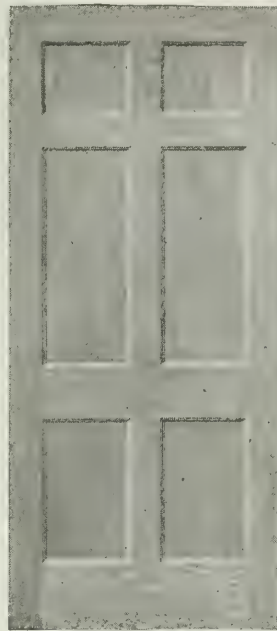




ONTARIO CLEAR WHITE  
PINE



LAMINATED "B"  
WHITE PINE STILES  
AND RAILS, YELLOW  
PINE LAMINATED  
PANELS



SYDNEY VENEERED  
PLAIN RED OAK



FT. WAYNE VENEERED  
PLAIN RED OAK

special attention being paid to special millwork which is manufactured both satisfactorily and promptly.

With excellent switching facilities direct from warehouse to trunk lines, rail shipments are always made on schedule time.

Local deliveries made by our own motor trucks.

When questions of proper construction warrants the making of special details, our detail draftsmen stand ready to assist architects at all times.

### Correspondence.

It is suggested that architects, contractors and builders communicate with the factory nearest them for information on any subject pertaining to millwork.

### References.

A few of the many hundreds of buildings in which "Bilt-Well" millwork has been installed:

Ford Motor Co., Des Moines, Iowa  
Des Moines Register & Leader, Des Moines, Iowa  
The Denniston Theater, Monroe, Mich.  
Prescott Public School, Dubuque, Iowa  
Coonley Hotel, Hampton, Iowa  
Y. W. C. A., Mason City, Iowa  
Decorah Catholic Church, Decorah, Iowa  
Mitchell High School, Mitchell, S. D.  
Moose Lodge Hall, Freeport, Ill.  
Belleville High School, Belleville, Wis.  
Girls' Dormitory, Wessington Springs, S. D.  
College for the Blind, Vinton, Iowa

### Territory Covered by "Bilt-Well" Factories.

By reason of peculiar advantages enjoyed by each factory because of location, transportation and market accessibility, it is recommended that the architect, the contractor and the builder correspond direct with the "Bilt-Well" factory located nearest them.

ADAMS & KELLY Co., OMAHA, NEBR., serving the building profession in Nebraska, Colorado, Wyoming and Utah.

ADAMS-ROGERS Co., INDIANAPOLIS, IND., serving the building profession in Indiana and Kentucky.

CARR-CULLEN Co., MINNEAPOLIS, MINN., serving the building profession in Minnesota, Wisconsin, North Dakota, South Dakota, Montana, Idaho and Washington.

CARR & JOHNSTON Co., PEORIA, ILL., serving the building profession in Illinois and Iowa.

THE COLLIER-BARNETT Co., TOLEDO, OHIO, serving the building profession in Ohio, Michigan, Pennsylvania, New York and West Virginia.

COLLIER-ADAMS MFG. Co., ST. JOSEPH, MO., serving the building profession in Missouri, Nebraska, Kansas and Oklahoma.

CARR & BAAL Co., DES MOINES, IOWA, serving the building profession in Iowa, Missouri and Minnesota.

CARR-TROMBLEY MFG. Co., ST. LOUIS, MO., serving the building profession in Missouri, Arkansas, Oklahoma and Mississippi.

CARR, RYDER & ADAMS Co., DUBUQUE, IOWA, serving the building profession in Iowa, South Dakota, Illinois, Wisconsin and parts of Minnesota.

# CARNAHAN MANUFACTURING CO.

Special Veneered Doors and Millwork to Detail

303 Mill Street  
LOOGOOTEE, IND.

## Products.

VENEERED DOORS: FRONT DOORS, INTERIOR DOORS, EVANS HOLLOW SANITARY DOORS.

Also, all kinds of Millwork, Interior Trim, Stairs, Wainscoting, Mouldings, etc.

## Special Millwork.

All kinds of special millwork made from architect's plans.

When plans are not available, competent estimators will go anywhere to figure on the work.

## Front Doors.

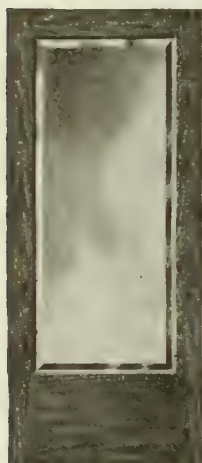
Made in any kind of wood desired, glass paneling or divided lights in different designs.

## Interior Veneered Doors.

See illustration of standard construction, the result of our many years' experience in the veneered door business.



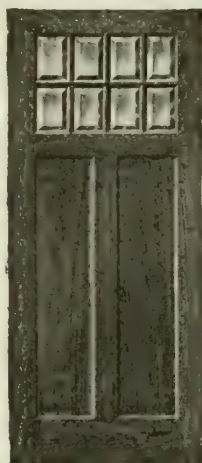
STANDARD CONSTRUCTION  
OF DOORS



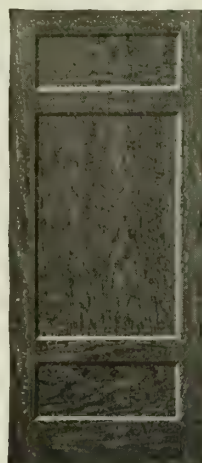
No. 19. Cove and Bead Sticking



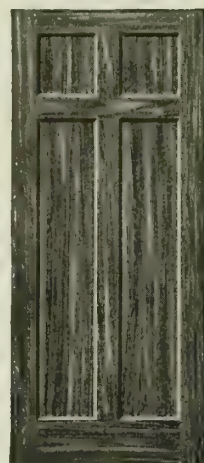
No. 20. Raised Mould



No. 41. Paneled with Divided Lights



No. 1A



No. 4A



No. 7A



No. 30

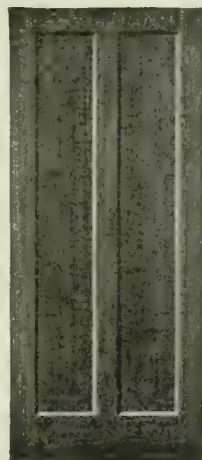


No. 31



No. 42

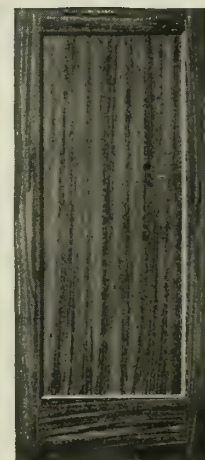
STANDARD VENEERED FRONT DOORS



No. 8A



No. 9A



No. 10A

INTERIOR VENEERED DOORS

Cove and bead sticking. Veneered in any kind of wood

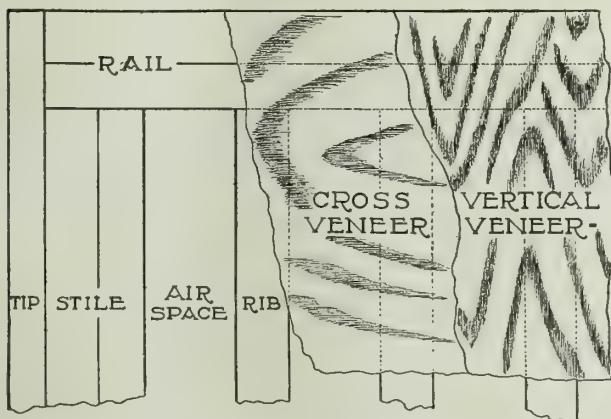


REFERENCES—The following buildings are a few of many where Carnahan interior veneered doors have been used:

Nurses' Home, Mobile, Ala.  
 Mutual Insurance Building, Jacksonville, Fla.  
 Apartments, Cleveland, Ohio  
 Apartments, Boston, Mass.  
 Girls' School, Fitchburg, Mass.  
 French Lick Springs Hotel, French Lick, Ind.  
 Elks' Home, LaFayette, Ind., Charles Nichol, Architect  
 St. Elizabeth Hospital, Niagara Falls, N. Y.  
 Kress Building, Houston, Tex.  
 City Hospital, St. Louis, Mo.  
 Jones Office Building, Pittsburgh, Pa.  
 Chamber of Commerce Building, Los Angeles, Cal.  
 Baker Loan & Investment Co. Building, Walla Walla, Wash.  
 Pantages Theater, Seattle, Wash.  
 Keefe Bros. Office Building, Butte, Mont.  
 Good Samaritan Hospital, Cincinnati, Ohio, Gustave W. Drach, Architect  
 LaFayette Loan & Trust Co. Building, LaFayette, Ind., Denison, Hiron & Darbyshire, Architects

### Hollow Sanitary Flush Doors.

CONSTRUCTION—The Evans process flush door is constructed with a frame of core wood the size of the door, into which a series of vertical ribs are placed with air spaces between. Over this frame is glued a 3/16-in. cross band, with a strip or tip of hardwood along the edges covering the glue joint between the core and the cross banding, thus avoiding the exposure of any end wood. The face veneer, consisting of a sheet of 1/8-in. veneer, is then applied, completely covering the surface of the door. See detail of construction.



### -EVANS-PROCESS-

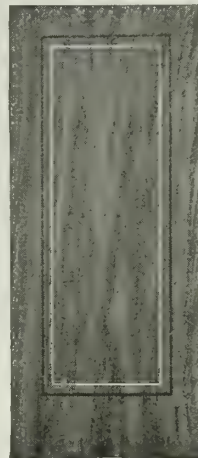


DETAIL OF CONSTRUCTION EVANS PROCESS HOLLOW SANITARY DOOR

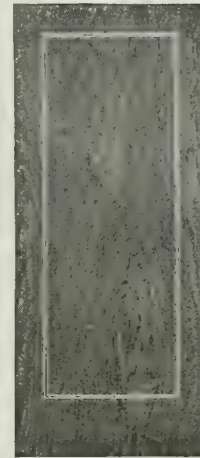
Covered by United States and Canadian Patents

ADVANTAGES—This is the only sanitary door on the market today that is as soundproof as a hollow partition, and is heat and cold resisting.

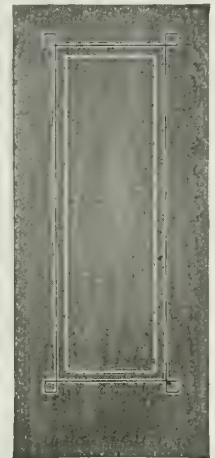
It does not shrink in length or breadth; it stays straight, and does not distort. It is light weight, weighing but one-half that of a solid core door, or 3½ lbs. per sq. ft. Light on its hinges; easy to open and close.



No. E51



No. E52

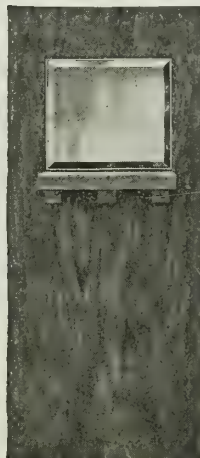


No. E53

Inlaid Ebony and Holly



No. E118



No. E114



No. E50

EVANS PROCESS SANITARY FLUSH DOORS

### Facilities.

The CARNAHAN MANUFACTURING Co. has three principal elements necessary for efficient service: abundant raw material, up-to-date manufacturing equipment and thoroughly competent artisans. Every facility is at the disposal of architects, and a specialty is made of architects' work.

### Guarantee.

These veneered doors are guaranteed against defective workmanship and material, when properly handled, and we agree to replace "in the white" (unfinished) any veneered door of our manufacture that proves to be defective.

### Catalogue.

Complete catalogue of products will be sent on request.

# CURTIS SERVICE BUREAU

CLINTON, IOWA

MAINTAINED IN THE MUTUAL INTEREST OF THEMSELVES AND THEIR CUSTOMERS BY THE FOLLOWING CURTIS COMPANIES

CURTIS BROS. & CO., Clinton, Iowa  
 CURTIS & YALE CO., Wausau, Wis., Pittsburgh, Pa., and  
 Washington, D. C.  
 CURTIS-YALE-HOWARD CO., Minneapolis, Minn.  
 CURTIS SASH & DOOR CO., Sioux City, Iowa

CURTIS, TOWLE & PAINE CO., Lincoln, Nebr., and  
 Topeka, Kans.  
 CURTIS, BOOTH & BENTLEY CO., Oklahoma City, Okla.  
 CURTIS DOOR & SASH CO., Chicago, Ill., Detroit, Mich.,  
 and Dayton, Ohio

## Manufacturers of Trade-marked and Guaranteed Woodwork for the Home

### Products.

WOODWORK of all kinds:  
 Doors, White Pine and Veneered.  
 Windows.  
 Interior Wood Trim and Cabinet Work  
 Stairways.  
 Porch Woodwork.  
 Paneling.  
 Blinds.  
 Frames.  
 Hardwood Flooring.  
 Mouldings.  
 Glass.

### Uses and Designs.

Curtis woodwork is called "the permanent furniture for your home," and this phrase correctly describes its uses. Wood, a material of natural beauty and extraordinary utility, is made into articles of household equipment that contribute to the convenience, comfort and beauty of a home's interior. Woodwork or permanent furniture is built into a house as an integral part of the house itself, and for this reason it comes under the province of the architect.

It is the aim of the Curtis Companies to produce a product which architects will recognize as having a worthy place in their work, and an important function to perform in houses that are properly designed and well built.

### Standard Designs and Sizes.

Many items of Curtis woodwork are made up in standard designs in standard sizes. These items are made to meet the standard requirements of the majority of American homes. On account of their large variety, the architect will find them adaptable to most of the residences which he designs, without any sacrifice of individuality.

Because standard designs are produced in quantities, they cost less than items made to order. Their quality is the equal, if not the superior, of special woodwork. Standard designs are always ready for immediate shipment.

### Construction.

Some idea as to the strength of Curtis door construction is gained from the fact that a pull of 5,253 lbs. was recently required in the testing laboratory to break apart the stile and rail of a white pine door.

All Curtis hardwood exterior doors have  $\frac{1}{4}$ -in. veneers. In every door great care is exercised to match the veneer in color and grain.

The lock-mitered joint is used on all cabinet work

1866  
**CURTIS**

TRADE-MARK

and colonnades, and the wood is carefully matched as to color and grain. All drawers in cabinet work are constructed so as always to slide easily without sticking or cramping.

Curtis woodwork is sandpapered at the factory. It is shipped "in the white" so that the architect can carry out his color schemes for finishing the interiors of the residences which he designs.

Curtis stairs are complete. They are built to a plan, and this plan is furnished for the guidance of the contractor in erecting them.

White pine is used in all windows and sash. Back-puttying holds in the glass and prevents the glass from rattling and the sash from rotting.

On porch work the same care is used in construction as on interior woodwork.

### Distribution.

Seven large producing plants, three warehouses and four branch offices distributing Curtis woodwork are located geographically favorable to the most important areas of home building in the Middle West.

Any lumber merchant can supply Curtis woodwork, and many retailers carry some of the designs in stock. If a schedule is sent with an order for Curtis woodwork, giving the dates upon which the different items will be needed, the acceptance of the order means that the woodwork will be delivered *on time*.

### Trade-mark and Guarantee.

Curtis woodwork is trade-marked so that the architect can conveniently specify and identify it. Every piece is unconditionally guaranteed according to this formal statement:

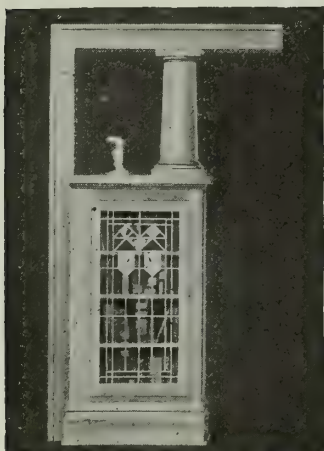
*The Makers of Curtis woodwork guarantee complete satisfaction to its users. We're not satisfied unless you are.*

### Catalogue No. 300.

The Curtis Catalogue No. 300 is a book of unusual character. It consists of 374 pages illustrating a large variety of woodwork designs. The illustrations are reproduced from photographs of the designs in actual use. Thus fidelity to the designs is insured, and even the grain of the wood is shown in its infinite variations.

The architect can depend upon designs selected from the Curtis Catalogue No. 300 being up to the representations of them in the book. The catalogue is distributed to retail lumber dealers, but any architect who requests it may have a copy. He will find it useful as a guide to permanent furniture.

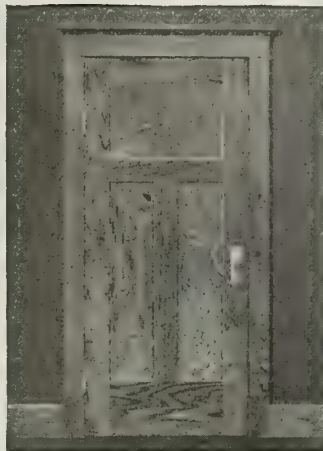




Standard Design Colonnade C-826  
Yellow pine  
Plain red oak



Standard Design Door C-662  
White pine stiles and rails with  
yellow pine panels  
Plain red oak  
Unselected birch



Standard Design Door C-663  
White pine stiles and rails with  
yellow pine panels  
Plain red oak  
Unselected birch



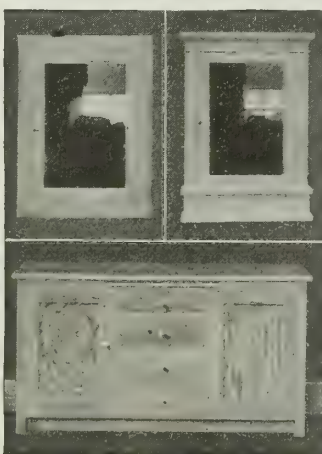
Standard Design Colonnade C-850  
Yellow pine  
Plain red oak



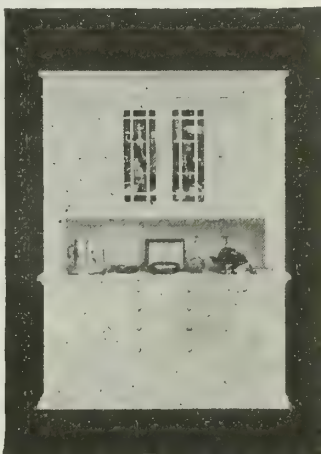
Standard Design Buffet C-1060  
Yellow pine  
Plain red oak



Standard Design Kitchen Cupboard  
C-1100  
Yellow pine



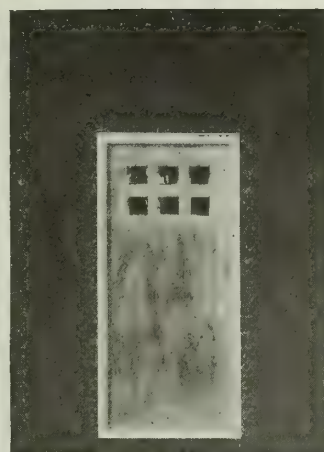
Standard Design Medicine Cases  
C-1201 and C-1202  
Standard Design Kitchen Work  
Table C-1141  
Yellow pine



Standard Design Sideboard C-1007  
Yellow pine  
Plain red oak



Stair Design C-1502



Slab Veneered Door C-569



Front Entrance C-630 with Standard  
Design Door C-474  
White pine  
Plain red oak  
Unselected birch



Standard Design Door C-472  
White pine  
Plain red oak  
Unselected birch

A FEW DESIGNS FROM THE CURTIS CATALOGUE NO. 300

# INDIANA LUMBER & MFG. CO.

Manufacturers of High Grade Interior Trim

742 South Michigan Street  
SOUTH BEND, IND.

## Products.

Manufacturers of Special High Grade INTERIOR TRIM, including Doors, Stairs, Cabinets, Store and Office Fixtures, Church Paneling, Railing, etc.

Exterior Millwork also furnished when desired.

## Classes of Construction.

Furnishing interior trim of high quality, for residences, churches and office buildings, is made a specialty.

## Methods.

The trim is either prepared for contractor to erect on the building, or we will figure to assemble trim at the factory ready to be applied to the opening.

## Stock.

A large stock of high grade hardwood lumber is constantly carried. The dry kiln capacity is extensive. These facilities enable prompt service to be given on urgent orders.

## Equipment.

The factory is equipped with the most improved machinery. This is operated in an economic manner

so that the cost of production is reduced to a minimum.

## Estimates.

This company is always pleased to quote prices on all classes of millwork, and asks architects and builders to send plans for estimate. Express paid on plans both ways.

## Plans.

All plans received will be considered for our use only, and all facts pertaining thereto will be considered as confidential.

## Attention to Details.

The highest standard in workmanship has been maintained for many years, and, on account of the reputation thereby gained, the company gives careful attention to details of plans and specifications.

## Co-operative Service.

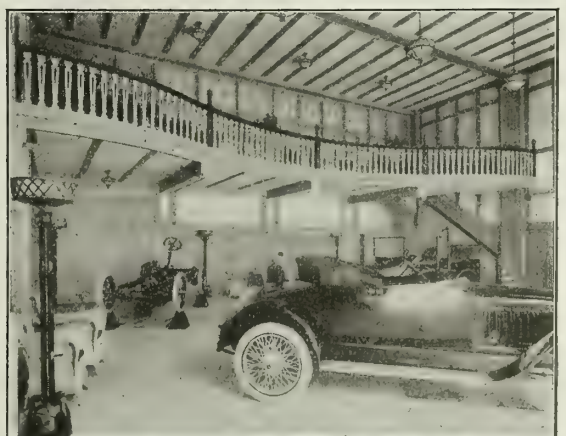
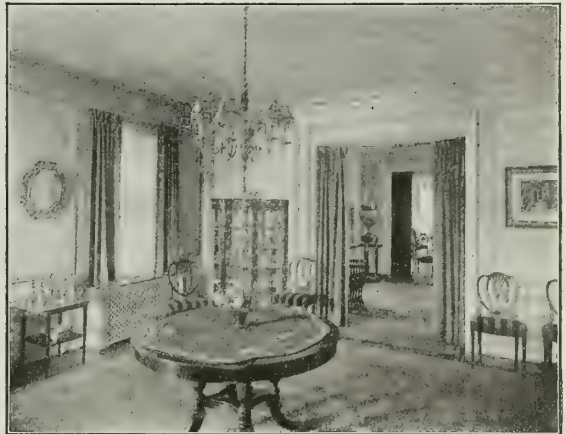
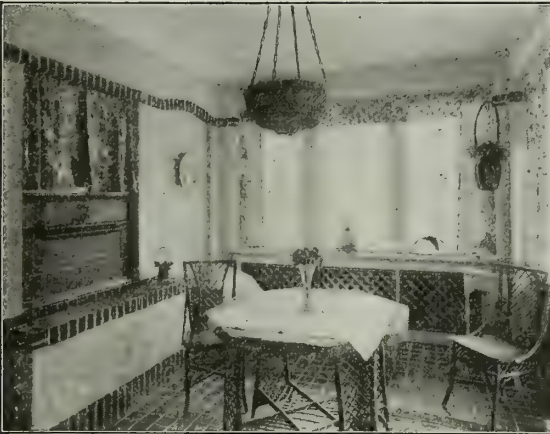
The company is always ready to co-operate with the architect by suggesting practicable methods of millwork construction.

Millwork estimates on tentative plans will be gladly furnished.

## Representative List of Installations.

BUILDING	LOCATION	ARCHITECT
Willard Avenue School	Highland Park, Mich.	Wells D. Butterfield, Detroit, Mich.
Central Savings Bank	Detroit, Mich.	Louis Kamper, Detroit, Mich.
Salem School Building	Salem, Ohio	C. W. Owsley, Youngstown, Ohio
First Church of Christ, Scientist	South Bend, Ind.	Leon E. Stanhope, Chicago, Ill.
Trinity Evangelical Church	Rochester, Ind.	Lewis H. Sturgis, Indianapolis, Ind.
Crockett Building	South Bend, Ind.	W. W. Schneider, South Bend, Ind.
Henry S. Martin School Building	Canton, Ohio	Frank L. Packard, Columbus, Ohio
Public Library	Mishawaka, Ind.	A. F. Wickes, Gary, Ind.
F. O. E. Aerie Building	South Bend, Ind.	Freyermuth & Maurer, South Bend, Ind.
Union Trust Bank Building	South Bend, Ind.	Austin & Shambleau, South Bend, Ind.
First Congregational Church	Toledo, Ohio	Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio
The Hunter Garage	Detroit, Mich.	Louis Kamper, Detroit, Mich.
Michigan Children's Home	St. Joseph, Mich.	Holabird & Roche, Chicago, Ill.
George Garage	Detroit, Mich.	Albert Kahn, Detroit, Mich.
A. W. Wallace Residence	Detroit, Mich.	A. W. Chittenden & Chas. Kotting, Detroit, Mich.
C. W. Gill Residence	Ann Arbor, Mich.	Samuel McC. Stanton, Ann Arbor, Mich.
H. S. Cover Residence	South Bend, Ind.	Austin & Shambleau, South Bend, Ind.
J. H. Murren Residence	Detroit, Mich.	H. S. Angell, Detroit, Mich.
Immaculate Conception School	Toledo, Ohio	DeVore & McGormley Co., Toledo, Ohio
M. W. Sales Residence	Detroit, Mich.	Louis Kamper, Detroit, Mich.
H. S. Badet Residence	South Bend, Ind.	Noel S. Dunbar, South Bend, Ind.
E. Louis Kuhn Residence	South Bend, Ind.	Austin & Shambleau, South Bend, Ind.
F. E. Keller Residence	Winamac, Ind.	Carl J. Horn, Logansport, Ind.
C. H. Haberkorn, Jr., Residence	Detroit, Mich.	Louis Kamper, Detroit, Mich.
F. L. Burdick Residence	Sturgis, Mich.	F. D. Van Volkenberg, Kalamazoo, Mich.
W. B. Fulton Residence	Charlotte, Mich.	T. Benjamin & Son, Grand Rapids, Mich.
W. D. Clifford Residence	Valparaiso, Ind.	Alfred D. Weber, Chicago, Ill.





EXAMPLES OF INTERIOR TRIM AND EXTERIOR MILLWORK



# MATTHEWS BROS. MANUFACTURING CO.

## Cabinet Makers

ESTABLISHED 1857

OFFICE AND FACTORY  
61-75 and 60-68 Fourth Street  
MILWAUKEE, WIS.

### Products.

The highest grade of CABINET WORK, such as FINE INTERIOR WOODWORK, BANK and OFFICE FITTINGS, SPECIAL FURNITURE, MANTELS, etc., for the better class of residences, hotels, office and public buildings.

### Quality and Workmanship.

Skilled supervision from the selection of the choicest woods to the complete installation in the building.



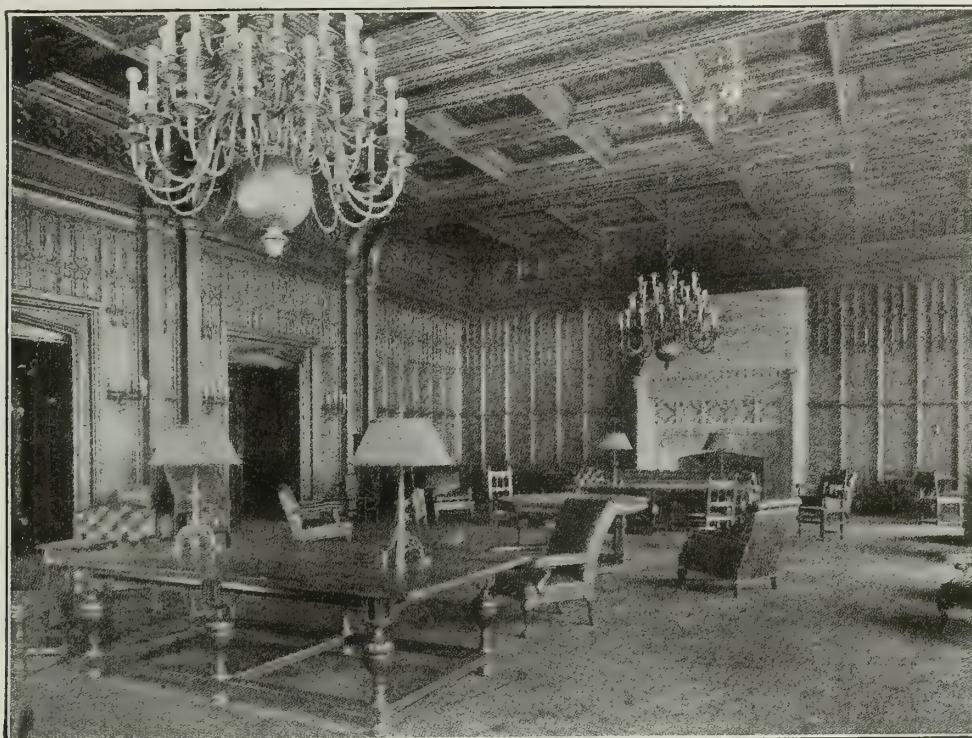
ELIZABETHAN ROOM, CONGRESS HOTEL, CHICAGO, ILL.

Cabinet work of this beautiful room was executed by MATTHEWS BROS. MANUFACTURING CO. in genuine English oak

### Prominent Examples of Work Executed by This Company.

BUILDING	LOCATION	ARCHITECT
John Dupee Residence	Coronado, Cal.	Parkinson & Bergstrom
Alexandria Hotel	Los Angeles, Cal.	Parkinson & Bergstrom
Security Savings Bank and Building	Los Angeles, Cal.	Weary & Alford Co.
First National Bank	Los Angeles, Cal.	Weary & Alford Co.
Citizens National Bank	Los Angeles, Cal.	John Parkinson
Security National Bank	Los Angeles, Cal.	Weary & Alford Co.
San Diego Savings Bank	San Diego, Cal.	Eames & Young
United States Custom House	San Francisco, Cal.	Weary & Alford Co.
Humboldt Savings Bank	San Francisco, Cal.	Weary & Alford Co.
First National Bank	Pueblo, Colo.	Cass Gilbert
Municipal Building	Waterbury, Conn.	Holabird & Roche
Telephone Building	Chicago, Ill.	Holabird & Roche
Mandel Bros. Building	Chicago, Ill.	
International Silver Co., Store Fixtures	Chicago, Ill.	Holabird & Roche
Auditorium Annex, Elizabethan Room, English Oak	Chicago, Ill.	
University Club, three lower floors	Chicago, Ill.	Shepley, Rutan & Coolidge
Mrs. Emmons Blaine Residence	Chicago, Ill.	Jarvis Hunt
J. H. Moore Residence	Chicago, Ill.	Arthur Heun
J. Ogden Armour Residence	Lake Forest, Ill.	Weary & Alford Co.
American National Bank	Indianapolis, Ind.	Price & McLanahan
James A. Allison (Prest-O-Lite Co.) Residence	Indianapolis, Ind.	Chas. A. Rich
J. D. Oliver (Oliver Chilled Plows) Residence	South Bend, Ind.	
J. W. Bettendorf (President Bettendorf Co.)	Bettendorf, Iowa	
Citizens' National Bank	Independence, Kans.	Weary & Alford Co.
State Bank of Winfield	Winfield, Kans.	Weary & Alford Co.
Copley-Plaza Hotel	Boston, Mass.	H. J. Hardenbergh





LOUNGING ROOM, SECOND FLOOR, THE UNIVERSITY CLUB, CHICAGO, ILL.

Cabinet work executed by MATTHEWS BROS. MANUFACTURING Co. in genuine English oak

**Prominent Examples of Work Executed by This Company (Continued).**

BUILDING	LOCATION	ARCHITECT
J. M. Longyear Residence, 1905	Boston, Mass.	D. Fred Charlton
Minot Building	Boston, Mass.	Parker, Thomas & Rice
Offices Columbian Life Ins. Co.	Boston, Mass.	Parker, Thomas & Rice
Henry Ford (Ford Motor Co.) Residence	Dearborn, Mich.	W. H. Van Tine
J. M. Longyear Residence, 1891	Marquette, Mich.	D. Fred Charlton
Metropolitan National Bank Building,	Minneapolis, Minn.	Weary & Alford Co.
Muehlebach Hotel	Kansas City, Mo.	Holabird & Roche
St. Louis Public Library, Special Furniture and Bookcases]	St. Louis, Mo.	Cass Gilbert
Third National Bank	St. Louis, Mo.	Weary & Alford Co.
United States Custom House	New York, N. Y.	Cass Gilbert
W. J. Hynes Residence	Omaha, Nebr.	F. A. Henninger
Willys Overland Administration Building	Toledo, Ohio	Mills, Rhimes, Bellman & Nordhoff
Exchange National Bank Building	Tulsa, Okla.	Weary & Alford Co.
Westinghouse Office Building	East Pittsburgh, Pa.	Thos. Rodd
Frick Building, entire Interior Woodwork, Banking Room, Brokers' Office, Club Room, Café, Restaurant, including Carved Figures and Furniture in latter room }	Pittsburgh, Pa.	{ D. H. Burnham & Co. { Geo. A. Fuller Co., Contractors
Frick Annex	Pittsburgh, Pa.	D. H. Burnham & Co.
Philadelphia Building	Pittsburgh, Pa.	McClure & Sparr
Fort Pitt Hotel	Pittsburgh, Pa.	Janssen & Abbott
H. C. Frick Library	Pittsburgh, Pa.	F. J. Osterling
A. R. Peacock (Carnegie Steel Co.) Residence	Pittsburgh, Pa.	Alden & Harlow
W. P. Snyder Residence	Pittsburgh, Pa.	Geo. S. Orth & Bro.
Col. J. M. Guffy, Residence	Pittsburgh, Pa.	Geo. K. Pearsons
R. R. Quay Residence	Pittsburgh, Pa.	Rutan & Russell
B. F. Jones (Jones & Laughlin Co.) Residence	Pittsburgh, Pa.	Alden & Harlow
Third National Bank	Pittsburgh, Pa.	Weary & Alford Co.
Union Arcade Building (H. C. Frick, owner)	Pittsburgh, Pa.	F. J. Osterling
City and County Building	Pittsburgh, Pa.	Edw. B. Lee
E. W. Mudge Residence	Pittsburgh, Pa.	H. D. Gilchrist
Utah Hotel (lower rooms)	Salt Lake City, Utah	Parkinson & Bergstrom
Davenport Hotel	Spokane, Wash.	Cutter & Malmgren
Old National Bank	Spokane, Wash.	D. H. Burnham & Co.
State Historical Library	Madison, Wis.	Ferry & Clas
Charles Allis Residence	Milwaukee, Wis.	A. C. Eschweiler
L. J. Petit (President, Wisconsin National Bank) Residence	Milwaukee, Wis.	Ferry & Clas
A. O. Trostel (V. Pres., Albert Trostel & Sons Co.) Residence	Milwaukee, Wis.	E. R. Liebert
Capt. Frederick Pabst Residence	Milwaukee, Wis.	Ferry & Clas
Col. G. G. Pabst (President, Pabst Brewing Co.) Residence	Milwaukee, Wis.	Ferry & Clas
Northwestern Mutual Life Insurance Building, Entire Interior Woodwork and Special Furniture	Milwaukee, Wis.	Marshall & Fox
First National Bank Building, Entire Interior Woodwork, Banking Fixtures and Furniture	Milwaukee, Wis.	D. H. Burnham & Co.
Wisconsin Hotel	Milwaukee, Wis.	Holabird & Roche
A. J. Lindemann Residence	Milwaukee, Wis.	Fitzhugh Scott
C. W. Case Deering Residence	Honolulu, T. H.	Holabird & Roche
H. H. Timken Residence	Canton, Ohio	H. D. Gilchrist

# MORGAN COMPANY

Manufacturers of Hardwood Doors and Woodwork of All Kinds

OSHKOSH, WIS.

BRANCH OFFICES AND PLANTS

BALTIMORE, MD.

CHICAGO, ILL.

SALES OFFICES

CLEVELAND, OHIO

NEW YORK, N. Y., 6 East 39th Street

DISTRIBUTERS

CHICAGO, ILL., MORGAN SASH AND DOOR CO.

BALTIMORE, MD., MORGAN MILLWORK CO.

DETROIT, MICH., MORGAN SASH AND DOOR CO.

## Products.

MORGAN DOORS: FRONT and INTERIOR, VENEERED, FLUSH or SANITARY, in both hardwood and soft wood.

Interior Woodwork, and Cabinet Work of any description, in accordance with architects' specifications and details: Stairwork; Colonnades and Mouldings; Grilles; Dressers; Kitchen Dressers; Medicine Cabinets; Shelves; Corner Beads; Base Corners.

Exterior Woodwork: Windows and Sash; Window and Door Frames; Gable Ornaments; Store Fronts; Columns, Spindles and Rails.

## Plants and Facilities.

Morgan doors are manufactured and distributed at the above mentioned cities. Each one of these plants is equipped with the most modern lumber manufacturing and door making machinery. Many of the machines are original with this company and are built to meet the requirements of the building trades at the present time, and are in harmony with its own ideas gained from long experience in all kinds of millwork manufacture.

The products of the MORGAN COMPANY are for sale by dealers in doors, sash, lumber, blinds, stairwork, interior finish and other millwork, throughout the country. The method of distribution permits shipments anywhere with dispatch.

## Guarantee.

Every *Morgan* door is guaranteed to be absolutely perfect in every respect. This guarantee means that should any defect be discovered, a Morgan door will, anywhere, be immediately replaced by a new one free of all charge.

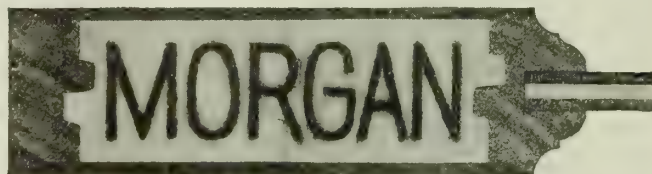
## Morgan Hardwood Veneered Doors.

Made of hardwood, they are light, strong, durable, weatherproof and wearproof, retaining at the same time all the beauties of hardwood grain.

The raw material comes from *Morgan* forests, is cut in *Morgan* mills and is manufactured from beginning to end under the personal supervision of the firm in its own factory.

Every piece of wood going into the door is made absolutely dry, then kept in rooms heated to a high degree of temperature so that no moisture can re-enter the pores. This is the first step toward construction.

The name "Morgan" is stamped on every door.



SECTIONAL VIEW OF MORGAN DOOR

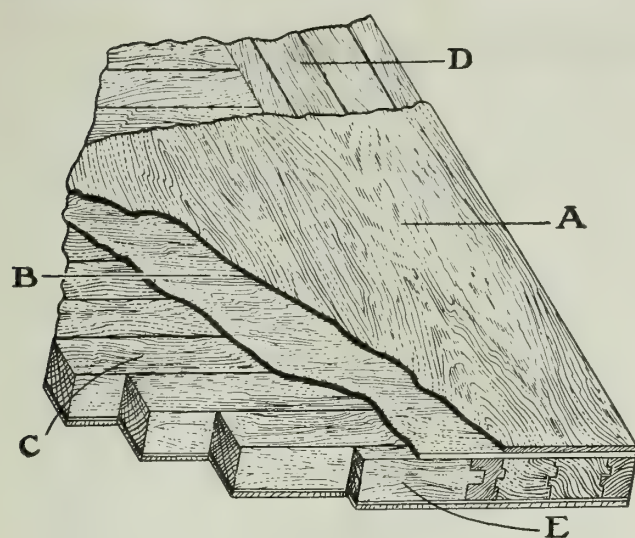
## Construction.

After the thorough drying process, the cores or foundations are built up of narrow strips of pine, with edges of hardwood glued together with best veneer glue, brought together by powerful hydraulic pressure and kept in pressure retainers for many hours, so as to make a perfect and durable joint. Cores are then planed to even thickness, face or surface veneers are applied, and again cores are subjected to tremendous hydraulic pressure. Grain of core, or centerpiece, is always placed at right angles to grain of veneer, thus increasing the strength and preventing swelling, shrinking or checking.

## Veneers.

Only the best grained and best quality rotary cut and sawed veneers are used. Plain oak, brown ash and birch contain rotary cut figures; while mahoganies and quartered oaks are selected for colors, as well as figures. The mahogany stain on Wisconsin birch escapes detection by experts.





DETAIL OF CONSTRUCTION MORGAN DOOR

- "A" 1/8-in. face veneer
- "B" Cross banding veneers
- "C" Solid rail construction with glued joints
- "D" Stile construction with glued joints
- "E" Edge strips to match veneers

**Construction Morgan Flush or Sanitary Doors.**

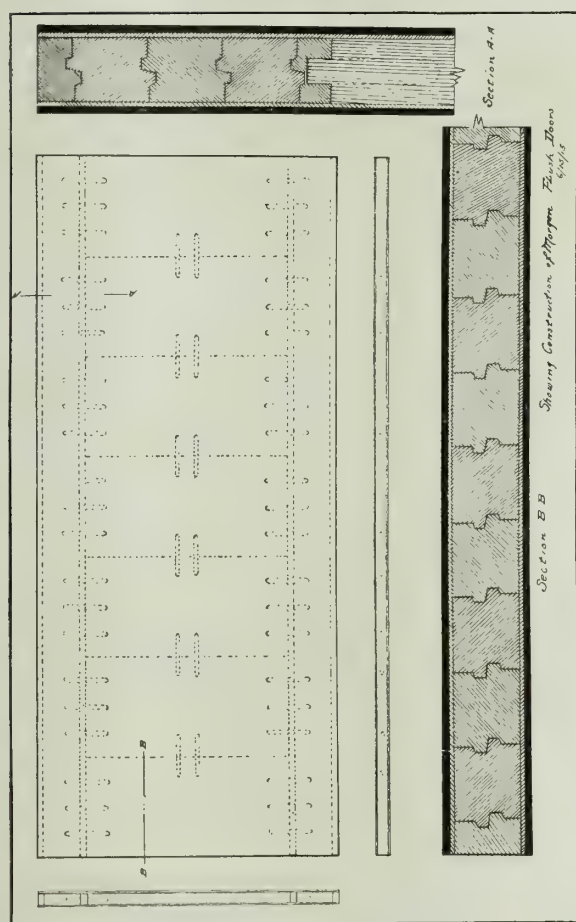
The core or foundation of the door is built up of thoroughly kiln dried pine, Morgan dowel construction being used. Stiles and top rail are 6 ins.; bottom rail 12 ins. This frame or foundation part of the door forms a perfect flush door in itself.

The frame is re-dried and then planed and sanded to an even thickness.

The cross banding is next put on, and the face veneers placed upon it. The cross banding and veneers are glued to the core in hydraulic presses of 300 tons capacity, a uniform pressure being maintained on all doors, irrespective of size.

MORGAN COMPANY have always had special methods for building doors, and these methods show to advantage in the doors with inlay. The strips of inlay are so placed as to permit hand smoothing of the entire surface at one time, thereby eliminating all imperfect joints.

Every door made by the company is guaranteed to be perfect.



SKETCH SHOWING CONSTRUCTION OF MORGAN FLUSH OR SANITARY DOORS

NOTE—Fifty-four dowels in each core



M-115. MORGAN FLUSH OR SANITARY DOOR

Design of Inlay I-1

Design shows quarter sawed white oak and flitch sawed veneers. The exquisite graining is result of careful selecting and sawing. Built in different woods. Can be stained and finished in different shades

# THE ATCHISON REVOLVING DOOR CO.

MAIN OFFICE AND FACTORY  
INDEPENDENCE, KANS.

AGENCIES IN ALL OF THE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

If this company is not listed in the City or Telephone Directory, write the main office, which will furnish the name of the nearest representative.

## Products.

ATCHISON REVOLVING DOORS, "Curved Wing" and "Straight Wing" Types, Full-folding Standard Type PB, Semi-folding Type C, Safety-exit or Panicproof Type NT, complete with Enclosures (or Vestibules) and connections. WINGS only for Marble Enclosures. CONNECTED METAL WORK.

## Reasons for Using Revolving Doors.

**ALWAYS CLOSED**—No other entrance will pass traffic without being open to outside cold and drafts. Ventilation is under control and lobbies are comfortable and rentable at the same time that people pass with maximum ease and efficiency, regardless of wind or weather. It is easier to go through an Atchison door than through one set of heavy checked swing doors, to say nothing of the usual two or even three sets.

**CAPACITY**—From 2000 to 3000 persons per hour, each way. This is greater than with swing doors, and in-and-out traffic is automatically divided.

**WAR ECONOMY**—Specify Atchison doors to save fuel and help win the war. Fuel shortage and high price increase the normal pre-war value of Atchison doors, which will now save from one-quarter to three-quarters of a car of coal monthly and pay for themselves in 3 or 4 years.

## General Data.

**MATERIALS**—All cabinet woods; bronze or steel, Nos. 10-12 gage on steel frames, Nos. 16-24 gage on wood cores; copper, 16-20 oz. on wood only. Enclosure work and connections in ornamental cast bronze and iron, guaranteed equal to the best work of others.

**METAL WINGS**—For metal wings, wood core construction is strongly urged instead of steel frames because of greater stiffness, lower cost, greater fire resistance and less weight. Heavy wings are slow to start and stop, and all-metal wings can not be made free from twisting without being too heavy. As for fire-proofness, an all-metal wing will twist and warp under heat much sooner than a wood core wing entirely incased in heavy metal.

**WOOD DOORS**—All doors are veneered, so cheap soft woods make no saving, but can be furnished.

**SCREEN DOORS**—Light D. A. screen or fly doors may be hung directly to ends of walls with removable hanging strips without interfering with the wings. This feature is possible only with the Atchison door, and is often used. See drawing No. 165.

**SIZE**—4 wing doors should not be smaller than 6 ft. outside diameter,

but if conditions only permit a smaller door, down to 5 ft. 6 ins. diameter, then the "curved wing" is best. Standard and best diameter is 7 ft., except for hotels, where 7 ft. 6 ins. or even 8-ft. doors give more room for hand baggage. Inside height should be from 7 to 8 ft.

3-wing doors can be as small as 4 ft. 6 ins. diameter, and are used where space will not permit a 4-wing door, and for interior air-lock and toilet room purposes. Practicable only for limited traffic, as in-and-out traffic is not fully divided. Can be furnished with wings to fold aside (drawing No. 166) or with 1 wing hinged only.

**GLASS HEIGHT**—Glass should never be lower than 18 ins. from floor, to allow drop arms to clear when dropped; 24 ins. minimum is better, to give higher bracing point and reduce racking strains.

**"FLUSH VENEERED" WALLS**—Made with improved cores at a cost lower than the old style vertical T&G linings, and show the most beautiful matched veneer effects. Unexcelled for all solid wall enclosures. See design No. 167.

**MARBLE ENCLOSURES**—Atchison wings are easy to use with marble enclosures, as no ceiling slot is needed, and slabs can be supported from the bearing channel which lies directly over the slab. Only a 1¾-in. center hole is needed. No other provision whatever for receiving the wings.

**MOTOR DRIVE**—Perfectly simple with Atchison doors because the center bearing is stationary and does not move aside on a wheeled carriage. All mechanism is mounted on the main supporting channel. Three speeds. Continuous operation, or push button or floor-mat control. ¼ h.p. required. Uses any power or lighting current. Friction clutch drive is safe and simple, allowing stopping either the door or motor without injury, and acting as the best possible brake against overspeeding.

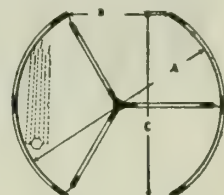
**SPEED CONTROL BRAKES**—Liquid check type can be furnished, but are rarely necessary, proper setting of the air-lock strips being a simple and efficient way of controlling the speed.

**AIR-LOCK STRIPS**—Consist of wide bottom rubbers for flexibility, thick felt top strips and tapered molded side rubbers with felt edges, all especially selected and developed for maintaining the air-lock with only the proper amount of friction.

**PATENTS**—Cover the "curved wing" and other Atchison features. No infringement suits need be feared. This company will guarantee against any loss or damage therefrom. Do not be misled by veiled "within-the-law" threats.

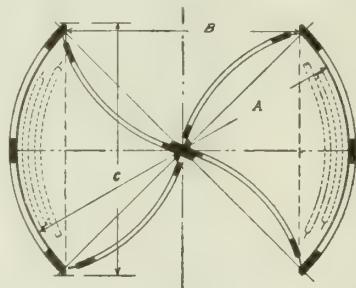
## The "Curved Wing."

The "curved wing" is the first and only improvement ever made which affects or increases the revolving value, and so is far more important than all other secondary improvements which have to do merely with



No. 166. 3-WING  
DOOR FLOOR PLAN  
DIMENSION TABLE

A	B	C
4' 6"	2' 2½"	4' 2"
5' 0"	2' 5½"	4' 7"
5' 6"	2' 8½"	4' 2"



No. 164. "CURVED-WING" DOOR  
FLOOR PLAN  
Note folded position of wings

DIMENSION TABLE		
A	B	C
6' 0"	4' 2½"	4' 7½"
6' 6"	4' 6¾"	4' 11¾"
7' 0"	4' 11"	5' 4"
7' 6"	5' 3¼"	5' 8¼"
8' 0"	5' 7½"	6' 0½"



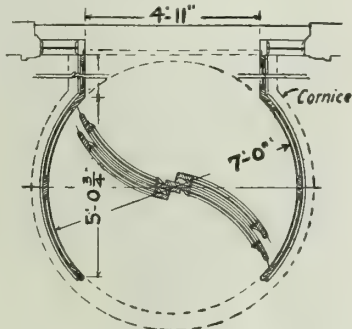
locking, folding, collapsing, etc. It makes passage through the door more than one-fourth easier, because the user pushes naturally against the outer stile, causing the center of the "curved wing" to be 6 ins. farther from the body than if straight. This gives more walking space in front, where it is useful, and permits a more natural, upright, easy step than is possible with the straight wing. No mysterious trick increases the area of the circle, but the space is simply made more useful for walking through, and every user is benefited. The "curved wing" is quoted at the actual extra cost, under a fixed policy, and is the best part of a revolving door investment.

**BREAKAGE**—Breakage of "curved wing" plates is so rare as to be negligible, but standby or replacement plates will be furnished at cost, eliminating any possible objection on that ground.

### Special Features of Full-folding Standard Type PB Doors.

**FOLDING**—Standard folding Type PB wings fold aside in pairs, on pivots, in 30 seconds or less, as easily as ordinary swing doors, *without overhead ceiling slots* or carriages or floor casters, and lie entirely back of the enclosure wall points or chord line (drawing No. 164). Folded wings are always in place ready for instant use, yet are as much out of the way as if removed entirely, and take up none of the open passage space.

**LOCKING WINGS**—Wings lock or unlock from inside or outside, in the diagonal position shown in drawing No. 92, at top and bottom, and each side, proof against entrance or injury by racking. They can also be fastened to the ceiling only, in crosswise, quartering or lengthwise positions, but not so securely because not fastened at bottom. For special additional security, stop work and lock cylinders (master-keyed if desired) can be furnished at extra cost. These control the operation of the folding pivot locks.



NO. 92. FLOOR PLAN

### Semi-folding Type C Doors.

Type C wings fold into one plane and fasten to ceiling only in a cross position for locking purposes, or lengthwise for passing traffic or objects. When revolving, they have exactly the same value as the more expensive types, and yet are low enough in price to be available for any smaller buildings, or where traffic does not justify the investment in the other type doors. The use of Type C doors is increasing.

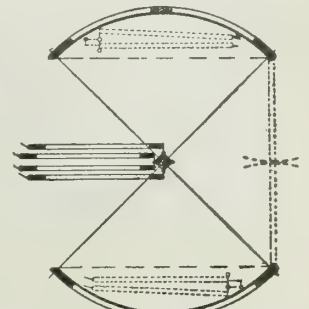
### Type NT Safety-exit Collapsible or "Panicproof" Doors.

For the few entrances that are the sole exits for

public assemblages or massed crowds (*not* offices, banks or hotels) use the Type NT doors, which can be opened under panic conditions, without knowledge of the mechanism, by simple and positive devices, but which will positively not release under wind pressure or accidental jarring. Elsewhere these more expensive NT wings should not be specified needlessly, as they are not in any way more up-to-date or more valuable for revolving or folded use. Instead of automatic releasing braces (which can not hold against wind pressure and jars, and at the same time give way under panic pressure), this company uses the push bar release cable brace, with toggle tightener, which takes up all slack in the braces and prevents rattling and breaking of braces.

Type NT wings are carried by a novel "trammel" hanger or hinge, and at the same time can be folded aside in pairs, just as the standard PB wings.

See drawing No. 165, showing wings in folded and collapsed positions.



NO. 165. FLOOR PLAN  
TYPE NT SAFETY-  
EXIT DOOR  
Showing screen doors

### Specifications.

"Furnish and install, where shown, Atchison 'curved [or straight] wing' standard folding [or safety-exit Type NT] revolving doors, with mechanism to permit folding wings aside in pairs to lie entirely within curvature of enclosure walls, without projection at any point, as made by THE ATCHISON REVOLVING DOOR CO., Independence, Kans. Hardware to be solid cast brass [or bronze], plain heavy design, polished [or brushed] finish. Glazing to be American polished plate [or 3/16-in. crystal sheet]."

If collapsible doors are needed, specify in addition: "Wings, and mechanism to be the Atchison Type NT safety-exit with 'trammel' hangers and push bar release cable brace and tightener, permitting egress under panic conditions without revolving."

### Facilities.

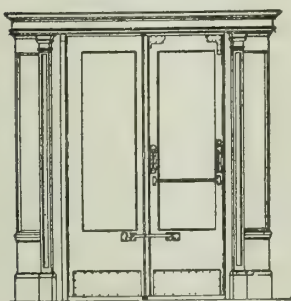
This company's plant is the largest revolving door factory in the world. It is of the sawtooth, concrete, motor drive type; and by reason of its central location and favorable manufacturing conditions, it can more than offset freight to any part of the United States.

### Estimates and Ordering.

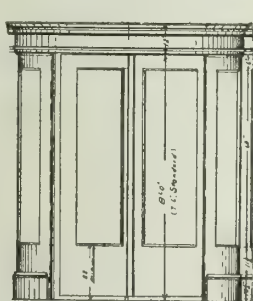
Agents can generally quote direct on stock designs or those shown below, but special doors must be quoted by factory. Send rough floor plan sketch of present entrance and kind of material and finish. All doors are made to order because of numerous variations, and this company urges the placing of orders during Spring and Summer to get good deliveries and avoid the seasonal rush of Fall and early Winter.

### References.

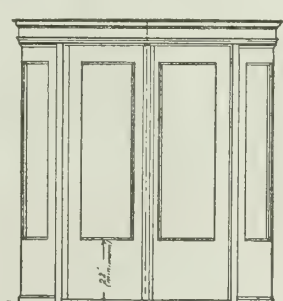
Lists of hundreds of doors all over the country, and Catalogue B, will be mailed on request.



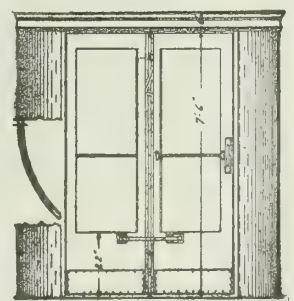
No. 7



No. 91



No. 95



No. 167

ELEVATION DESIGNS OF ATCHISON REVOLVING DOORS

## VAN KANNEL REVOLVING DOOR CO.

## MAIN OFFICE

TELEPHONE:

CIRCLE 1876, 1877 AND 1878

250 West 54th Street  
NEW YORK, N. Y.

## BRANCH OFFICES

WASHINGTON, D. C., 232 Woodward Building  
PITTSBURGH, PA., 345 Fourth Avenue  
ATLANTA, GA., 814 Candler Building  
CHICAGO, ILL., 1119 Chamber of Commerce  
ST. PAUL, MINN., 615 Ryan Annex  
SAN FRANCISCO, CAL., 8 Monadnock Building Arcade  
NORFOLK, VA., 235 Monticello Arcade Building  
DETROIT, MICH., 319 Hammond Building  
CLEVELAND, OHIO, 1214 Schofield Building  
INDIANAPOLIS, IND., 120 East Washington Street  
OMAHA, NEBR., 773 Brandeis Building

KANSAS CITY, MO., 323 Reliance Building  
ST. LOUIS, MO., 1116 Chemical Building  
BOSTON, MASS., 6 Beacon Street  
LOUISVILLE, KY., 306 West Main Street  
FORT WORTH, TEX., 414 Texas State Bank Building  
PHILADELPHIA, PA., 1416 Land Title Building  
NEW ORLEANS, LA., 909 Union Street  
COLUMBUS, OHIO, 407 Brunson Building  
DENVER, COLO., 215 Chamber of Commerce  
NASHVILLE, TENN., 409 Commercial Club Building  
CINCINNATI, OHIO, 409 Johnston Building  
RALEIGH, N. C., Commercial National Bank Building

## Products.

Manufacturers of three distinct types of REVOLVING DOORS, known under the following terms: AUTOMATIC COLLAPSIBLE, PANICPROOF TYPE; STANDARD "C" RIGID BRACE ARM TYPE; STANDARD "N" RIGID BRACE ARM TYPE.

VAN KANNEL REVOLVING DOORS are manufactured in various styles, using the above types. The styles of doors are as follows: 3-Wing Revolving Door; 4-Wing Revolving Door and 6-Wing Revolving Door.

VAN KANNEL AUTOMATIC RELEASING FIRE EXIT DEVICES.

Van Kannel Revolving Pantry Windows (Patented).

VAN KANNEL AUTOMATIC LOCKING and RELEASING CASEMENT WINDOW DEVICES.

For Building Directories and Bulletin Boards, see page 1438.

## Original Patentee.

This company is the pioneer manufacturer and original patentee of revolving doors; its patents cover every practical improvement and substantial feature. Architects may spare their clients expense and embarrassment from patent litigation by specifying Van Kannel doors.

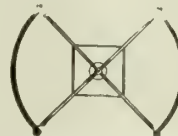
## Van Kannel Revolving Doors.

**AUTOMATIC COLLAPSIBLE PANICPROOF TYPE**—This type of door has 3, 4, or 6 wings hung independently of each other on a central shaft of metal and the wings are held together by flexible cables. This type of door is rapidly superseding the old rigid brace arm type, owing to its feature of absolute safety at all times and under all conditions. Its safety feature lies in the fact that the revolving wings are so arranged that by the application of pressure to any part of the revolving structure, slightly more than is necessary to revolve the door, the revolving wings will instantly and automatically collapse and fold outwardly in the line of egress, leaving a free, unobstructed passageway.

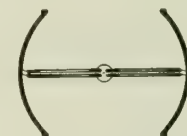
**Specifications**—These specifications cover only the automatic collapsible panicproof type, which is the

most modern type and should be used wherever revolving doors are desired.

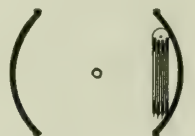
Provide and install, where shown on drawings, revolving doors of the automatic collapsible panicproof type, manufactured by the VAN KANNEL REVOLVING DOOR CO. Revolving wings to be hung independently of each other on a central shaft, and held in a radial position by means of flexible bronze cables, and to be so arranged that by application of unusual pressure to any part or parts of any 2 of the revolving wings, wings will automatically collapse and fold flat on each other in an outward position. Revolving wings to be hung from a self-oiling ball bearing located above ceiling in a removable carriage, and be so arranged that they may be released from the central position by one side of opening. All hardware to be solid bronze. Glazing to be American polished plate. The revolving door contractor to furnish the revolving wings, circular walls, ceiling and cornice.



Wings in Revolving Position, Excluding Wind, Snow, Dust and Noise



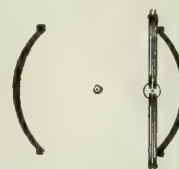
Locked Position. Locking Bolts Operative from Either Side of Vestibule



Side Full Open Position. Wings Folded Within Vestibule Walls



AUTOMATIC COLLAPSIBLE PANICPROOF DOOR  
Collapsed position. Wings folded in line of egress in case of fire or panic



Special Full Open Position, Utilizing Exit Space for Summer Use



Central Open Position. Commonly Used in Summer for Dividing Traffic

DIAGRAMS OF VARIOUS POSITIONS OF WINGS

**RIGID BRACE ARM TYPE**—STYLES "C" AND "N."—These two types consist of either 3, 4 or 6 wings held together in their radial position by rigid braces; the wings are collapsed only by means of pressing a spring when it is desired to have the doors open in the middle, or pushed to one side for a wide open passageway. These types, although collapsible as to the folding of the wings, are not automatically so, as in the case of the automatic collapsible panicproof type of door previously described.



**HINGED WALL CONSTRUCTION—**The hinged wall construction may be used wherever greater exit space is desired. The hinged sections flex back automatically, and when used in connection with the automatic collapsible revolving wings represent the most perfect type of revolving door.

**3-WING REVOLVING DOOR—**The 3-wing revolving door is especially adapted for entrances that are too small to accommodate a 4-wing door at least 6 ft. in diameter. It is being used to a great extent in entrances to toilet rooms in schools, institutions and public buildings and the company has installed 34 of these doors for the new Prudential building, Newark, N. J. Approximately 5 ft. diameter.

**MATERIALS—**Materials used for entire construction are any kind of hardwood, bronze or steel on a metal frame or wood core covered with various gages of metals in either copper, steel or bronze, using the following gages—Nos. 24, 20, 16.

Revolving door vestibules may be made of other materials such as marble, tile or cement as the requirements may be needed in order to carry out architectural treatments.

**STOCK DESIGNS—**Several stock designs are carried on hand in plain and quartered oak, birch and mahogany, on which practically immediate delivery can be quoted.



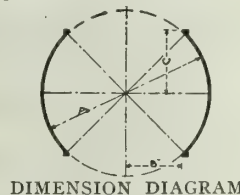
Designs 1192-1 and 2  
1192-1 as shown  
1192-2 same with glass panels in walls



Designs 1192-3 and 4  
1192-3 as shown  
1192-4 same with glass panels in walls

VAN KANNEL REVOLVING DOOR CO. STOCK DESIGNS

A	B	C
6' 0"	24½"	28¼"
6' 6"	26⅝"	30½"
7' 0"	28¾"	32½"
7' 6"	30¾"	34⅝"
8' 0"	32⅞"	36¾"



DIMENSION DIAGRAM

## Van Kannel Automatic Releasing Fire Exit Devices.

Patented in the United States.

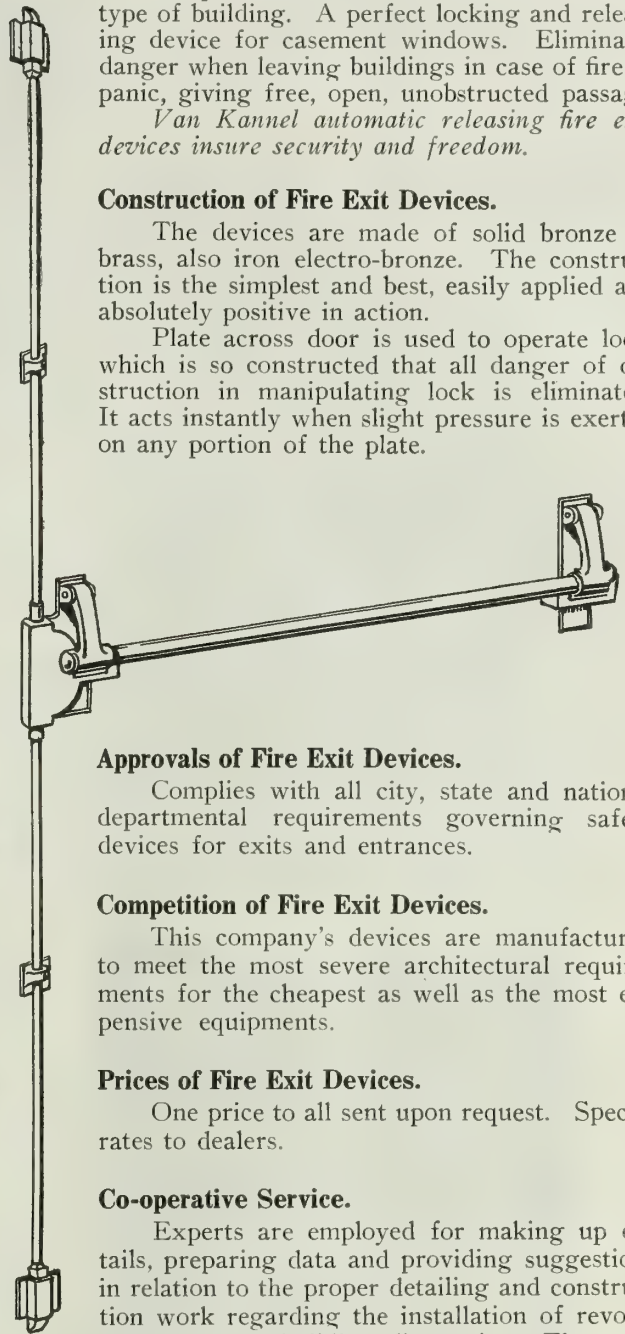
Adapted to exit and entrance doors of every type of building. A perfect locking and releasing device for casement windows. Eliminates danger when leaving buildings in case of fire or panic, giving free, open, unobstructed passage.

*Van Kannel automatic releasing fire exit devices insure security and freedom.*

### Construction of Fire Exit Devices.

The devices are made of solid bronze or brass, also iron electro-bronze. The construction is the simplest and best, easily applied and absolutely positive in action.

Plate across door is used to operate lock, which is so constructed that all danger of obstruction in manipulating lock is eliminated. It acts instantly when slight pressure is exerted on any portion of the plate.



### Approvals of Fire Exit Devices.

Complies with all city, state and national departmental requirements governing safety devices for exits and entrances.

### Competition of Fire Exit Devices.

This company's devices are manufactured to meet the most severe architectural requirements for the cheapest as well as the most expensive equipments.

### Prices of Fire Exit Devices.

One price to all sent upon request. Special rates to dealers.

### Co-operative Service.

Experts are employed for making up details, preparing data and providing suggestions in relation to the proper detailing and construction work regarding the installation of revolving doors and building directories. The company's drafting force is at the service of its clients.

FIRE EXIT DEVICE

# REVOLVING DOOR & FIXTURE CO.

TELEPHONE, GREELEY 4404

1328 Broadway  
NEW YORK, N. Y.

WALTER S. ELY, GENERAL MANAGER

## Products and Services.

REVOLVING DOORS of every description and of any desired material; TURNSTILES.

Motor Devices for Revolving Doors and Turnstiles.

Specialists in all Mechanical Devices as applied to Revolving Doors. Complete installations contracted for anywhere in the United States and Canada.

This company supplies Fixtures for Revolving Doors to manufacturers of cabinet work, kalamein work, hollow steel and architectural bronze work, together with construction details and, if desired, assembling and erecting labor.

## Automatic Panicproof Revolving Doors.

Wings are suspended from a universal ball bearing located in a dustproof oil chamber mounted on a carriage running on tracks. The wings can be folded centrally and moved to one side in the usual manner.

THE SLIP-BAR—Each wing is hung to the center post with spring hinges which hold it under spring control when the braces are detached, preventing slamming of the wings against each other and breaking the glass, which happens in other panicproof revolving doors.

The braces which hold the wings in rotating position are the vital feature of a panicproof door. This company uses neither cables nor chains, but manufactures the only slip-bar brace that pushes or pulls out

under undue pressure. Brace is positive in action, durable, and conforms to all building and fire department regulations.



SOLID BRONZE WINGS, PANICPROOF SLIP-BAR CONSTRUCTION, RECENTLY INSTALLED IN THE SUN LIFE INSURANCE BUILDING, MONTREAL, CAN.

DARLING & PEARSON, Toronto, Can., Architects

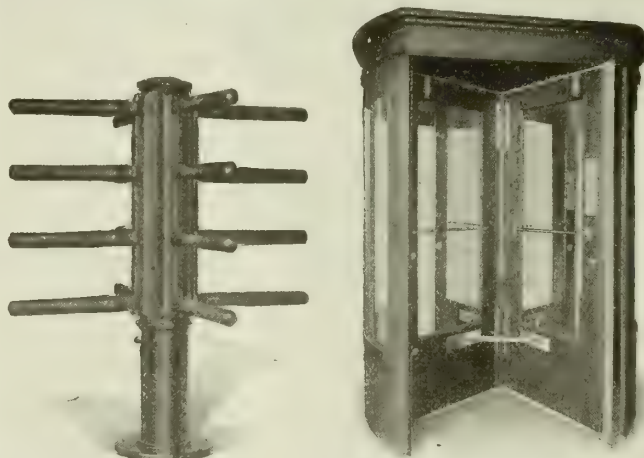
Stiles are 3 ins. wide, made of rectangular bronze tubing. Furnished with panel below glass or with any desired moulding, hand rails, push plates, etc. Bulletin No. 353.



CABINET MADE MAHOGANY WINGS, PANICPROOF SLIP-BAR CONSTRUCTION, ERECTED FOR GRUNWALD HOTEL, NEW ORLEANS, LA.

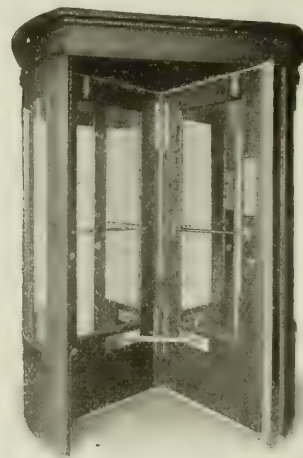
WOGAN & BERNARD, Architects

Bronze covered mouldings and ornamental push plates. Shows supplementary screen doors in two wings. Quickly converted. Only summer and winter door made. Bulletin No. 602.



TURNSTILE  
For baffle gates

Wood and iron construction. Any height or diameter; cross bars spaced to meet any requirements. Reversible right- or left-hand direction stops. Noiseless in action. Bulletin No. 758



STANDARD DESIGN NO. 106,  
PANICPROOF SLIP-BAR  
CONSTRUCTION

Enclosure No. 3609; Wings  
No. 4415

Meets average requirements; adapted to slight architectural changes. Any material; any wood or hardware finish; kick plates and key locking bolts when desired. Ask for details



# THE UNIVERSAL BALANCE DOOR, INC.

TELEPHONE:  
GRAMERCY, 4094

71 West 23rd Street  
NEW YORK, N. Y.

## Products.

The UNIVERSAL BALANCE DOORS and FIXTURES for same.

## Description.

The Universal Balance door is made up of two equal vertical sections or wings, the one balancing the other against wind, gravity and inertia, when used respectively in buildings, on ships or cars.

The two wings are so connected as to be *Universally Balanced*, so that no force is required to actuate these doors except that necessary to counteract the friction of the hinges and a light spring to overcome the hinge friction, the wind having no effect on the doors.

This door can not be slammed and can not be blown open. Two lines of persons may pass in and out at the same time, its capacity being a notable feature.

Where it is found necessary, a special safety device is attached permitting both wings to be pushed outward.

No unsightly fixtures protrude from this door, the mechanism being concealed within a small casing above the door, and is easily accessible.

It is noiseless and easy in action; it does not push, pound or pinch, and to a great extent prevents the breaking of glass.

This door is specially adapted as cabin doors on ships and ferry boats, in which the varying forces of gravity and inertia constantly affect the ordinary swing doors. The Universal Balance Door neutralizes the effects from the rocking and pitching of the vessel.

Send for further information and estimates.

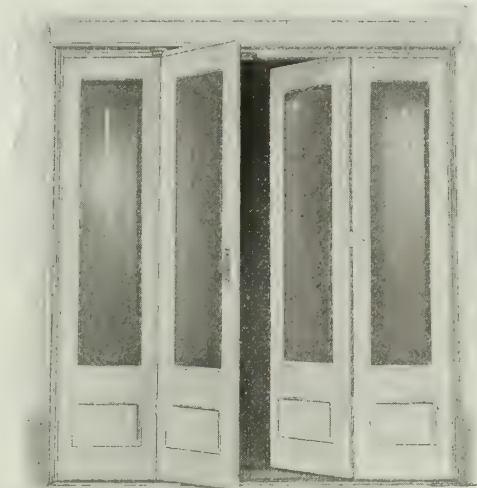
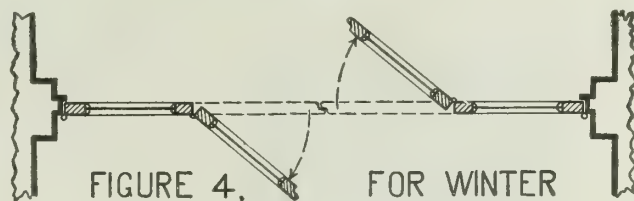
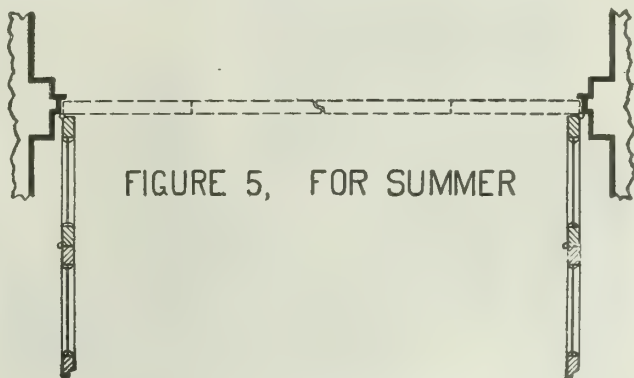


FIG. 3. UNIVERSAL BALANCE DOOR HINGED TO TWO FOLDABLE PANELS  
Wings in open position



PLAN OF ABOVE—ADAPTED FOR ENTRANCES FROM 7 TO 10 FT. IN WIDTH



SAME AS ABOVE—SHOWING WINGS AND PANELS FULLY OPEN

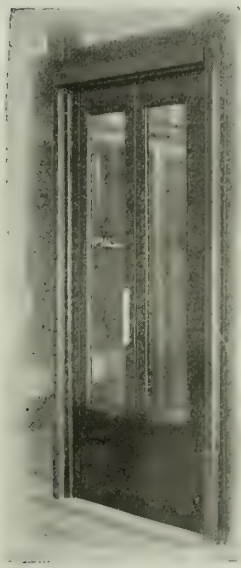


FIG. 1. UNIVERSAL BALANCE DOOR IN CLOSED POSITION  
(3-ft. opening)



FIG. 2. OPENED BY FINGER PRESSURE AGAINST A STRONG WIND

# FRANK F. SMITH METAL WINDOW HARDWARE CO.

Manufacturers of Improved Panic Exit Locks

NEWARK, N. J.

REPRESENTED THROUGHOUT THE UNITED STATES AND CANADA

## Product.

SMITH'S IMPROVED PANIC EXIT LOCKS, especially adapted to exit and entrance doors in theaters, schools, churches, hotels, factories and public buildings.

## Description.

Patented in the United States and Canada, November 17, 1914.

Panic exit locks made of solid brass or bronze—devices that are of the best construction, easily applied and always positive in action. A slight touch against any part of cross bar means instant release of the exit lock, causing the door to be opened outward.

Gravity action is one of the strongest points in favor of Smith's improved panic exit locks. Gravity is an action that does away with the dependency upon springs which do not give durability, and gravity, as understood, can always be depended upon.

Smith's improved panic exit locks are the original and only real gravity exit locks upon the market. This gravity feature is embodied in all style exit locks with the vertical rod.

The gravity panic exit locks latch easily, both top and bottom, sliding into strikes as would a good working car latch. There is no rebounding and the latches will catch on their own accord. Sure safeguard from entry on outside, yet the latches are easily and quickly released from the inside by a slight touch against any part of cross bar.

COMBINATION FOR DOUBLE ENTRANCE DOORS—A, extra large size, style 736 or 737 with style 75.

B, large size, style 436 or 437 with style 70.

C, medium size, style 416 or 417 with style 40.



TRADE-MARK

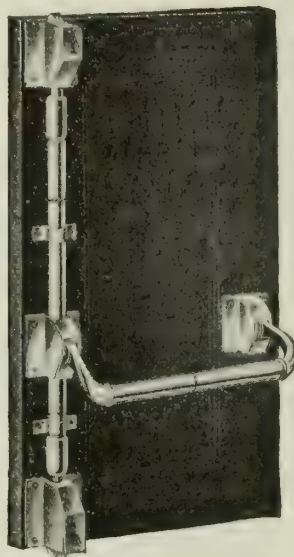
## Panic Exit Locks for Single Exit Doors.

No outside trim. Gravity action. Furnished with automatic and permanent dogs.

Extra large size: style 75,  $\frac{9}{16}$ -in. rod, 1-in. cross bar. Housings  $3\frac{5}{8}$  by  $2\frac{5}{8}$  ins.

Medium sizes: style 45,  $\frac{9}{16}$ -in. rod,  $\frac{7}{8}$ -in. cross bar; style 40,  $\frac{1}{2}$ -in. rod,  $\frac{7}{8}$ -in. cross bar. Housings on both,  $2\frac{3}{4}$  by  $2\frac{1}{4}$  ins.

Small size: style 25,  $\frac{1}{2}$ -in. rod,  $\frac{3}{4}$ -in. cross bar. Housings  $2\frac{1}{4}$  by 2 ins.



PANIC EXIT LOCK FOR SINGLE EXIT DOOR

## Double Cross Bar Exit Locks.

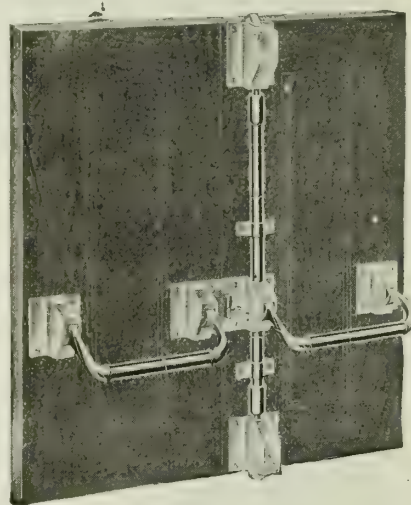
Allow releasing of lock by slight touch against either cross bar at any point on either door.

Extra large size, style 475.

Large size, style 445.

Medium size, style 440.

Small size, style 425.

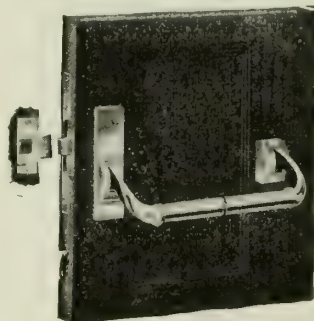


DOUBLE CROSS BAR EXIT LOCK

## Mortise Type Exit Locks.

For classroom doors. Furnished with permanent dog. No outside trim, style 31. Handle only outside, style H31.

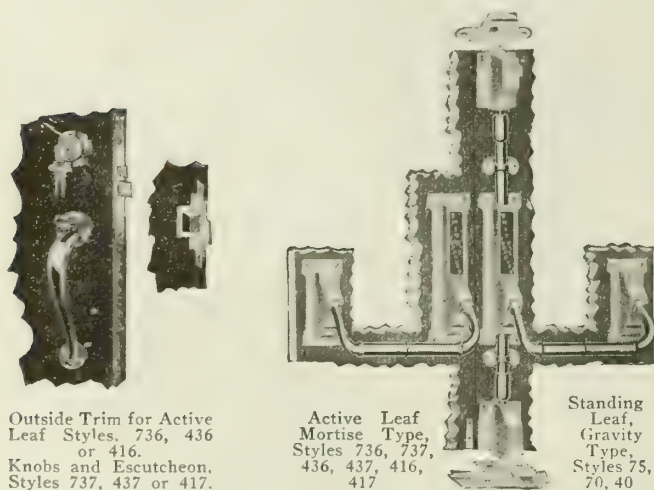
Many other styles to meet with every requirement. Recommended by prominent architects and schoolboards.



MORTISE TYPE EXIT LOCK

## Catalogue.

Send for new catalogue No. 12. Prices within reach. Deliveries prompt.



Outside Trim for Active Leaf Styles, 736, 436 or 416. Knobs and Escutcheon, Styles 737, 437 or 417.

Active Leaf Mortise Type, Styles 736, 737, 436, 437, 416, 417

Standing Leaf, Gravity Type, Styles 75, 70, 40

COMBINATION FOR DOUBLE ENTRANCE DOORS



# VONNEGUT HARDWARE CO.

Manufacturers and Distributors of Von Duprin Self-releasing Fire Exit Devices

UNITED STATES FACTORIES  
CHICAGO AND NORTH CHICAGO, ILL.

INDIANAPOLIS, IND.

CANADIAN FACTORY  
BELLEVILLE, ONT.

BRANCH OFFICES  
UNITED STATES OF AMERICA

ATLANTA, GA., BEAULLIEU & APPLEWHITE, 1317 Third National Bank Building. Telephone, Ivy 1754

BALTIMORE, MD., T. B. & H. S. HENDRICKSON, 521 Commerce Street, Philadelphia, Pa. Both Telephones

BOSTON, MASS., ROBERT J. GILKIE, 73 Tremont Street. Telephone, Haymarket 411

CHICAGO, ILL., JOHN C. BOLD & Co., Conway Building, 111 West Washington Street. Telephone, Franklin 4888

CLEVELAND, OHIO, A. R. STOEFFLER Co., 310 Citizens Building. Telephone, Main 1997

DENVER, COLO., W. H. CLARK, 207 Interstate Trust Building. Telephone, York 3571

EL PASO, TEX., C. C. GAINES, 307 First National Bank Building. Telephone, 436

LOS ANGELES, CAL., W. H. STEELE, 600 Metropolitan Building. Telephones Broadway 502; 60871

NASHVILLE, TENN., GEO. W. RUTH, 45 Noel Block. Both Telephones, 2604-2605

NEW YORK, N. Y., GRANT PULLEY AND HARDWARE COMPANY, 101 Park Avenue. Telephone, Murray Hill 7590

PEORIA, ILL., H. F. KIRCHER & Co.

PHILADELPHIA, PA., T. B. & H. S. HENDRICKSON, 521 Commerce Street. Both Telephones

PORTLAND, ORE., A. J. CAPRON & Co., 17 Ainsworth Building. Telephone, Main 410

SALT LAKE CITY, UTAH, HARRIS BROS., 310 Atlas Block. Telephone, Wasatch 4342

ST. LOUIS, MO., W. E. WAY, 715 Victoria Building. Telephone, Olive 3777

SEATTLE, WASH., F. T. CROWE & COMPANY, 413 Globe Building

SPOKANE, WASH., CONSOLIDATED SUPPLY COMPANY, 1310 W. Ide Avenue

TACOMA, WASH., F. T. CROWE & COMPANY, 1005 A Street

WASHINGTON, D. C., T. B. & H. S. HENDRICKSON, 521 Commerce Street, Philadelphia, Pa. Both Telephones

DOMINION OF CANADA: BELLEVILLE, ONT., SPRINGER LOCK MFG. CO.

## FOREIGN

AUSTRALIA: SYDNEY, N. S. W., F. LINDSAY THOMPSON, 52 Sydney Arcade, King Street

ENGLAND and the UNITED KINGDOM: H. G. McMICKEN, 25 Compayne Gardens, Hampstead, N. W. C., LONDON, ENG. Telephone, 762 City

FRANCE: H. G. McMICKEN, 25 Compayne Gardens, Hampstead, N. W. C., LONDON, ENG. Telephone, 762 City

NEW ZEALAND: SYDNEY, N. S. W., F. LINDSAY THOMPSON, 52 Sydney Arcade, King Street

JAPAN: TOKYO, F. W. HORNE COMPANY, 6 and 7 Takiyamacho Kyobashiku

CUBA: HAVANA (For Island of Cuba), LA ROSA COMMERCIAL Co., San Ignacio 25. Telephone, N1309

## Products.

VON DUPRIN SELF-RELEASING FIRE EXIT DEVICES.

Von Duprin Automatic Door Holders.

# Von Duprin

(Registered United States Patent  
Office, No. 85021)  
TRADE-MARK

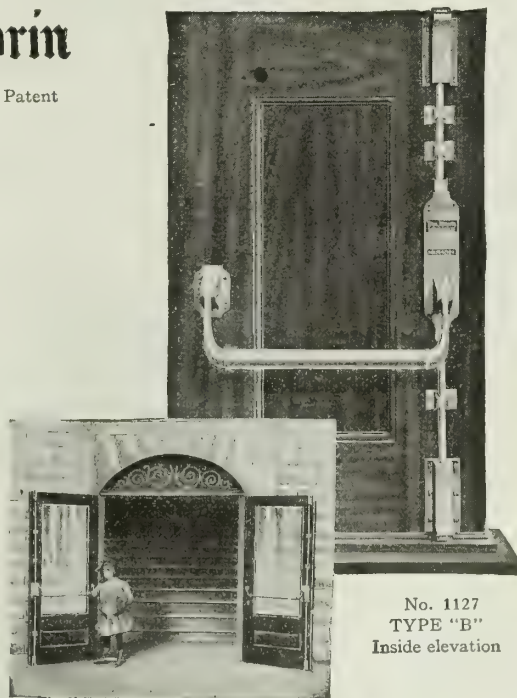
## Patents.

Patented in the United States and Canada. Other patents pending.

## Von Duprin Self-releasing Fire Exit Devices.

Represent a simple and effective solution to the problem of eliminating the danger of persons being trapped in burning buildings through difficulty in opening the doors.

**PRINCIPAL FEATURES**—A substantial brass bar passes across the full width of the door, on the inside, about waist high. This bar projects from the door and connects directly with the mechanism of the locking devices. *A slight pressure on the double acting cross bar, toward or from the door, at any point will instantly release deadlock and latches.* During a panic the rush of people will unavoidably press the bar, and thus open the doors to safety. A child can operate it without difficulty. The usual hardware trim is applied to the outside of the door. Made in brass or bronze only.



SELF-RELEASING FIRE EXIT LATCH  
For standing door of double entrance doors, or both doors of double exit doors

SIMPLE, STRONG, SYMMETRICAL, DURABLE—Parts subject to hard service are made *very extra heavy*. Elementary parts are made uniformly light, in order to avoid the necessity for extra heavy hinges and door checks. Von Duprin devices need no heavier door checks than are ordinarily used with regular locks.

All vertical rods are *solid brass or bronze*.

These devices can not be blocked by accident or design.

*Perhaps* not the cheapest, but by far the best, and consequently the cheapest in the end.

#### Slogan.

"Safe Exit is a Universal Demand."

#### Prices.

Prices are list, f.o.b. cars factories, Chicago, North Chicago, Ill., or Belleville, Ont.

Terms—2% for cash in 10 days.

Canadian architects will please use Canadian list.

NOTE—For sale by all hardware dealers (*insuring legitimate competition*) with whom a *special contract* is made, *with prices alike to all*.

#### Competitive Devices.

We make a complete line of cheaper devices *only for competitive work*. Nothing can be said for them except that they are lower in price than the Von Duprin line and *are better than any other devices at the same price*. They are not illustrated, for it would only confuse the architect, as it is assumed that architects using "SWEET'S ARCHITECTURAL CATALOGUE" want nothing but highest grade, commendable goods.

#### Approvals.

United States Government (War Department) Ordnance Department, appropriation for armament of Fortifications "C"

United States Government (Municipal Department), Snowden Ashford, Architect

United States Government (Treasury Department), Bureau of Printing and Engraving Building

Australian Government, Geo. McRae, Government Architect, N. S. W.

New York Board of Standards (N. Y. City Fire Dept.), Deputy Fire Commissioner

New York Board of Fire Underwriters, New York, N. Y.

New York Bureau of Buildings (Borough of the Bronx), New York, N. Y.

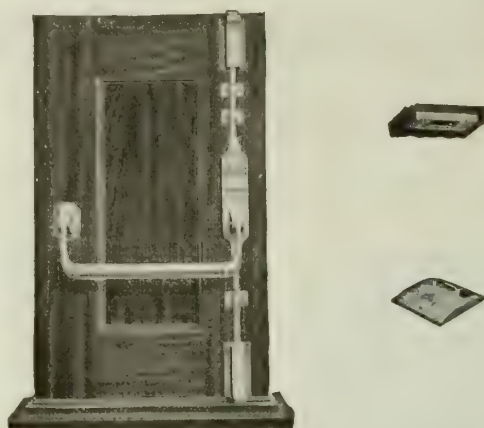
National Board of Fire Underwriters, Chicago, Ill.

Members of International Association of Building and Factory Inspectors

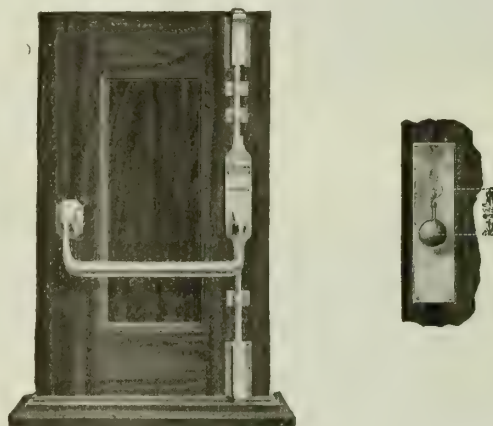
London, England, Canadian Red Cross Society, especially approved for hospitals

#### References.

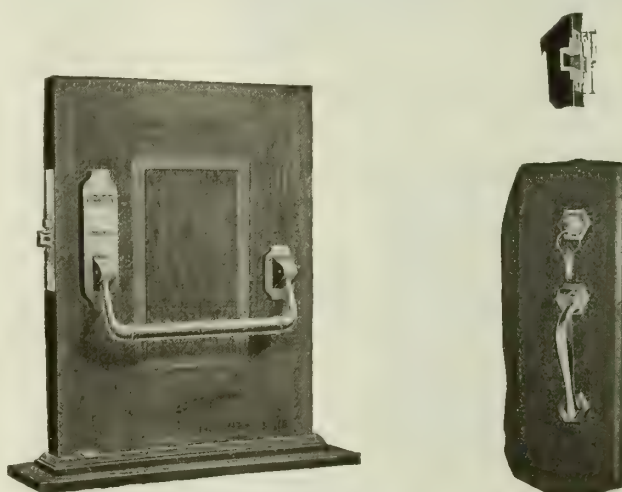
A long list can be furnished of America's largest and most progressive cities, where all old hardware has been removed, and Von Duprin devices applied to entrance doors of all schools throughout the entire city—some having as many as 600 sets of Von Duprin's in use—whose directors will gladly say they have cut hardware maintenance expense to almost nothing.



No. B-1127 VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR STANDING DOOR)  
With top and bottom strikes



NO. B-1123 VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR ACTIVE DOOR)  
With knob and escutcheon (top and bottom strikes, as B1127)



NO. B-1724 AUXILIARY VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR ACTIVE DOOR)  
With grip and thumb piece, and open throat strike



**Specifications.**

NOTE TO ARCHITECTS—To secure "*Von Duprin Service*," we strongly suggest adopting the following specifications, which give the advantage of our newest type of cross bar action, which is "to-or-from" the door; likewise, the new symmetrical vertical type of lock case which eliminates many elementary parts heretofore used, simplifying the working parts, thereby insuring the highest possible efficiency.

*These specifications are particularly adaptable to schools and theaters.*

**DOOR STILES**—Door stiles for mortise lock should be 4½ ins. or wider.

**ASTRAGAL**—To obtain the feature of "independent-acting" double doors (which is a very important factor in quick release), specify astragal shown on second page following.

**THRESHOLD STRIKES**—Our No. 1 is standard. We make strikes for all conditions (see second page following for standard thresholds by leading architects).

**COMBINATION No. 1**—No. B-1127 AND B-1123, WITH TWO B-47.  
*For Double Entrance Doors—*

Furnish for standing door, No. B-1127 Von Duprin, Type "B" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

Furnish for active door, No. B-1123 Von Duprin, Type "B," Self-releasing Fire Exit Device.

Keys to be alike, and master keyed under.....[City] Master Key System.

Each device to be equipped with No. B-47 Von Duprin Hook Dogging Device, with pin tumbler lock attachment.

All Strikes to detail.

Price per set, complete, polished brass or bronze... \$66.45

Price per set, complete, standard finishes..... 70.35

**COMBINATION No. 2**—No. B-1127 AND B-1724 AUXILIARY, WITH ONE B-47

*For Double Entrance Doors—*

Furnish for standing door, No. B-1127 Von Duprin, Type "B" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

Furnish for active door, No. B-1724 Auxiliary Von Duprin, Type "B," Self-releasing Fire Exit Device, with grip and thumb piece and cylinder lock, open throat strike and buffer, with feature of retracting latch and auxiliary bolts to reverse locked position.

Keys to be alike, and master keyed under.....[City] Master Key System.

One No. B-47 Von Duprin Hook Dogging Device, with pin tumbler lock attachment, to be used in connection with No. B-1127 Device.

All Strikes to detail.

Price per set, complete, polished brass or bronze... \$56.10

Price per set, complete, standard finishes..... 59.80

**COMBINATION No. 3**—B-1127 AND B-1722 AUXILIARY, WITH ONE B-47

*For Double Entrance Doors—*

Furnish for standing door, No. B-1127 Von Duprin, Type "B" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

Furnish for active door, No. B-1722 Auxiliary Von Duprin, Type "B," Self-releasing Fire Exit Device, with knob and escutcheon and cylinder lock, open throat strike and buffer, with feature of retracting latch and auxiliary bolts to reverse locked position.

Keys to be alike, and master keyed under.....[City] Master Key System.

One B-47 Von Duprin Hook Dogging Device, with pin tumbler lock attachment, to be used in connection with No. B-1127 Device.

All Strikes to detail.

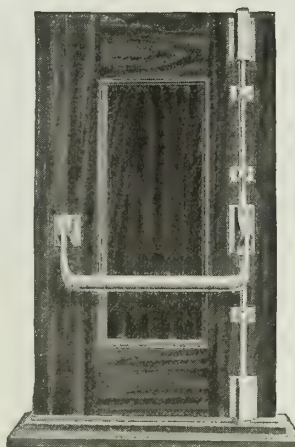
Price per set, complete, polished brass or bronze... \$54.40

Price per set, complete, standard finishes..... 58.10



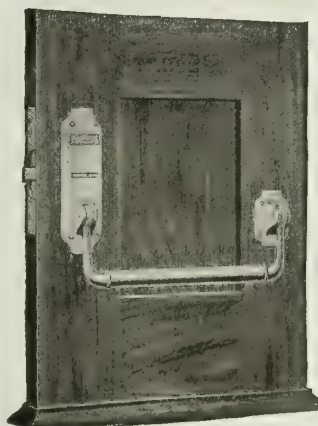
NO. B-1722 AUXILIARY VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR ACTIVE DOOR)

With knob and escutcheon, and open throat strike



NO. C-8127 GRAVITY VON DUPRIN, TYPE "C," SELF-RELEASING FIRE EXIT DEVICE (FOR STANDING DOOR)

With top and bottom strikes



NO. B-1124 VON DUPRIN, TYPE "B," SELF-RELEASING FIRE, EXIT DEVICE (FOR SINGLE DOOR)

With grip and thumb piece, and guarded strike

**COMBINATION No. 4—No. C-8127 GRAVITY AND B-1722 AUXILIARY**
**For Double Entrance Doors—**

Furnish for standing door, No. C-8127 Gravity Von Duprin, Type "C" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

Furnish for active door, No. B-1722 Auxiliary Von Duprin, Type "B," Self-releasing Fire Exit Device, with knob and escutcheon and cylinder lock, open throat strike and buffer, with feature of retracting latch and auxiliary bolts to reverse locked position.

Keys to be alike, and master keyed under.....[City]

Master Key System.

All Strikes to detail.

Price per set, complete, polished brass or bronze... \$51.65

Price per set, complete, standard finishes..... 55.05

**COMBINATION No. 5—No. B-1124**
**For Single Entrance Doors—**

Furnish with No. B-1124 Von Duprin, Type "B," Self-releasing Fire Exit Device, with grip and thumb piece and cylinder lock, with feature of retracting latch bolt to reverse locked position.

Keys to be alike, and master keyed under.....[City]

Master Key System.

Price complete, polished brass or bronze..... \$27.50

Price complete, standard finishes..... 29.15

**COMBINATION No. 6—No. B-1122**
**For Single Entrance Doors—**

Furnish with No. B-1122 Von Duprin, Type "B," Self-releasing Fire Exit Device, with knob and escutcheon and cylinder lock, with feature of retracting latch bolt to reverse locked position.

Keys to be alike, and master keyed under.....[City]

Master Key System.

Price complete, polished brass or bronze..... \$25.80

Price complete, standard finishes..... 27.05

**COMBINATION No. 7—No. B-1124½V**
**For Single Emergency Exit Doors Adjacent to Entrance Doors (not regularly used as Entrance but for Emergency Exit only)—**

Furnish No. B-1124½V Von Duprin, Type "B," Self-releasing Fire Exit Device (no hardware outside), with control for retracting the latch bolt to reverse locked position.

Price complete, polished brass or bronze..... \$17.40

Price complete, standard finishes..... 18.15

**COMBINATION No. 8—No. B-1127 AND B-1141, WITH ONE B-47**
**For Double Emergency Exit Doors (used only as Emergency Exit, but to be under key control to gain entrance from outside)—**

Furnish for standing door, No. B-1127 Von Duprin, Type "B" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

Furnish for active door, No. B-1141 Von Duprin, Type "B," Self-releasing Fire Exit Device, with cylinder lock (no outside trim).

One No. B-47 Von Duprin Hook Dogging Device, with 2-pin tumbler lock attachment, to be used in connection with No. B-1127 Device.

Keys to be alike, and master keyed under.....[City]

Master Key System.

Price per set, complete, polished brass or bronze... \$52.75

Price per set, complete, standard finishes..... 55.50

**COMBINATION No. 9—No. B-1124½V**
**For Single Fire Escape Doors—**

Furnish No. B-1124½V Von Duprin, Type "B," Self-releasing Fire Exit Device, with control for retracting the latch bolt to reverse locked position.

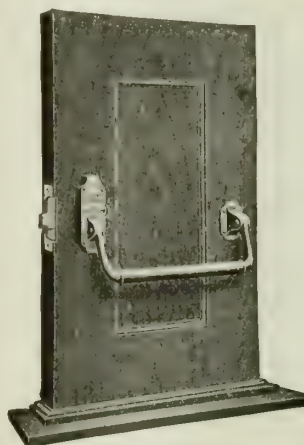
Price complete, polished brass or bronze..... \$17.40

Price complete, standard finishes..... 18.15



**NO. B-1122 VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR SINGLE DOOR)**

With knob and escutcheon, and guarded strike



**NO. B-1124½V VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR SINGLE EXIT DOOR)**

With guarded strike



**NO. B-1141 VON DUPRIN, TYPE "B," SELF-RELEASING FIRE EXIT DEVICE (FOR ACTIVE DOOR)**

With cylinder and open throat strike



COMBINATION No. 10—No. B-972

For Double Doors (Exit Only) for Theaters—

Furnish No. B-972 Von Duprin, Type "B" (Self-latching Bolt Heads), Double Arm Self-releasing Fire Exit Device.

Price complete, polished brass or bronze..... \$38.25  
Price complete, standard finishes..... 40.70

COMBINATION No. 11—No. B-902

For Double Doors (Exit Only) for Theaters—

Furnish No. B-902 Von Duprin, Type "B" (Dead Bolting Heads), Double Arm Self-releasing Fire Exit Device.

Price complete, polished brass or bronze..... \$35.20  
Price complete, standard finishes..... 37.55

COMBINATION No. 12—No. B-1127

For Double Exit Doors (with overlapping Astragal) for Theaters—

Door having the astragal, and which opens first, to be provided with No. B-1127 Von Duprin, Type "B" (Self-latching Bolt Heads), Self-releasing Fire Exit Device.

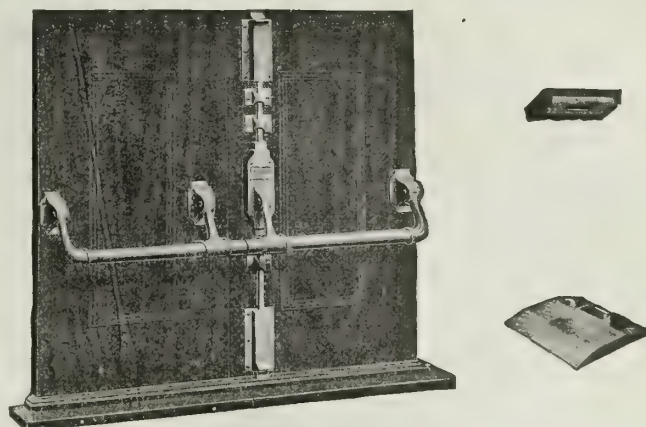
Price complete, polished brass or bronze..... \$25.95  
Price complete, standard finishes..... 27.80

COMBINATION No. 13—No. 8127 GRAVITY

For Double Exit Doors (with overlapping Astragal) for Theaters—

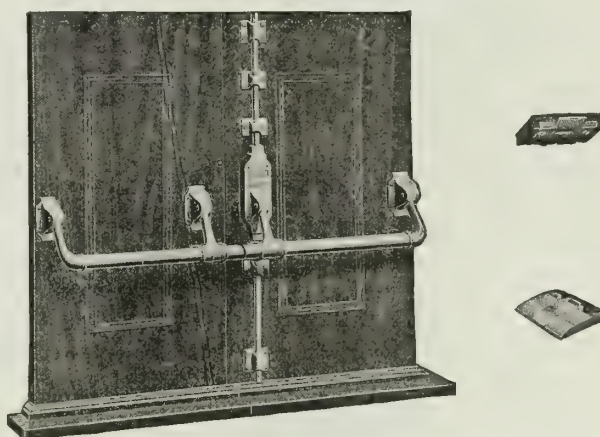
Door having the astragal, and which opens first, to be provided with No. 8127 Von Duprin, Type "B" (Latch Bolt Heads), Self-releasing Fire Exit Device.

Price complete, polished brass or bronze..... \$25.85  
Price complete, standard finishes..... 27.60



NO. B-972 VON DUPRIN, TYPE "B," DOUBLE ARM, SELF-RELEASING FIRE EXIT DEVICE (EXIT ONLY)

With top and bottom strikes



NO. B-902 VON DUPRIN, TYPE "B," DOUBLE ARM, SELF-RELEASING FIRE EXIT DEVICE (EXIT ONLY)

With top and bottom strikes

Catalogue.

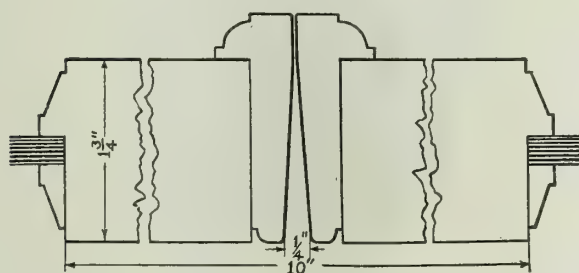
Call for Catalogue No. 12A.

Von Duprin Astragal.

This astragal gives free use of both doors, and has been used for years by the most prominent school architects in the United States.

Absolutely satisfactory in all respects.

Made by all mills.

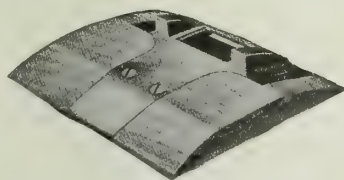


VON DUPRIN ASTRAGAL

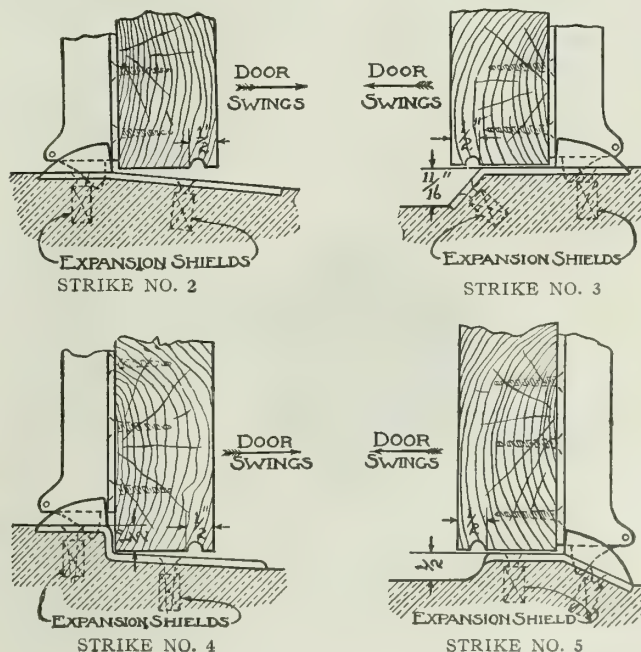
Von Duprin Sill or Threshold Strikes.

No. 1 Bottom Strike, showing threshold.

This style strike furnished on all orders, unless otherwise specified.



NO. 1 BOTTOM STRIKE



SPECIAL NOTE—A threshold  $\frac{5}{8}$ -in. high (for escape of latch bolt) should be used when devices Nos. 27, 123, 272, 927, 931, 972, 1123, 1127, 1131 are specified, as we do not recommend automatically holding bolts in released position, because of the fragile nature of the component parts necessary to perform the same. If no thresholds are used, specify LR 1127, etc.

# MILLER LOCK COMPANY

PHILADELPHIA, PA.

## Products.

Manufacturers of KEYED and KEYLESS LOCKS and PADLOCKS (including "STANDARD TIME" LOCKS and PADLOCKS) for lockers, cupboards, closets, wardrobes, drawers, school desks, etc.

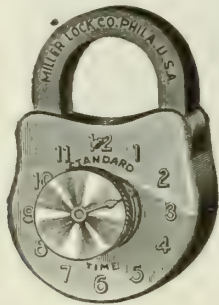
Keyless Post Office Boxes, Keyless Apartment House Letter Boxes, Railroad Switch Locks, Night Latches, etc.

### "Standard Time" Keyless Padlocks.

For wood or metal lockers.

3,300 changes available.

Brass interior parts. Can be opened in the dark. Positively non-pickable. Rustproof and dustproof. Self-locking. Guaranteed against everything except fire and abuse. Can be furnished with chain attached.



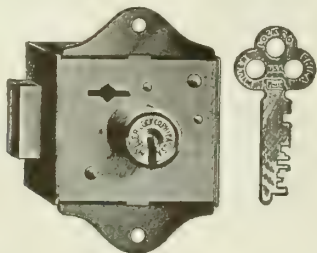
"STANDARD TIME" KEYLESS PADLOCK  
Size, 2 ins.

Number	Material	Finish	Shackle
34	Steel	Japanned	Malleable
340	Brass	Sand blast	Nickelplated Brass

### Keyed Lock for Metal Lockers, Cupboards and Closets.

Eight tumblers. Unlimited changes. 3,000 changes with master-key. Selvege to center of cylinder  $\frac{7}{8}$  in.

Brass interior parts. Can be furnished alike, different, different and master-keyed, or in sets master-keyed. Can be furnished for any thickness of metal or wood.



KEYED LOCK  
Size,  $2\frac{1}{2} \times 1\frac{1}{16}$  ins.

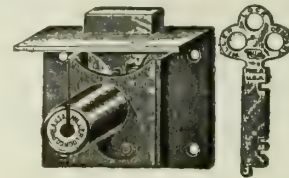
Number	Material	Finish
L353J	Steel	Japanned
L353B	Steel	Brass plated

### Keyed Lock for Drawers and Desks.

Two tumblers.

Selvege to center of cylinder  $\frac{3}{4}$  in.

7,000 key changes available in D271 and DB271 and 3,000 in D271 $\frac{1}{2}$  and DB271 $\frac{1}{2}$ , by increasing number of tumblers. Bolt, tube and interior parts are brass. Can be made for any thickness of wood. Tube cut for cupboard as well as drawer.



KEYED LOCK  
Size,  $1\frac{3}{4} \times 1\frac{1}{2}$  in.

Number	Material	Finish	Changes available with master key
D271	Steel	Bright	1,300
DB271	Brass	Buffed	1,300
*D271 $\frac{1}{2}$	Steel	Bright	300
*DB271 $\frac{1}{2}$	Brass	Buffed	300

\*Made with beveled latch bolt.

### "Standard Time" Keyless Lock.

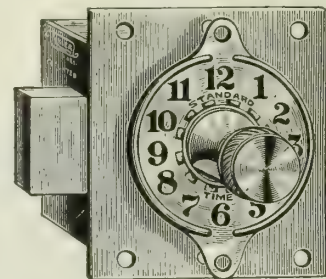
For wood and metal lockers, wardrobes, drawers, desks and cupboards.

3,300 changes available.

Selvege to center of cylinder  $1\frac{1}{2}$  in.

Brass interior parts. Can be opened in the dark. Combinations easily changed. Positively non-pickable. Guaranteed against everything except fire and abuse.

Made for any thickness of wood or metal, either right or left hand.



"STANDARD TIME" KEYLESS LOCK  
Size,  $2\frac{13}{16} \times 2\frac{1}{4}$  ins.

No.	Type	Material	Finish
3332	Cupboard Locker Wardrobe	Brass	Dipped
3332B	Cupboard Locker Wardrobe	Steel	Japanned
3360	Drawer Desk	Brass	Dipped
3360B	Drawer Desk	Steel	Japanned



Keyed Lock for Drawers, Desks and Cupboards.

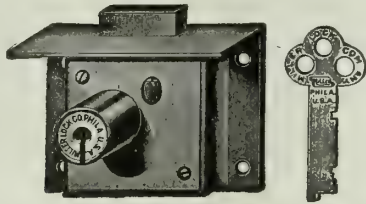
Three tumblers. Polished finish. Selvedge to center of cylinder  $\frac{7}{8}$  in.

7,000 key changes available in D281P and DB281P and 3,000 in D280 $\frac{1}{2}$ P and DB280 $\frac{1}{2}$ P, by increasing number of tumblers.

Bolt, tube and interior parts are brass.

Can be made for any thickness of wood.

Tube cut for cupboard or wardrobe as well as drawer.



KEYED LOCK  
Size, 2 $\frac{3}{4}$  x 1 $\frac{1}{4}$  in.

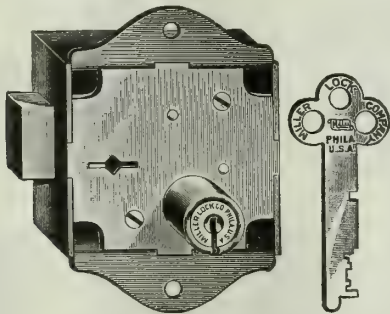
Number	Material	Changes available with master key
D281P	Steel	1,500
DB281P	Brass	1,500
*D280 $\frac{1}{2}$ P	Steel	1,200
*DB280 $\frac{1}{2}$ P	Brass	1,200

\*Made with beveled latch bolt.

Keyed Lock for Metal Lockers, Cupboards and Closets.

Eight tumblers. Unlimited changes. 10,000 changes with master-key. Selvedge to center of cylinder 1 $\frac{5}{16}$  in.

Brass interior parts. Master-keying is genuine, *i. e.*, the master-key, as well as the change key, operates every tumbler in the lock. Key can not be removed until bolt is thrown in locked position. Can be furnished alike, different, different and master-keyed, or in sets master-keyed. Can be furnished for any thickness of metal or wood.



KEYED LOCK  
Size, 3 $\frac{1}{4}$  x 2 $\frac{1}{4}$  ins.

Number	Material	Finish
L381J	Steel	Japanned
L381B	Steel	Brass plated
*L385 $\frac{1}{2}$	Steel	Japanned
*L385 $\frac{1}{2}$ B	Steel	Brass plated

\*Made with beveled latch bolt.

Keyed Lock for Wood Lockers, Closets and Wardrobes.

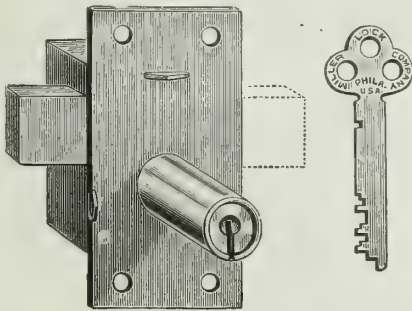
Five tumblers. 560 changes available with master-key. Selvedge to center of cylinder 1 in.

2,700 key changes available.

Bolt, tube and interior parts are brass.

Can be made for any thickness of wood.

Long bolt especially adapted to wooden doors or lockers.



KEYED LOCK  
Size, 3 $\frac{1}{2}$  x 1 $\frac{1}{4}$  in.

Number	Material	Finish
W24	Steel	Bright
WB24	Brass	Dipped

Keyed Padlock.

For wood or metal lockers and desks.

Five tumblers. Unlimited changes. 6,000 changes with master-key.

Brass interior parts. Positively non-pickable. Can be furnished with chain attached. Self-locking.



KEYED PADLOCK  
Size, 1 $\frac{3}{4}$  ins.

Number	Material	Finish	Shackle
50	Steel	Japanned	Malleable
52	Brass	.....	Nickelplated
			Bronze buffed
53	Brass	Sand blast	Malleable
			Enameled

References.

The following are a few of the many buildings in which "Miller" locks and padlocks have been installed:

- |  |                                       |
|--|---------------------------------------|
| Detroit Y. M. C. A.                    | Detroit (Mich.) Schools               |
| Boston Y. M. C. A.                     | Newark (N. J.) High Schools           |
| Louisville Y. M. C. A.                 | Saskatoon Y. M. C. A.                 |
| University of Wisconsin                | Edmonton Y. M. C. A.                  |
| Northwestern University                | Washington (D. C.) Y. M.              |
| Pratt Institute (Brooklyn, N. Y.)      | C. A.                                 |
| Princeton University                   | West Side, New York, Y. M.            |
| Toledo High Schools                    | C. A.                                 |
| Pittsburgh High Schools                | U. S. Navy                            |
| Washington and Lee University          | U. S. Post Office Department          |
|  | U. S. Treasury Department             |
| Denver Y. M. C. A.                     | University of Pennsylvania            |
| University of Chicago                  | University of California              |
| Union of South Africa P. O. Department | 2d Regiment Armory, N. G. Pa.         |
| Cornell University                     | Wilmington (N. C.) Y. M. C. A.        |
| Dallas (Tex.) Y. M. C. A.              | Providence Y. M. C. A.                |
| Toronto Y. M. C. A.                    | Western Union Telegraph Co.           |
| Duluth Y. M. C. A.                     | Iowa State College                    |
| Minneapolis Public Schools             | Massachusetts Institute of Technology |
| Pittsburgh Y. M. C. A.                 | And practically all large Railroads.  |
| Baltimore Y. M. C. A.                  |                                       |

ESTABLISHED 1876

**BOMMER BROTHERS****Spring Hinges**

Classon and Willoughby Avenues  
BROOKLYN, N. Y.

TELEPHONE:  
PROSPECT 7600

**Products.**

SPRING BUTT HINGES; LAVATORY SPRING HINGES; STRIKES, BOLTS and LATCHES for Lavatory and Hospital Doors; DOOR HOLDERS; FLOOR MORTISE SPRING HINGES; BALL BEARING PIVOT HINGES; VERTICAL DOUBLE RELEASE and HORIZONTAL HOLDBACK FLOOR SURFACE SPRING HINGES.

**Quality.**

Standard for over 40 years, and steadily improved, retaining superiority over all others.

**Prices.**

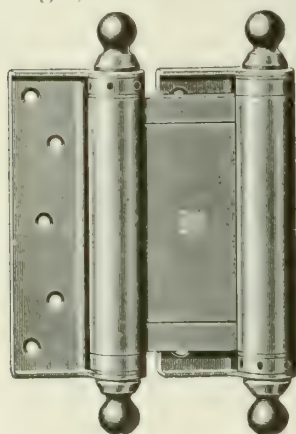
Prices are guaranteed to be no higher than those for goods of corresponding type.

**Specifications.**

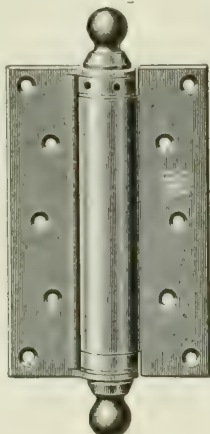
Architects, in specifying these products, should use the word "Bommer" and in addition thereto, if possible, number of the article and finish. Hardware dealers and lock manufacturers can include them in their contracts.

**Catalogues.**

Complete catalogue of the Bommer line forwarded upon application. For projects requiring special spring hinges, details of construction are solicited.



DOUBLE ACTION BOMMER HINGE



SINGLE ACTION BOMMER HINGE

**Requirements.**

Always use the largest size hinge which the thickness of the door will permit.

Size of hinge required	For doors not exceeding the following combinations of width and thickness	Thickness of hanging strip
3 ins.	3 1/4" x 2'3" or 1" x 2'0"	1 1/2 in.
4 ins.	7 1/4" x 2'6" or 1 1/4" x 2'0"	5/8 in.
5 ins.	11 1/4" x 2'6" or 1 1/2" x 2'3"	3/4 in.
6 ins.	11 1/4" x 2'9" or 1 3/4" x 2'3"	3/4 in.
7 ins.	13 1/4" x 2'9" or 2" x 2'6"	7/8 in.
8 ins.	11 1/2" x 3'0" or 2 1/4" x 2'6"	1 in.
10 ins.	13 1/4" x 3'0" or 2 1/2" x 2'9"	1 1/4 ins.
12 ins.	21 1/4" x 3'3" or 3" x 3'0"	1 1/4 ins.

**Bommer Spring Butt Hinges.**

Bommer double acting spring butt hinges are the only faultless and technically correct double acting spring butt hinges. They have the weight supporting bearings located so as to entirely relieve both adjustable spring holders from supporting the weight of the door, enabling both coil springs to respond freely and evenly in the barrels of the hinge when the door is opened in either direction, increasing durability and decreasing the breakage of the springs. By this construction, the durability of the hinge becomes practically unlimited and unequal wear of the barrel ends is eliminated.

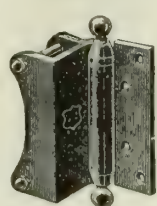
struction, the durability of the hinge becomes practically unlimited and unequal wear of the barrel ends is eliminated.

Bommer spring hinges exclusively have an efficient lubricating system, by which all bearings as well as the springs and the inner surface of barrels may be lubricated, permitting abatement of disturbing noises.

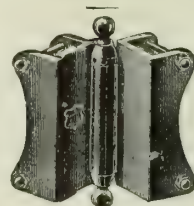
Bommer spring butt hinges are made of wrought steel, bronze and brass, in all finishes. They all have steel bearings throughout.

**Bommer Lavatory Spring Hinges.**

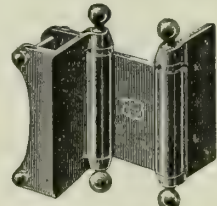
The following illustrations show a complete line of box flanged spring hinges for clamping lavatory doors on to marble or slate partitions, being also suitable for public comfort stations, bathhouses, and hospital work. Made of brass nickelplated or bronze highly polished, adaptable to all conditions met with in such work.



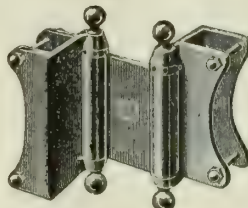
No. 1000



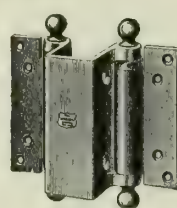
No. 1001



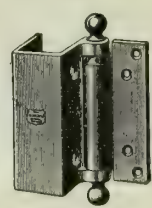
No. 1005



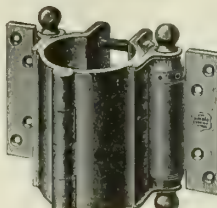
No. 1006



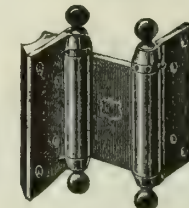
No. 1015



No. 1002



No. 1017



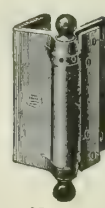
No. 1019



No. 1018



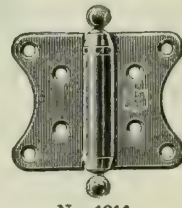
No. 1016



No. 1003



No. 1004



No. 1011

BOMMER LAVATORY SPRING HINGES

In most styles illustrated the box flanges are adjustable 1/8 in. each way, but the thickness of both marble and door must be stated when specifying. Regularly made to close the door, but the single action can be furnished with reverse springs to hold it open if so ordered. The flanges are 4 ins. in length.

**Blanks for Lavatory Hinges.**

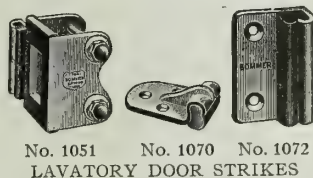
For extra light and narrow lavatory doors, if close economy is essential, blanks can be furnished for use



in connection with single acting lavatory spring hinges shown on preceding page.

### Strikes for Lavatory Doors.

Adjustable strikes, having rubber bumper (Style 1051) to clamp to the marble, for use with lavatory spring hinges in connection with any style of bolt or latch, can be furnished. Style 1070 is for fastening to face of door; style 1072 for fastening to edge of door.



No. 1051 No. 1070 No. 1072  
LAVATORY DOOR STRIKES

### Bommer Door Holder.

Is the best, easiest to apply, and most effective device for holding open doors of public or office buildings and residences. A light pressure of the foot will either throw or retract the bolt. The rubber tip prevents marring of floor. Will reach  $1\frac{1}{2}$  ins. from door to floor. Furnished in wrought steel or bronze metal, in all finishes.



DOOR  
HOLDER

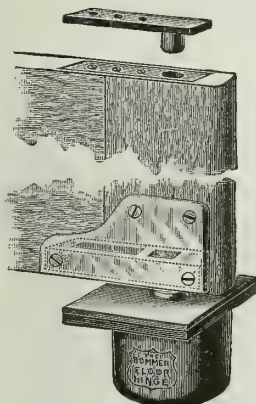
### Bommer Floor Mortise Spring Hinges.

The Bommer floor mortise spring hinge supports the weight of the door on tool steel ball bearings set upon a raised centerpost, giving an easy movement to the door. The ball bearings are protected from water and dirt. Only the best oil tempered steel springs are used. These hinges can be furnished with an invisible socket bar and adjustable top pivot instead of side plates if preferred.

No hanging strip is required. The back edge of the door is slightly rounded. The tension of the spring is adjustable. These floor hinges are double acting; but by using a stop-head, they work equally well single acting.



CAST IRON BOX  
Suitable for setting all sizes of floor mortise hinges and pivots into tile or cement floors



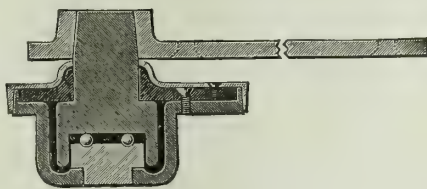
FLOOR MORTISE  
SPRING HINGE

REQUIREMENTS, MORTISE TYPE

Thickness of door	Use size	Dimensions of top plate	Depth of cup	Distance from center of spindle to door casing
$\frac{3}{4}$ to $1\frac{1}{2}$ ins.	2	$3\frac{3}{4}$ x $5\frac{1}{8}$ ins.	3 ins.	$1\frac{3}{4}$ ins.
$1\frac{1}{2}$ to 2 ins.	4	$3\frac{3}{4}$ x $5\frac{1}{8}$ ins.	$3\frac{1}{2}$ ins.	$1\frac{3}{4}$ ins.
2 to $2\frac{1}{2}$ ins.	6	$4\frac{1}{2}$ x $6\frac{1}{2}$ ins.	$3\frac{3}{4}$ ins.	2 ins.
$2\frac{1}{2}$ to $3\frac{1}{2}$ ins.	8	$4\frac{1}{2}$ x $6\frac{1}{2}$ ins.	$3\frac{3}{4}$ ins.	2 ins.

### Bommer Ball Bearing Pivots without Springs.

These pivots can be used to hang doors either double or single action. They are durable, noiseless, work smoothly and permit the heaviest doors to be used with but slight exertion.



BALL BEARING PIVOT

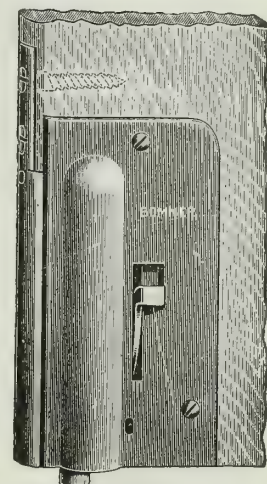
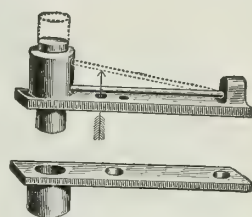
REQUIREMENTS, PIVOTS

Thickness of door	Use size	Dimensions of top plate	Depth of cup	Distance from center of pivot to door casing
$\frac{3}{4}$ to $1\frac{1}{2}$ ins.	26	1 x 4 ins.	$1\frac{1}{8}$ ins.	$\frac{5}{8}$ in.
$1\frac{1}{4}$ to $2\frac{1}{2}$ ins.	27	4 x $3\frac{1}{4}$ ins.	$1\frac{1}{2}$ ins.	$1\frac{1}{2}$ ins.
2 to 4 ins.	28	$5\frac{1}{2}$ x $5\frac{1}{4}$ ins.	$3\frac{1}{4}$ ins.	$2\frac{1}{4}$ ins.

### Bommer Vertical Double Release Floor Surface Spring Hinge.

Permits door to stand open at any angle by pressing down either side pedal with the foot. The spring tension automatically reengages itself when door is closed. The pintle is of large diameter and rests in a corresponding socket in the floor plate which is fastened to the floor surface, obviating the need of cutting holes in the floor. The weight of the door is carried on hardened steel ball bearings located in the upper part of the hinge away from water, dust and dirt. The top pivot has a spring actuated plunger which permits the door to be taken down quickly and easily without removing the screws.

For tile or concrete floor, special right angle floor plate can be furnished instead of the floor plate shown in the illustration.



VERTICAL FLOOR SURFACE  
SPRING HINGE

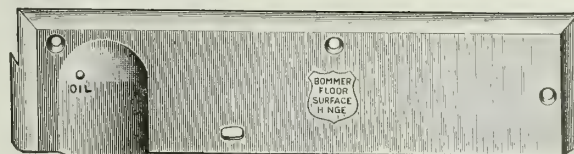
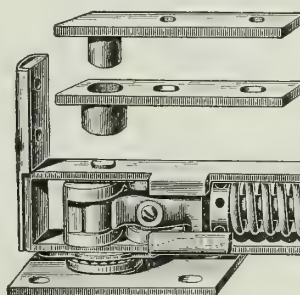
REQUIREMENTS, VERTICAL TYPE

Thickness of door	Use size	Dimensions of floor plate	Distance from center of spindle to door casing
$1\frac{1}{8}$ to $1\frac{1}{2}$ ins.	20	$2\frac{3}{4}$ x $3\frac{3}{8}$ ins.	$1\frac{1}{4}$ ins.
$1\frac{1}{2}$ to 2 ins.	22	3 x $3\frac{1}{2}$ ins.	$1\frac{1}{2}$ ins.
$1\frac{3}{4}$ to $2\frac{1}{4}$ ins.	24	$3\frac{1}{2}$ x $4\frac{3}{8}$ ins.	2 ins.

### Bommer Horizontal Holdback Floor Surface Spring Hinge.

Will hold the door open when swung back 90°. The spring power can also be entirely released whenever desired; it has an efficient alignment feature; the tension of the spring is adjustable. The floor plate is screwed to the floor surface, obviating the need of cutting holes in the floor. The weight of

the door is carried on hardened steel ball bearings. All moving parts can be lubricated through a hole in the side plate.



HORIZONTAL FLOOR SURFACE SPRING HINGE

REQUIREMENTS, HORIZONTAL TYPE

Thickness of door	Use size	Dimensions of floor plate	Distance from center of spindle to door casing
$1\frac{1}{8}$ to $1\frac{1}{2}$ ins.	18	$2\frac{3}{4}$ x $3\frac{1}{2}$ ins.	$1\frac{1}{2}$ ins.
2 to $2\frac{1}{2}$ ins.	19	4 x 5 ins.	$2\frac{1}{8}$ ins.



## CHICAGO SPRING BUTT COMPANY

## Spring Hinges

GENERAL OFFICES AND WORKS  
334-340 Union Park Court  
CHICAGO, ILL.

EASTERN OFFICE AND WAREHOUSE  
81-81½ Walker Street  
NEW YORK, N. Y.

## Products.

Manufacturers of a complete line of PATENT SPRING HINGES, including "Chicago" Spring and Springless Butt-hinges; "Triplex" Spring Butt-hinges; "Relax," "Premier" and "Ajax" Spring Pivot-hinges; "Triplex" Lavatory Spring Hinges; Lavatory Door Bolts, Latches and Stops.

"Chicago" Fire Station Spring Hinges and Checking Door Holders; "Chicago" Garage Spring Hinges and Door Bolts; "Triplex," "Chicago" and "Sagless" Gate Spring Hinges; "Sanitax" Closet Seat Spring Hinges.

## Superior Quality.

Our spring hinges are of recognized superiority; have distinctive advantages and are guaranteed in every respect. Specifications embodying suggestions for spring hinges of special construction are solicited.

## Ordering.

In specifying, designate article by number, size, and finish. Hardware dealers are in possession of lists, prices, and complete data pertaining to our products. Made in standard sizes and all standard finishes. Any special finishes can be furnished promptly.

## Prices.

Prices are comparative with those of standard grades and quality.

Quotations on special goods and finishes supplied on request.

**"Chicago" Double Acting Spring Butt-hinges No. 1½.**

"Chicago" spring butt-hinges are constructed in a most substantial manner. The spring power, effected by both a torsion and leverage principle, produces a positive action as well as an easy movement of the door.

General construction and mechanical action of this hinge produce best results obtainable in operating doors subject to excessive and violent use.

For doors of the following thicknesses:

$\frac{7}{8}$ to 1 in.	$1\frac{3}{4}$ to 2 ins.
$1\frac{1}{8}$ to $1\frac{1}{4}$ ins.	$2\frac{1}{4}$ to $2\frac{1}{2}$ ins.
$1\frac{3}{8}$ to $1\frac{1}{2}$ ins.	$2\frac{3}{4}$ to $3\frac{1}{2}$ ins.



Registered U. S. Pat. Office.

This combination not advisable on outside doors subject to draughts, where pair of spring hinges should be used.



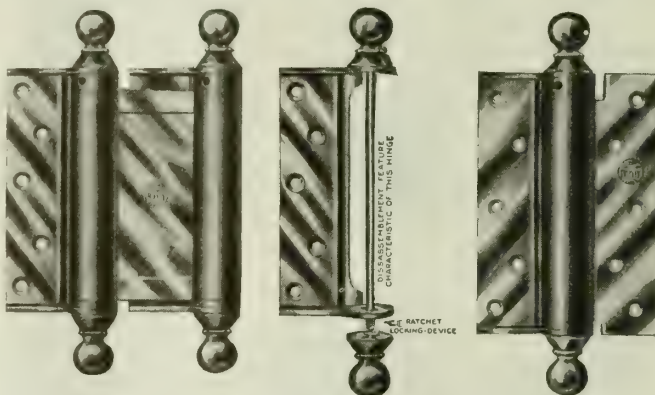
No. 3½  
"CHICAGO"  
SPRINGLESS  
BUTT-HINGE

**"Triplex" Spring Butt-hinges Double Acting, No. 2001; Single Acting No. 2002.**

The Chicago "Triplex"

spring butt-hinge is constructed on scientific and practical principles. The body is made of one integral piece, giving a maximum of strength and rigidity. The broad steel bearings, hardened lug bushings and disassembled features are characteristics of this product. Springs are made of the best tempered steel wire, in ample proportions for the most excessive requirements.

Single acting hinges can be furnished with reverse springs to throw door open when released. These hinges also supplied with a wide sweep to clear a hand rail on office gates.



No. 2001  
"TRIPLEX" DOUBLE ACTING  
SPRING BUTT-HINGE

No. 2002  
"TRIPLEX" SINGLE ACTING  
SPRING BUTT-HINGE

## DIMENSIONS "TRIPLEX" SPRING BUTT-HINGES

Size of hinge	Door	Hanging strip	Doors					
			Thickness, Width,		Thickness, Width,			
Length of flange, ins.	Thickness, ins.	Depth, ins.	ins.	ft. ins.	ins.	ft. ins.	ins.	ft. ins.
3	$\frac{3}{4}$ to 1	$\frac{5}{8}$	$\frac{3}{4}$ by 2	3 to 1	$\frac{1}{4}$ by 2	0		
4	$\frac{7}{8}$ to $1\frac{1}{4}$	$\frac{5}{8}$	$\frac{7}{8}$ by 2	6 to $1\frac{1}{4}$	by 2	0		
5	$1\frac{1}{8}$ to $1\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{8}$ by 2	6 to $1\frac{1}{2}$	by 2	3		
6	$1\frac{1}{4}$ to $1\frac{3}{4}$	$\frac{5}{8}$	$1\frac{1}{4}$ by 2	9 to $1\frac{3}{4}$	by 2	3		
7	$1\frac{3}{8}$ to 2	$\frac{5}{8}$	$1\frac{3}{8}$ by 2	9 to 2	by 2	6		
8	$1\frac{1}{2}$ to $2\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$ by 3	0 to $2\frac{1}{4}$	by 2	6		
10	$1\frac{3}{4}$ to $2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{4}$ by 3	0 to $2\frac{1}{2}$	by 2	9		
10	$2\frac{1}{4}$ to $2\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{1}{4}$ by 3	0 to $2\frac{3}{4}$	by 2	6		
12	$2\frac{1}{4}$ to 3	$1\frac{1}{4}$	$2\frac{1}{4}$ by 3	3 to 3	by 3	0		



No. 1½  
"CHICAGO"  
SPRING  
BUTT-HINGE

**"Chicago" Double Acting Springless Butt-hinges No. 3½.**

"Chicago" springless butt-hinges can be employed advantageously in combination with a spring hinge where doors are light or narrow.

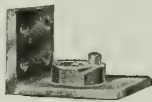
**Chicago "Relax" Spring Pivot-hinges.**

Chicago "Relax" spring pivot-hinge (Type 6000) is adapted for highest class requirements. It is applied to surface of floor, thereby avoiding cutting into

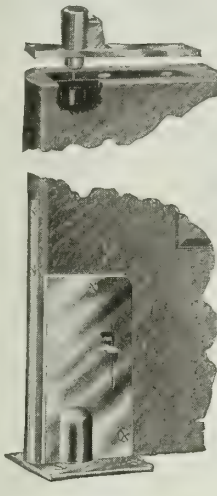


same or possible interference with girders or iron beams. The tension is adjustable. The spring action is readily released, allowing door to be placed open at any desired position; a great convenience, and eliminates the tendency of springs to lose their power as a result of remaining fixed at high tension when doors are held open by door holders.

Weight of door is carried on ball bearings located in the top of hinge, being protected from dirt and moisture. Adjustable top pivot furnished with this hinge permits door to be fitted closely to top casing and to be taken down readily without removing any screws. No hanging strip required. Jamb edge of door is slightly rounded. For tile or concrete floors specify concrete floor plates.



CONCRETE FLOOR PLATE



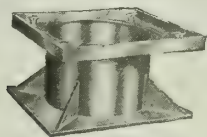
No. 6000 CHICAGO "RELAX" SPRING PIVOT-HINGE

DIMENSIONS "RELAX" SPRING PIVOT-HINGE

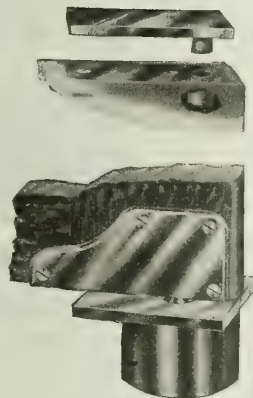
For doors, thickness, ins.	Floor plate		Pintle center to door casing, ins.
	Width, ins.	Length, ins.	
1 1/8 to 1 1/2	2 3/4	3 1/2	1 3/4
1 1/2 to 2	3 1/4	3 3/4	1 1/2
1 3/4 to 2 3/4	3 3/4	4 1/2	2 1/8

### "Chicago" Spring Pivot-hinges.

Spring pivot-hinge (Type 5000) is very substantial in construction. The tension is adjustable. Easy action and minimum of wear produced by broad ball bearing, which distributes weight and friction over large area. Can be furnished with an invisible shoe and adjustable top pivot in place of regular shoe and side plates. In tile or concrete floors concrete floor boxes should be embedded, in which hinge is held by machine screws. No hanging strip required. Jamb edge of door is slightly rounded.



CONCRETE FLOOR BOX



No. 5000 "CHICAGO" SPRING PIVOT-HINGE

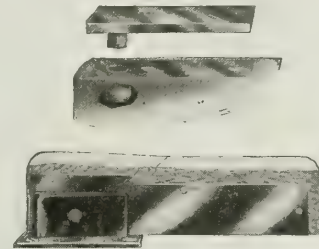
DIMENSIONS "CHICAGO" SPRING PIVOT-HINGE

For doors, thickness, ins.	Top cover		Box depth overall, ins.	Pintle center to door casing, ins.
	Width, ins.	Length, ins.		
7/8 to 1 1/2	4	4 1/2	2 7/8	1 3/4
1 3/8 to 2	4 3/4	5	3 3/8	1 7/8
2 to 2 1/2	4 3/4	6	3 3/8	2 1/8
2 1/2 to 3 1/2	4 3/4	6	3 3/8	2 1/8

### Chicago "Premier" Spring Pivot-hinges.

Spring pivot-hinge (Type 4000) is applied to surface of floor. Mechanical action eliminates any tendency of wear in bearings. Action of spring is compression; spring is made of best tempered steel flat wire; tension is readily adjusted. With this hinge, door will remain open if swung beyond 90°. No hanging strip required. Jamb edge of door is slightly rounded.

For tile or concrete floors specify concrete floor plates.



No. 4000

CHICAGO "PREMIER" SPRING PIVOT-HINGE

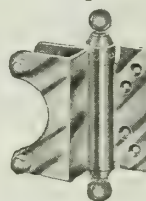
DIMENSIONS "PREMIER" SPRING PIVOT-HINGE

For doors, thickness, ins.	Floor plate		Pintle center to door casing, ins.
	Width, ins.	Length, ins.	
1 1/8 to 1 3/4	3	4	1 1/2
1 3/4 to 2 3/4	3 3/4	5	1 7/8

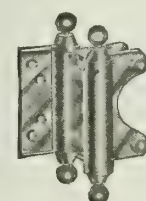
### "Triplex" Lavatory Spring Hinges.

Chicago "Triplex" lavatory spring hinges, as illustrated, are made in bronze, brass or nickeline metal for marble thickness as specified. The flanges are 4 ins. Nos. 2242, 2244, 2246, and 1247 have adjustable box flanges, adjustable 1/8 in. over and under the following sizes by which they are specified: 1 in., 1 1/4 ins., 1 1/2 ins., 1 3/4 ins. and 2 ins.

Single acting lavatory hinges can be used in combination with a springless hinge, where doors are very narrow or light weight, as shown by articles No. 2244 and No. 2444. Where doors swing out and occupancy indicator is not desired, a checking springless hinge, No. 2246 or No. 2446, can be used, which holds door ajar when not bolted shut. Where doors swing in, hinges can be furnished with reverse springs to hold door open.



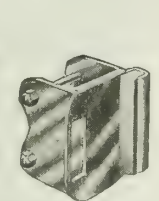
No. 2242



No. 2241



No. 2442



No. 1247F



No. 2244



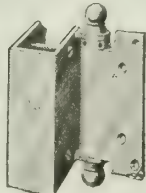
No. 2246



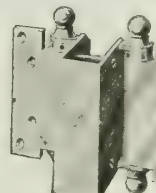
No. 2444



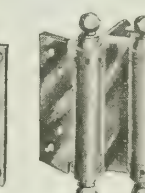
No. 2446



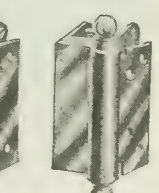
No. 2842



No. 2642



No. 2542



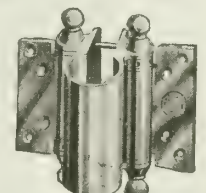
No. 2742



No. 1244



No. P2222



No. 2342

CHICAGO "TRIPLEX" LAVATORY SPRING HINGES, STOPS AND BOLTS



# LAWSON MFG. COMPANY

Manufacturers of Spring Hinges

228-230 West Superior Street  
CHICAGO, ILL.

## Products.

"NU" JAMB HINGES, Single and Double Acting; SURFACE FLOOR SPRING HINGES; LAVATORY DOOR SPRING HINGES, BLANKS, STRIKES, KEEPERS, LATCHES, BOLTS and ACCESSORIES.

Screen Door Hinges and Sets, Mortise Floor Spring Hinges, Mortise Floor Pivot Hinges and Push Plates.

## "Nu" Jamb Hinges.

GENERAL DESCRIPTION OF IMPROVED FEATURES—These hinges are made both single and double acting, ranging in size from 3 to 10 ins., including a new 9-in. (the size increase being per inch), of wrought metal, steel, bronze or brass, and in all hardware finishes.

An exceptionally strong connection is provided between the barrels (see sectional view). The center having barrel arranged on one side thereof allows direct application to jamb, eliminating cost, finishing and mortising of a hanging strip.

Springs made of best tempered steel wire; proportioned in each individual hinge, as to size of wire, diameter and number of coils, to produce best results. Special bearings are provided to reduce friction to a minimum, and the ball tips are held in place by concealed locking ring. Material and workmanship guaranteed.



## Surface Floor Spring Hinges.

The reputation which these hinges have obtained through years of satisfactory service stamps them as most desirable devices in every respect.

The construction eliminates trouble and reduces cost of application.

There are several patented features:

A positive locked holdback at 90°, which is original with this company.

An alignment that is accessible from the outside, located on the floor plate and not incased in the hinge.

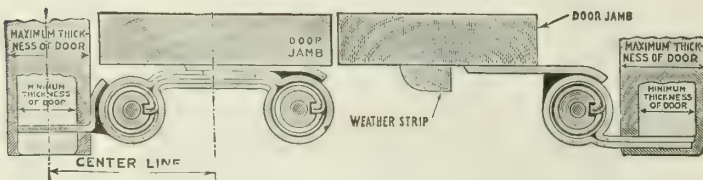
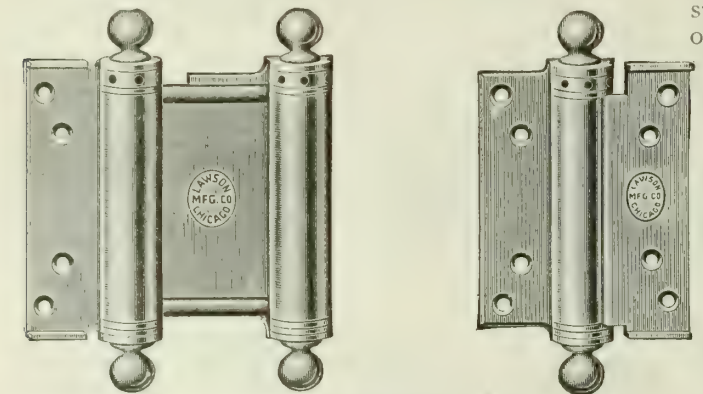
A roller bearing, journaled on top and bottom in guideway rollers, which centers the door and reduces oscillation.

Heavy bevelled side plates are made without any projection at the pivot point, to harmonize with push plates.

The side plates are reversible, doing away with the necessity of specifying the hand when ordering split trim.

For concrete or tile floors an angle jamb plate is furnished, which is fastened to the door jamb.

Nos. 500 and 600 surface floor hinges are for doors 1 1/8 to 1 3/4 ins. thick and of standard size. No. 900 surface floor hinge is for doors 1 3/4 to 2 1/2 ins. thick and of standard size.



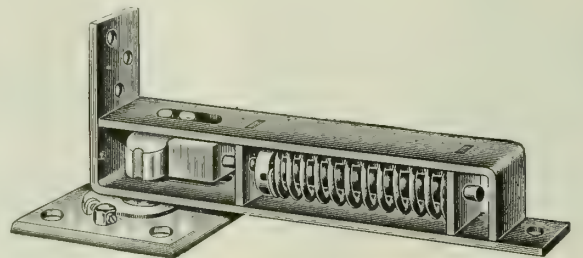
Double Acting Single Acting  
SINGLE AND DOUBLE ACTING JAMB HINGES AND DETAIL SHOWING APPLICATION TO DOOR JAMB WITHOUT HANGING STRIP

Can also be used with hanging strip if desired

## SCHEDULE FOR SELECTING CORRECT SIZE OF HINGE

Size of hinges	For doors			
3"	3 1/4" thick	x 2' 3" wide	or 1" thick	x 2' 0" wide
4"	1 1/2" " "	x 2' 6" " "	1 1/4" " "	x 2' 0" " "
5"	1 1/2" " "	x 2' 6" " "	1 1/2" " "	x 2' 3" " "
6"	1 3/4" " "	x 2' 9" " "	1 3/4" " "	x 2' 3" " "
7"	1 3/4" " "	x 2' 9" " "	2" " "	x 2' 6" " "
8"	1 1/2" " "	x 3' 0" " "	2 1/4" " "	x 2' 6" " "
9"	1 3/4" " "	x 3' 0" " "	2 1/2" " "	x 2' 9" " "
10"	2 1/4" " "	x 3' 0" " "	2 3/4" " "	x 2' 6" " "

For outside doors subject to draft, wide or heavy doors of hardwood, metal covered doors or doors weighted with heavy plate glass or hardware, use largest size hinge the thickness of door will permit. Wide doors require larger size hinges than narrow doors

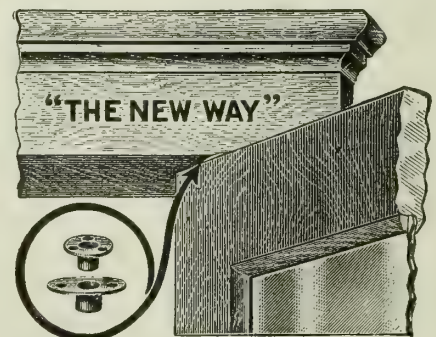


NOS. 500, 600 AND 900 SURFACE FLOOR HINGES

The company has replaced the old cast iron top pivot and socket with one of modern construction, far more durable, made of wrought metal.

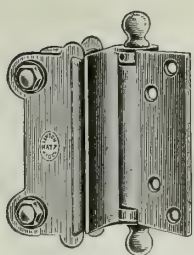
It is invisible and requires no mortising, thereby saving time and labor.

Furnished with all makes of Lawson surface floor spring hinges.

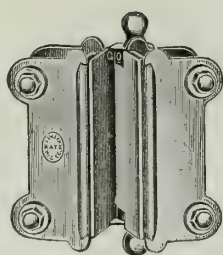


INVISIBLE TOP PIVOT AND SOCKET

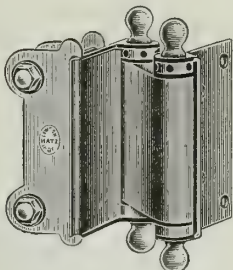




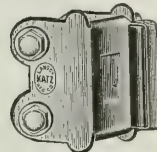
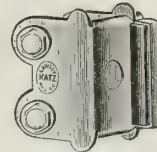
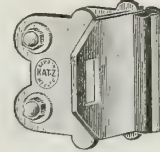
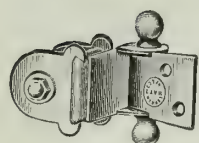
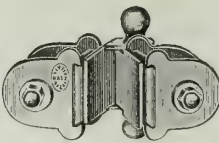
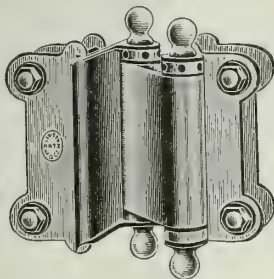
No. 1900. Single Acting Hinge



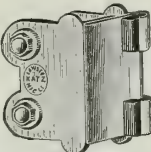
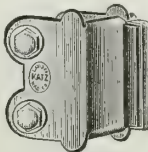
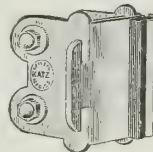
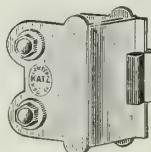
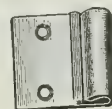
No. 1902. Single Acting Hinge



No. 1904. Double Acting Hinge

No. 1942  
For mortise bolt, for right or left hand doors opening in or outNo. 1946  
For mortise bolt, for right or left hand doors opening in or outNo. 1948  
For rim bolt, for right or left hand doors opening inNo. 1910. Hinge Blank  
For use with Hinge No. 1900 on light and narrow doorsNo. 1912. Hinge Blank  
For use with Hinge No. 1902 on light and narrow doors

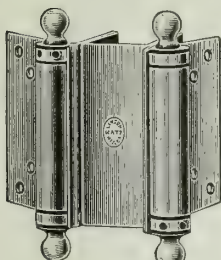
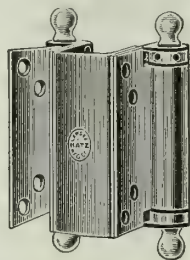
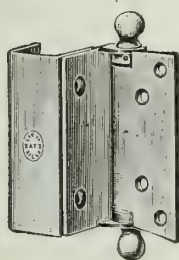
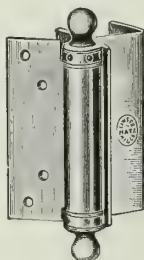
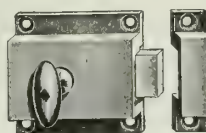
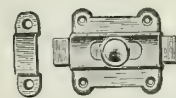
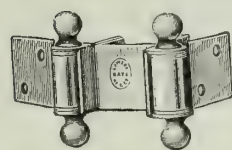
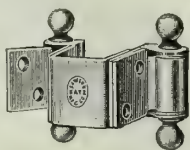
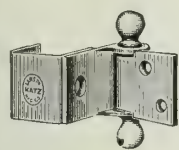
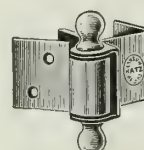
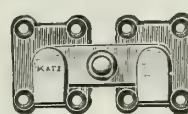
No. 1905. Double Acting Hinge

No. 1949  
For rim bolt, for right or left hand doors opening outNo. 1940  
No bolt hole. For right or left hand doors opening in or outNo. 1944  
For throw latch, for right or left hand doors opening inNo. 1945  
For throw latch, for right or left hand doors opening outNo. 1960  
For face of doorNo. 1962  
For edge of door or partition

## LAVATORY HINGES WITH ADJUSTABLE BOX

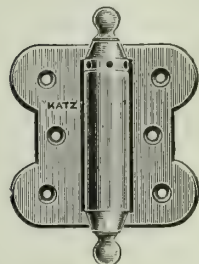
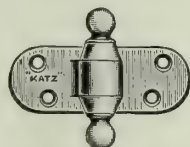
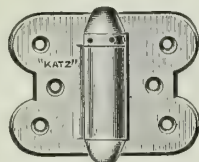
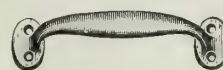
For marble or slate partitions of the following thickness:  $\frac{7}{8}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ ,  $1\frac{3}{4}$ , 2 ins. The box flange for the marble is adjustable  $\frac{1}{8}$  in. over and under above sizes, to allow for variations in thickness. Nickel plated, polished brass or bronze metal.

When ordering, state exact thickness of marble and door.

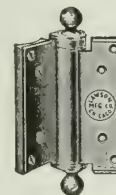
No. 1909. Single Acting Hinge  
For 2 doors opening out (right and left) hung to same partitionNo. 1906. Single Acting Hinge  
For 2 doors opening in (right and left) hung to same partitionNo. 1907. Single Acting Hinge  
For one door opening inNo. 1908. Single Acting Hinge  
For one door opening outNo. 1990  
Rim BoltNo. 1985  
IndicatorNo. 1995  
Slide BoltNo. 1966  
Slide BoltNo. 1919. Hinge Blank  
For use with Hinge No. 1909 on light and narrow doorsNo. 1916. Hinge Blank  
For use with Hinge No. 1906 on light and narrow doorsNo. 1917. Hinge Blank  
For use with Hinge No. 1907 on light and narrow doorsNo. 1918. Hinge Blank  
For use with Hinge No. 1908 on light and narrow doorsNo. 1964  
Throw Latch

## LAVATORY HINGES WITH SOLID BOX

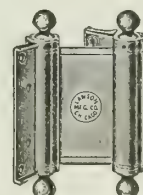
For marble or slate partitions without hanging stile. Solid box flange for the marble made of wrought metal. When ordering, state exact thickness of marble and door.

No. 1920. Single Acting Hinge  
Length of flange, 4 ins.No. 1930. Hinge Blank  
For use with hinge No. 1920 on light and narrow doorsNo. 1922. Single Acting Hinge  
Length of flange, 3 ins.No. 1970  
Door PullNo. 1982  
Hook and Bumper

## LAVATORY DOOR BOLTS, LATCHES AND ACCESSORIES



No. 1924



No. 1926

## SINGLE OR DOUBLE ACTING HINGES WITH PIPE PLATES

For standard pipe  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$  ins. inside diameter. To avoid error, also state exact outside diameter of pipe

LAVATORY DOOR SPRING HINGES AND BLANKS  
For wood or marble partition. Regularly furnished for wood partitions. If wanted for marble partition, state thickness.

Single acting hinges can be furnished with reverse spring

# THE SHELBY SPRING HINGE CO.

SHELBY, OHIO

## Products.

"SHELBY CHIEF" DOUBLE ACTING, BALL BEARING SURFACE FLOOR HINGE; "SHELBY CHIEF" FLOOR HINGE and DOOR CHECK; "SHELBY" SPRING BUTT HINGES.

Door Holders, Door Bumpers, Push Bars, Door Bolts, Sash Locks, Push Plates, Screen Door Hinges and large line of Builders' Hardware Specialties.

## The "Shelby Chief" Surface Floor Hinge.

Double acting and ball bearing floor hinge. The pioneer of the floor hinge industry; has been improved from time to time, thoroughly tested, and is absolutely guaranteed to give unequaled satisfaction.

**CONSTRUCTION**—The frame of this hinge is made from heavy wrought steel, the spring from the best oil tempered spring steel, the floor plates and surface cover plates from steel, real brass or bronze metal, finished to match any builders' hardware finish.

**The Action**—Instant and noiseless; it operates on hardened steel ball bearings set in tempered cups, mechanically balanced at every point which reduces friction to a minimum and insures maximum strength.

**ALIGNMENT**—Accomplished by means of two corrugated plates placed at the outer end of the spring, with corrugated faces together; the tension of the spring holds the plates in position without bolts.

To align the door, move the plate next to spring, with a punch in the opposite direction from which the door is to be thrown.

**INSTALLATION**—Fit the door the full size of the opening, then round the back edge to allow the door to swing close to the jamb. Apply the pivot socket by boring a hole in top of the door, and the pivot by boring a hole in top jamb and securing with wood screws; cut out the back lower corner of the door the size of the hinge; mortise the attaching plate in door at bottom. Insert lug on top of hinge in hole in attaching plate; shove hinge forward and put in front screws; put door in place and fasten floor plate to sill and apply cover plates.

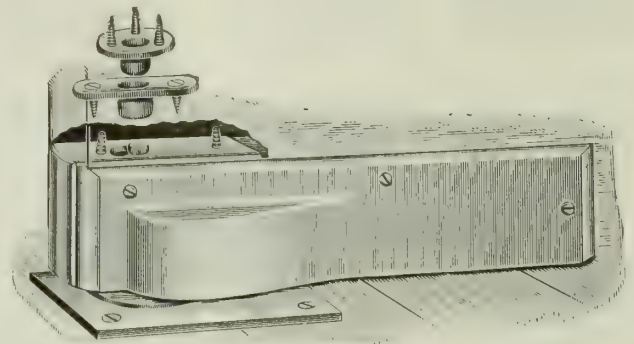


Fig. 1. Application

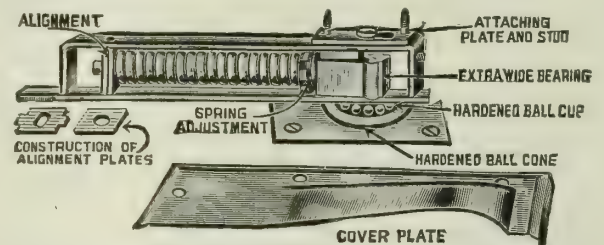


Fig. 2. Side Plate Removed, Showing Working Parts of Hinge "SHELBY CHIEF" DOUBLE ACTING, BALL BEARING FLOOR HINGE.

## "Shelby Chief" Floor Hinge with Jamb Plate.

This style hinge is used where it is desired to hang the door to the jamb rather than have the hinge rest on the floor; also, where iron beams, concrete or tile floors are used (Fig. 3).

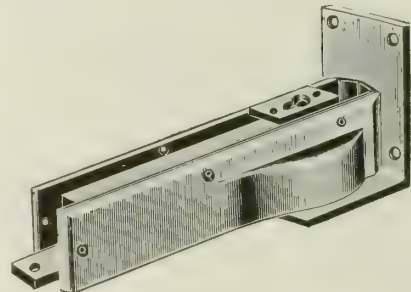


Fig. 3. "SHELBY CHIEF" FLOOR HINGE WITH JAMB PLATE

## PRICES AND FINISHES "SHELBY CHIEF" DOUBLE ACTING, BALL BEARING FLOOR HINGE

Finish	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Finish	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Finish	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.
Planished steel	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Steel polished	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Bronze or brass metal	No.	Thickness of door 1 3/8 to 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.
Japanned dead black.....	2	\$2.80	4	\$3.50	6	\$6.10	Bronze plated	62	\$4.55	64	\$4.90	66	\$7.50	Bronze, high polish.....	122	\$7.00	124	\$8.40	126	\$11.60
Bronze plated.....	12	3.50	14	4.20	16	6.80	Brass plated..	72	4.55	74	4.90	76	7.50	Brass, high polish.....	132	7.00	134	8.40	136	11.60
Dull brass plated.....	15	3.75	17	4.55	19	7.35	Nickelplated..	82	4.55	84	4.90	86	7.50	Antique, copper finish..	142	7.70	144	9.10	146	12.25
Antique, brass plated.....	21	3.75	23	4.55	25	7.35	Dull brass plated	92	4.80	94	5.25	96	8.00	Dull brass finish.....	152	7.70	154	9.10	156	12.25
Brass plated..	22	3.50	24	4.20	26	6.80	Antique, brass plated.....	102	4.80	104	5.25	106	8.00	Antique, brass finish.....	153	7.70	155	9.10	157	12.25
Sand blast antique copper	32	4.45	34	4.70	36	7.45	Sand blast antique brass.....	111	4.80	113	5.25	115	8.00	Nickel finish..	162	8.20	164	9.50	166	13.00
Antique, copper plated.....	31	4.45					Verd antique..	112	5.00	114	5.50	116	8.00	Oxidized, silver finish..	172	11.20	174	12.60	176	16.00
Imitation bower-barff.	42	3.75	44	4.55	46	7.35		117	5.30	119	5.70	121	8.40	Verd antique.	182	8.40	184	9.80	186	13.20
	52	3.75	54	4.55	56	7.35														

Above prices per complete set packed in box with screws.  
Specify by number. Affix J. P. to above numbers when specifying hinges with jamb plate.



**"Shelby Chief" Surface Floor Hinge and Door Check.**

A practical and economical device for operating and controlling double swinging doors.

It consists of a compact liquid check designed and built to rest on the upper back corner of the door to control the closing speed, also stop it on dead center, and to work in harmony with the well-known "Shelby Chief" floor hinge (described on opposite page).

Flip-flapping is impossible where a "Shelby Chief" hinge and check is used. It protects children, garments and property.

The installation is practically the same as the "Chief" floor hinge. It is not necessary to cut into the floors, as the working parts of both hinge and check are attached to the door.

Especially desirable where stone or concrete floors are used (Figs. 4 and 5).

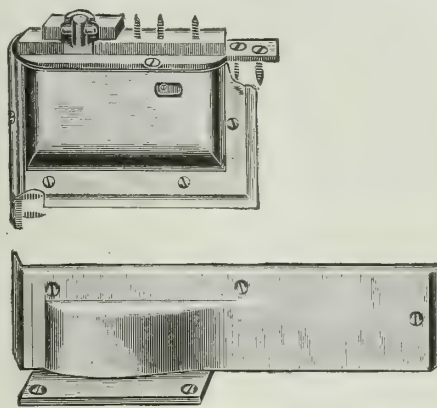


FIG. 4. DOOR CHECK AND FLOOR HINGE

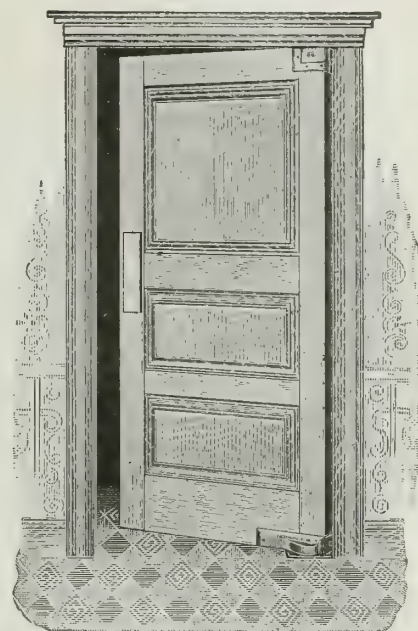


FIG. 5. "SHELBY CHIEF" DOOR CHECK AND FLOOR HINGE IN OPERATION

**PRICES AND FINISHES "SHELBY CHIEF" DOOR CHECK AND FLOOR HINGE**

These sets can be furnished to the consumer at about 50% off the list

Finish	No.	Thickness of door 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Finish	No.	Thickness of door 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.	Finish	No.	Thickness of door 1 3/4 ins.	No.	Thickness of door 1 3/4 to 2 ins.	No.	Thickness of door 2 1/4 to 3 ins.
Planned steel							Steel polished							Bronze or brass metal						
Japanned dead black.....	4002	\$11.80	4004	\$13.50	4006	\$17.10	Bronze plated....	4062	\$15.55	4064	\$16.90	4066	\$20.50	Bronze, high polish.....	4122	\$19.00	4124	\$21.40	4126	\$25.60
Bronze plated....	4012	13.50	4014	15.20	4016	18.80	Brass plated....	4072	15.55	4074	16.90	4076	20.50	Brass, high polish.....	4132	19.00	4134	21.40	4136	25.60
Dull brass plated....	4015	13.75	4017	15.55	4019	19.35	Nickelplated....	4082	16.30	4084	17.75	4086	21.50	Antique, copper finish.....	4132	19.00	4134	21.40	4136	25.60
Antique, brass plated.....	4021	13.75	4023	15.55	4025	19.35	Antique, copper plated.....	4092	15.80	4094	17.25	4096	21.00	Antique, copper finish.....	4142	19.70	4144	22.10	4146	26.25
Brass plated....	4022	13.50	4024	15.20	4026	18.80	Dull brass plated....	4102	15.80	4104	17.25	4106	21.00	Dull brass finish.....	4152	19.70	4154	22.10	4156	26.25
Antique, brass sand.....	4031	15.45	4033	16.70	4035	20.45	Antique, brass plated.....	4111	15.80	4113	17.25	4115	21.00	Antique, brass finish.....	4152	19.70	4154	22.10	4156	26.25
Antique, copper sand.....	4032	15.45	4034	16.70	4036	20.45	Sand blast antique brass....	4112	16.30	4114	17.75	4116	21.50	Nickel finish.....	4153	19.70	4155	22.10	4157	26.25
Antique, copper plated.....	4042	13.75	4044	15.55	4046	19.35	Verd antique....	4117	17.30	4119	18.70	4121	22.40	Nickel finish.....	4162	20.70	4164	22.50	4166	27.25
Imitation bowerbarff.....	4052	13.75	4054	15.55	4056	19.35								Oxidized, silver finish.....	4172	24.70	4174	27.10	4176	31.50
														Verd antique....	4182	21.40	4184	23.80	4186	28.20

Specify by number. Affix J. P. to above numbers when specifying sets where hinges with Jamb Plate are to be used

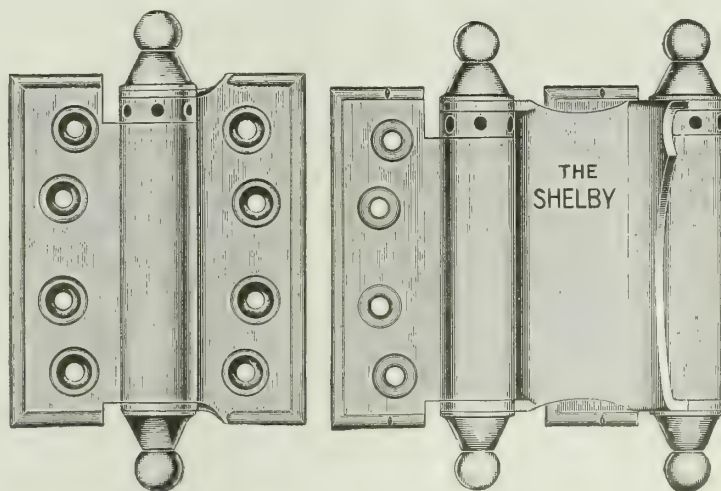
**"Shelby" Spring Butts.**

In sizes of 3, 4, 5, 6, 7, 8 and 10 ins., double and single acting.

Made from wrought steel, real bronze or brass metal, finished to match all builders' hardware.

**SIZE HINGE TO USE FOR DOORS**

6 x 2 ft. x 3/4 to 1 in.	Use size 3 inches
7 x 2 ft. x 1 to 1 1/8 ins.	" " 4 "
7 x 2 1/4 ft. x 1 to 1 1/2 ins.	" " 5 "
7 x 2 1/2 ft. x 1 to 1 3/4 ins.	" " 6 "
8 x 2 1/2 ft. x 1 1/4 to 2 ins.	" " 7 "
8 x 3 ft. x 1 1/2 to 2 1/4 ins.	" " 8 "
9 x 3 ft. x 1 3/4 to 2 1/2 ins.	" " 10 "
10 x 3 ft. x 2 to 3 ins.	" " 12 "



Single Acting Double Acting  
FIG. 6. SHELBY SPRING BUTTS

# THE STANLEY WORKS

## Builders' Hardware

MAIN OFFICE AND FACTORY

NEW BRITAIN, CONN.

BRANCH FACTORIES: NILES, OHIO; BRIDGEWATER, MASS.

WAREHOUSES AND BRANCH OFFICES: NEW YORK, N. Y., 100 Lafayette Street; CHICAGO, ILL., 73 E. Lake Street

### Products.

BUILDERS' and GARAGE HARDWARE in WROUGHT BRONZE and STEEL, including: Loose Pin and Ball Bearing Butts and Hinges; Door Bolts, etc.; Thumb Latches, Handles, Hardware for mill and factory doors; Storm Sash Hangers and other miscellaneous Builders' Hardware.



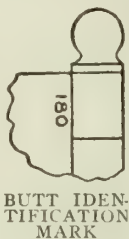
### Territory.

THE STANLEY WORKS' products can be obtained from any of the leading builders' hardware dealers.

Other builders' hardware manufacturers, such as P. & F. Corbin, Russel & Erwin, Sargent, and Yale & Towne, will furnish Stanley products whenever they are specified by name and catalogue number.

### Identification.

All Stanley products are stamped with THE STANLEY WORKS' trade-mark. Numbers, designating certain types of butts, and symbols, designating certain finishes, are also stamped on the back of each butt, as described under specific headings.



### How to Specify.

Use the name Stanley, together with the size, the catalogue name and number, and proper symbol for the finish desired, thus: "All butts to be 'Stanley' 5 ins. by 5 ins., wrought bronze, ball bearing butts No. 180 A."

For additional specification data, see succeeding pages.

### Finishes.

All Stanley wrought steel products are manufactured from cold rolled steel which is made in THE STANLEY WORKS' own steel mills.

The process of cold rolling hardens the steel and gives it a bright, uniformly smooth surface. This finish is designated in unplated goods as "bright steel."

Electroplated goods of the best grades are first highly polished and then heavily plated and finished in various effects of bronze, brass, copper, etc.

The table gives a partial list of finishes, with symbols, and corresponding symbols of other makes:

Stanley Works	Description	Yale & Towne Mfg. Co.	Russel & Erwin Mfg. Co.	P. & F. Corbin	Sargent & Company
A	Standard light bronze...	B Z 10	11	B	P
C	Brass plate...	A Z 10	10	A	B
D2	Copper oxidized, light mottled...	C Z 17	7 1/2	R	A B
F	Dull brass...	A Y 22	9	D A	O B
G	Bower barff, rustless...	F X 80	46	F	B B
H	Dead black electroplate...	B X 16	06	K F	B N
N	Nickel...	N Z 10	4	E	N
S F2	Brass oxidized, mottled, sand finish...	A X 17	09 1/2	S H A	R K
S F4	Dull brass, slightly oxidized, sand finish...	A X 24	09 C	S H A	R D

SHERARDIZING—An antirust finish, called "Stanley Sherardized."

Products are sherardized before they are assembled, thus insuring a complete coating of all parts.

This finish is recommended for all articles exposed to the weather.

Many articles are sherardized and then electroplated in various finishes. These goods have the rust preventing feature, with the appearance of plated products.

All sherardized and plated butts are stamped with the letter "Z" on the back near the joint.

### Number and Size of Butts to Use on Doors.

The use of three butts on every door is recommended for the purpose of counteracting the tendency of doors to throw out of alignment, which causes them to stick and bind with probable disfigurement of the woodwork. Experience has shown that as a general rule doors when hung on only two butts are apt to give trouble from warping.

Table shows proper size of butts to use on doors of different dimensions:

Door dimensions	Weight of door, lbs.	Size of butts, ins.
Cupboards		2 1/2
3/4 in. and 1 1/4 ins., screen doors...	30	3 x 3
1 3/8 ins. thick and less than 2 ft. 8 ins. wide.	30 to 50	3 1/2 x 3 1/2
1 3/8 ins. thick and 2 ft. 8 ins. or more in width	50 to 60	4 x 4
1 3/4 ins. thick and less than 3 ft.	60 to 75	4 1/2 x 4 1/2
1 3/4 ins. thick and 3 ft. or more in width...	75 to 100	5 x 5

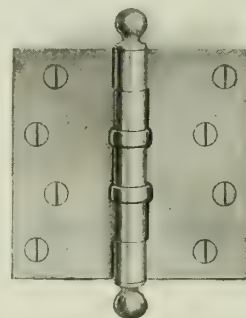
### Ball Bearing Butts.

Stanley ball bearing butts are the most satisfactory made for hanging doors.

They are recommended especially for heavy doors; doors through which heavy traffic passes and doors having door checks.

Their joints are equipped with ball bearing washers. The washers are so constructed that they can not come apart, and the improved brass cap protects the balls from moisture and dust.

The hardened tool steel balls are set in a case hardened raceway, and each bearing will sustain a load of 1,000 lbs. without crushing.



BALL BEARING BUTT

### Non-rising Pins.

Stanley wrought bronze butts, all Stanley ball bearing butts and butts of the No. 239 grade are equipped with a patented non-rising pin. This pin can be easily slipped in or out, but can not rise or work up with the action of the door.



NON-RISING PIN



## Wrought Bronze Metal Butts.

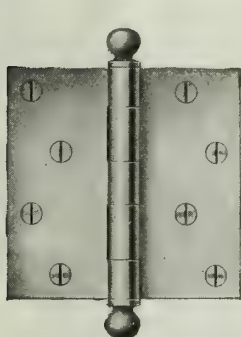
Stanley wrought bronze metal butts are recommended for all exterior doors and for all interior doors where durability, wearing qualities, fine appearance and absolute protection from rust are of the first consideration.

Stanley *wrought* bronze butts have the advantage over cast bronze butts in that the knuckles or joints are wider than in the cast butts, consequently increasing the bearing surface at the most necessary point, and eliminating wear caused by friction, which in time would allow a door to sag. The process of cold rolling wrought bronze insures a uniformity of quality in all parts.

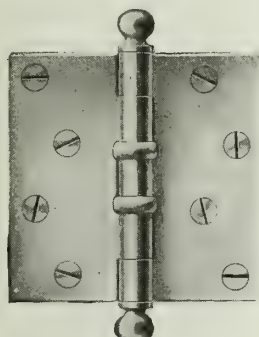
The uniform thickness of *wrought* bronze metal butts is also in their favor as their application is simplified thereby, a straight even mortise of regular depth allowing them to be flush with the surface of jamb, offering no place for collection of dust and dirt and greatly enhancing the appearance of workmanship and construction.

**No. 175 WROUGHT BRONZE METAL LOOSE PIN BUTTS**—Have sherardized steel, non-rising loose pins and ball tips; self-lubricating, sherardized steel bushings in the joints; edges near joints are beveled to form close fit; all sizes have five knuckles in the joint; polished and highly finished.

**No. 180 WROUGHT BRONZE METAL BALL BEARING LOOSE PIN BUTTS**—Have non-rising loose pins and ball tips; ball bearing washers; edges near joints are beveled to form close fit; all sizes have five knuckles in the joint; polished and highly finished.



No. 175. Ball Bearing



No. 180. Ball Bearing

### WROUGHT BRONZE BUTTS

SIZE, WEIGHT AND GAGE, NOS. 175 AND 180

Sizes, ins.	2½ x 2½	3 x 3	3½ x 3½	4 x 4	4½ x 4½	5 x 5	5½ x 5½	6 x 6
†Weight, lbs.	½	¾	1¼	*1¾	**2¼	3	3½	4¾
Gage	.089	.092	.123	.130	.134	.134	.148	.160

†Net weight per pair without screws or boxes.

\*No. 180, weight 1½ lbs. \*\*No. 180, weight 2½ lbs.

**No. 181 WROUGHT BRONZE METAL BALL BEARING BUTTS**—Extra heavy. Sizes, 6 by 6, 5 lbs.; 7 by 7, 6½ lbs.; 8 by 8, 8 lbs. Gage for all sizes is No. .203.

**FINISHES**—All wrought bronze metal butts are made in any finish desired.

## Wrought Steel Butts.

Stanley wrought steel plated butts are made in three grades:

**GRADE ONE**—Is highly polished, cop-perplated and then heavily electroplated. The edges near joint are beveled to form close fit (see illustration), the outer edges are milled and the joints of barrel ground. No. BB239 and No. 239. The designating number is stamped on the back of each butt, and they are referred to as being *highly polished and heavily plated*.

INNER BEV.  
ELED EDGE

**GRADE TWO**—Is heavily electroplated and polished, with the joints of barrel ground. No. BB241½ and No. 241½. The designating number is stamped on the back of each butt, and they are referred to as being *polished*.

**GRADE THREE**—Is heavily electroplated. No. BB241 and No. 241, and are referred to as being *planished*.

**BALL BEARING BUTTS**—Non-rising loose pins and ball tips.

No. BB239—Highly polished and heavily plated; inner edges beveled.

No. BB241½ — Polished and plated.

No. BB241—Planished.

Sizes, 2½x2½, 3x3, 3½x3½, 4x4, 4½x4½, 5x5, 5½x5½ ins.

**Extra Heavy Ball Bearing Butts**—Non-rising loose pins and ball tips.

No. 851—Plain steel without screw holes; four ball bearing washers.

No. 252—Highly polished and heavily plated; inner edges beveled; four ball bearing washers.

No. 250 (not illustrated)—Highly polished and heavily plated. Similar to No. 252. Has two ball bearing washers.

Sizes, 6x4, 6x5, 6x6, 6x7, 6x8, 7x6, 7x7, 7x8, 7x10, 8x6, 8x10 ins.

**LOOSE PIN BUTTS**—Non-rising loose pins and ball tips.

No. 239—Highly polished and heavily plated; inner edges beveled; non-rising pin.

No. 241½—Polished and plated.

No. 241—Planished.

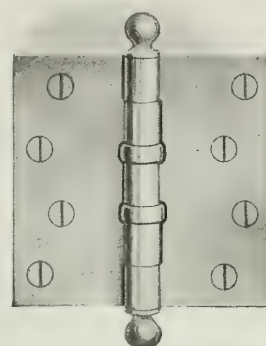
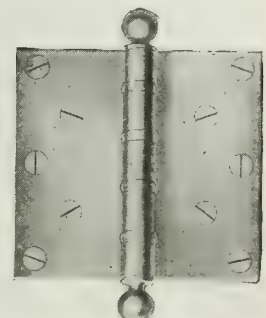
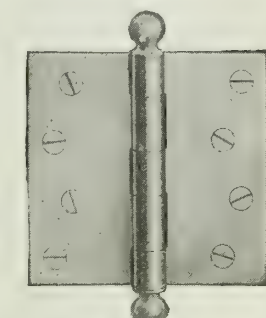
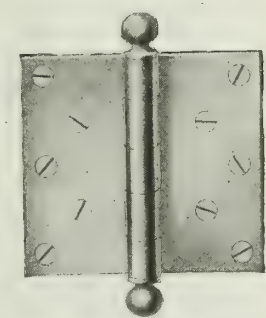
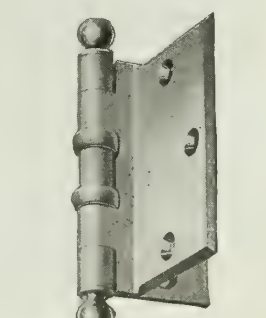
**Extra Heavy Loose Pin Butts**—Non-rising pins.

No. 249—Highly polished and heavily plated.

Sizes, 3½x3½, 4x4, 4½x4½, 5x5, 6x4, 6x5, 6x6, 6x7, 6x8, 7x10, 8x6, 8x10 ins.

**HALF SURFACE BUTTS**—No. BB165, ball bearing, beveled edge with ⅞-in. offset. Time and labor are saved in hanging doors with these butts, as only the casement is mortised, the door put in place and the ornamental leaf screwed to the surface of the door.

Sizes, 2½x2½, 3x3, 3½x3½, 4x4, 4½x4½, 5x5 ins.

NOS. BB239, BB241½,  
BB241 BALL BEAR-  
ING BUTTSNOS. 851, 252A EXTRA  
HEAVY BALL BEAR-  
ING BUTTSNOS. 239, 241, 241½  
LOOSE PIN BUTTSNO. 249. EXTRA HEAVY  
LOOSE PIN BUTTSNO. BB165  
SURFACE BUTTS

**Wrought Steel Template Butts for Metal Doors.**

The holes of these butts are drilled to template to match the holes in the metal doors. Templates to use in drilling the holes in the doors are furnished when required. The surface leaf has a beveled edge.

The butts have non-rising pins with ball tips. The bottom ball tip is slotted so it can be unscrewed and the pin and washers reversed.

**FULL SURFACE TEMPLATE BUTTS**—No. BB170—Ball bearing, highly polished and heavily plated, with offset.

No. BB171—Ball bearing, planished, with offset.

**HALF SURFACE TEMPLATE BUTTS**—No. BB172—Ball bearing, highly polished and heavily plated.

No. BB173—Ball bearing, planished.

**MORTISE TEMPLATE BUTTS**—No. BB174—Highly polished and heavily plated, with ball bearing.

No. BB179—Planished, with ball bearings.

No. BB856—Plain steel, with ball bearings.

No. 856—Plain steel, without ball bearings.

Sizes of mortise template butts,  $2\frac{1}{2} \times 2\frac{1}{2}$ ,  $3 \times 3$ ,  $3\frac{1}{2} \times 3\frac{1}{2}$ ,  $4 \times 4$ ,  $4\frac{1}{2} \times 4\frac{1}{2}$ ,  $5 \times 3$ ,  $5 \times 4$ ,  $5 \times 5$ ,  $5\frac{1}{2} \times 5\frac{1}{2}$ ,  $6 \times 5$  ins.

Nos. 174 and 179 butts are equipped with non-rising pins.

**Fast Joint Template Butts.**

For metal windows or transoms.

No. 176—Highly polished and heavily plated.

No. 178—Planished.

Sizes,  $2\frac{1}{2} \times 2\frac{1}{2}$ ,  $3 \times 2\frac{1}{2}$ ,  $3 \times 3$ ,  $3\frac{1}{2} \times 3\frac{1}{2}$ ,  $4 \times 4$  ins.

**Specifications for Butts.**

**MANUFACTURE**—All butts throughout shall be of THE STANLEY WORKS, New Britain, Conn., manufacture.

**SIZES**—Sizes shall be not less than required by the following:

Door Dimensions,  $1\frac{3}{8}$  ins. thick and less than 2 ft. 8 ins. wide, 30 to 60 lbs., butts  $3\frac{1}{2} \times 3\frac{1}{2}$  ins.;  $1\frac{3}{8}$  ins. thick and 2 ft. 8 ins. or more in width, 50 to 60 lbs., butts  $4 \times 4$  ins.;  $1\frac{3}{4}$  ins. thick and less than 3 ft. wide, 60 to 75 lbs., butts  $4\frac{1}{2} \times 4\frac{1}{2}$  ins.;  $1\frac{3}{4}$  ins. thick and 3 ft. or more in width, 75 to 100 lbs., butts  $5 \times 5$  ins.

Doors weighing over 100 lbs. shall be equipped with butts of the extra heavy patterns.

All butts shall be of sufficient size to allow the door to swing back parallel with the wall without striking the trim of the door.

**NUMBER OF BUTTS TO BE FURNISHED**—All swinging doors, and all casement and hinged sash and transoms shall each be equipped with three butts.

**FINISH**—The finish of butts is to match the finish of other hardware in the same room.

**BALL BEARING BUTTS**—The following doors shall be equipped with THE STANLEY WORKS ball bearing butts; exterior doors, vestibule doors, metal covered or hollow metal doors, doors from corridors to rooms and all doors having door checks.

**LOOSE PIN BUTTS**—THE STANLEY WORKS loose pin butts shall be used for all doors and hinged sash unless otherwise specified.

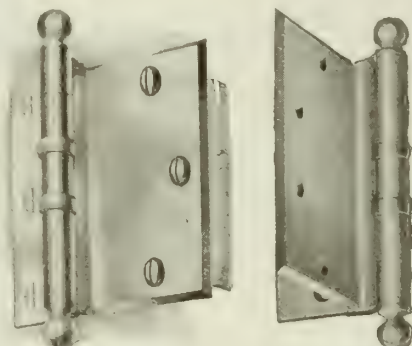
**WROUGHT BRONZE METAL BUTTS**—THE STANLEY WORKS wrought bronze metal butts shall be furnished for all exterior doors, all exterior hinged windows and for all doors in the following rooms. [Specify names of rooms].

**Note**—THE STANLEY WORKS wrought bronze metal butts are recommended for all work where quality is the first consideration and especially where serious weather conditions prevail and where cleaning and polishing of the metal will be required.

**WROUGHT STEEL BUTTS**—THE STANLEY WORKS wrought steel butts shall be furnished for all interior doors, transoms and hinged sash, unless otherwise specified to have wrought bronze metal butts.

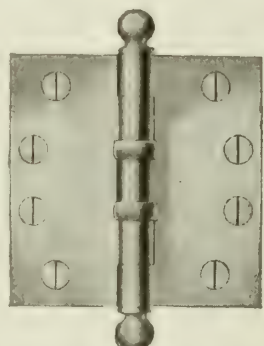
**Note**—THE STANLEY WORKS No. 239 line is recommended where a plated butt of the highest grade is desired. The No. 241½ line is recommended for moderate cost work.

**TEMPLATE BUTTS**—THE STANLEY WORKS wrought steel template butts (specify number) shall be furnished for all metal covered or hollow metal doors.

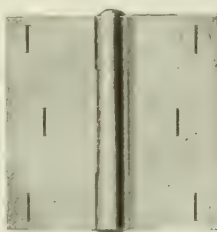


NOS. BB170, BB171  
FULL SURFACE  
TEMPLATE BUTTS

NOS. BB172,  
BB173 HALF  
SURFACE  
TEMPLATE  
BUTTS



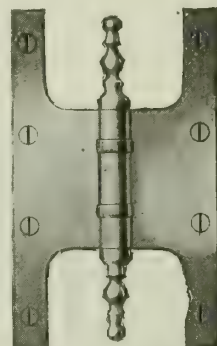
NOS. BB174, BB179, BB856  
MORTISE TEMPLATE  
BUTTS



NOS. 176, 178. FAST  
JOINT TEMPLATE  
BUTTS

**Paumelles.**

Because of the artistic effect of the barrel and steeple tip, the Stanley ball bearing paumelle No. 5345 is being used on doors of stock thicknesses, although its long leaves, which are mortised into the jamb, were originally designed for light or French doors. The gage of the metal and the strength of the butts are such, however, that No. 5345 is just as serviceable as the standard type of butt. The surface is highly polished.

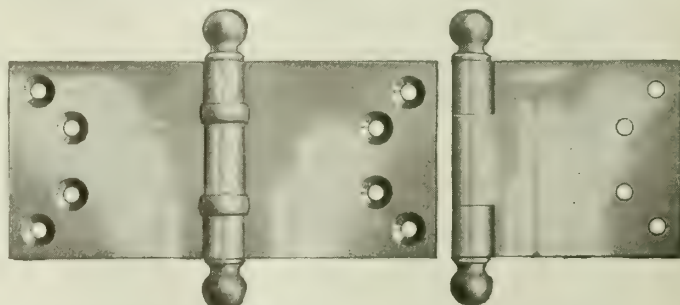


NO. 5345. BALL  
BEARING  
PAUMELLE

**Accordion Door Butts.**

Nos. BB243 and 243 have recently been designed for accordion or folding doors, or wherever a large offset is desirable. Both these butts are the same except that the joints of No. BB243 are fitted with ball bearing washers and the barrel equipped with the Stanley patented non-rising pin. Open, they measure  $2\frac{3}{4} \times 6$  ins.

When open, these butts have sufficient clearance to receive the combined thicknesses of doors between the anchor door and the wall.



No. BB243

No. 243

ACCORDION DOOR BUTTS

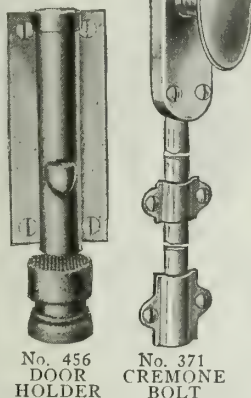


**Cremone Bolt 371.**

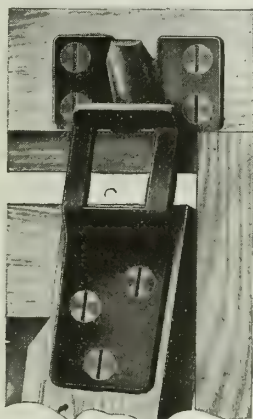
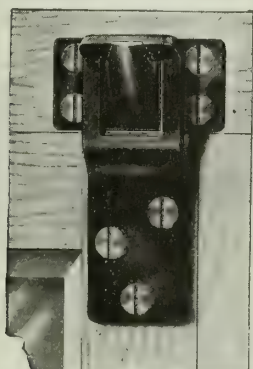
This new Cremone bolt is one of the neatest bolts that can be selected for any work. It is wrought steel, except the graceful knob which is wrought brass. The half oval bolt is polished. 371 is packed with two center guides, two end guides, and three staples. 3-, 3½-, 4- and 4½-ft. rods are carried in stock by THE STANLEY WORKS, although any length and finish can be furnished.

**Stanley Door Holder 456.**

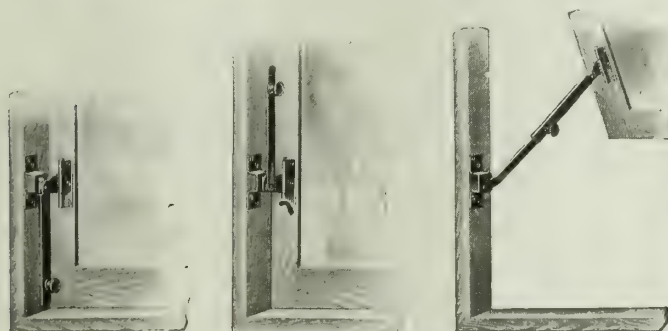
This holder has two strong springs—one to control the bolt and the other to reinforce the rubber tip. This second spring prevents the rubber from slipping and the door slamming because of uneven or highly polished floors. The holder is operated directly above the rubber cup and its spring. The release is made of solid bronze, all other parts are of cold rolled wrought steel.

**Peerless Storm Sash and Window Screen Hangers and Fasteners.**

Peerless sash hangers and fasteners furnish a practical, simple, and safe method of hanging storm sashes or screens. Once these fixtures are applied, it is an easy matter to hang or to remove the screen or sash. Peerless hangers and fasteners are finished in high grade japan or Stanley sherardized. The full line is illustrated and described in THE STANLEY WORKS' general catalogue. This line includes 1715 hanger and 1723 fastener which are here illustrated.



STORM SASH AND WINDOW SCREEN HANGER 1715



APPLICATION OF PEERLESS SASH FASTENER 1723

**Stanley Garage Hardware.**

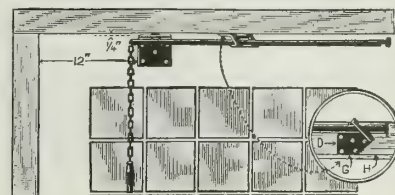
The most complete garage hardware line made, covering the equipment of garages of all sizes having hinged doors.

Stanley hinges, door holders, bolts, and other fittings comprising Stanley garage hardware have been especially designed for garage use. They are planned for brick, concrete and wooden garages, and for many special conditions. Also for mill and factory doors.

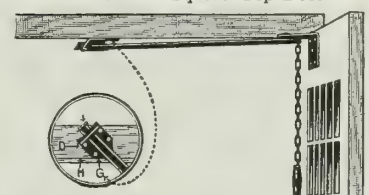
Stanley garage hardware is put up in "sets" which simplifies its prompt and efficient handling.

**STANLEY GARAGE DOOR HOLDERS**—Prevent wind slamming the door against automobile.

No. 1774—Made of steel, it is strong enough to hold garage door of any weight. Three parts: U-shaped 30-in. bar of heavy steel; pivot plate with 7/16-in. rivet, coupling the bar to door; and bumper plate, which locks bar to frame of garage. Chain is 4 ft. long.



No. 1774 on Square Top Door



Door Open to More than a Right Angle

Holder operates automatically. When door is opened to a little more than a right angle, notches in end of bar drop over bottom of slotted plate, locking door open. Released by pulling chain.

Packed complete with directions, staples and screws, 1 pair in box; gross weight per pair, 8½ lbs.

**STANLEY GARAGE HINGES**—The satisfactory way to open garage doors is to swing them out on hinges. Garage doors swung on hinges close snugly, and are as weathertight as the entrance door of a residence.

Stanley garage hinges, being especially designed for garage work, have a substantial, attractive appearance in harmony with the atmosphere of a private garage, and give to it a distinctive, artistic touch.



TWO-CAR STUCCO GARAGE

Doors are swung out on Stanley garage hinges No. 1457, 24-in. length at top and bottom and 10-in. in centers; are held open with Stanley holders No. 1774 and bolted with Stanley Cremone bolts No. 1052



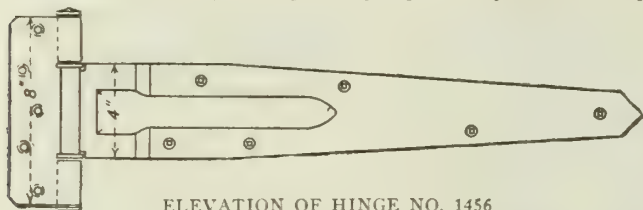
No inside space is wasted operating garage doors which swing out. There is nothing about them to adjust, get out of order, or become clogged with ice and snow. If garage has more than one main opening, as in a two- or three-car garage, all the doors can be opened at the same time, allowing the use of the entire entrance.

It is easier to swing comparatively heavy doors out than to push them back. The ball bearings fitted between the joints of Stanley garage hinges allow the door to be operated quietly and easily. They protect the hinges from unsightly signs of wear.

The long, ornamental leaf gives these hinges a powerful leverage strength which holds up the door, insuring it against sagging. They brace the door by reaching across the stile onto the rail and hold the door together, reinforcing and strengthening its construction. The use of three hinges counteracts the tendency of doors to warp out of alignment, and consequently prevents them from sticking and binding.

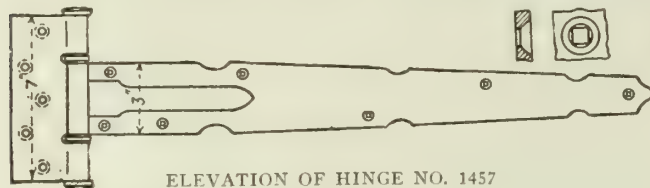
Stanley garage hinges are made in standard sizes. There is no delay in getting special parts, no special orders to meet unusual cases of construction. Time and labor are saved in hanging doors on these hinges as only the jamb is mortised, the door wedged in place, and the surface leaf applied.

From every point of view—utility, strength, appearance, durability, efficiency and economy—architects will always find Stanley garage hinges perfectly satisfactory.



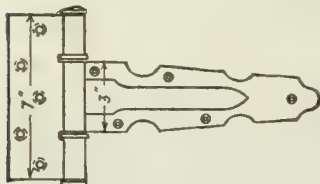
ELEVATION OF HINGE NO. 1456

Scale  $1\frac{1}{2}$  ins.=1 ft. 24 ins. long. Two holes are exposed for fastening screws or bolts on the outside in hanging. Three of the fastenings are covered when door is closed and hinge can not be removed.



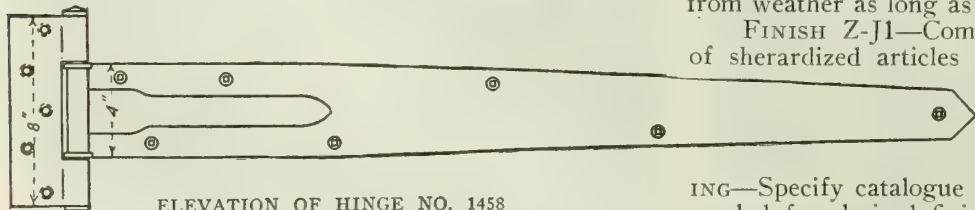
ELEVATION OF HINGE NO. 1457

Scale  $1\frac{1}{2}$  ins.=1 ft. 24 ins. long. Used at top and bottom of medium weight doors. Offset  $1\frac{1}{16}$  ins., throw  $2\frac{3}{8}$  ins.



ELEVATION OF HINGE NO. 1457

Scale  $1\frac{1}{2}$  ins.=1 ft. Used at center of height of door in combination No. 1457 or No. 1458 at top and bottom. Is 10 ins. long and has the same offset throw as No. 1457 or No. 1458.



ELEVATION OF HINGE NO. 1458

Scale  $1\frac{1}{2}$  ins.=1 ft. 36 ins. long,  $1\frac{1}{16}$  in. offset gives  $2\frac{3}{8}$  ins. throw. No. 1459 same dimensions as No. 1458 except that the pad is 4 ins. wide and the offset is  $2\frac{3}{8}$  ins., giving the hinge a  $4\frac{1}{2}$ -in. throw for garages with brick or concrete walls.



COPPER CAP



STEEL RACEWAYS, BALL BEARINGS



NO. 1096. CASE BOLT

NO. 1055 6-IN. CHAIN BOLT

NO. 1056 6-IN. FOOT BOLT

NO. 1055. 10-IN. CHAIN BOLT

NO. 1056. 10-IN. FOOT BOLT

STAPLES FOR NO. 1052 CREMONE BOLT

NO. 1138. FOOT BOLT STRIKE For concrete floors

NO. 1263. HEAVY SINGLE THUMB LATCH WITH ESCUTCHEON PLATE

NO. 1266. HEAVY PULL MOUNTED ON ESCUTCHEON PLATE

NO. 1052. HEAVY CREMONE BOLT

NO. 1264. HEAVY DUPLEX LATCH

Handles and thumb pieces provide a comfortable grip in handling heavy garage doors from either side

NO. 1052. HEAVY THUMB LATCH WITHOUT ESCUTCHEON PLATE

### Finishes for Garage Hardware.

FINISH Z—"Stanley Sherardized," an antirust finish for all articles exposed to the weather.

FINISH J1—Dead black japan, giving protection from weather as long as coating remains unbroken.

FINISH Z-J1—Combining rust preventing feature of sherardized articles with rich appearance of dead black japanned products.

FINISH J—A heavy coating of bright japan.

DIRECTIONS FOR ORDERING—Specify catalogue number of articles, followed by symbol for desired finish. Thus, garage door holder No. 1774, sherardized and coated in dead black japan, should be ordered as No. 1774-Z-J1.



**Stanley Garage Hardware Sets.**

For the convenience of architects when specifying, Stanley garage hardware is put up in sets.

**SETS A AND B**—For brick, concrete, or other construction requiring heavy doors. No. 1458 hinges (with  $1\frac{1}{16}$ -in. offset and  $2\frac{1}{8}$ -in. throw). When long hinges can not be used on top rail of curved top doors with panels of glass, No. 250 or No. 252 (6x6 ins. or 6x8 ins.) butts will be substituted for the No. 1458 or No. 1459 hinges respectively.

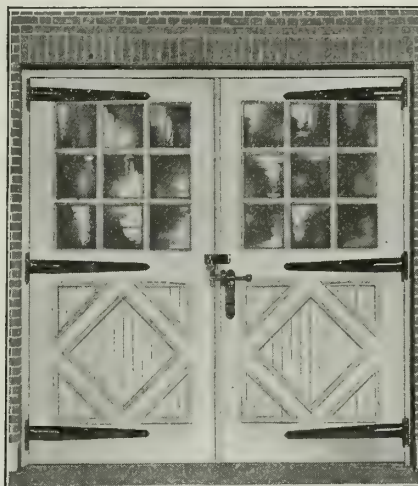
When garage is provided with a small side entrance door, the No. 1096 6-in. cased bolt (substituted for the No. Sc 915½ extra heavy safety hasp) provides the best means of locking the main doors from the inside.

When ordering Sets A or B, specify choice of No. 1458 hinge, No. 250 or No. 252 butts. State if floor is concrete; if doors are curved top with glass panels; if side entrance door is provided; and finish desired.

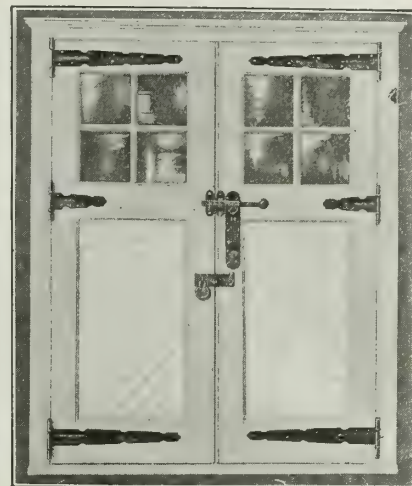
**SETS C AND D**—When garage is provided with a small side entrance door, the No. 1096 6-in. cased bolt (substituted for the No. Sc 915½ extra heavy safety hasp) provides the best means of locking the main doors from the inside.

If it is desired to lock the doors from outside of building, No. Sc 915½ extra heavy safety hasp, used with a regular padlock, gives greatest security.

When ordering Sets C or D, state if floor is concrete; if doors are curved top with glass panels; if side entrance door is provided; and finish desired.



Outside View of Doors Trimmed with Sets A or B



Outside View of Doors Trimmed with Sets C or D



Inside View of Doors Trimmed with Sets A or C



Inside View of Doors Trimmed with Sets B or D

DOORS EQUIPPED WITH SETS A, B, C, D OF GARAGE HARDWARE

**SETS COMPRISE—**

**SET A—Hinges**—3 pairs Nos. 1458 or 1456 equipped with ball bearings.

**Door Holders**—1 pair No. 1774.

**Bolts**—1 No. 1052 top and bottom locking Cremone bolt with staples.

**Latch**—1 No. 1264 extra heavy duplex latch.

**Padlock Hasp**—1 No. Sc 915½ hasp or 1 No. 1096 6-in. extra heavy cased bolt.

**SET B—Hinges**—3 pairs Nos. 1458 or 1456 equipped with ball bearings.

**Door Holders**—1 pair No. 1774.

**Bolts**—1 No. 1055 10-in. extra heavy chain bolt with staples; 1 No. 1056 10-in. extra heavy foot bolt with floor plate.

**Padlock Hasp**—1 No. Sc 915½ hasp or 1 No. 1096 6-in. extra heavy cased bolt.

**Latch**—1 No. 1264 extra heavy duplex latch and 1 No. 1266 handle and plate.

**SET C—Hinges**—2 pairs No. 1457 24-in., equipped with ball bearings; 1 pair No. 1457 10-in., equipped with ball bearings.

**Door Holders**—1 pair No. 1774.

**Bolts**—1 No. 1052 top and bottom locking Cremone bolt with staples.

**Latch**—1 No. 1264 extra heavy duplex latch.

**Padlock Hasp**—1 No. Sc 915½ hasp or 1 No. 1096 6-in. extra heavy cased bolt.

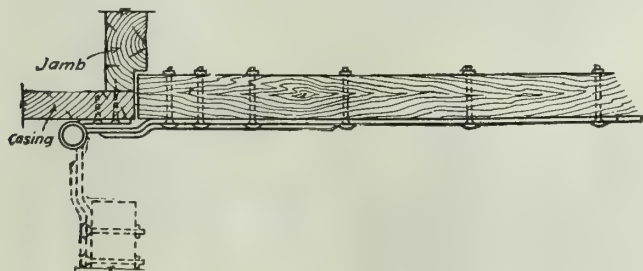
**SET D—Hinges**—2 pairs No. 1457 24-in., equipped with ball bearings; 1 pair No. 1457 10-in., equipped with ball bearings.

**Door Holders**—1 pair No. 1774.

**Bolts**—1 No. 1055 10-in. extra heavy chain bolt with staple; 1 No. 1056 10-in. foot bolt with floor plate.

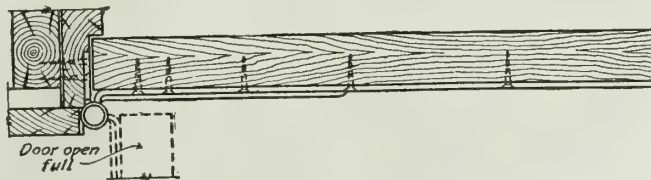
**Latch**—1 No. 1264 handle and plate.

**Padlock Hasp**—1 No. Sc 915½ or No. 1096 6-in. cased bolt.



PLAN OF HINGE NO. 1456 ATTACHED TO DOOR

When door is opened 90° the full width of opening from jamb to jamb is available. Casing should be flush with face of door. Holes in long leaf are countersunk for screws and are punched square for bolts.



PLAN OF HINGE NO. 1458 ATTACHED TO DOOR

Short leaf of hinge is applied to jamb, which is mortised to receive it. The long leaf is applied to surface of door with carriage bolts, lag or wood screws. Hinges made with combination holes.

# ALLITH-PROUTY COMPANY

SUCCESSOR TO ALLITH MFG. CO., CHICAGO, ILL., AND T. C. PROUTY CO., LTD., ALBION, MICH.

Manufacturers of Door Hangers, Fire Door Hardware and White Enamel Hardware

GENERAL OFFICES AND FACTORY  
DANVILLE, ILL.

BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 32 Howard Street  
PHILADELPHIA, PA., 521 Commerce Street  
BOSTON, MASS., 136 Pearl Street

CHICAGO, ILL., 202 North Wabash Avenue  
SAN FRANCISCO, CAL., 787-793 Brannan Street  
LOS ANGELES, CAL., 229 South Los Angeles Street

## Products.

DOOR HANGERS and TRACKS; SPRING HINGES; FIRE DOOR HARDWARE; ELECTRICALLY OPERATED DOOR HARDWARE; WHITE ENAMEL HARDWARE; STORE LADDERS; OVERHEAD CARRIERS; SLIDING DOOR LATCHES. Hardware Specialties.

## Door Hangers.

This company makes various styles and grades of door hangers to meet all conditions, and here illustrates some of the best and most popular numbers. Although flat and trolley track hangers are manufactured, the round or tubular track style, originated by them, is recommended particularly, and has proved in many respects more satisfactory than any other.

Great care is exercised in the selection of suitable steels and metals to meet the requirements of finish, strength and durability, and castings are almost altogether malleable iron, thoroughly annealed and practically non-breakable.

## Finish.

The standard finish on door hangers and kindred lines is baked black japan, but electro-galvanized is furnished if desired. Floor hinges and finishing hardware are electroplated in the various hardware finishes.

## Electrically Operated Door Hardware.

This company has perfected and placed on the market a complete type of electrically operated door hardware which can be installed and used in any kind of building.

It is controlled by two push buttons, which can be placed wherever desired. Push one button and the check locking arrangements disengage, the doors open and fold back out of the way and the lamp is lighted; push the other button and the doors close, the check locking device makes them secure and light is turned off. Four seconds required for each complete operation.

Interruptions can be made in movements of doors when in operation, and no damage can be done to the mechanism should doors strike an obstacle.

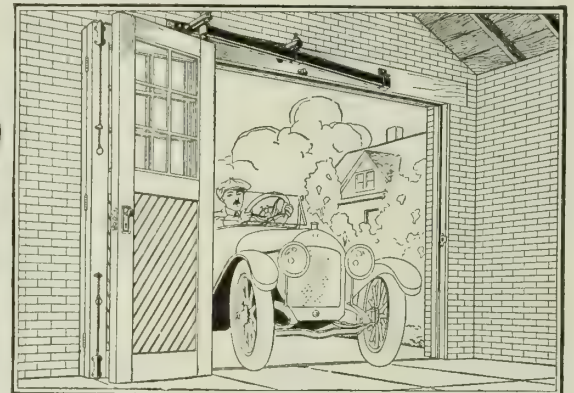
This type of hardware is ready at all times; no usage is too hard; it is practically noiseless; of plain, durable construction and all wearing parts are made of high grade steel. Each part is tested before complete assembly (with motor) for shipment.



ALLITH-PROUTY ELECTRICALLY OPERATED DOOR OPENING AND CLOSING HARDWARE WITH CHECK LOCKING DEVICE AND LIGHT CONNECTIONS



NO. 1080  
HANGER



INSTALLATION OF NO. 1080 HANGER ON A THREE DOOR GARAGE

For 3, 4, 5, and 6 sliding, folding doors with No. 60 trolley track



NO. 1080-C  
CENTER  
BRACKET

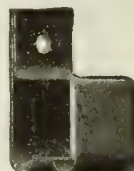


NO. 1080-E END ADJUST-  
ABLE BRACKET



NO. 1081-I  
INTERMEDIATE  
ADJUSTABLE  
BRACKET

This line of hardware allows doors to fold back at any angle and does away with door sagging



No. 60-C  
Center Bracket



No. 60-E  
End Bracket



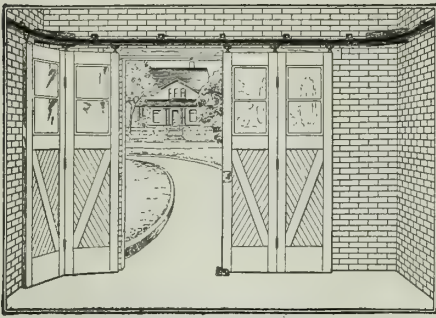
No. 79



No. 1079

NO. 79 AND 1079 HANGERS AND HARDWARE

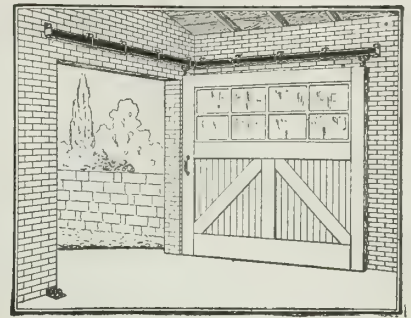




NO. 79 AND 1079 HANGERS WITH NO. 60 TROLLEY TRACK (CURVED)



NO. 1080 FIVE-DOOR OUTFIT WITH PASSAGE DOOR



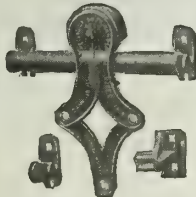
NO. 79 HANGERS WITH NO. 60 TROLLEY TRACK (STRAIGHT)



No. 1010—"Watershed"



No. 17—"Warehouse"



No. 2—"Old Reliable"



NO. 80



No. 95

ALLITH-PROUTY ROLLING LADDERS



No. 74  
"Corner Door"



No. 6  
"Warehouse"



No. 5—"Parlor Door"—Noiseless

TYPES OF ALLITH-PROUTY DOOR HANGERS AND TRACKS FOR ALL PURPOSES

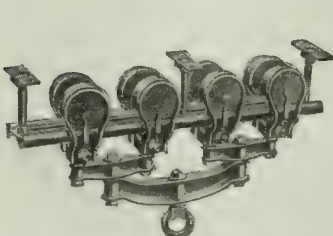


No. 396 "Drawtite"

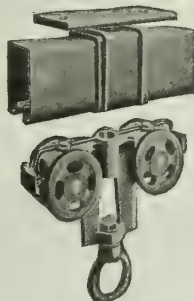


No. 33

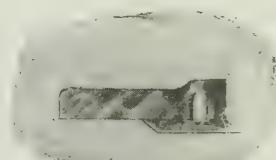
ALLITH-PROUTY SLIDING DOOR LATCHES



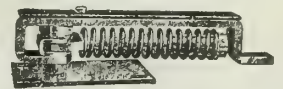
NO. 210 ROUND TRACK OVERHEAD CARRIER



NO. 167 TROLLEY TRACK OVERHEAD CARRIER



Hinge Attached



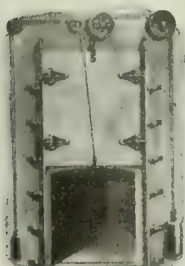
No. 3200. Exposed View

ALLITH-PROUTY FLOOR HINGES

Made in 2 sizes for doors 1½ to 2 ins. thick, and 1¾ to 3 ins. thick. Has case hardened steel instead of castings in all wearing parts and oil tempered springs and ball bearings



ALL ALLITH-PROUTY FIRE DOOR HARDWARE BEARS THIS LABEL



Vertical Type

All automatically operated fire door hardware bears the Underwriters' Laboratory label

AUTOMATICALLY OPERATED FIRE DOOR HARDWARE



Sliding Type

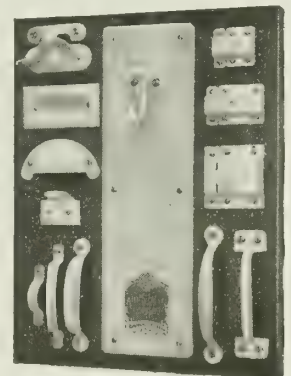


Swinging Type

### White Enamel Hardware.

Our attractive and durable No. 10 white enamel finish. The demand for this popular finish is fast increasing and superior facilities enable us to furnish a product of unsurpassed quality. This finish may be had in any of the light hardware.

The illustration is a reproduction of "No. 10 Sample Board," which is sent to dealers on request. Actual size 10 by 13 ins., displaying hardware full size.



NO. 10 WHITE ENAMEL HARDWARE

# DIAMOND DOOR HANGER CO., INC.

TELEPHONE CONNECTION

28-30 Rodney Street  
BROOKLYN, N. Y.

Agents in all the principal cities of the United States and Canada and our name will be found listed in the telephone directories

## Products.

"DIAMOND" TUBULAR BALL BEARING SLIDING DOOR HANGERS, and BAR LOCKS for elevator enclosure doors; also, for parlor, barn, fire, or other doors, where strong, durable, smooth-running hangers are required.

## "Diamond" Hangers.

The "Diamond" hanger is simple in construction, consisting of a tubular track, groove bar and separator, with balls placed equal distances apart assembled and held in place in such a manner that there are no weak parts to wear out or get out of order.

Best materials and workmanship.

ADVANTAGES—(1) Requires less space than other hangers.

(2) Is easily installed and quickly adjusted.

(3) Dirt or dust can not lodge in track.

(4) The load can be equally distributed over the entire width of door.

(5) Is the only hanger in which the balls turn only on their tangent points.

(6) Prices are no higher than for other high class hangers.

(7) It is the only tubular ball bearing door hanger that the balls, when in place, hold the carrying bar without any lost motion.

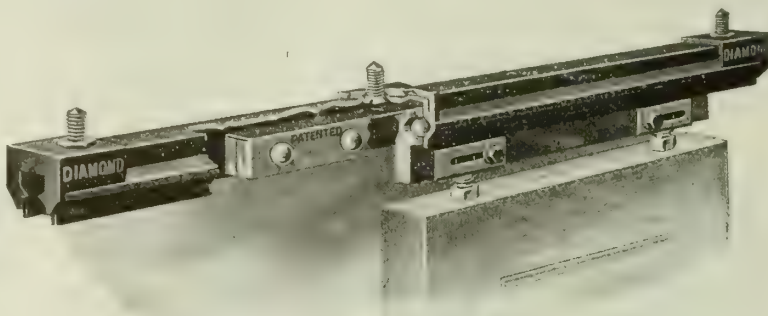
(8) Under all conditions these hangers move with absolute accuracy, making them the best for use with automatic or semiautomatic operating devices.

The advantages above enumerated make these hangers without question the best on the market.

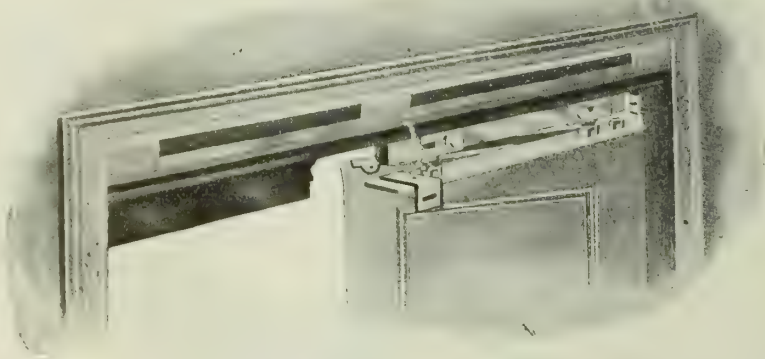
If architects try them, they will use no others.

ORDERING—In ordering, state actual width, thickness and approximate weight of door; how much they lap at center and jambs, and whether of wood, kalamein or steel; also, whether they open to right or left (taken from inside the elevator).

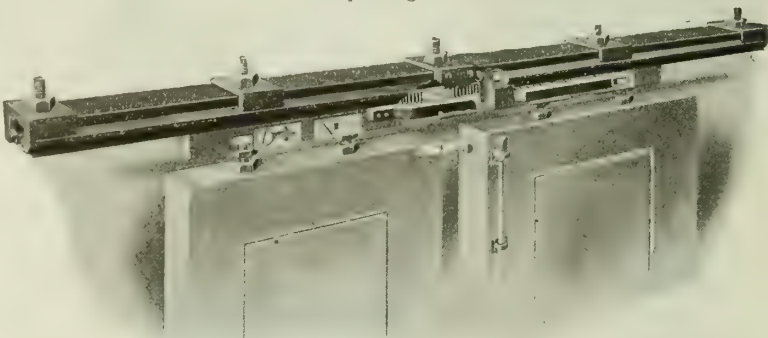
REFERENCES—A list of important buildings in which this "Diamond" hanger is used will be sent on application.



"DIAMOND" SINGLE DOOR HANGER NO. 2  
Will carry door weighing up to 2000 lbs.



"DIAMOND" SINGLE DOOR HANGER NO. 2  
With pivoting device

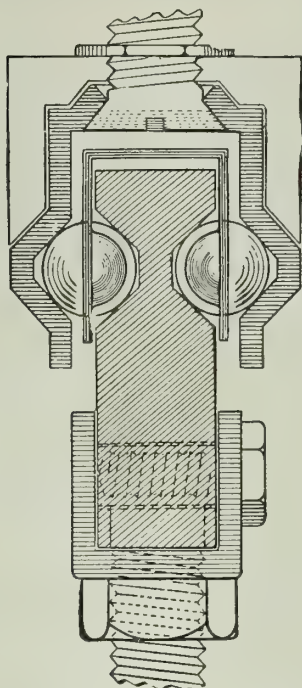


DOUBLE HANGER NO. 3  
With gear for moving two doors in opposite directions simultaneously

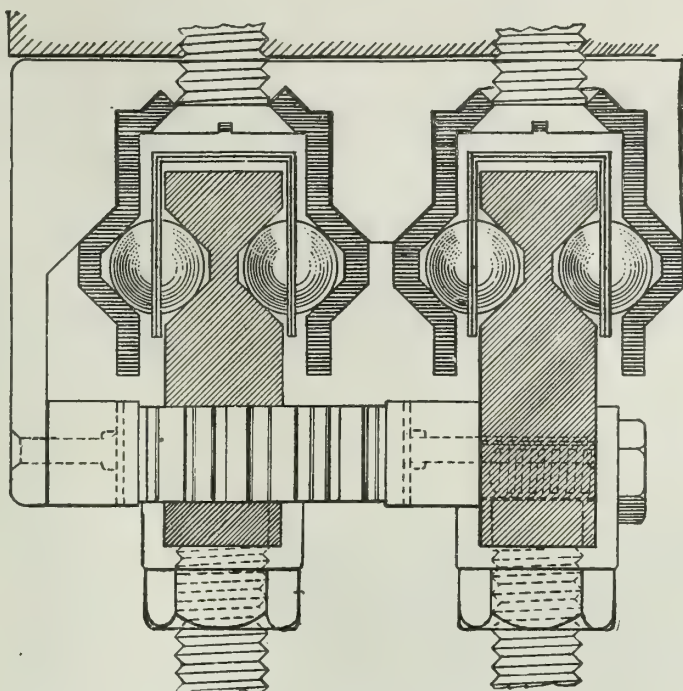


TWO-SPEED HANGER NO. 4  
For moving two doors in same direction, one traveling at double speed of other

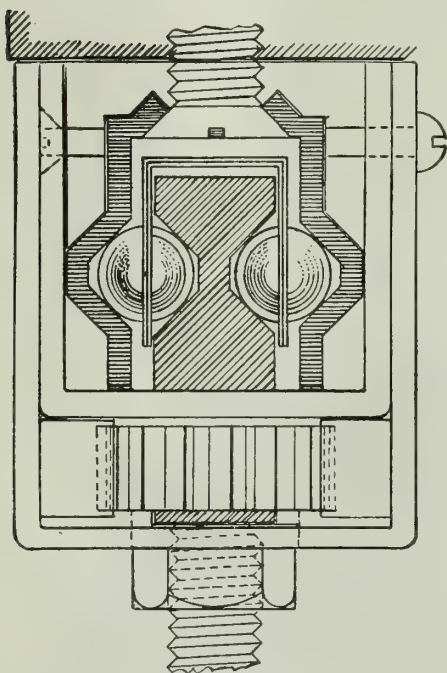




CROSS SECTION SINGLE  
HANGERS NOS. 1 AND 2  
Full size  
(Patented Aug. 30th, 1907)



CROSS SECTION TWO-SPEED HANGER NO. 4  
Full size

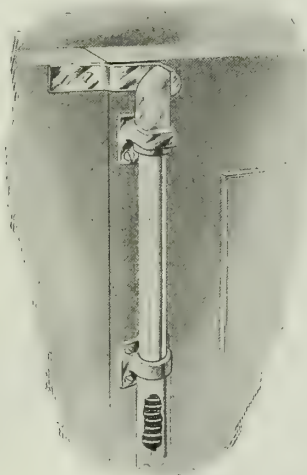


CROSS SECTION DOUBLE HANGER NO. 3  
Full size

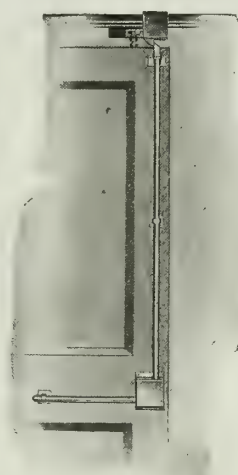
Note small sectional space required  
Hangers Nos. 1 and 2 show cross section single hanger, full size  
Hanger No. 3 shows cross section double hanger, full size  
Hanger No. 4 shows cross section 2-speed hanger, full size, with rack and pinion  
Hanger No. 5 is the same as No. 4, without rack and pinion

### "Diamond" Bar Locks.

These bar locks are of best workmanship and materials, and have proved their efficiency through service under various and exacting conditions. The same movement of the hand both unlocks and moves the doors.



"DIAMOND" BAR LOCK NO. 2  
Drop lock applied to doors opening in opposite directions



"DIAMOND" BAR LOCK NO. 4  
With cross bar to be used where vertical lock is out of reach of operator

### Literature.

Send for catalogue and list of installations.

# THE McCABE HANGER MFG. CO.

425-427 West 25th Street  
NEW YORK, N. Y.

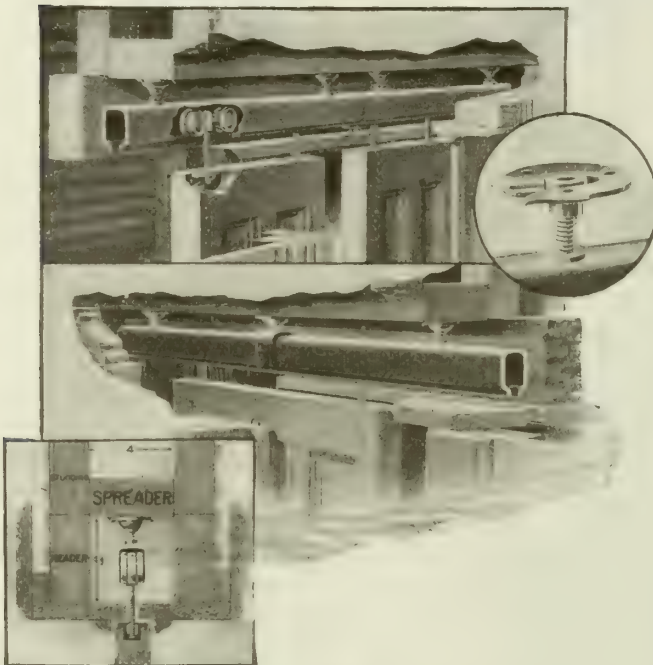
## Products.

All Types of SLIDING DOOR HANGERS, including PARLOR DOOR HANGERS, ACCORDION FOLDING DOOR and FOLDING PARTITION HANGERS, ELEVATOR DOOR and BARN DOOR HANGERS; COMBINATION FLOOR GUIDE and WEATHERSTRIPS.

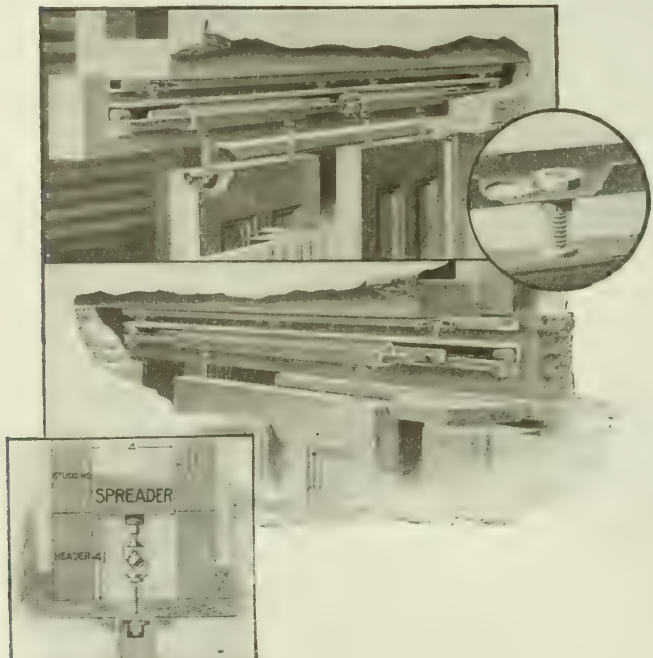
Vertical Bar Elevator Door Locks, Overhead Conveying Devices, Expansion Bolts, etc.

## Parlor Door Hangers.

"McCABE NO. 10"—This is a simple, durable and



"McCABE NO. 10" PARLOR DOOR HANGER



"McCABE NO. 5" BALL BEARING PARLOR DOOR HANGER

noiseless device. Track is made of No. 13-gage cold drawn steel, and carriages have drop forged frames and ball bearing fiber wheels. Track and carriages are adjustable, so that any inequalities of the spreader or the door may be remedied.

The illustration shows method of installing. Head-room required,  $4\frac{1}{2}$  ins.

"McCABE NO. 5"—The latest improvement in ball bearing hangers for interior sliding doors. Wheels are entirely eliminated, the doors sliding on  $\frac{3}{4}$ -in. polished steel balls. Friction and wear are therefore reduced to the minimum, and the operation of the doors is accompanied with least sound.

The channel header is punched in four places to receive the lifting nuts, which (by unfastening the one at the left) permit the track to be drawn out of the pocket, adjustment made, and the track then readily replaced. By turning the bolt which screws into the door, vertical adjustment, up or down, may be made.

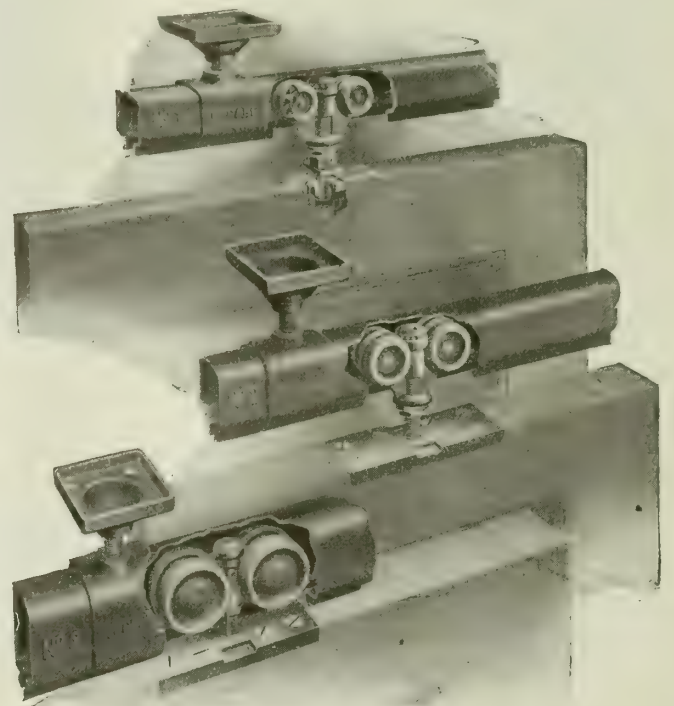
How to SPECIFY—All interior sliding doors shall be hung with "McCabe No. 5" [or No. 10] Parlor Door Hangers.

## Accordion or Folding Door Hangers for Accordion or Folding Partitions.

Track is made of No. 13-gage cold drawn steel, and swiveled carriages have drop forged frames and ball bearing wheels.

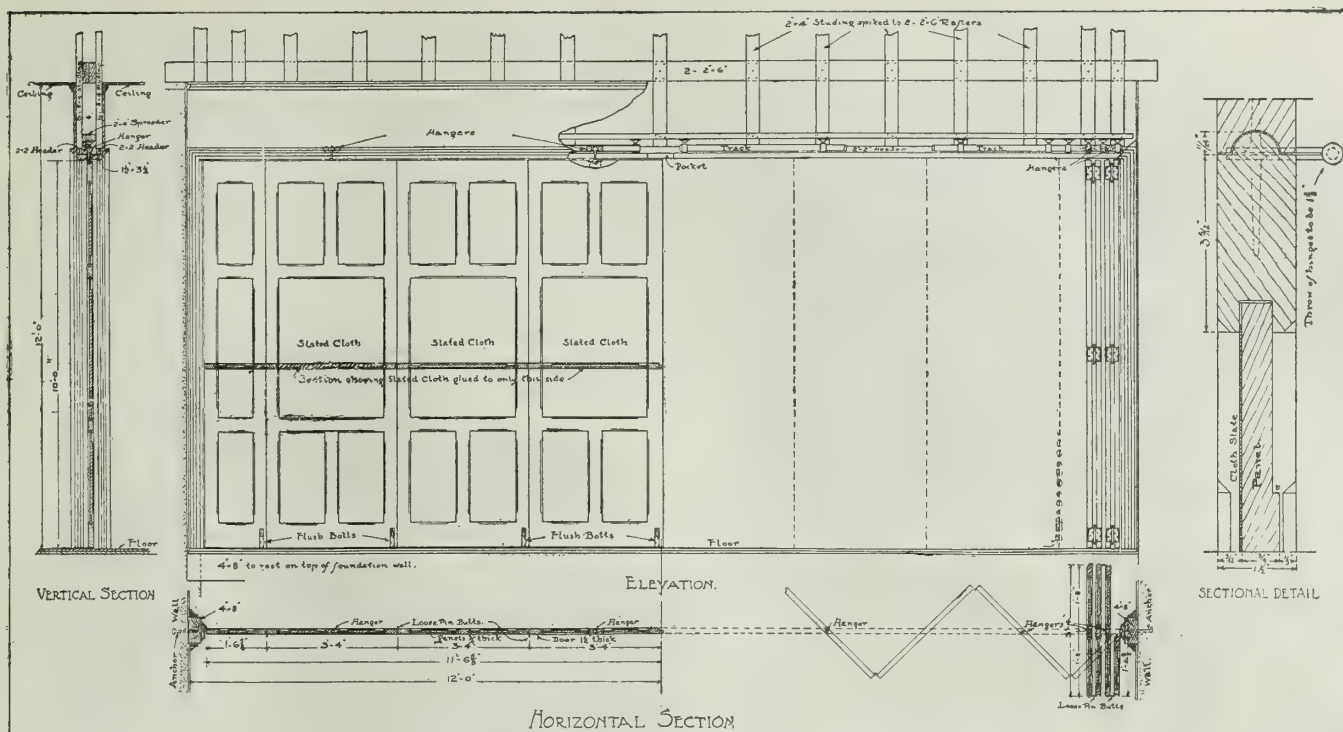
One carriage only is used on each alternate door, placed in the exact center of the door as shown.

If possible, doors should not exceed 3 ft. in width, or 100 lbs. in weight; as a carriage is used on each alternate door only, and when the doors are folded back, the entire weight is concentrated on a few inches of track.



ACCORDION OR FOLDING DOOR HANGER  
Ball bearing swiveled carriage





STANDARD DETAILS OF ACCORDION DOORS AS HUNG WITH MCCABE HANGERS

Any number of doors may be placed in an opening, commencing with a half door hinged to the jamb at either side, as per above illustration. This half door must be exactly one-half the width of the full doors, less the throw of the hinge.

**How to SPECIFY**—Folding doors and partitions shall be equipped with "McCabe" Accordion Door Hangers.

**Note**—For 1½-in. or 1¾-in. doors, specify Track No. 1 and Carriage No. 71;

For 1¾-in. doors, specify Track No. 2 and Carriage No. 72;

For 2-in. to 2½-in. doors, specify Track No. 3 and Carriage No. 73.

### Barn Door Hangers.

The "McCabe" No. 60 and No. 3 barn door hangers are the best hangers on the market for barns, garages, warehouses, piers, and like structures. Track is made of No. 12-gage cold drawn steel, and the carriages are equipped with ball bearing steel wheels, all parts thoroughly hardened to insure long wear. Apron No. 19 allows for both vertical and horizontal adjustment of the door.

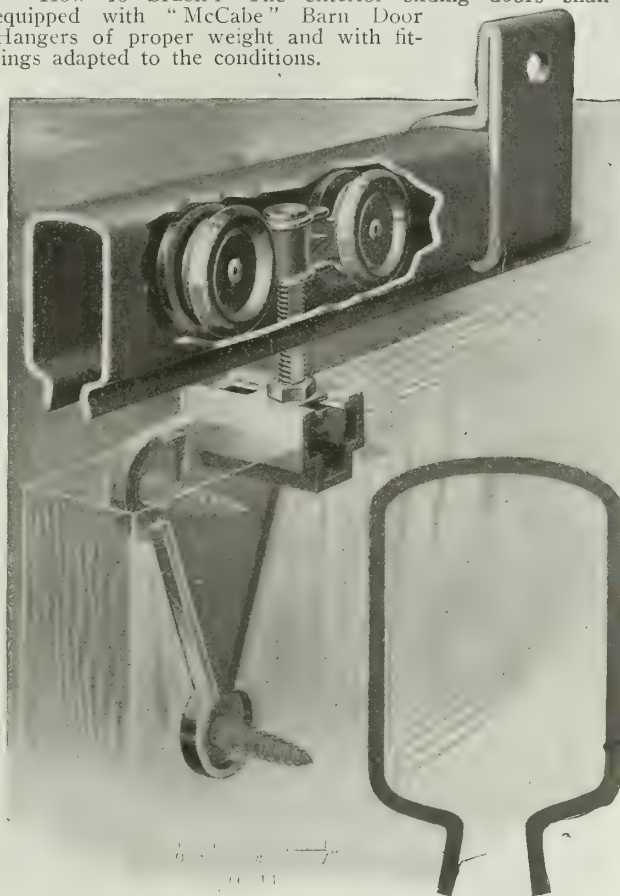
No. 3 track, with brackets spaced every 2 ft., will carry doors weighing from 500 to 700 lbs.; and No. 4 track, similarly supported, will carry doors weighing from 800 to 1000 lbs. For heavier doors, use more brackets and double-tree carriages.

The following table may be used to determine the weights of the doors for the purpose of selecting a hanger of the proper strength, and determining the structural member by which the track is supported. Use full thickness of door, regardless of paneling.

DOOR WEIGHTS

Material	Weight in pounds of each square foot of door for various thicknesses								
	1 in.	1 1/2 ins.	1 3/4 ins.	2 ins.	2 1/4 ins.	2 3/4 ins.	2 5/8 ins.	3 ins.	3 1/2 ins.
White pine .....	2.083	3.12	3.64	4.16	4.68	4.95	5.47	6.25	7.29
Oak and ash .....	4.000	6.00	7.00	8.00	9.00	9.50	10.50	12.00	14.00
Chestnut .....	3.417	5.13	6.03	6.83	7.69	8.12	8.97	10.25	11.96
Cypress .....	5.333	8.00	9.33	10.66	12.00	12.66	14.00	16.00	18.66
Whitewood .....	2.417	3.63	4.23	4.83	5.44	5.74	6.34	7.23	8.46

**How to SPECIFY**—The exterior sliding doors shall be equipped with "McCabe" Barn Door Hangers of proper weight and with fittings adapted to the conditions.



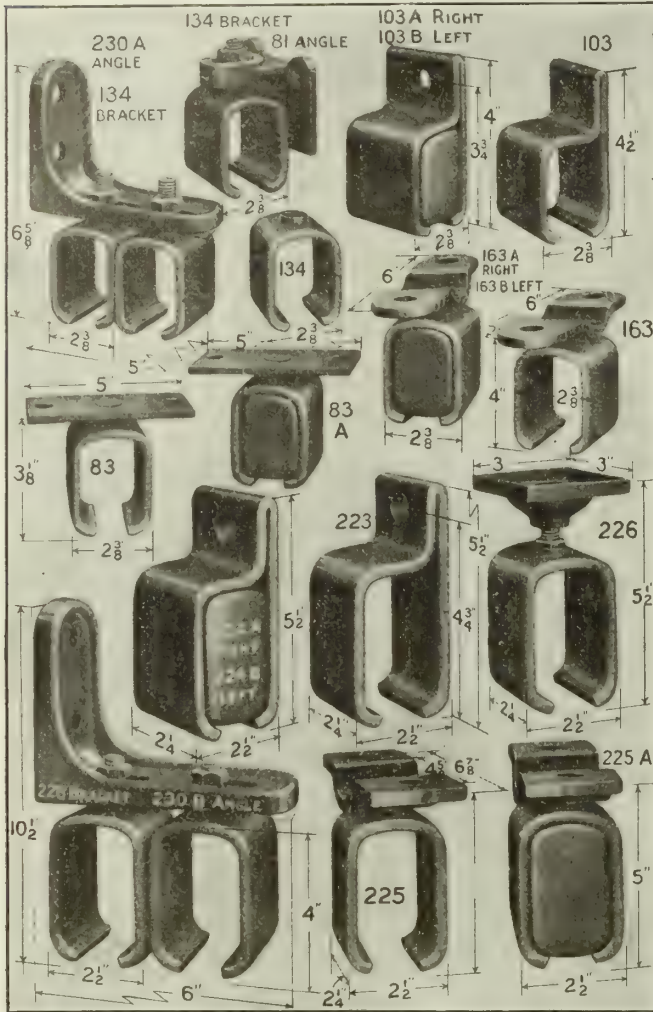
"McCABE" NO. 3 BARN DOOR HANGER

### Brackets.

The following illustration shows the various forms of brackets used for hanging track to the structural member of door opening. Dimensions are given, so that due allowance may be made on full size details. The 6



fittings in the lower half of illustration are for No. 4 track, the rest for No. 3 track.



BRACKETS FOR NOS. 3 AND 4 TRACK

### Floor Guide.

The accompanying illustration shows the "McCabe" floor guide and weatherstrip for use with exterior sliding doors when the floor is of concrete.

HOW TO SPECIFY—Fit the sliding doors with the "McCabe" Floor Guide and Weatherstrip.



FLOOR GUIDE AND WEATHERSTRIP

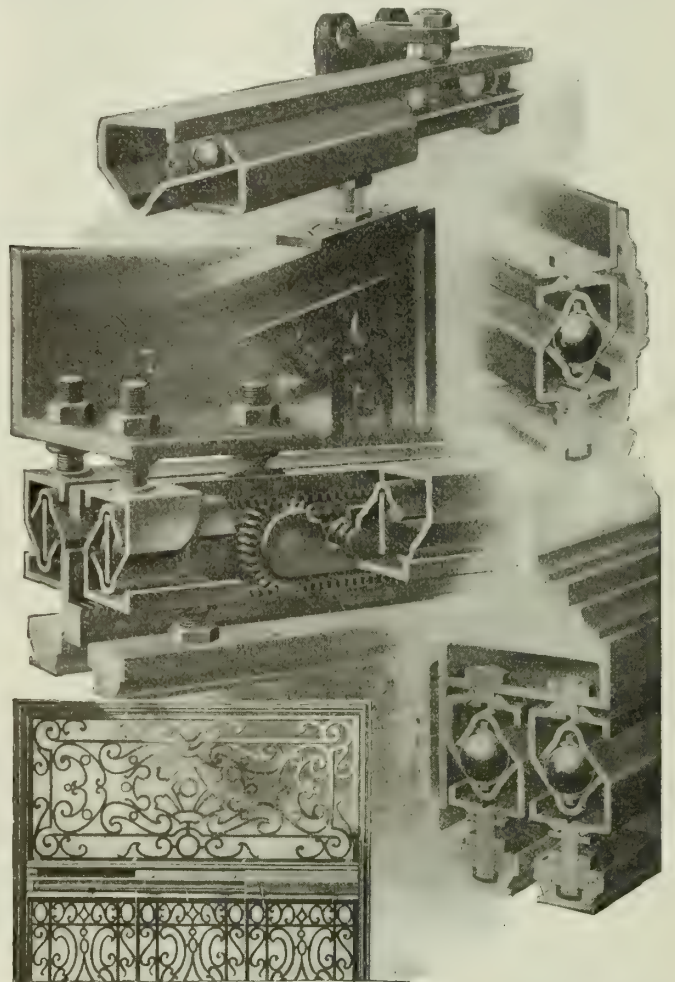
### "McCabe No. 5" Elevator Door Hanger.

Track is made of No. 10-gage cold rolled steel; a smooth rolling surface for the bearings, and of sufficient thickness and strength to insure long and efficient serv-

ice. The length of the track is equal to the full travel of the doors, and the weight is therefore always evenly distributed.

Bearings consist of  $\frac{3}{4}$ -in. hardened steel balls, spaced 3 ins. apart. These are the largest size balls used in elevator door hangers, and they are spaced close together, an ordinary 3-ft. door requiring 17 balls. Friction and noise are reduced to a minimum, and quiet, easy-running doors are the result. Doors may be adjusted laterally or vertically without difficulty.

HOW TO SPECIFY—Equip elevator doors with "McCabe No. 5" Elevator Door Hangers and "McCabe" Vertical Bar Locks.



"McCABE NO. 5" ELEVATOR DOOR HANGER FOR SINGLE- AND TWO-SPEED DOORS

### A FEW BUILDINGS EQUIPPED WITH "McCABE NO. 5" ELEVATOR DOOR HANGERS—

BUILDING AND LOCATION	ARCHITECT
Merchants' Nat. Bank, St. Paul, Minn.	Jarvis Hunt
Union Station, Dallas, Tex.	Jarvis Hunt
Chemistry Building, Illinois State University	Jas. B. Dibelka
Westminster Courthouse, New Westminster, B. C.	Gardiner & Mercer
Methodist Hospital, Los Angeles, Cal.	W. S. Garrett
Y. M. C. A., Atlanta, Ga.	Shattuck & Hussey
Y. M. C. A., Springfield, Mass.	
French Lick Springs Hotel, French Lick Springs, Ind.	D. A. Bohlen & Son
Union Central Building, Cincinnati, Ohio	Cass Gilbert and Garber & Woodward
Harris Emery Department Store, Des Moines, Iowa	Proudfoot, Bird & Rawson
Proctor's Theater, Newark, N. J.	Arland W. Johnson

### Catalogues, etc.

Complete catalogue and details of any McCabe product will be gladly furnished on application.



# NATIONAL MANUFACTURING COMPANY

Manufacturers of Builders' Hardware

STERLING, ILL.

## Products.

No. 66 RIGID STORMPROOF DOOR HANGER (Patented); No. 77 FLEXIBLE STORMPROOF DOOR HANGER (Patented); No. 88 ADJUSTABLE STORMPROOF DOOR HANGER; STORMPROOF RAIL (Patented); "BIG 4" FLEXIBLE DOOR HANGER (Patented); "BRACED" RAIL; No. 82 "SILENT" PARLOR DOOR HANGER; No. 240 BALL BEARING FLOOR HINGE; No. 27 GARAGE DOOR LATCH; No. 800, No. 801, No. 805 AND No. 806 GARAGE DOOR SETS; No. 810 GARAGE DOOR HOLDER and FOOT and CHAIN BOLT SETS, for swinging doors.

Barn Door Bumpers, Door Latches, Stay Rollers, Door Pulls, Screen and Storm Sash Hangers and Adjusters, Hasps of various kinds, Staples, Ball Tip, Light and Light Narrow Butts, Parliament Butts, Ornamental Butts and Hinges, Plain Hinges of various kinds, Washers, Corner Irons, Mending Plates, Angles, Braces, Cellar Window Sets, Foot Scrapers, Door Plates, Push Plates, Sash Locks, Iron Wire Hooks and Eyes, Cupboard Turns, Chimney Caps, Chimney Tops, Fuel Chutes.

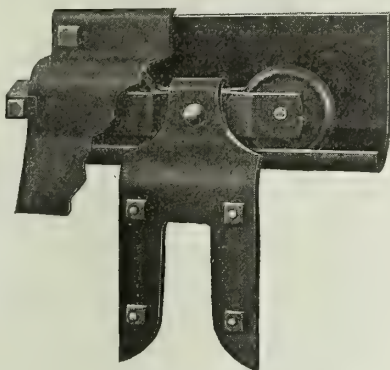
### No. 66 Rigid Stormproof Door Hanger (Patented).

This hanger is of very simple construction, is made of heavy gauge steel, and can carry a great weight.

It has two wheels, in tandem, with steel roller bearings that absolutely prevent friction. The wheel treads are of a width sufficient to insure easy rolling.

Great care is not required in attaching this hanger to a door, for the equalizing pin in the center of the wheel truck puts half the load on each wheel.

The bearings are free from japan. The wheel and the frame are japanned before they are assembled, and the wheel is reamed out *after* the japanning; therefore no japan is in the bearings.



NO. 66 RIGID STORMPROOF DOOR HANGER (Patented)

### No. 77 Flexible Stormproof Door Hanger (Patented).

The No. 77 incorporates all the excellent features of the No. 66 hanger and, in addition, has a flexible hinge joint. When the door hangs straight down there is no vibration in the hanger. When anything bumps against the door, however, the hinge joint allows the door to swing out. This flexible feature places the No. 77 hanger in a class with the well-known "Big 4" hanger, which is described on the next page.

Note the improved construction. The connecting strap and the drop strap are heavily embossed to make

the hanger exceedingly strong. This method of attaching the connecting strap to the truck allows free action of the equalizing pin, so that the truck is held firmly in an upright position. The steel used in the drop strap and the connecting strap is 3/16 in. thick.

There are oil holes for the bearings.

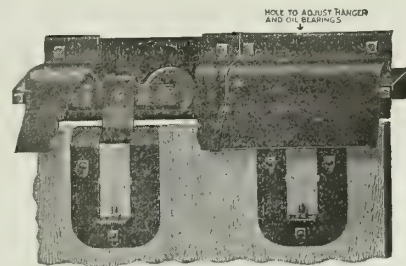


NO. 77 FLEXIBLE STORMPROOF DOOR HANGER (Patented)

### No. 88 Adjustable Stormproof Door Hanger.

This hanger is constructed as No. 77 is, except that it has two adjustment features, a vertical and a lateral one.

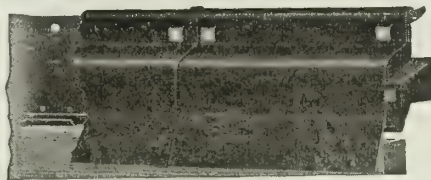
The adjustment construction is very simple, and is easily operated. It allows the door to be carried closer to the rail than it could be with any other adjustable hanger that is known.



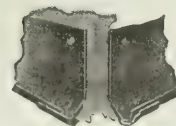
NO. 88 ADJUSTABLE STORMPROOF DOOR HANGER

### The Stormproof Rail.

The cover of this improved rail is long enough to give protection to the opening between the top of the door and the bottom of the rail. (See the sectional view of the hanger and the rail on the next page.) No cover splice is needed, for the ends of the cover sections dovetail together and make a strong, weather-proof construction.



THE STORMPROOF RAIL (Patented)



VIEW SHOWING CONSTRUCTION OF RAIL JOINTS

A new style end cap is provided, which closes securely the openings in the ends of the rail. It is unusually wide at the base to give additional bracing

strength, and is held in place by a lag screw  $3\frac{1}{2}$  ins. long and  $\frac{5}{16}$  in. thick.

This rail fits closely against the building. It is not only stormproof, but also birdproof.

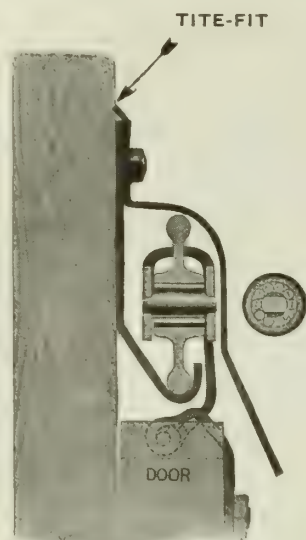
The rail joints are dovetail so that the rail is practically one piece.

No brackets are needed, for the rail itself forms a continuous bracket, is exceedingly strong, and will support all the weight that the hangers will carry.

The smallest holes shown in the illustration are for nails that will hold the rail in position until the lag screws can be inserted.

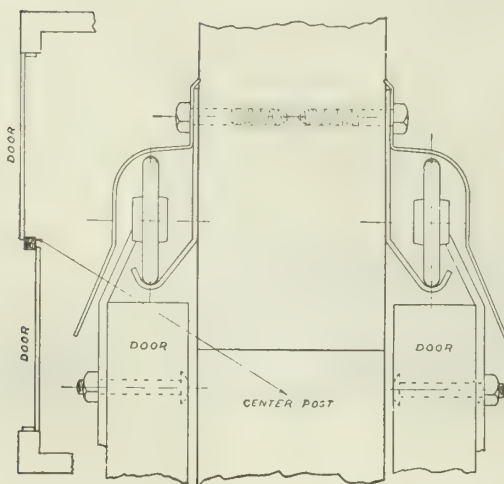
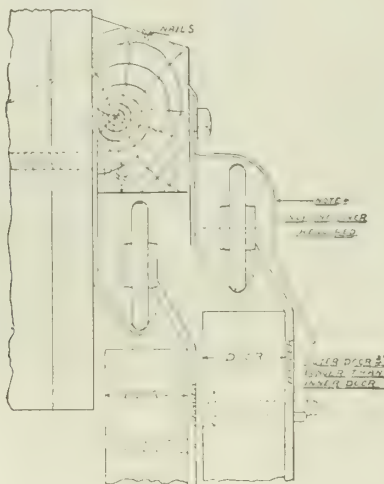
The holes for the lag screws are 2 ft. apart.

The rail is made in two pieces, track and cover. The carpenter has



SECTIONAL VIEW OF STORM-PROOF HANGER AND RAIL

Shows clearly the length of the improved cover, which fully protects the opening above the top of the door. Note the Tite-Fit, stormproof feature at the top, the perfect tread for the wheels and the roller bearings



METHODS OF HANGING DOORS TO PASS EACH OTHER

The above drawings illustrate two interesting and practical methods of using the No. 66 or the No. 77 stormproof hangers and rail. Either method may be used without need of special brackets or equipment. The method shown in the upper drawing reduces cost, for it requires only one cover.

Full size drawings illustrating these methods will be sent on request

only one-half of the weight to handle when he lines up the rail, for the cover is not put in place until everything is ready for the insertion of the lag screws.

The cover can be removed whenever the inside of the rail needs to be painted.

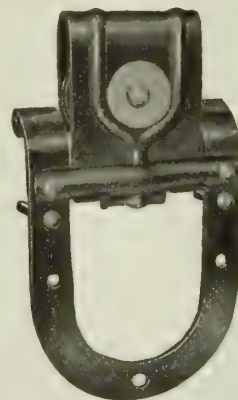
**SIZES AND WEIGHT**—The stormproof rail is made in lengths of 4, 6, 8 and 10 ft.

The weight per 100 ft. is 300 lbs.

The lag screws to secure the rail are  $2\frac{1}{2}$  ins. long and  $\frac{3}{8}$  in. thick. Those to fasten the end caps in the rail are  $3\frac{1}{2}$  ins. long and  $\frac{5}{16}$  in. thick.

### The "Big 4" Flexible Door Hanger (Patented).

This hanger is built on extremely heavy lines and in the simplest form of construction. Its hood is embossed to insure great strength. There are no complicated parts to get out of order. Like the stormproof door hangers described on the preceding page, the "Big 4" is made entirely of steel, and has roller bearings that absolutely prevent friction and give a free motion to the door.



Front View  
"BIG 4" FLEXIBLE DOOR HANGER



Side View

The "Big 4" is both flexible and rigid. When the door hangs straight down in its normal position, the hanger is perfectly rigid and has no vibration; but when anything bumps against the door, a flexible device (shown below) allows the door to swing out and rise higher than it could with any other hanger.

The door is also closer to the track than it could be with any other hanger.

The axle has on its end a shoulder that keeps the wheel housing from being pressed together and binding on the hub of the wheel. The axles and the rivets are sherardized to prevent rust.

The methods employed in japing and reaming are those used in making the No. 66 stormproof door hanger.

There are three bolt holes in each hanger.

The two studs, together with the hook turned under the rail, prevent the hanger from jumping the track.

They also serve as guides when the hanger is being attached to the door.



SECTIONAL VIEW OF AXLE AND BEARINGS



FLEXIBLE FEATURE OF "BIG 4" HANGER



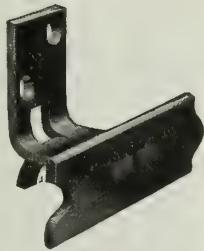
**The "Braced" Rail.**

This rail is used with "Big 4" hangers. Its brackets are as thick and as wide as the rail itself. It is braced below so that the screws will hold more than three times as much as they would if it were not braced.

The holes are staggered so that the screws will not go into the same grain of wood.

The brackets are only 12 ins. apart and double riveted. They make the rail very rigid.

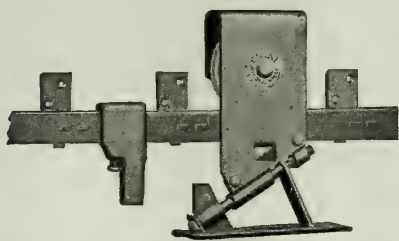
Any flat-rail barn door hanger will run on this rail.



THE "BRACED" RAIL

**No. 82 "Silent" Parlor Door Hanger.**

This is silent not only in name but also in fact.



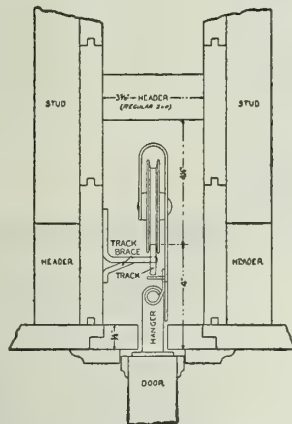
NO. 82 "SILENT" PARLOR DOOR HANGER

Its construction is extremely simple. There are no complicated parts to get out of order.

By means of a flexible hinge joint the hanger adjusts itself to the top of a door, whether that is square or not; therefore the door is very easily hung.

All the weight of the door is carried by the adjusting screw, which is very heavy and long and will not work loose and let the door drop. A sort of lock nut at the end of the adjusting screw also keeps the door from dropping.

The wheel has a tread of vulcanized fiber, and is supplied with steel roller bearings.



CONSTRUCTION OF POCKET FOR "SILENT" PARLOR DOOR HANGER

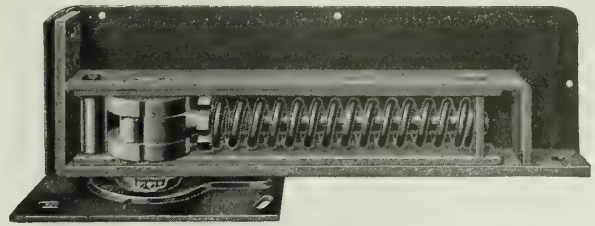
**No. 240 Ball Bearing Floor Hinge.**

The construction of this new floor hinge is radically different from that of others. The spring closing features and the part that bears the weight of the door are independent of each other, although they are necessarily together in the hinge.

The spring pressure, and not the weight of the door, causes the wear in all spring hinges. In No. 240 hinge, the pressure of the spring is not against the hinge bearing, which carries the door; but it is against a 1-in. case hardened roller. This prevents wear on the hinge bearing; and consequently, whenever the door is at rest, the No. 240 hinge will keep it firmly in the center of the opening.

The door, when swung to either side, is held open 95°.

Actual test has proved that in the typical floor hinge commonly used the maximum pressure of the spring against the bearing carrying the weight of the door is 300 lbs. The pressure on this bearing in the



NO. 240 BALL BEARING FLOOR HINGE

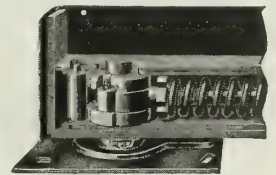
No. 240 hinge is 10 lbs., and therefore the saving in wear in favor of this hinge is in the ratio of 30 lbs. to 1.

The spring in No. 240 hinge is oil tempered, and its pressure can be adjusted.

The ball bearings are of the best quality.

To attach the pivot to the top of the door it is necessary only to bore five 7/8-in. holes. No chiseling is necessary.

The construction of the pivot plate for the head jamb is unique. To place the bearing portion in the right position it is necessary simply to place the end of the plate against the head jamb and insert three screws. No mortising or measuring is required.



SECTIONAL VIEW OF NO. 240 HINGE

Note construction of bearings and, at left, case hardened roller which receives the spring pressure

**FINISH**—This hinge is furnished in any finish desired.

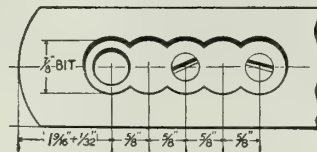
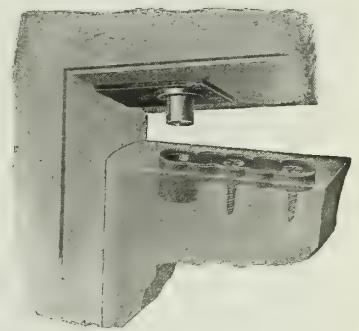


DIAGRAM SHOWING HOW PIVOT AND PIVOT PLATE FOR TOP OF DOOR ARE ATTACHED



VIEW SHOWING HOW PIVOT AND PIVOT PLATE FOR TOP OF DOOR ARE ATTACHED

**No. 27 Garage Door Latch for Swinging Doors.**

This latch will improve the appearance of any garage door. Its handles, which have long, graceful lines, make it look like a door lock of the higher grade. There is a handle on each side of the door.

There are no complicated parts to get out of order. The mechanism is simplicity itself, and works easily and effectively.

The latch is reversible so that it may be used on either a right or a left hand door.

The regular finishes of No. 27 garage door latch are japan, dead black japan, sherardized and dead black japan, sherardized and plated any finish.



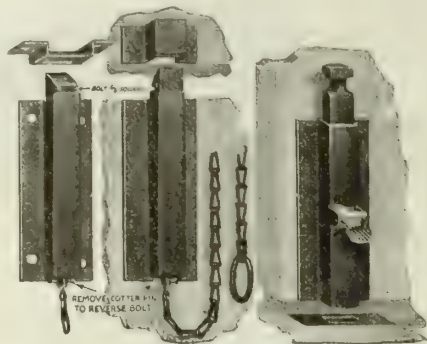
NO. 27 GARAGE DOOR LATCH

**Foot and Chain Bolt Set.**

The set consists of No. 830 foot bolt for the lower part of a garage door and No. 820 chain bolt for the top of it.

No. 830 FOOT BOLT—This bolt is unlocked and raised by a lever that has positive action. To keep the bolt up there is a friction spring of oil tempered steel.

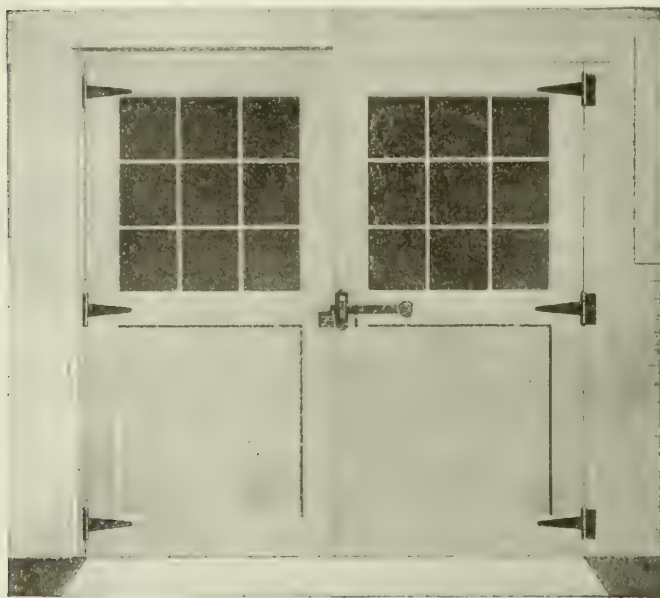
No. 820 CHAIN BOLT—Has a steel spring that keeps it up so that it locks the door. The bolt is unlocked by a pull on a high grade safety chain. The plate has a rounded top and forms a roller shaped bearing on which the bolt works easily. The removal of the cotter pin makes it possible to reverse the bolt.



FOOT AND CHAIN BOLT SET  
No. 830 Foot Bolt and No. 820 Chain Bolt

**No. 800 Garage Door Set for Swinging Doors.**

Swinging doors have many advantages for garage use. They are easily opened and shut, and fit so closely in their casing that they are weatherproof. Moreover, they cost much less than doors that have hanger and rail equipment.



OUTSIDE VIEW OF NO. 800 GARAGE DOOR SET

At left, hinge is shown with T-part reversed and mortised in jamb; at right, hinge is shown as a full surface hinge

No. 800 set has a loose pin reversible T-hinge, which can be used as a full surface hinge, or can have its T-part reversed and mortised in a jamb when it is used on a brick building. After the hinge has been put in place, the end of the pin can be riveted slightly to prevent its removal.

This set consists of 3 pairs of 8-in. reversible T-hinges, 1 No. 820 chain bolt, 1 No. 830 foot bolt, 1 No. 5 door pull, 1 No. 29 all steel latch. Also furnished with 10-in. reversible T-hinge when so specified.

Another set, No. 801, is the same as No. 800, except that it has No. 27 latch instead of No. 29.

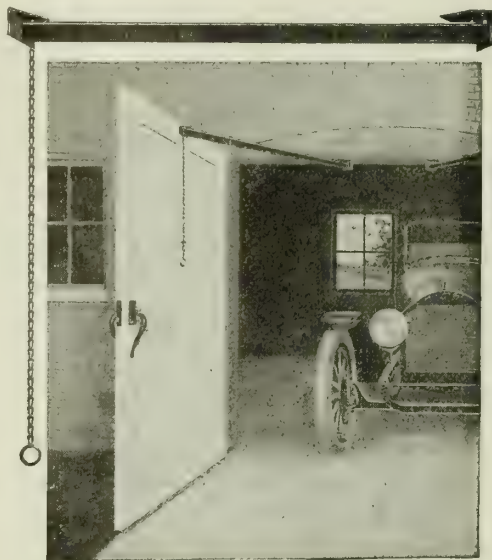
The regular stock finishes for these sets are japan, dead black japan, sherardized, sherardized and dead black japan.



INSIDE VIEW OF NO. 800 GARAGE DOOR SET

**No. 810 Garage Door Holder for Swinging Doors.**

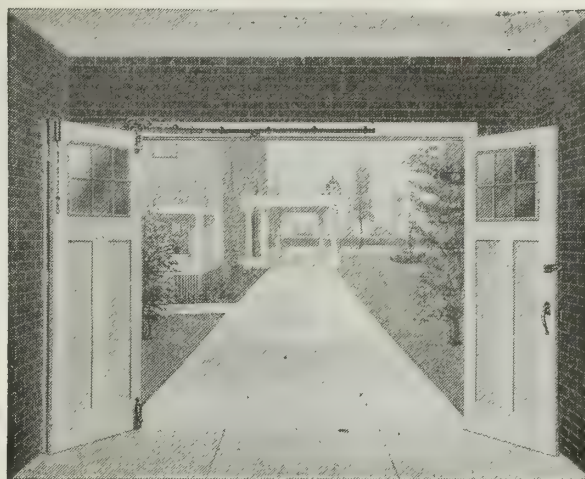
This device holds the doors securely open and keeps them from damaging a car when it either enters or leaves the garage. It has a rigid U-shaped steel arm 32 ins. long which, when the door is opened, slides through an embossed steel catch plate until two notches at its inner end catch in the plate and hold the door open. To close the door it is necessary only to pull lightly on a safety chain that lifts the arm so that the notches can no longer hold it. Then the arm slides back through the plate. A swivel joint allows the arm to fold back along the head jamb when the door is closed.



NO. 810 GARAGE DOOR HOLDER

No. 810 garage door holder is made throughout of heavy gauge steel, and is strong enough for any door. Its regular stock finishes are japan, dead black japan, sherardized, sherardized and dead black japan.





OUTSIDE VIEW OF NO. 805 AND NO. 806 GARAGE DOOR SETS

Exterior appearance enhanced by absence of any structural iron work. Note how one door opens without disturbing the others.

INSIDE VIEW OF NO. 805 AND NO. 806 GARAGE DOOR SETS

As doors open inward, no snow or ice interferes. Doors swing into jamb against stop.

## No. 805 and No. 806 Garage Door Sets for Sliding and Swinging Doors.

The easiest working garage door set—a simple push opens, and a slight pull closes the doors—no binding or friction. Cheapest combination to efficiently equip garage doors.

Minimum space required in opening, as doors are hung on inside and fold and slide against inner wall.

Door stops in jamb same as high class house construction. Doors absolutely weathertight.

Hangers adjustable in case of swelling or raising of cement floor.

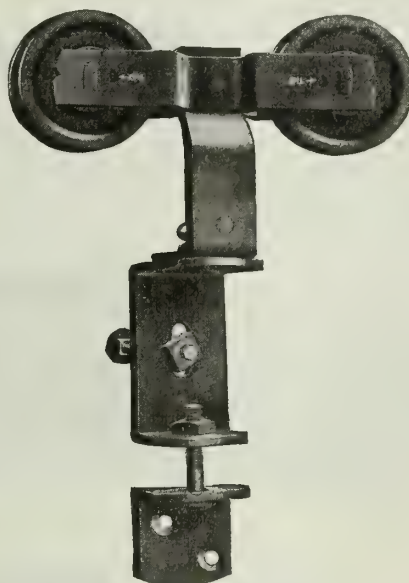
Free access to garage, one door being hung so that it will open without disturbing the other two doors.

Furnished regularly with 6-ft. braced rail for 8-ft. opening. When used on larger doors, width of opening should be given when ordering.

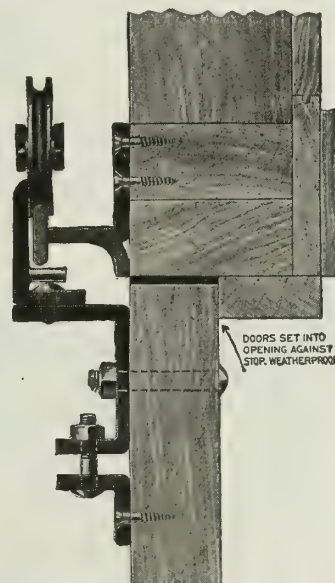
Set No. 805 includes: No. 29 latch; 1 swivel hanger; 6-ft. braced rail; 4½ pair 4 by 4-in. Jap. No. 505 T. P. butts; 1 No. 820 chain bolt; 1 No. 830 foot bolt; 1 No. 5 pull; 1 4½-in. No. 30 safety hasp. All necessary bolts and screws.

No. 806 set includes the same, except that No. 27 latch is used instead of No. 29.

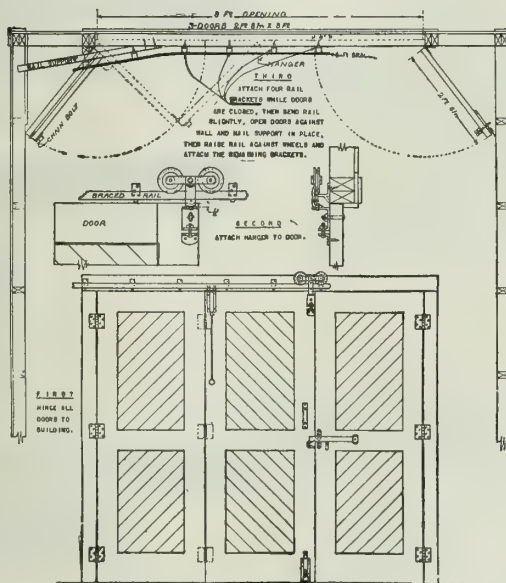
Both sets furnished in japan finish.



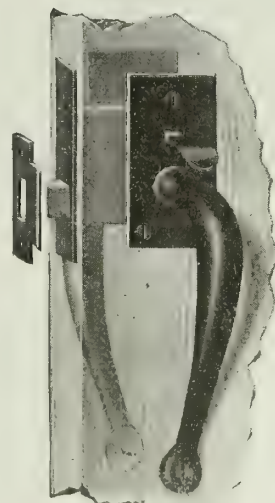
SWIVEL HANGER  
Turns on track without sticking or binding



SECTIONAL VIEW OF SWIVEL  
HANGER



### DETAILS SHOWING OPERATION



NO. 27 LATCH  
No complicated parts to get  
out of order

# RELIANCE-GRANT ELEVATOR EQUIPMENT CORP.

## Door Hangers and Bar Locks

TELEPHONE:  
VANDERBILT 799

101 Park Avenue  
NEW YORK, N. Y.

AGENCIES IN ALL LARGE CITIES

### Products.

BALL BEARING DOOR HANGERS.  
ELEVATOR DOOR CONTROLLERS.  
ELEVATOR DOOR LOCKS.  
GARAGE DOOR HANGERS.  
DRAWER SLIDES.

For Sash Pulleys, see pages 760-61; for Revolving Window Fixtures, see page 739; for Wood Rolling Partitions, see page 770.

### Construction of Reliance Hangers.

Reliance hangers are made from special analysis steel which is high carbon (very hard, strong and tough), compounded and rolled to our specifications.

The grooves are milled—not rolled—and set to the proper gage by hand, so that the balls run perfectly free, with no binding at any point. The balls are retained in their respective places by spacers best adapted to the purpose. The hangers are made to suit the weight of the doors and have a very large factor of safety.

The method of installation has been arranged so that the cost of erection at the job has been reduced to a minimum, a few screws being all that is necessary. Templates can be furnished so that the drilling and tapping may be done at the shop instead of in the field.

Modern equipment and highest grade material, together with best workmanship by skilled mechanics, guarantee that orders will be filled promptly.

### Description of Reliance Hangers.

Single hanger "G," designed for light grille doors, for bank work, etc., made on the same principle as regular steel hanger, but of drawn metal instead of solid steel tracks.

Width of back plate  $2\frac{1}{2}$  ins. From back of back plate to center of bolt for top of door  $\frac{5}{8}$  in. Distance from top of door to bottom of back plate  $1\frac{1}{2}$  ins.

The company also makes a drawn metal hanger of heavy material.

Single hanger "B," and device to swing both door and panel into hall in order to get full width of the car when it is not practicable to swing the transom bar overhead. Swing transom bar in all cases if possible.

Width of back plate 3 to  $3\frac{3}{4}$  ins. From back of back plate to center of bolt  $\frac{3}{4}$  in.

This swing device can be applied to any of our various styles of hangers and requires  $\frac{5}{8}$  in. extra room between top of door and bottom of hanger.

Single hanger "C" for medium weight doors. Width of back plate 3 ins. From back of back plate to center of bolt for top of door  $\frac{3}{4}$  to  $1\frac{1}{8}$  ins. From top of door to bottom of back plate  $1\frac{3}{8}$  ins.

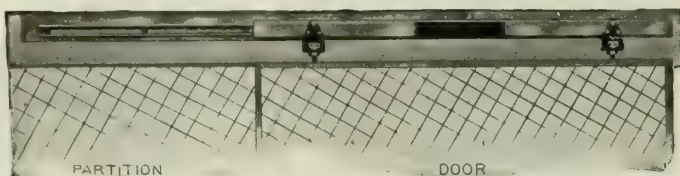
Single hanger "D" is made the same as style "B," except for the connections for tops of doors. Width of back plate  $3\frac{3}{4}$  to  $4\frac{1}{2}$  ins.

The proper straps or bolts necessary will be furnished, according to the thickness and weight of doors.

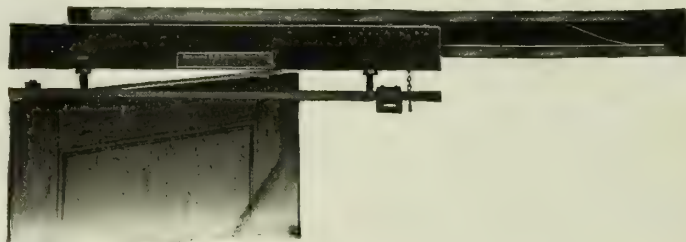
Double hanger "H" has double gear opening device for moving two doors in opposite directions at the same time. Allow 1 in. headroom above back plate for this device.

Always made with gear on right unless ordered other hand. Width of back plate 4 to  $5\frac{1}{2}$  ins.

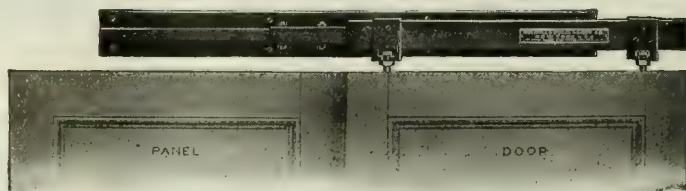
This can be furnished without racks and gears, if desired, for parlor doors.



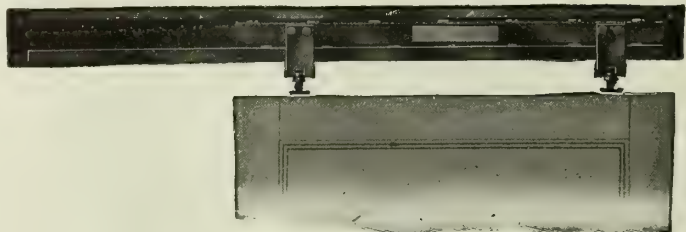
SINGLE HANGER "G," DOOR CLOSED



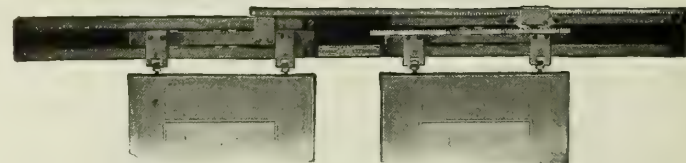
SINGLE HANGER "B," WITH SWING DEVICE



SINGLE HANGER "C," DOOR CLOSED



SINGLE HANGER "D," DOOR PARTLY OPEN



DOUBLE HANGER "H," DOORS PARTLY OPEN



Two-speed hanger "K" for moving doors in same direction, one traveling at double speed of other. Requires 1 in. headroom above back plate. Width of back plate 4 to 5½ ins. About ¾ in. required between top of door and bottom of lower track where hanger bolts are used; about 2 ins. where hanger straps are used. Where doors are thin, use style "K," Fig. 58.

Three-speed hangers and hangers for folding gates are also made.

### End Sections of Reliance Hangers (See Illustrations.)

Fig. 51—Single hanger, showing hanger bolts

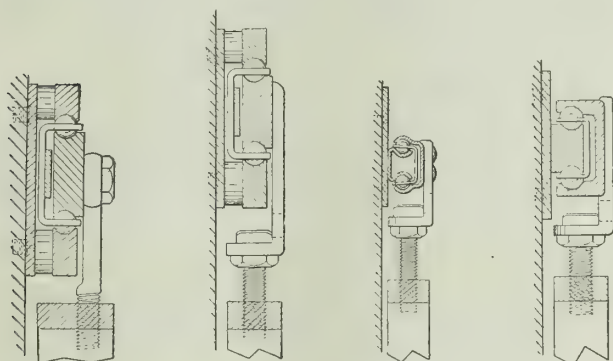


FIG. 51

FIG. 53

FIG. 54

FIG. 56

END SECTIONS OF RELIANCE HANGERS (ONE-FOURTH ACTUAL SIZE)

for connecting to top of door where door is over 1¾ ins. thick.

Fig. 53—Single hanger "B." Has angle iron riveted entire length of center track, with flange turned in. Suitable for doors ¾ to 1¼ ins. thick.

Fig. 54—Single hanger "G."

Fig. 56—Single hanger "C." Suitable for door 1 to 2 ins. thick.

Fig. 57—Double hanger "H." Device for moving in opposite directions two doors at same time.

Fig. 58—Two-speed hanger "K." Suitable for doors ⅞ or 1 in. thick, and requires 6¼ ins. from top of door to top of opening device.

Fig. 59—Two-speed hanger "K-B" with hanger bolts for connecting to top of doors when doors are 1½ ins. thick or more. This hanger made with straps, as shown in Fig. 58, where doors are between 1¼ and 1½ ins. in thickness.

### Construction of Grant Hangers.

Grant hangers are made with stationary tracks of drawn steel.

The moving track is of hot rolled steel. The grooves in the latter are milled.

**SINGLE GRANT HANGER**—This hanger is suitable for doors up to 2 ins. in thickness and 200 lbs. in weight.

Occupies 5 ins. headroom above door.

**TWO-SPEED GRANT HANGER**—This hanger is suitable for doors up to 2 ins. in thickness and 150 lbs. in weight.

Occupies 5¾ ins. above top of door.

**CENTER CLOSING GRANT HANGER**—This hanger is suitable for doors up to 2 ins. in thickness and 200 lbs. in weight.

Occupies 5¾ ins. above top of door.



TWO-SPEED RELIANCE HANGER "K-B," DOORS CLOSED

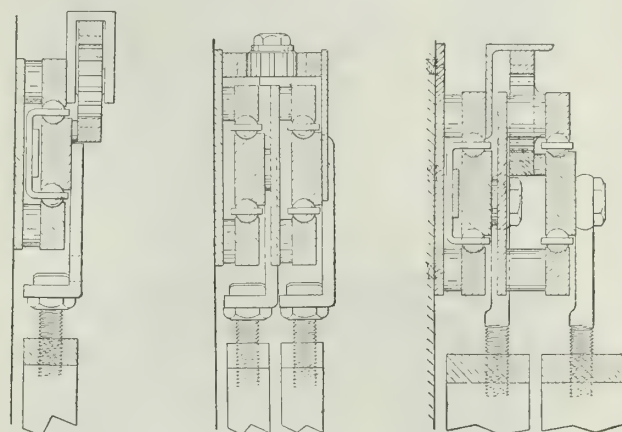
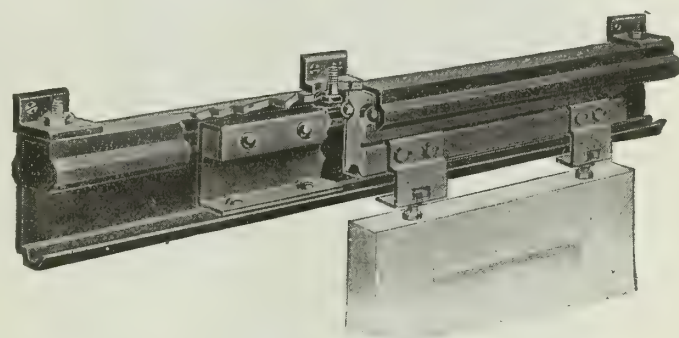


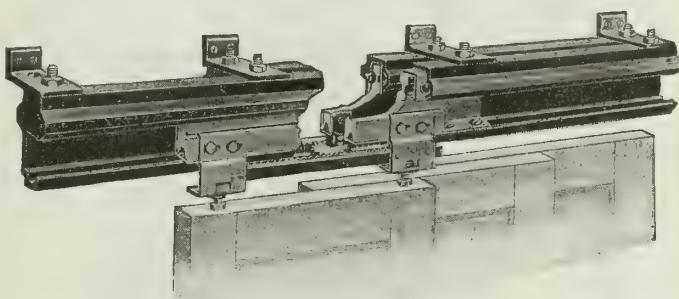
FIG. 57

FIG. 58

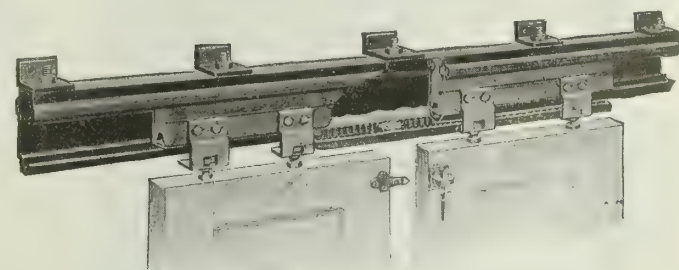
FIG. 59



SINGLE GRANT HANGER



TWO-SPEED GRANT HANGER



CENTER CLOSING GRANT HANGER

### End Sections of Grant Hangers.

- Fig. 60—Single Grant Hanger.  
Fig. 61—Two-speed Grant Hanger.  
Fig. 62—Center closing Grant Hanger.

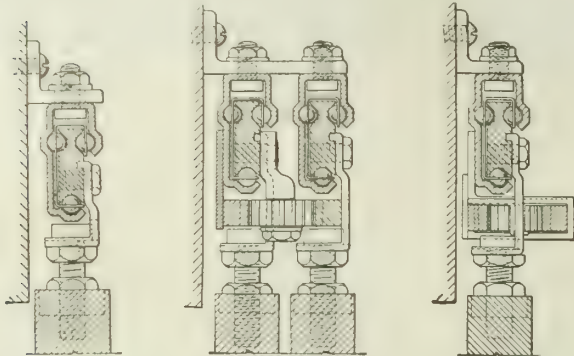
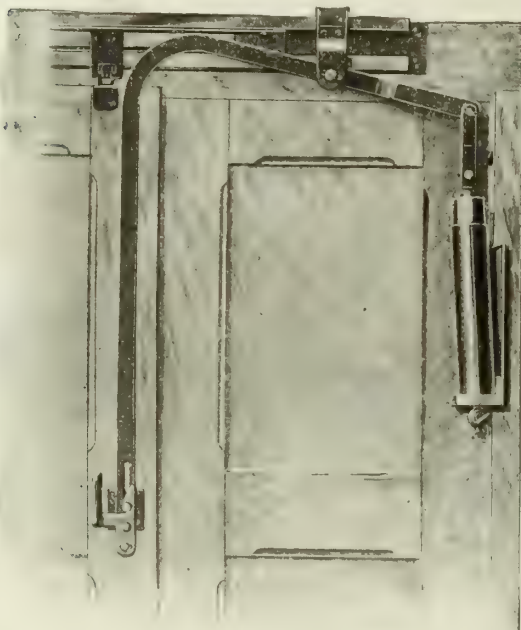
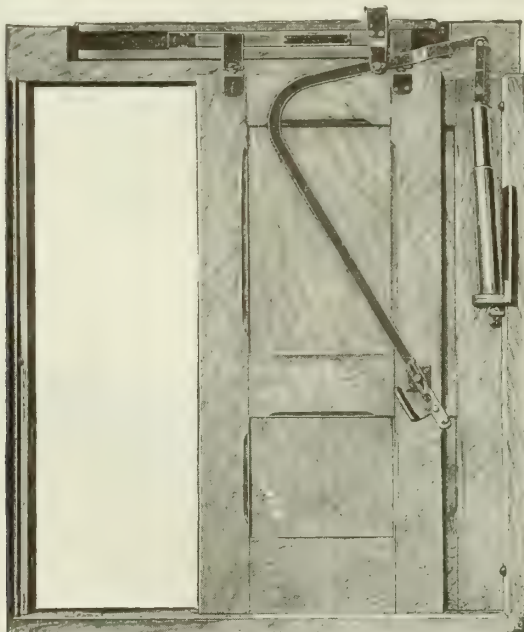


FIG. 60 FIG. 61 FIG. 62  
END SECTIONS OF GRANT HANGERS (ONE-FOURTH  
ACTUAL SIZE)



SHOWING GRAVITY CONTROLLER FOR SINGLE DOOR, CLOSED



SHOWING GRAVITY CONTROLLER FOR SINGLE DOOR, OPEN

### Reliance Gravity Door Controller.

The operation of these door controllers is plainly evident from the illustrations.

The weight of the plunger closes the door and the handle locks it in this position. A straight pull opens the door.

Regulation is provided to relieve the air tension under the plunger and change the speed of closing.

A special layout will be prepared to suit conditions.

The projection from the face of the door is  $1\frac{3}{4}$  ins. for the handle.

The plunger occupies about 3 ins., but can ordinarily be located in the corner of the elevator shaft out of the way of the car.

### Garage Door Hangers.

The Reliance ball-bearing garage door hanger style "W" is intended for 3 doors, to utilize the entire width of the garage for 2 cars. Illustration clearly shows the method.

For doors  $1\frac{1}{2}$  to 2 ins. thick and each weighing 150 to 200 lbs.

Practically no more effort is used in sliding the 3 doors than is needed to move a small single door.

The center door is made about 1 in. higher than the side doors, and about  $1\frac{1}{2}$  ins. wider.

The extra height is to allow the sliding door to lap up past the head jamb, and the extra width to allow the side doors to clear the hinges and fold close against the center door.

The floor is made about 1 in. higher to act as a guide and stop for the doors.

Weatherstrips may be used on the 2 swing doors which shut tight against jamb stops at either side.

Special drawings will be prepared on request.

Send for special literature on the subject.



Doors Closed



Doors Opened

GARAGE DOORS EQUIPPED WITH GARAGE HANGER "W"



### Reliance Lock No. 97.

This is a vertical bar lock which does not require a spring of any kind. A slight pressure on the handle releases the catch, and upon closing the door the weight of the vertical rod causes the lock to engage.

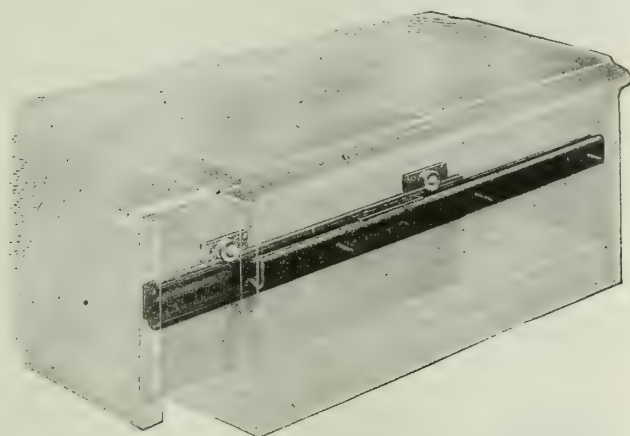
### Reliance Bar Lock.

Bar lock "A" is made of steel tubing and has a knurled handle with a spring concealed therein. This lock is made of the proper length to bring the centre of the handle 3 ft. 6 ins. from the floor. Unless otherwise noted, the height of the door will be figured as 7 ft. Can be furnished with brackets to bring the centre of the lock  $\frac{3}{4}$  in. or 1 in. from the face of the door, and will require either  $1\frac{3}{8}$  ins. or  $1\frac{5}{8}$  ins. from the door.

This lock will be finished black oxydized unless ordered in statuary bronze.

### Reliance Ball Bearing Drawer Slide.

This slide is for use with built-in drawers, for banks, libraries, hospitals, etc., as well as private residences, for linen and other drawers. The sides of the drawer should be set in  $\frac{11}{16}$  in., as clearly shown in cut. The small rollers furnished allow the drawer to be extended to its full depth. The only measurement required when ordering is the depth of drawer from the back of the front panel.



RELIAENCE BALL BEARING DRAWER SLIDE

### Specifications.

Specify Reliance or Grant hangers, with name of opening device, if double doors.

### Ordering.

In ordering, state actual width of door (not the opening), thickness and approximate weight, whether of wood, iron or kalamein, as we furnish knees or plates for connecting to wood or kalamein doors.

If double speed hangers are desired, state which way doors close, looking from inside of elevator car.

### Estimates, etc.

We shall be pleased to furnish estimates to cover unusual conditions. Special information given on request.

### References.

List of installations will be furnished on request.

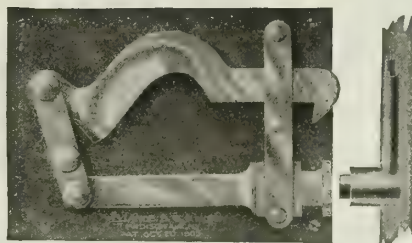


LOCK NO. 97



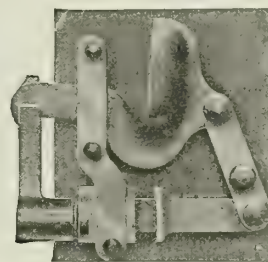
BAR LOCK

Shows lock with knurled handle mounted on board to show connections



GRAVITY LOCK NO. 1

Door open. Shows right-hand lock. Back plate,  $6\frac{1}{2}$  by  $4\frac{1}{2}$  ins. Thickness of lock,  $\frac{7}{8}$  in.



GRAVITY LOCK NO. 2

Door closed. Shows left-hand lock. Back plate,  $4\frac{1}{2}$  by  $5\frac{1}{2}$  ins. Thickness of lock,  $\frac{7}{8}$  in.



GRAVITY LOCK NO. 3

Unlatched. Has extension rod across door. Back plate  $4\frac{1}{2}$  by  $5\frac{1}{2}$  ins. Thickness of lock, 1 in.

# RICHARDS-WILCOX MANUFACTURING CO.

INCORPORATED

Manufacturers of Door Hangers and Hardware Specialties

CABLE ADDRESS:  
"TROLLEY, AURORA"

AURORA, ILL.

CANADIAN FACTORY  
LONDON, ONTARIO

## BRANCH OFFICES

NEW YORK, N. Y., 85 Walker Street  
BOSTON, MASS., 132 Pearl Street  
LOS ANGELES, CAL., 503 Equitable Building  
ST. LOUIS, MO., 1735 Boatmen's Bank BuildingPHILADELPHIA, PA., 507 Arch Street  
CHICAGO, ILL., 15 East Lake Street  
SAN FRANCISCO, CAL., 324 Underwood Building  
MINNEAPOLIS, MINN., 321 Plymouth Building

## Products.

DOOR HANGERS and TRACK for Sliding Doors of all kinds and weights: GARAGE DOOR OUTFITS; ELECTRIC DOOR OPENER and CLOSER, for garages, warehouses, packing houses, etc.; ELEVATOR DOOR HANGERS; ELEVATOR DOOR CLOSER and CHECK; SLIDING PARTITION DOOR HARDWARE; HOUSE, BARN, GABLE, WAREHOUSE and FREIGHTHOUSE DOOR HANGERS; FIRE DOOR HARDWARE; WAREHOUSE DOORS; DOOR CLOSERS and CHECKS.

Angle Iron Door Frames; Overhead Carrying Systems, including Trolley and I-beam Monorail; Light Cranes; Store Shelves and Ladders; Hardware Specialties.

## No. 435 and No. 1035 Slidetite Garage Door Outfits.

The floor plans herewith show a few possibilities of this outfit, a fixture that will allow hinge doors to fold and slide inside of building, thus using the minimum space. Recommended for doors not over 3 ft. wide. Can be arranged for 3-, 4-, 5- or 6-door openings.

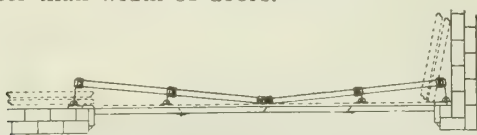
These doors occupy less room when open than single doors and permit use of part or all of opening at any time. Will not sag and are weatherproof. Allow use of doors that correspond with architecture of residence. Doors are stopped in same manner as a house door; narrow width of doors precludes warping.

The 3-door arrangement is excellent for openings up to 9 ft. wide. Provides an entrance door, which can be hinged to jamb, as shown, or to middle door, when it folds back to the side with the other two doors.



FLOOR PLAN, 3-DOOR ARRANGEMENT

The 4-door outfit is the one most generally used. Doors are hinged together in pairs and slide and fold right and left. Doors will stand at any angle with the wall, depending upon wall space adjoining opening; they fold back parallel with front wall where wall space is greater than width of doors.

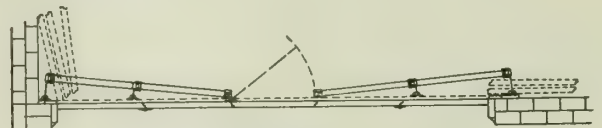


FLOOR PLAN, 4-DOOR ARRANGEMENT

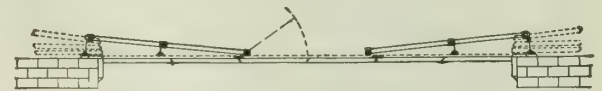
No. 1035 Slidetite duplicates No. 435 but is adapted particularly to heavy doors such as are equipped with the R-W Stewart electric door opener and closer, and are ordinarily installed in public garages.



NO. 435 SLIDETITE GARAGE DOOR OUTFITS



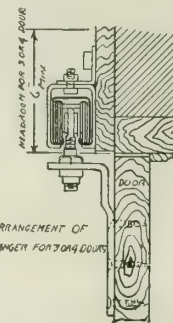
FLOOR PLAN, 5-DOOR ARRANGEMENT



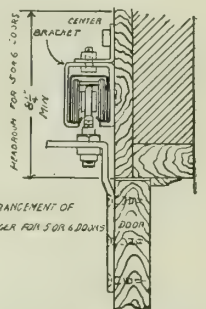
FLOOR PLAN, 6-DOOR ARRANGEMENT



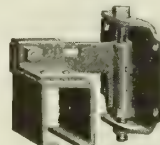
NO. 435 HANGER



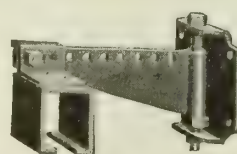
ARRANGEMENT OF HANGER FOR 3 OR 4 DOORS



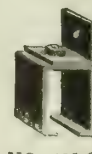
ARRANGEMENT OF HANGER FOR 5 OR 6 DOORS

VERTICAL SECTION SHOWING HANGER AND TRACK ARRANGEMENT  
For 3 and 4, or 5 and 6 doors

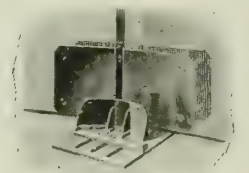
NO. 435-I INTERMEDIATE BRACKET



NO. 435-E END BRACKET



NO. 435-C CENTER BRACKET



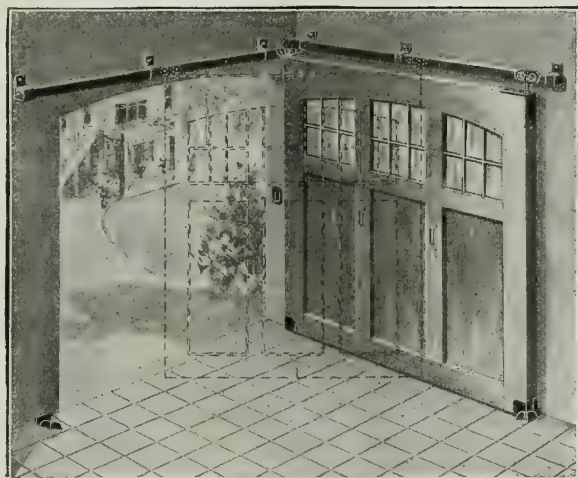
NO. 271 FLOOR GUIDE WITH NO. 301-72 BUMPER SHOE



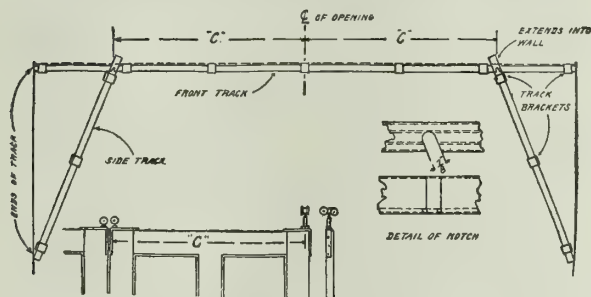
**No. 235 Right Angle Garage Door Outfits.**

For single or double doors, which slide around the corner into a place at right angles to closed position. Of two styles, those using straight track only and those using straight and curved tracks. Narrow doors sliding in same direction may be hinged together and operated in pairs when curved track is used, but with straight track only one door can be moved in same direction.

The "right angle" feature makes No. 235 Garage door outfit exceptionally popular.



RIGHT ANGLE SLIDING DOOR  
Single door style



DETAILS OF TRACK ARRANGEMENT, DOUBLE DOOR STYLE

RIGHT ANGLE GARAGE DOOR HANGER SIZES

Hanger number	Track number	Bearings in hangers	Pendant	Top of door to bottom of front track		Clearance required above bottom of front track	
				Minimum, ins.	Maximum, ins.	Side wall bracket, ins.	Ceiling bracket, ins.
235-1	31	Roller	Short	1	1 3/4	7	6
235-11	31	Roller	Long	1 1/8	2 1/8	7 1/2	6 1/2
235-7	232	Roller	Short	1 1/8	2 1/8	9 1/8	7 1/8
235-17	232	Roller	Long	1 1/8	2 1/8	9 1/8	7 1/8
235-2	33	Roller	Short	1 1/8	2 1/8	9 1/2	8 1/4
235-12	33	Roller	Long	1 1/8	2 1/8	9 1/2	8 1/4
235-3	31	Ball	Short	1	1 3/4	7	6
235-8	232	Roller	Short	1 1/8	2 1/8	9 1/8	7 1/8
235-4	33	Roller	Short	1 1/8	2 1/8	9 1/2	8 1/4
235-5	31	Ball	Short	1	1 3/4	4 5/8	3 1/2
235-9	232	Ball	Short	1 1/8	2 1/8	5 5/8	4 3/4
235-6	33	Ball	Short	1 1/8	2 1/8	6	4 3/4

For doors 1 3/4 to 2 ins. thick, use No. 31 track.

For doors 2 to 2 1/2 ins. thick, use No. 232 track.

For doors 2 1/2 to 3 ins. thick, use No. 33 track.

For use on double doors, specify for each door one 4-wheel hanger with long pendant for outer end of door and one 2-wheel hanger for inner end where doors meet at center of opening. For single doors, use 4-wheel hanger, short pendant on front end.

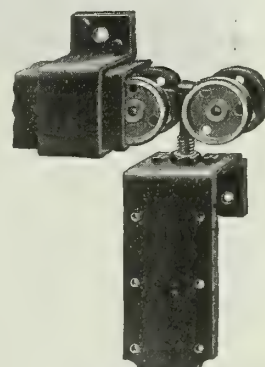
**Nos. 256 to 259 and Nos. 356 to 359 Parallel Garage Door Outfits.**

Adapted to openings for two or more cars. Double or triple tracks may be used with side wall or overhead attachment. A steel weatherstrip is placed between the



PARALLEL GARAGE DOORS

tracks to close space between tracks and top of doors. Floor guides set into floor and floor guide weatherstrips attached to bottom of doors should be used if it is desired to make bottom of doors weathertight. Nos. 256 to 259 have brackets for side wall attachment; Nos. 356 to 359 have brackets for overhead attachment.



NO. 29 1/2-B NOFAULT  
TROLLEY DOOR  
HANGER

**R-W Trolley Hangers for Barns, Warehouses and Factories.**

Different sizes are manufactured to suit different sizes and weights of doors. Track brackets can be attached to side or ceiling. Track made in 4 sizes.

TROLLEY HANGERS, SIZES AND WEIGHTS

Hanger number, lateral adjust-ment	Hanger number, lateral and vertical adjust-ment	Hanger name	Track number	Doors, thick-ness, ins.	Weight, lbs.	Bearings in hangers	Distance	
							Top of door to bottom of track, ins.	Bottom of track to center of hole in bracket, ins.
20	*20 1/2 B	R-W Gem R-W Stayrite	31 31	1 3/4 to 2 1/2 1 3/4 to 2 1/2	300 400	Roller Ball	1 7/8 min. 2 3/8 max.	3 3/4 3 3/4
24	25	R-W Superior R-W Peerless	31 31	1 3/4 to 2 3/4 1 3/4 to 2 3/4	400 400	Roller Roller	1 1/8 min. 2 1/2 max.	3 3/4 3 3/4
28L	*27 1/2 B	R-W Expansion	31	1 3/4 to 2 3/4	400	Ball	2 1/2 min. 2 3/8 max.	3 3/4 4 1/4
28V	R-W Acme R-W Premium	32 32	1 3/4 to 2 3/4 1 3/4 to 2 3/4	500 500	Roller Roller	1 1/4 min. 1 5/8 max.	4 1/4 4 1/4	4 1/4 4 1/4
29L	*28 1/2 B	R-W Supreme	32	1 3/4 to 2 3/4	500	Ball	2 1/2 min. 2 3/8 max.	4 1/4 4 1/4
29V	R-W Hercules R-W Economy	232 232	1 3/4 to 2 3/4 1 3/4 to 2 3/4	600 600	Roller Roller	1 1/8 min. 1 3/4 max.	4 1/4 4 1/4	4 1/4 4 1/4
120	*29 1/2 B	R-W Nofault	232	1 3/4 to 2 3/4	600	Ball	1 3/8 min. 1 3/4 max.	4 1/4 4 1/4
	121	R-W King R-W Samson	33 33	1 3/4 to 3 1 3/4 to 3	800 800	Roller Roller	1 1/4 min. 1 3/4 max.	5 5
	*123 1/2 B	R-W Victor	33	1 3/4 to 3	800	Ball	1 1/8 min. 1 3/4 max.	5 5
	150	R-W Jumbo	33	1 3/4 to 3 1/2	1000	Roller	1 1/4 min. 1 3/4 max.	5 5
	*150 1/2 B	R-W Overall	33	1 3/4 to 3 1/2	1000	Ball	1 1/8 min. 1 3/4 max.	5 5
	149-1		145	1 3/4 to 2 3/4	2500	Ball	1 3/8 min. 1 3/4 max.	6 6
	149-2		145	2 1/2 to 3 3/4	2500	Ball	1 3/8 min. 1 3/4 max.	6 6

\*Can be furnished with knuckle joint for curved track. When so specifying, add the word "knuckle joint."

†For doors 1 3/4 to 2 ins. thick, specify No. 1 size hanger. For thicker doors, specify No. 2 size hangers.



**R-W Electric Door Opener and Closer.**

Saves time and labor expense. Opens and closes almost any type of door from any point or points by electric power. Operator controls door as completely as if he were manipulating it by hand. Doors can be opened and closed, or can be stopped at any point and the operation continued or reversed by pressing proper button.

This device is made of unbreakable steel parts and actuated by electric motor. It is all above the doors and occupies no valuable space.



R-W ELECTRIC DOOR OPENER AND CLOSER OPERATING NO. 1035 SLIDETITE DOORS

**DIRECTIONS FOR ORDERING**—Furnish sketch showing all dimensions as follows: (1) Number of openings; (2) width of opening; (3) height of opening; (4) thickness of doors; (5) distance jamb to side wall, right side; (6) distance jamb to side wall, left side; (7) distance from top of door to nearest overhead obstruction or ceiling. (8) Is electric current direct or alternating? (9) Give voltage, cycles and phase; (10) kind of doors—single or double sliding, single or double swinging, Slidetite, vertical, etc.

**Ideal Elevator Door Hangers.**

**TRACK AND HANGERS**—For passenger and freight service. Track is a rectangular shaped tube made of heavy gauge steel, the bottom forming two parallel runways for the steel balls upon which the hanger rolls. These balls are kept an equal distance apart by a retainer. Length of track equals entire width of opening, or run of doors.

The hanger, of heavy gauge steel, accurately fits the balls over which it runs. Length of hanger is equal to width of door.

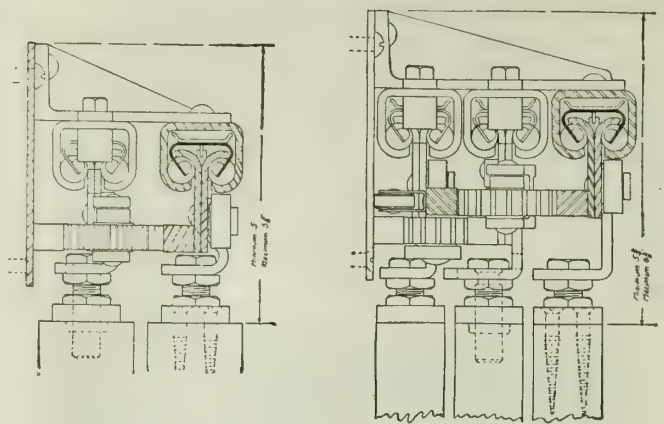


NO. 728-1 R-W IDEAL ELEVATOR FIXTURE

**SPECIFICATION DATA**—No. 727-1 for Single Doors Weighing up to 300 Lbs.—Track furnished with brackets for side wall attachment. Track has lateral and hanger has vertical adjustment. Space required above door,  $4\frac{3}{4}$  to  $5\frac{3}{8}$  ins.

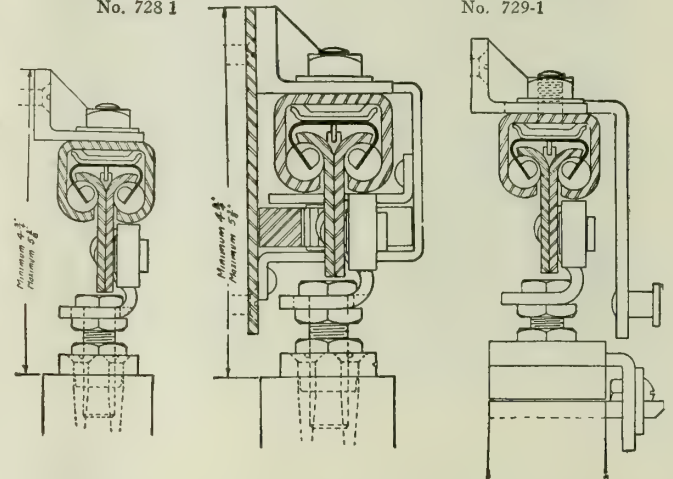
No. 728-1 for 2-speed Doors Weighing up to 200 Lbs.—Made with rack and pinion attachment for operating two doors in same direction, one door moving at twice the speed of the other. Has a  $4\frac{1}{2}$ -in. wide wall plate to which complete fixture is assembled. Space required above doors, 5 to  $5\frac{3}{8}$  ins.

No. 729-1 for 3-speed Doors Weighing up to 200 Lbs.—Made with rack and pinion attachment for operating 3 doors in same direction, the fast door at three times the speed, the intermediate



No. 728 1

No. 729-1



No. 727-1

No. 730

No. 732

CROSS SECTIONS, IDEAL ELEVATOR DOOR HANGERS

door at twice the speed of the slow door. Fixture assembled complete to wall plate 5 ins. wide. Space required above doors,  $5\frac{3}{4}$  to  $6\frac{3}{8}$  ins.

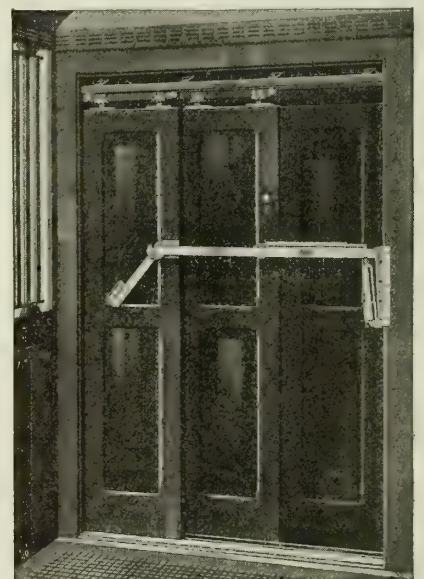
No. 730 for Doors in Pairs Weighing up to 300 Lbs.—Made with rack and pinion attachment for simultaneously operating both doors in opposite directions. Fixture assembled complete to wall plate  $4\frac{1}{4}$  ins. wide. Space required above doors,  $4\frac{3}{4}$  to  $5\frac{3}{8}$  ins.

No. 732 for Combination Swing and Slide Doors Weighing up to 300 Lbs.—Used when stationary door is hinged and it is desirable to swing both doors open so as to use full width of elevator opening, and yet it is not practicable to swing transom bar to which track is attached. It is usually more satisfactory to arrange to swing transom bar, if possible. Space required above doors,  $5\frac{3}{8}$  to  $5\frac{3}{4}$  ins.

Fixtures reversible, and can be used on right or left hand doors.

**743 Ideal Elevator Door Closer and Check.**

When using this device, doors are always closed when car leaves the floor. Performs this work positively and easily, and eliminates accidents, noise and



IDEAL ELEVATOR DOOR CLOSER AND CHECK



slamming of doors. Can be used with any standard hanger: single, 2-speed, 3-speed, doors in pairs, or combination swing-out.

The long lever handle starts the doors easily. The spring can not be overwound. The spring and checking mechanisms are separate and can be readily regulated independent of each other to suit the varying conditions. Made right or left hand.

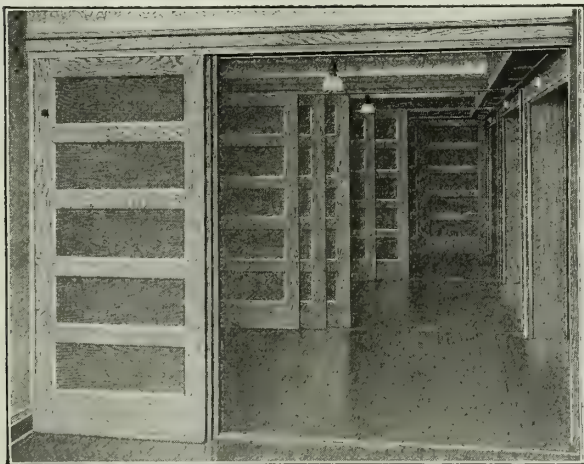
### Sliding Partition Door Hardware.

Designed for three types of sliding door partitions: parallel, accordion and flush, for churches, schools, auditoriums, clubs, Y. M. C. A. rooms, libraries and other public buildings.

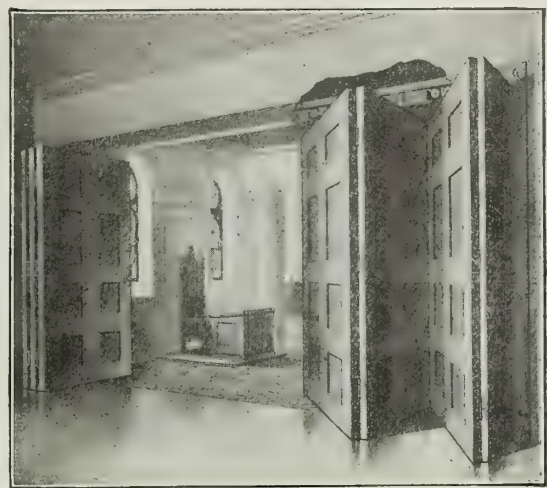
Service includes the furnishing of illustrations, plans, drawings and special instructions.

**SLIDING PARALLEL DOOR HANGERS**—Doors slide parallel to each other, with separate track for each door. Number of doors is not limited, but a better appearance is obtained by using not more than two or three doors sliding in same direction. Pockets may be provided for doors, or instead a stationary panel or door used. Floor guides may be used to steady bottom of doors. Door locks may be employed, and flush bolts to secure bottom of doors to floor.

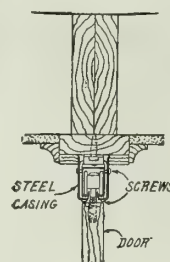
Detailed information given on receipt of floor plan with measurements and statement of requirements.



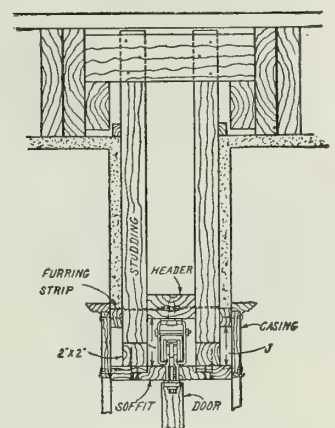
SLIDING PARALLEL DOOR INSTALLATION IN SUNDAY SCHOOL ROOM



SLIDING ACCORDION DOOR PARTITIONS



ANOTHER METHOD



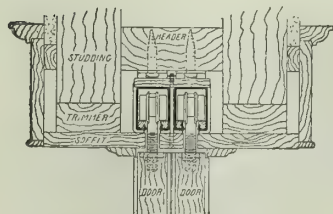
TYPICAL OVERHEAD CONSTRUCTION DETAILS

**Number of Hangers Required**—4-wheel hangers, Nos. 135 and 335 accordion door hangers are preferable, and, when used, 1 hanger is applied to each alternate door, beginning with door farthest from half door. If desirable to install hanger on each door, No. 137 accordion door hanger, a 2-wheel hanger, can be used. Hangers have ball bearing swivel and vertical screw adjustment.

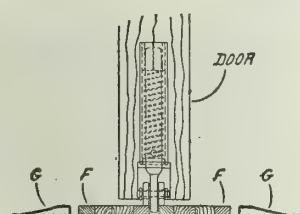
**Directions for Ordering**—Brackets should be spaced 2 to 2½-ft. centers, according to weight of door. First three brackets over half door should be spaced 1 to 1½-ft. centers. At end of opening farthest from hinge jamb, an 8-in. space should be left between end of track and jamb. Below this point, fit a removable section of soffit to enable carpenter to remove hanger. When doors are folded to both sides, two pieces of track are needed. In center of opening a 1-ft. space should be left between ends of track and removable soffit section fitted below this point.

DATA, SLIDING ACCORDION DOOR HANGERS

Hanger number	Wheels	Bearings	Track number	Thickness of doors, ins.	Distance top of soffit to bottom of header, ins.	Distance top of door to top of soffit, ins.		Distance top of jamb to bottom of furring strip, ins.
						7/8" soffit	1 1/8" soffit	
135-0	4 metal	Ball	30½	1 3/8	3 1/4	1 1/8	1 3/8	3 1/4
135-01	4 metal	Ball	31	1 3/8	3 3/8	1 1/8	1 3/8	3 1/4
135-1	4 fiber	Roller	31	2 & 2 1/4	3 3/8	1 1/8	1 3/8	3 1/4
135-2	4 fiber	Roller	33	2 1/2	5 1/4	1 1/8	1 3/8	4 3/4
335	4 gray iron	Ball	526	1 3/8 & 1 3/4	3 7/8	1 1/8	1 3/8	3 1/4
137-0	2 metal	Ball	30½	1 3/8	3 1/4	1 1/8	1 3/8	3 1/4
137-1	2 fiber	Ball	31	1 3/4	3 3/8	1 1/8	1 3/8	3 1/4
137-2	2 gray iron	Ball	31	2 & 2 1/4	3 7/8	1 1/8	1 3/8	3 1/4



TYPICAL CROSS SECTION THROUGH HEAD JAMB



FLOOR GUIDE AND TRACK

**SLIDING ACCORDION DOOR HANGERS**—All doors can be folded to one side or they may be divided at center and half the doors folded to each side. A half door is required adjoining jamb toward which the doors fold. Doors should not exceed 3 ft. in width.



FLOOR PLAN, ACCORDION DOOR HANGERS

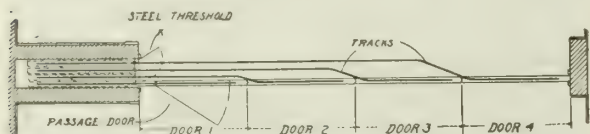
**FLUSH DOOR HANGERS**—For closing large openings.

When doors are open, they are concealed in pockets, or partition may be composed of one stationary door and a number of sliding doors, all when opened occupying position alongside stationary door.

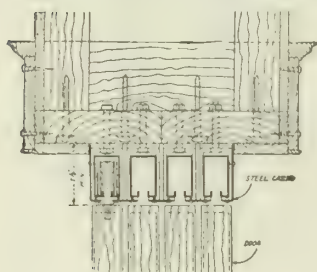




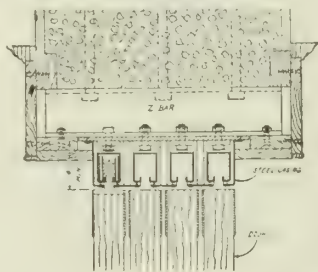
INSTALLATION OF FLUSH DOOR PARTITION IN PHILADELPHIA SCHOOL



PLAN AND ELEVATION OF PARTITION IN WHICH DOORS SLIDE INTO POCKET



DETAILS WITH WOODEN HEADER CONSTRUCTION



DETAILS WITH CONCRETE HEADER CONSTRUCTION

**Specification Data**—Width of doors not limited by equipment, but all doors should be same width except first and last doors. Outer stiles of these doors should be slightly wider to allow for lap over jamb. Flush door bolt should be used at bottom of each door at side farthest from pocket. When desirable, wicket passage door may be built in one of sliding doors. In that case, steel bar threshold should be used.

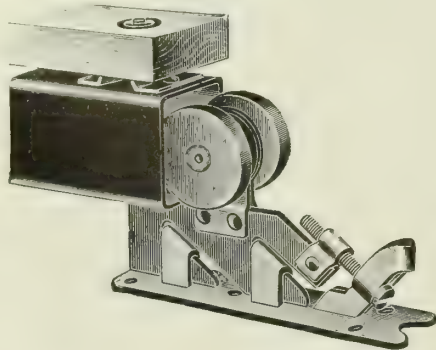
Hangers regular for doors  $2\frac{1}{2}$  ins. thick, but can be furnished for doors of any thickness. Hangers No. 443 for No. 164 track, or No. 444-1 for No. 75 track, will accommodate doors up to 500 lbs. For heavier doors No. 444-2 hanger and No. 164 track.

Brackets, malleable iron, tapped to receive screws used in attaching casing and soffits. Steel casing and soffits take less space and are neater in appearance than wood. Meeting stiles of doors should be fitted with male and female astragal.

### House Door Hangers.

**No. 19 HERO HANGER**—Ball bearing with steel balls and noiseless fiber wheels,  $2\frac{1}{8}$  ins. diameter. Meets all ordinary sliding door requirements. Accessible adjustment in both hanger and track. Track is No. 16 gauge steel, furnished with wood header, adjustable as shown; weight,  $2\frac{1}{4}$  lbs. per ft.

**No. 221 ADVANCE HANGER**



NO. 19 HERO HOUSE DOOR HANGER

—A noiseless 4-wheel hanger. The box shaped track protects hanger from dirt and falling plaster. Both hanger and track have accessible adjustment. Track is No. 16 gauge steel, hard maple lined, No. 221

clinch type and furnished with wood header, adjustable as shown; weight  $2\frac{1}{2}$  lbs. per ft. Wheels, gray iron, lathe turned,  $1\frac{7}{8}$  ins. diameter. Steel frames and hardened bearings.

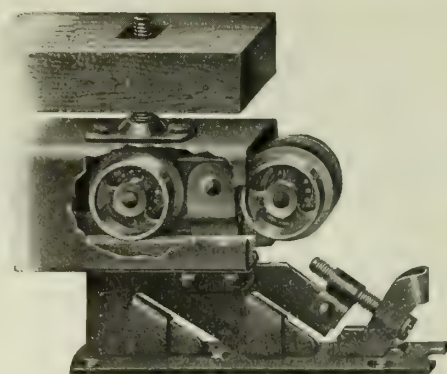
### Fire Door and Fire Shutter Fixtures.

Our line of fire door equipment is the most complete in the United States, and includes all types, as follows: inclined and level track; solid or round; vertical sliding; and horizontal doors; swinging doors, single and double.

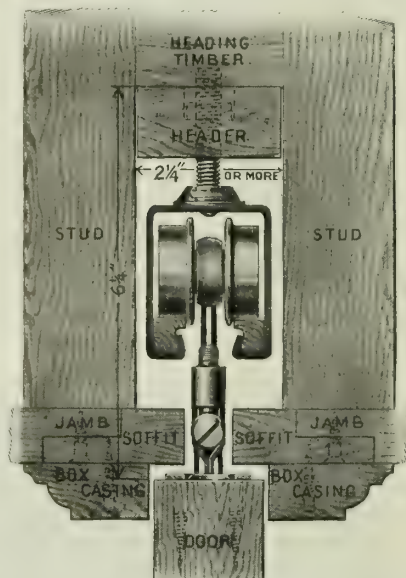
Also fire shutter and trap fire door fixtures.

Fixtures marked with \* in table are approved by the Underwriters' Laboratories, Inc. Hardware furnished to meet special requirements.

For more detailed data, ask for fire door hardware catalogue. Blue prints sent on request.

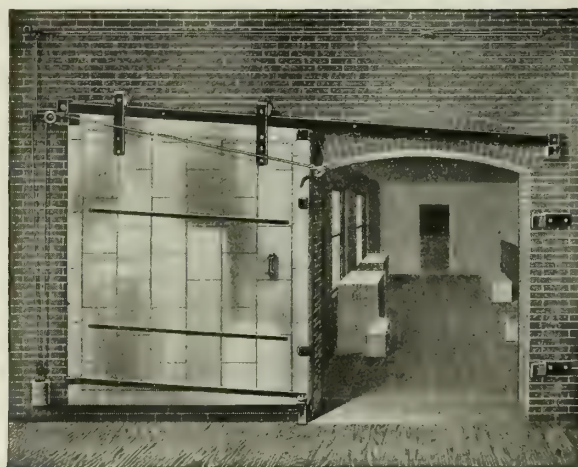


NO. 221 ADVANCE HOUSE DOOR HANGER



APPLICATION OF NO. 221 ADVANCE HOUSE DOOR HANGER

Same for other hangers except measurements



NO. 102 MONARCH FIRE DOOR FIXTURES

Recommended where headroom exceeds 3 ft. Two fusible links, one in opening and one near ceiling. Door closes by gravity



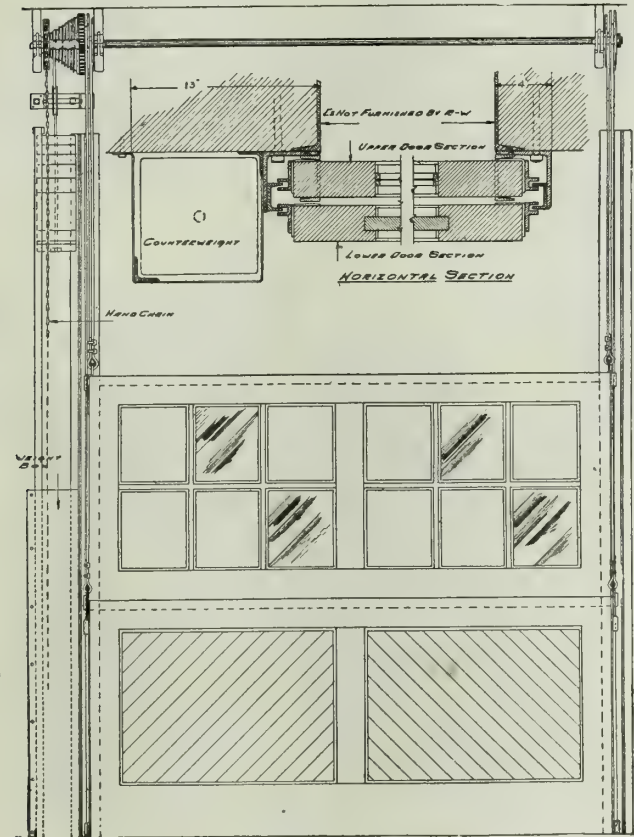
DATA, FIRE DOOR FIXTURES

Type of door	Fixture number	Round or flat track	Clearance required		
			Above top of opening, ins.	At side of opening	
				Where doors slide or swing, ins.	Opposite side, ins.
Incline track sliding door	102*	Flat	14†	Width of opening + 22	13½
	201*	Flat	14†	Width of opening + 19	13½
	645*	Round	12†	Width of opening + 18	13½
	646*	Round	12†	Width of opening + 15	13½
Level track sliding door	303	Flat	14†	Width of opening + 19	19
	304	Flat	9†	Width of opening + 19	19
Sliding doors in pairs	204*	Flat	14†	Width of opening + 19	
	604*	Round	12†	Width of opening + 15	
Single swing doors	206		9	10	3½
	406*		none	11	3½
	606			3½	3½
Swing doors in pairs	306		10	10	10
	506*		10	11	11
	706		3½	3½	3½
Side wall required					
				Doors under 300 lbs.	Doors over 300 lbs.
Vertical sliding doors	203	Flat	Height of opening + 19	15 and 21	21 and 28
	603	Round	Height of opening + 19	16 and 22	22 and 29

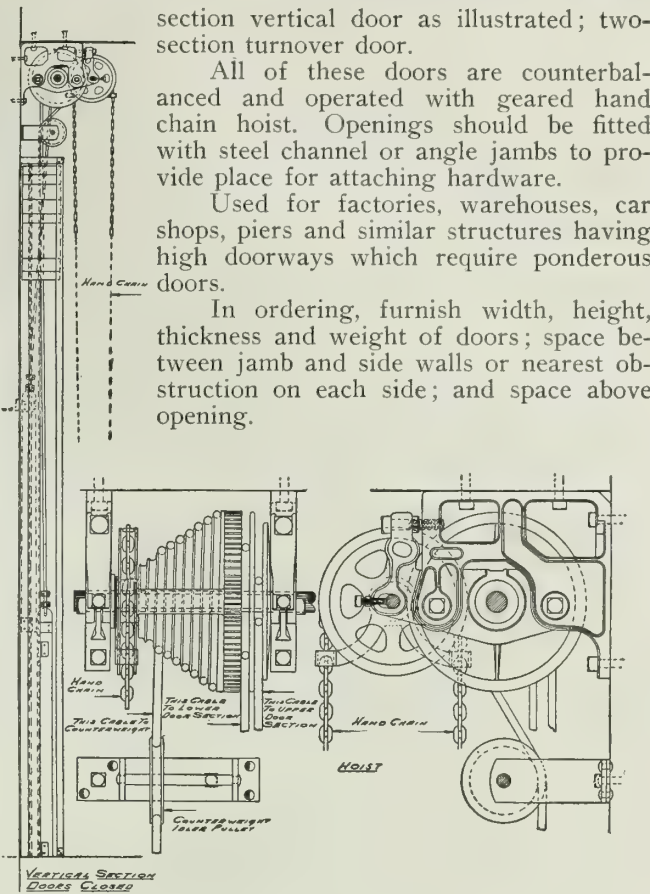
Adjustable hanger can be furnished with Nos. 102, 201, 204, 303, 645, 646 and 604 fixtures, and requires 3 ins. more headroom above top of opening than rigid hangers.  
\*Are approved and labeled by National Board of Fire Underwriters.  
†For arched top openings add ¾ in. for each foot of track back of the center of the opening, to the dimension given. For square top opening add ¾ in. for each foot of track back of edge of opening towards which the door slides in closing, to the dimension given.

Lift Warehouse Doors.

Kinds of doors: One-section turnover door with track supporting top of doors; one-section turnover door, top of door supported by cables, suitable for doors not over 8-ft. high; one-section vertical door; two-



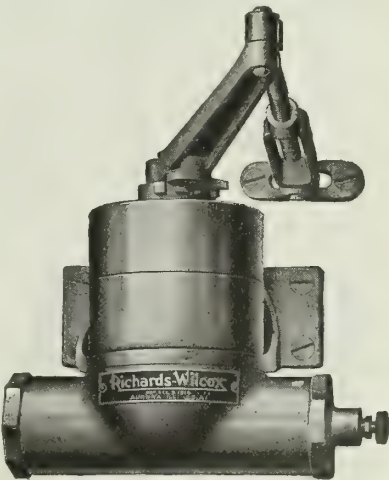
NO. 503 TWO-SECTION VERTICAL DOOR



DETAIL, NO. 503 TWO-SECTION VERTICAL DOOR

Door Closer and Check.

In this device, the crank and pitman principle is improved and simplified. All working parts in checking cylinder made of steel drop forgings. While tension of spring can be adjusted to suit conditions by pawl and tooth dog, overwinding is impossible. Not necessary to remove check from door to remove spring. This liquid check is leak-proof. The only truly reversible check. Parts are interchangeable. No special tools required in assembling or winding up spring. Flush, soffit or corner brackets furnished extra when required.



DOOR CLOSER AND CHECK  
Attached with regular casing bracket

DATA, DOOR CLOSER AND CHECK

Size		
1	For screen and very light doors.....	6 lbs.
2	For light interior doors not over 3 ft. wide and vestibule doors not over 2 ft. 6 ins. wide.....	7½ lbs.
3	For medium weight interior doors not over 3 ft. wide, or light outside doors not over 2 ft. 6 ins. wide.....	10 lbs.
4	For heavy interior doors or medium weight outside doors not over 3 ft. wide.....	12 lbs.
5	For heavy outside doors not over 3 ft. 6 ins. wide.....	15 lbs.
6	For extra heavy outside doors and large doors operated against very strong drafts.....	18 lbs.

Extra heavy doors or doors subject to strong drafts require check one size larger than specified. Checks furnished regularly in gold bronze. Checks furnished in silver bronze or ivory black at same prices. Special finishes to order.

# THE STOWELL COMPANY

Automatic Fire Door Equipment and Door Hangers  
SOUTH MILWAUKEE, WIS.

## Products.

Manufacturers of the WILBERN AUTOMATIC FIRE DOOR EQUIPMENT; WILBERN ADJUSTABLE FIRE DOOR HANGERS; No. 20A WILBERN AUTOMATIC CLOSING FIXTURES; WILBERN FIRE DOOR TRACK; TIN CLAD DOORS, with Underwriters' Label; DOOR HANGERS for Warehouse, Factory and Depot Doors, Freight Car Doors, Baggage, Express and Mail Car Doors, Elevator Doors, etc.

Fire Door Accessories.

## Underwriters' Approval.

The Wilbern fire door equipment is regularly inspected and labeled under the supervision and direction of the Underwriters' Laboratories, Inc.

This equipment has successfully withstood the severe tests of laboratories as well as actual fire, particulars of which will be gladly forwarded to architects, intending purchasers and other interested parties on request.

## Automatic Feature of Equipment.

The fusible links, when the fire heat reaches a certain degree, collapse, thus releasing the weights. This action permits the doors to close securely.

## Wilbern Adjustable Fire Door Hangers.

Either the adjustable or the non-adjustable Wilbern hangers may be used with Wilbern automatic closing fixtures. The superiority of Wilbern fixtures over all others for gravity fire doors lies largely in those hangers which are adjustable. See Figs. 1, 2 and S-1. As fire doors are hung against rough brick walls, it is essential that they be adjustable, that they may remain in perfect working order.

No. 4A (Fig. 1) is a malleable iron hanger with 5-in. roller bushed sheave with machine turned groove. Axle is  $\frac{5}{8}$  in. in diameter and will sustain a weight of several tons. Being reinforced with high ribs down the neck of the hanger, where the greatest strain comes

in time of fire, it will, therefore, retard fire much longer than other designs.

No. 6 (Fig. 2) is made from  $3\frac{1}{2}$ - by  $\frac{3}{8}$ -in. steel, and is equipped with 7-in. malleable iron roller bushed sheave having machine turned groove.

These hangers have both vertical and lateral adjustments, and can not jump the track. Adjustments permit doors to be hung close against wall and tight to floor, precluding possibility or existence of drafts. Also, doors can be occasionally adjusted to conform to varying circumstances, and can be kept in perfect condition, thus saving expense for repairs.

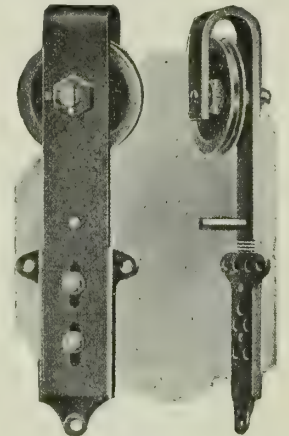


FIG. 2. WILBERN NO. 6  
ADJUSTABLE FIRE  
DOOR HANGERS  
Approved by New England  
Mutuals

## Wilbern Automatic Closing Fixtures No. 20A.

A set of these fixtures consists of: 18 lbs. of weights, 2 cord links, 1 link holder, 2 fusible links, 2 pair link hooks, 1 stay roller, 1 front stop, cord sheave and back stop with release trigger, 2 binders, 2 half oval strips, 2 flat strips, 1 flat strip for stay roller, 1 weight holder, 8 bumper shoes, 1 handle, 1 wedge, 1 flush pull, 1 tackle block, 2 expansion screw hooks, track brackets, washers for wall bolts, instruction card and sufficient sash cord. Bolts and screws are included, except bolts through the wall.

The No. 20A Wilbern Eastern Style Fixture has but one link, the one on the edge of the door.

## Tin Clad Doors.

Door, single or double, must lap opening 4 ins. on each side and 4 ins. on top, and must be made of three thicknesses of  $\frac{7}{8}$ -in. matched lumber covered

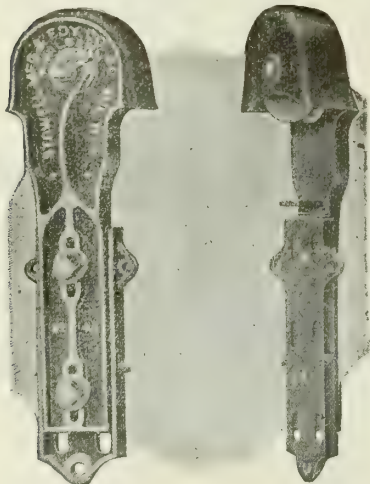


FIG. 1. WILBERN NO. 4A ADJUST-  
ABLE FIRE DOOR HANGERS  
Approved by National Board of Fire Under-  
writers



FIG. S-1. SECTIONAL  
VIEW OF WILBERN  
ADJUSTABLE DOOR  
HANGER

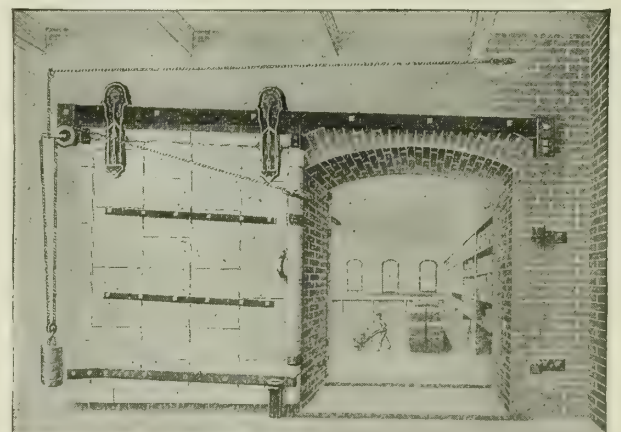


FIG. 3. WILBERN NO. 4A ADJUSTABLE HANGERS, WITH NO.  
20A WILBERN FIRE DOOR FIXTURES  
Labeled under direction of Underwriters' Laboratories, Inc.



with tin. Doors require weights at rate of about 1/2 lb. per sq. ft. This company also supplies doors tinned per Underwriters' specifications, and bearing their label. (See Fig. 3.)

DOUBLE DOORS—Adjustments are especially necessary on double doors which meet in center of opening. (See Fig. 4.) The Wilbern adjustments make it possible to hang double doors on incline tracks so as to prevent a "V"-shaped opening between them, thus thwarting the fire from creeping through.

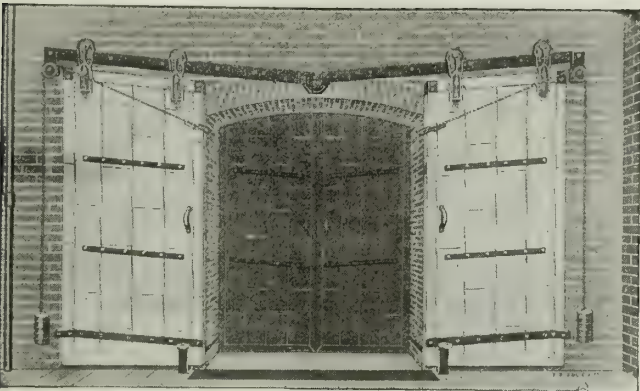


FIG. 4. WILBERN NO. 4A HANGERS, WITH NO. 20A WILBERN AUTOMATIC FIXTURES. DOUBLE DOORS.

Round Track.

The Wilbern adjustable hanger is also adapted to round track, as shown in Fig. 5; size No. 5 has 3-in. wheel and runs on track, 1 5/16 ins. outside dimensions, No. 14 gage. Size No. 9 has 5-in. wheel and runs on track, 1 1/2 ins. outside dimensions, No. 10 gage.

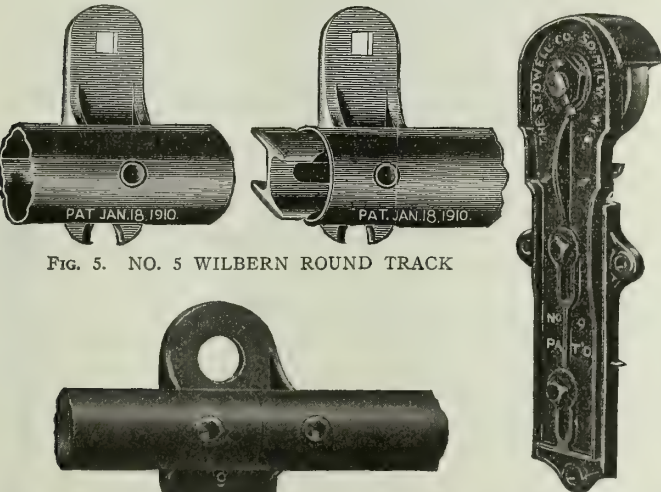


FIG. 5. NO. 5 WILBERN ROUND TRACK

FIG. 6. NO. 9 WILBERN HANGER FOR ROUND TRACK



FIG. 7. NO. 9 WILBERN ROUND TRACK

Hangers for Railroad Work, on Heavy Doors.

The Wilbern adjustable hanger is used extensively by railroads for warehouses and freight houses. The adjustments enable ordinary workmen to correct doors which give trouble through any exterior cause, thus re-

ducing repair account and avoiding expense of sawing bottoms of doors or resetting hangers.

Blue Prints.

Send for blue prints of Wilbern Parallel Door Equipment for large freight houses and dock sheds. The Canadian Government adopted this type for five miles of dock sheds along St. Lawrence River.

Wilbern Special Features.

- (1) The owner can keep his doors in constant repair without expense.
- (2) The contractor can install doors perfectly in far less time than is required with common hangers.
- (3) The architect always wishes to give his clients the most substantial and trustworthy material at lowest ultimate cost.
- (4) The underwriter and his inspectors can insist that imperfectly working doors be corrected in their presence, by immediate adjustment.

LIST PRICES FOR HANGERS, TRACK AND FIXTURES SEPARATELY

No. 4A	Wilbern Adjustable Fire Door Hangers, weight, 40 lbs. per pair..	\$7.00
No. 6	Wilbern Fire Door Hangers, Adjustable, weight, 35 lbs. per pair	7.00
No. 20A	Wilbern Non-Adjustable Fire Door Hangers, per pair.....	4.10
No. 20A	Wilbern Automatic Closing Fixtures, per set.....	12.00
No. 20A	Wilbern Automatic Closing Fixtures, Eastern Style, One Link..	11.00
	Wilbern Fire Door Track (3 1/2"x 3/8", with Brackets, per foot.....	.40
	Extra weights, per pound.....	.07
	Discount, 40 %..	cent.
No. 5	Wilbern Adjustable Round Track Hangers, weight, boxed, 105 lbs. per doz., per doz. pairs.....	19.20
No. 5	Wilbern Round Track, weight 110 lbs. per 100 ft., per 100 ft....	14.00
No. 9	Wilbern Adjustable Round Track Hangers, weight, 30 lbs., per pair.....	5.00
No. 9	Wilbern Round Track, per 100 ft.....	25.00
	Subject to discount.	

LIST PRICES PER OPENING FOR COMPLETE EQUIPMENT

Width of opening	No. 4A Wilbern Adjustable Hangers No. 20A Wilbern Fixtures	No. 20A Wilbern Non-adjustable Hangers No. 20A Wilbern Fixtures	No. 4A or No. 6 Wilbern Adjustable Hangers No. 20A Wilbern Fixtures, Eastern Style	No. 20A Wilbern Non-adjustable Hangers No. 20A Wilbern Fixtures, Eastern Style
2'6"	\$21.70	\$18.70	\$20.70	\$17.35
3'0"	22.00	19.00	21.00	17.70
3'6"	22.35	19.35	21.35	18.05
4'0"	22.70	19.70	21.70	18.40
4'6"	23.00	20.00	22.00	18.70
5'0"	23.30	20.30	22.30	19.05
5'6"	23.65	20.65	22.65	19.40
6'0"	24.00	21.00	23.00	19.70
6'6"	28.20	23.70	27.20	22.40
7'0"	28.50	24.00	27.50	22.70
7'6"	28.85	24.35	27.85	23.00
8'0"	29.20	24.70	28.20	23.40
8'6"	29.50	25.00	28.50	23.70
9'0"	29.80	25.30	28.80	24.00
9'6"	30.15	25.65	29.15	24.40
10'0"	30.50	26.00	29.50	24.70

Openings wider than 6 ft. require 3 hangers; these are included in above lists Discount 40 %.

References.

This equipment is to be found in successful operation in plants in almost every State in the Union.  
International Harvester Company of America, Chicago, Ill. All plants.  
Sherwin-Williams Co., Cleveland, Ohio. All plants  
Studebaker Corporation, South Bend, Ind.  
Eastman Kodak Co., Rochester, N. Y.  
J. I. Case Threshing Machine Co., Racine, Wis.  
J. Deere Plow Co., Moline, Ill.  
John A. Roebling's Sons Co., Trenton, N. J.  
Marathon Paper Mills Co., Wausau, Wis.  
Bryant Paper Mills Co., Kalamazoo, Mich.  
Henney Buggy Co., Freeport, Ill.  
Simmons Mfg. Co., Kenosha, Wis.  
Diamond Match Co., Barberton, Ohio, and Oshkosh, Wis.

# WAGNER MANUFACTURING COMPANY

## Door Hangers and Hardware Specialties

MAIN OFFICE AND WORKS  
CEDAR FALLS, IOWA

### SALES AGENCIES

NEW YORK, Wm. A. DAUNT, 31-33 East 27th Street  
PITTSBURGH, L. F. GIBSON, Box No. 526  
BIRMINGHAM, BREWER FIRE RETARDANTS COMPANY  
SEATTLE, F. T. CROWE & COMPANY  
PORTLAND, ORE., FREDERICK S. COOK & COMPANY  
SAN FRANCISCO, WATERHOUSE-WILCOX COMPANY  
LOS ANGELES, WATERHOUSE-WILCOX COMPANY

NEW ORLEANS, A. BALDWIN & COMPANY, LIMITED

SAN DIEGO, WATERHOUSE-WILCOX COMPANY, c/o Theo. F. Snyder, Central Mortgage Building  
SALT LAKE CITY, CHARLES F. PORTER  
DENVER, R. J. O'CONNOR, 1628 Glenarm Street  
OMAHA, D. B. MARSHALL, 1116 Jackson Street  
MINNEAPOLIS, WARNER HARDWARE COMPANY  
MEMPHIS, D. A. FISHER, INC.

### Products.

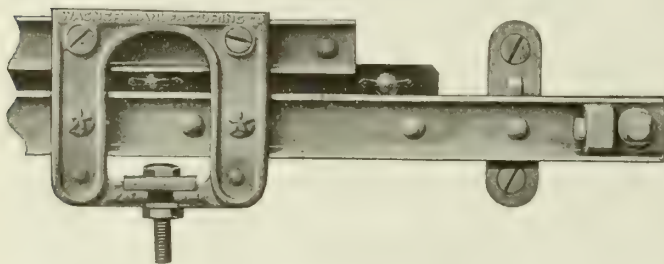
BALL BEARING ELEVATOR DOOR HANGERS.  
ELEVATOR DOOR LOCKS.

Wagner Door Hangers and Tracks for house, barn, garage, warehouse or factory; Fire Door Fixtures; Sliding Door Latches; Door Catches; Studding Sockets; Coal Chutes; Complete Garage Door Equipments, including Hangers, Tracks, Door Guides, Stops and Weatherstrips.

### Wagner-Star Ball Bearing Elevator Door Hangers.

Wagner-Star hangers consist of upper and lower grooved steel tracks with large solid steel balls running between.

Hangers and track are assembled as one unit.



WAGNER-STAR ELEVATOR DOOR HANGER

**SELF-CLEANING TRACK**—Made of two 1½-in. structural steel channels milled smoothly on top to receive ball bearings.

**LARGE BEARINGS**—Bearing consists of a single row of solid steel balls ⅝-in. in diameter, which are held at equal distances from each other by a steel ball retainer fitted into the grooved track, so that the action is entirely ball bearing.

**NOISELESS**—The open track used in Wagner-Star hangers positively eliminates noise, in addition to preventing the accumulation of dirt, which in time would cause the doors to stick, and would at all times cause undue wear on the bearings.

**DIRECT APPLICATION OF LOAD**—Weight of doors is applied directly in a vertical plane to ball bearings and track.

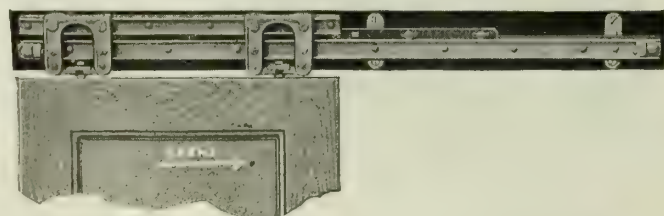
**SAFETY**—The bolt that is screwed into the door is flattened on two sides and equipped with a lock washer, which prevents turning, so that doors can not become detached from hangers and fall down elevator shaft.

**EASY ADJUSTMENT**—Doors can be raised or lowered at any time by simply loosening nut and turning bolt.

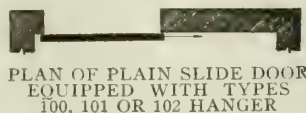
**TYPES**—Wagner-Star hangers are made for all standard types of single, two-speed, and center-parting doors.

### Wagner-Star Hangers for Single Doors.

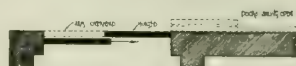
For doors of any construction weighing up to 400 lbs. Standard finish, black.



WAGNER-STAR HANGER APPLIED TO SINGLE DOOR



PLAN OF PLAIN SLIDE DOOR  
EQUIPPED WITH TYPES  
100, 101 OR 102 HANGER



PLAN OF COMBINATION  
SLIDE AND SWING DOOR  
EQUIPPED WITH TYPES  
100, 101 OR 102 HANGER

**HOW TO SPECIFY**—For iron and hollow metal doors up to 1½ ins. thick, specify Type 100; 1¼ to 2 ins. thick, specify Type 101. For wood and metal covered doors 1½ to 2 ins. thick, specify Type 102.

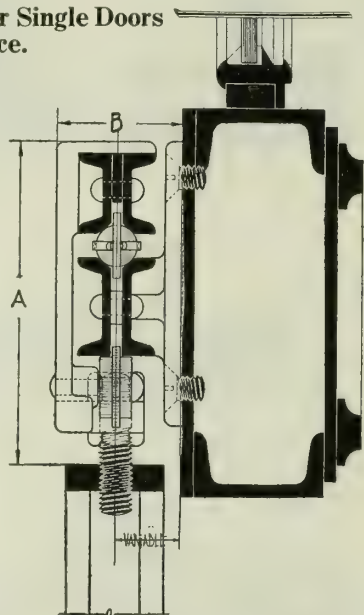
### Wagner-Star Hangers for Single Doors with Swing Device.

For doors of any construction weighing up to 400 lbs. Standard finish, black.

Hanger is attached to a bar which is pivoted on one end of door. When entire opening is required, bar is unfastened, permitting door to be swung out as shown in plan.

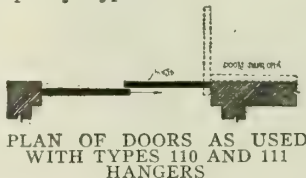
For use only where there is no transom bar or where transom bar is stationary.

**HOW TO SPECIFY**—For iron and hollow metal doors up to 1½ ins. thick, specify Type 110. For doors of any construction from 1¼ to 2 ins. thick, specify Type 111.



CROSS SECTION OF HANGER  
FOR SINGLE DOORS  
1/3 actual size

DIMENSIONS, INS.



PLAN OF DOORS AS USED  
WITH TYPES 110 AND 111  
HANGERS

Types	Minimum		Maximum	
	A	B	A	B
100 and 101 . . . . .	5	1 13/16	5 1/2	2 11/16
102, 110 and 111 . . . . .	5 1/2	1 13/16	6	2 11/16

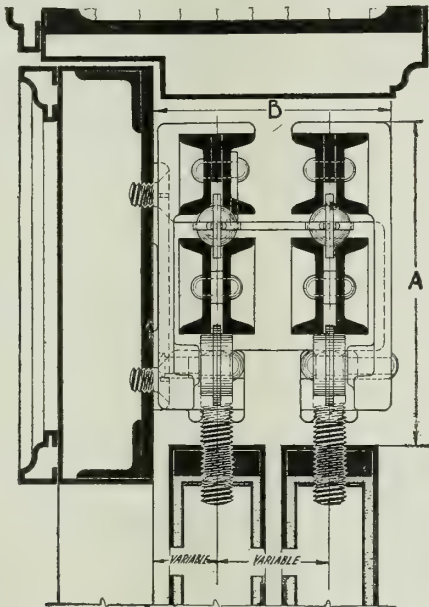


### Wagner-Star Hangers for Two-speed Doors.

The Wagner-Star two-speed hangers have no racks, gears, lazy tongs, or levers. These parts, with their expensive maintenance, danger to passenger's hands, and their unsightly appearance, are eliminated. The ball retainer of the fast door is connected with the hanger of the slow door by a malleable casting. Since the ball retainer moves at half the speed of the door, it follows that the slow door will move at half the speed of the fast door, as the slow door is connected with the ball retainer of the fast door. Nothing is simpler; action is positive; both doors move at the same time, one at twice the speed of the other.



WAGNER-STAR HANGER APPLIED TO TWO-SPEED DOORS



CROSS SECTION OF HANGER FOR TWO-SPEED DOORS  
1/3 actual size



PLAN OF TWO-SPEED DOORS EQUIPPED WITH TYPES 200, 201 OR 202 HANGERS



PLAN OF COMBINATION SLIDE AND SWING TWO-SPEED DOORS EQUIPPED WITH TYPES 200, 201 OR 202 HANGERS

DIMENSIONS, INS.

Types	Minimum		Maximum	
	A	B	A	B
200.....	5	3 3/8	5 1/2	3 3/8
201.....	5	4	5 1/2	4
202.....	5 1/2	4 5/8	6	4 5/8

How to SPECIFY—For iron and hollow metal doors up to 1 1/4 ins. thick, specify Type 200; 1 3/8 to 2 ins. thick, specify Type 201. For wood and metal covered doors 1 1/2 to 2 ins. thick, specify Type 202.



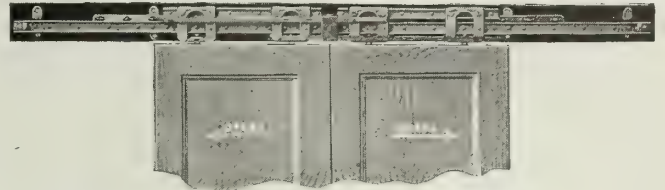
PLAN OF COMBINATION SLIDE AND SWING TWO-SPEED DOORS EQUIPPED WITH TYPES 210 AND 211 HANGERS

DIMENSIONS, INS.

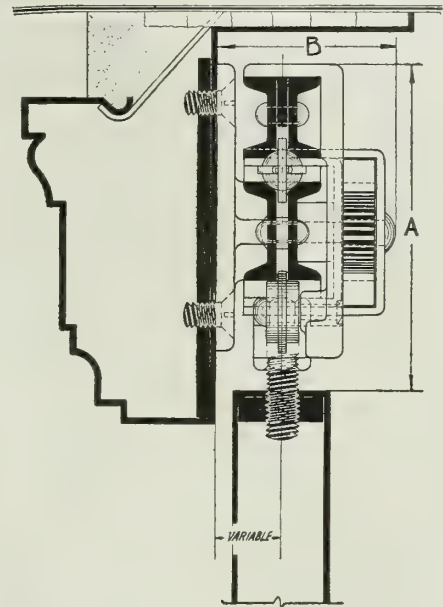
Types	Minimum		Maximum	
	A	B	A	B
210.....	5 1/2	3 3/8	6	3 3/8
211.....	5 1/2	4	6	4 5/8

How to SPECIFY—For iron and hollow metal doors up to 1 1/4 ins. thick, specify Type 210. For doors of any construction, 1 3/8 to 2 ins. thick, specify Type 211.

### Wagner-Star Hangers for Center-parting Doors.



WAGNER-STAR HANGER APPLIED TO CENTER-PARTING DOORS



CROSS SECTION OF HANGER FOR CENTER-PARTING DOORS  
1/3 actual size



PLAN OF CENTER-PARTING DOORS EQUIPPED WITH TYPES 400, 401 OR 402 HANGERS

DIMENSIONS, INS.

Type	Minimum		Maximum	
	A	B	A	B
400.....	5	2 1/8	5 1/2	3
401.....	5	3	5 1/2	3 1/8
402.....	5 1/2	3 1/2	6	3 1/2

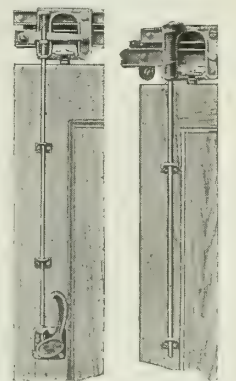
How to SPECIFY—For iron and hollow metal doors up to 1 1/8 ins. thick, specify Type 400. For iron and hollow metal doors from 1 1/4 to 2 ins. thick, specify Type 401. For wood and metal covered doors, 1 1/2 to 2 ins. thick, specify Type 402.

### Wagner-Star Elevator Door Locks.

TYPE A, GRAVITY SPRING LOCK—Operation is positive. Can not fail to work; weight of rod alone would be ample to bring it to a locked position, but this lock is also equipped with a spring which makes the action doubly sure. Illustration shows lock as an integral part of the hanger, which is the way it is regularly furnished.

TYPE B, SPRING LOCK—An efficient lock of the plain spring type, designed for use where Type A lock can not be used, as for instance, when it is desired to operate door from back end instead of the front.

FINISHES—Standard finish, black. Other finishes special.



TYPE A TYPE B  
WAGNER-STAR ELEVATOR DOOR LOCKS

Requires 1 1/4 ins. from face of door.  
Unless height is specified, locks are furnished for doors 7 ft. high

# COBURN TROLLEY TRACK MFG. CO.

## Standard Metal Covered Fire Doors and Shutters

### HOLYOKE, MASS.

#### WAREROOMS

NEW YORK, 90 West Street

PHILADELPHIA, 422 Commerce Street

CHICAGO, 65 East Lake Street

BOSTON, 180 High Street

### Products.

NATIONAL STANDARD TWO-PLY and THREE-PLY, DOUBLE and SINGLE LOCK JOINT METAL COVERED FIRE DOORS and SHUTTERS and HARDWARE; KALAMEIN IRON or COPPER COVERED PANEL DOORS and TRIM for general interior use; KALAMEIN IRON or COPPER COVERED ELEVATOR DOORS; HOUSE, BARN and GARAGE DOOR HANGERS and TRACK; "NO-TRAC" SLIDING DOOR HANGERS.

Swing Fire Door Iron Jamb Frames; Fire Door Fusible Link Fixtures; Rolling Ladders for high shelving; Overhead Track Conveying Systems.

### Standard Fireproof Doors and Shutters.

Manufactured, labeled and inspected under the supervision of the Underwriters' Laboratories, Inc., and carefully constructed to meet the requirements of building departments in all large cities.

This company also manufactures unlabeled doors.

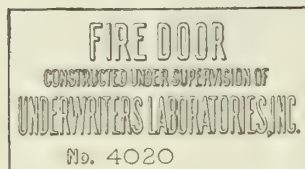
Doors and shutters that do not bear the labels have not been inspected by the Underwriters Laboratories, Inc.

in various styles to suit requirements. Those shown here are the National Style "A," which is probably the most popular labeled, incline slide, single door in use, and labeled Style "B," the double, inclined slide doors.

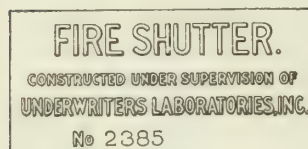
Regular Style "A" door is similar to National "Style A," but is not labeled. Style "E" is a single door on an inclined slide for limited headroom. Style "C," single door on level slide. Style "D," single door on level slide for limited headroom. Styles "G" and "H" are single, vertical slide doors. Style "J," double, vertical slide. Style "N," labeled, single swing door. Style "R," unlabeled single swing door. Style "NN," double swing doors, labeled or unlabeled. Style "RR," double swing doors, unlabeled.

SHUTTERS—Style "O," made with square or arched tops to fit the masonry opening.

DIMENSIONS—Drawings on which quotations are based should give the clear width and height of the opening and headroom over, and the thickness of the wall.



UNDERWRITERS' LABEL

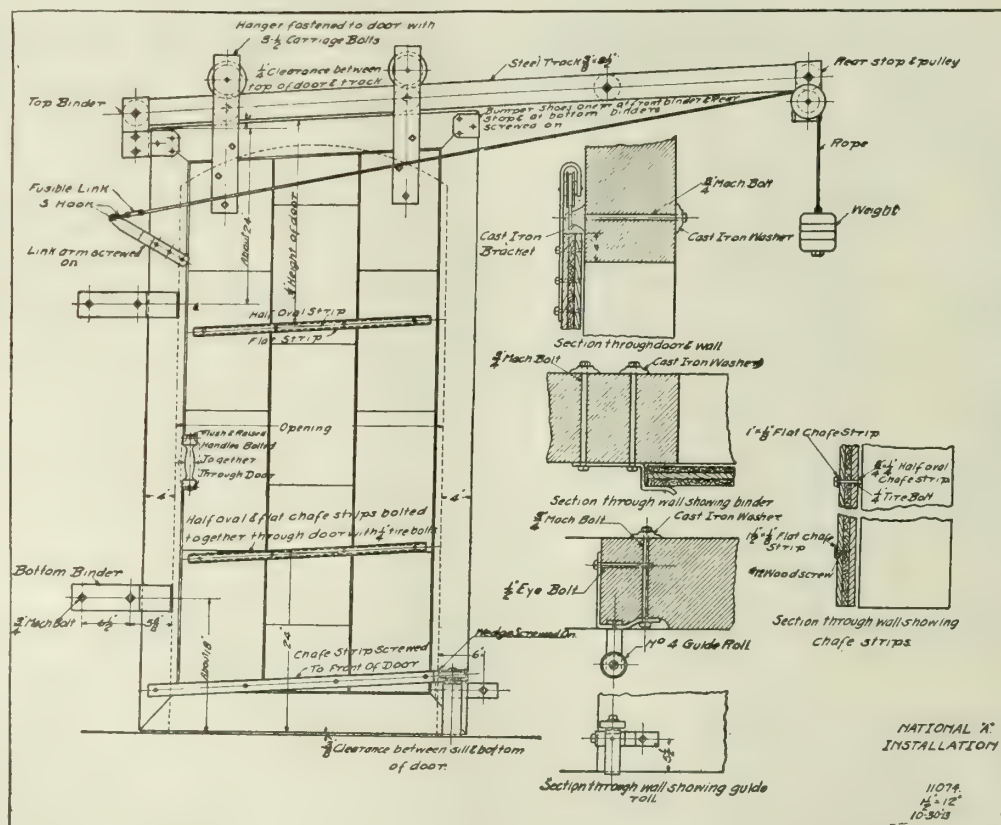


UNDERWRITERS' LABEL

**LABELLED DOORS—**  
Three-ply (2½ ins. thick), two-ply (1¾ ins. thick). Both are covered with 14 by 20-in. I. C. 113-lb. plates with double lock joints.

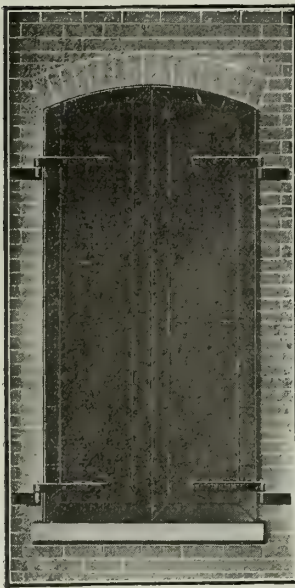
**UNLABELLED DOORS and SHUTTERS—**Same as above except covering, which is 14 by 20-in. 108-lb. plates with single lock joints.

**STYLES —** Standard fireproof doors are made



DETAILS OF NATIONAL STYLE "A" INCLINE SLIDE FIRE DOOR





STYLE "O"  
FIRE SHUTTERS

### Kalamein Doors.

The Coburn metal covered door in a fire-proof partition completely isolates the room from fire.

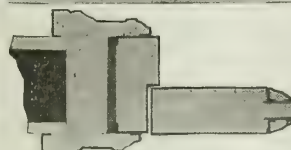
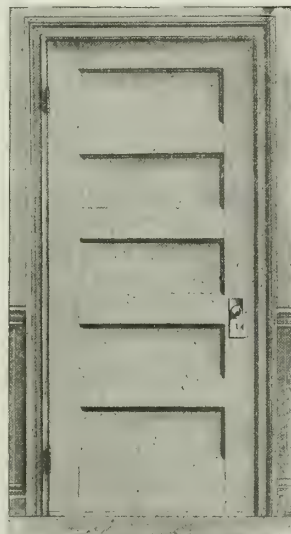
This company manufactures and carries a large stock of standard mouldings, jams and trim, and can produce special mouldings and trim to required details.

Doors are covered with kalamein iron, galvanized iron or copper.

**ELEVATOR DOORS**—Metal covered elevator doors are made to suit all standard conditions in a wide variety of stock patterns and to special design when desired.



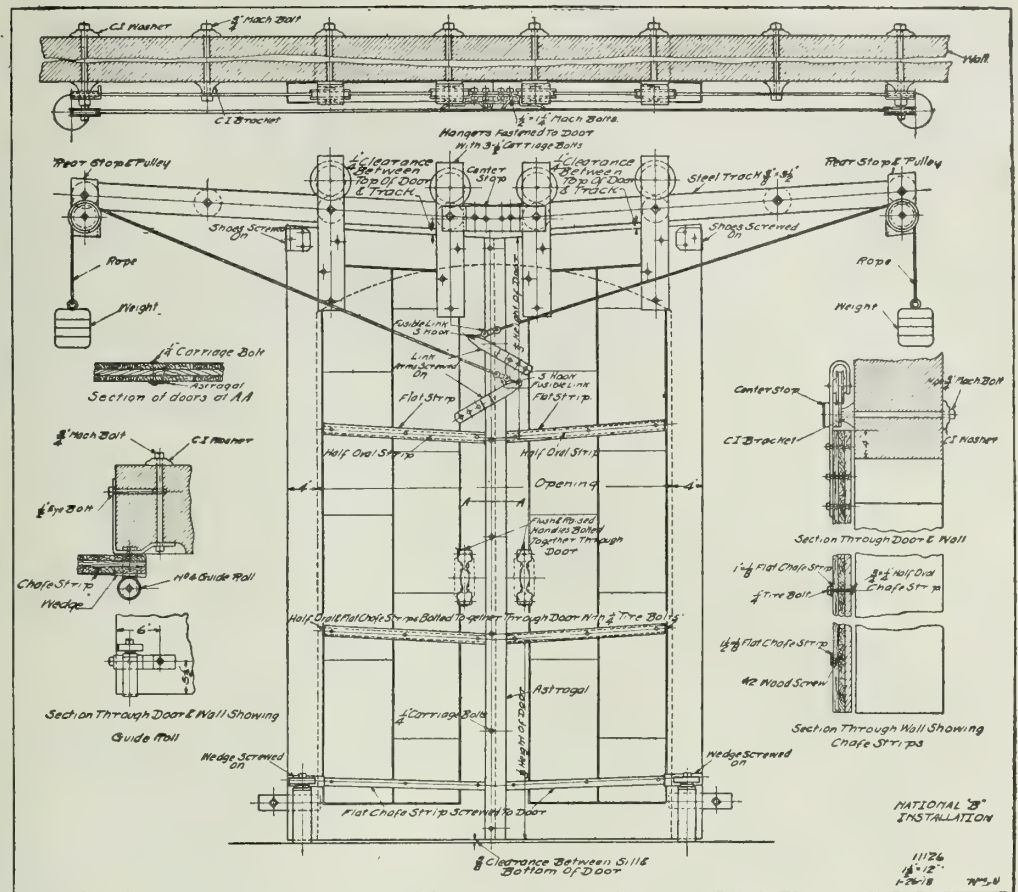
METAL COVERED PANEL  
ELEVATOR DOORS



COBURN METAL COVERED  
PANEL DOOR AND TRIM

### Coburn House, Barn and Garage Door Hangers.

These are a complete line and are made to suit various requirements.



DETAILS OF LABELED STYLE "B" FIRE DOORS

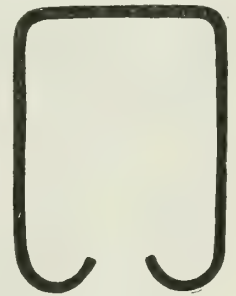
In specifying track, hangers and brackets, always give the thickness of doors.

**TRACK**—For doors 300 lbs. or less use No. 1 track; 500 lbs. or less, No. 2½ track; 1200 lbs. or less, No. 4 track. Doors exceeding 1200 lbs. require special track. Tracks Nos. 1 and 2½ are No. 16 gage steel; No. 4 is No. 13 gage steel.

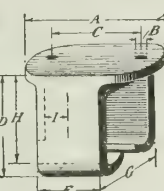
Curved tracks are furnished on correct radius for clearance of corner doors of different width.

**BRACKETS**—Should be placed 4 to 5 ft. on centers. For parallel runs of track "double run wall brackets" or "triple run wall brackets" should be used, except where storm shields are required. Where attached to outside of a building a hood should be used to protect the top of the door.

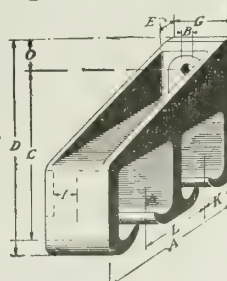
When storm shields are required use "single run" wall brackets with cast pads as shown.



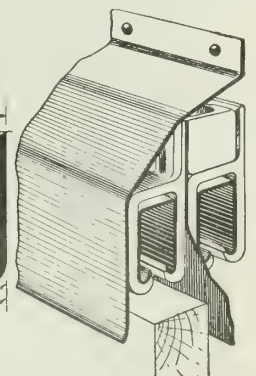
SECTION THROUGH  
TRACK



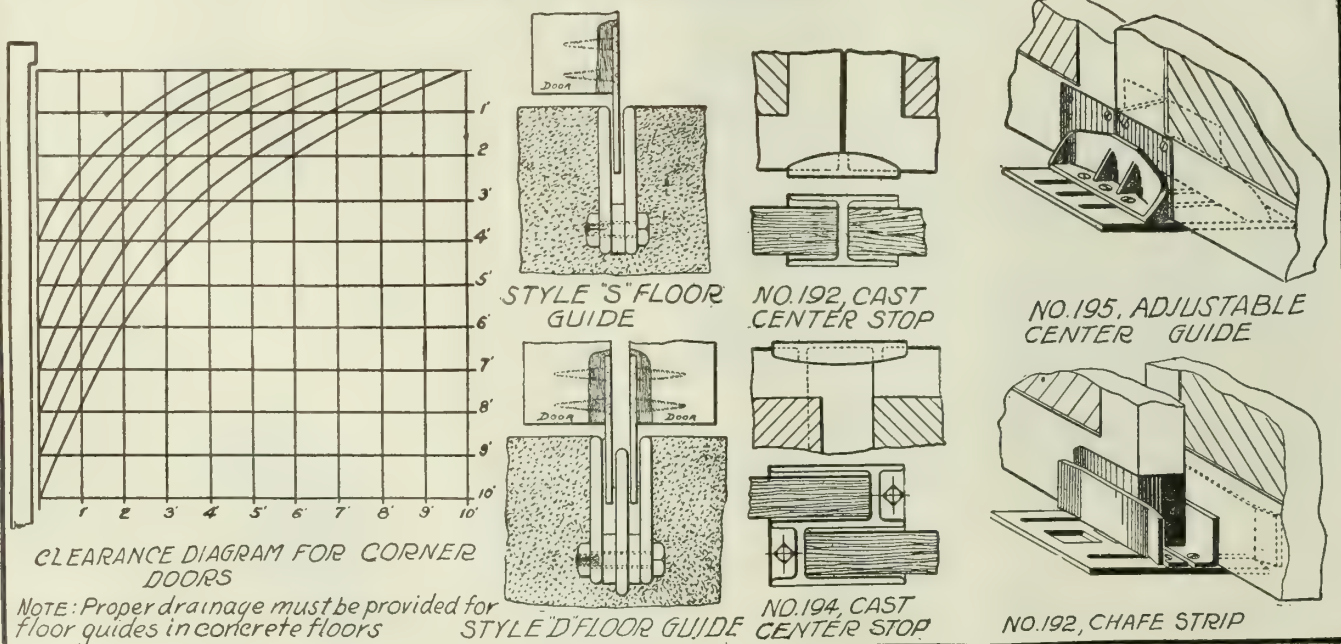
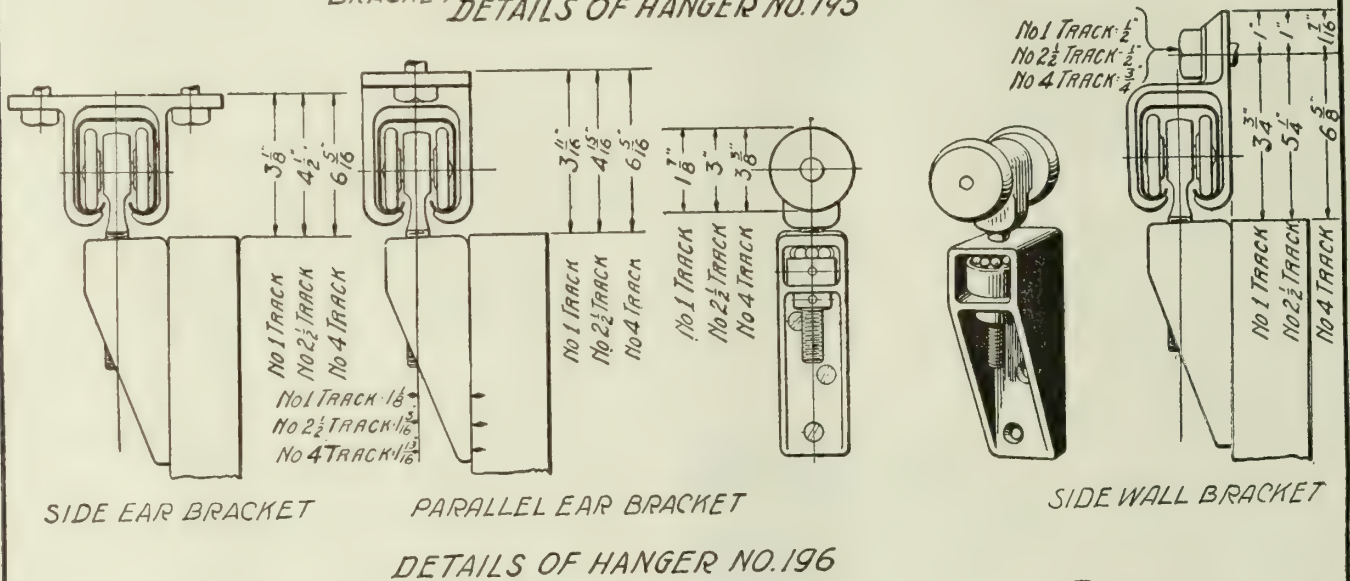
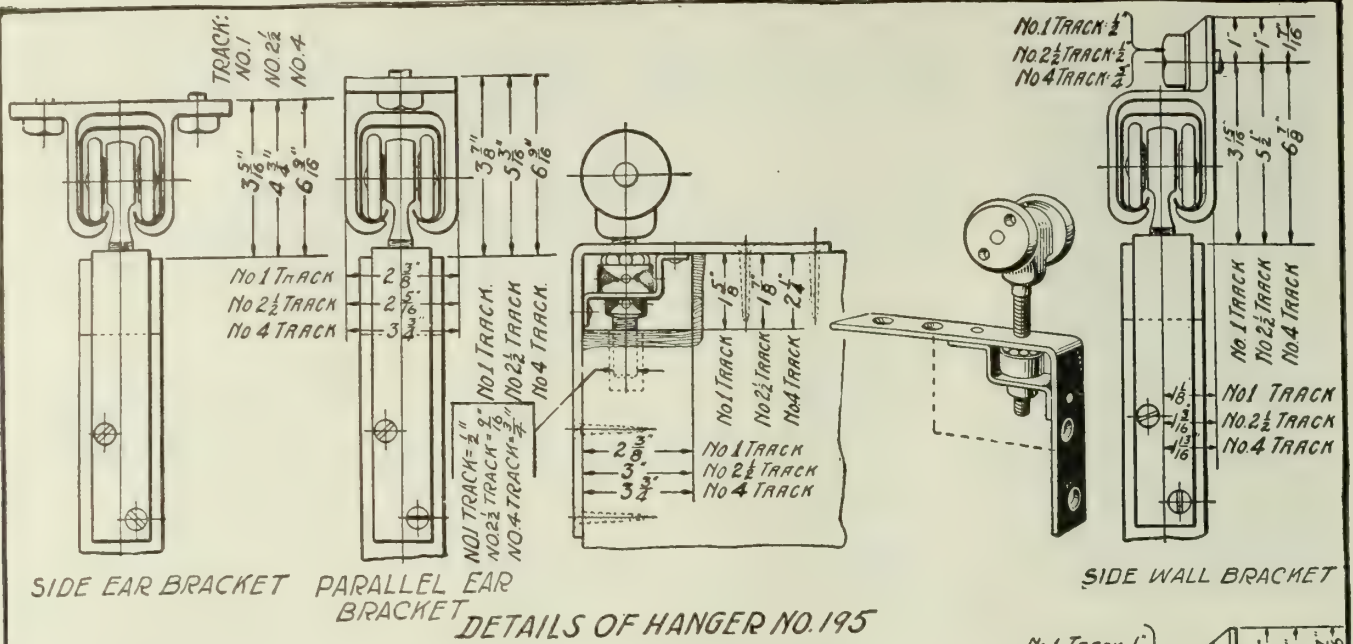
PARALLEL BAR  
BRACKET



DOUBLE RUN  
WALL BRACKET



HOOD WITH STYLE  
"T" STORM SHIELD



DETAILS OF COBURN HANGERS, FLOOR GUIDES, ETC.



# "No-trac" Door Hanger.

This is a patented device, the use of which permits a door, or set of doors, to be moved horizontally without tracks or trolleys.

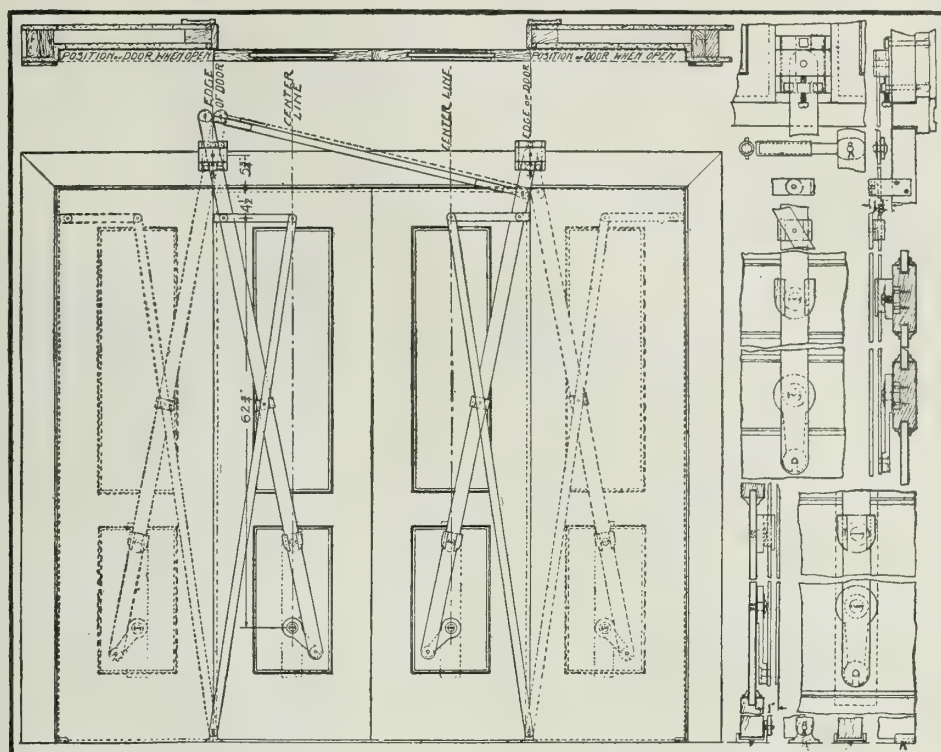
Each door is hung from a pivot above the head jamb of the opening to a simple but ingeniously devised pendulum, which is so modified by its connection to a crank arm and steadied by the relative action of a balancing device that the point where the door is sustained moves in a true horizontal line as the pendulum swings, and the plumb position of the door is thus maintained throughout its travel. The crank arm is either at the top or base of the pendulum as conditions of headroom, etc., dictate.

"No-trac" hangers are arranged for single, two-way and for three-speed doors, and self-closing devices are used for the different conditions when required.

The erection and adjustment is simple.

Pendulum and balancing device are concealed in hollow metal doors when desired and arranged for, and the cross section space required for their use under any circumstances is the minimum.

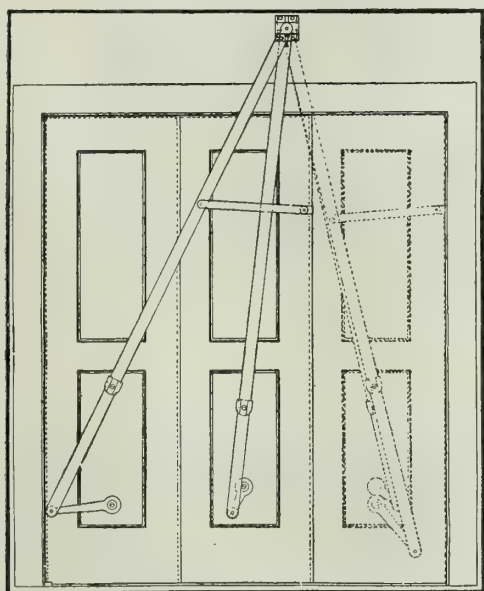
Simplicity of basic principle and strength of parts are an assurance of easy operation, freedom from continual readjustments and repairs, and of long life. The fact that in "No-trac" hangers there



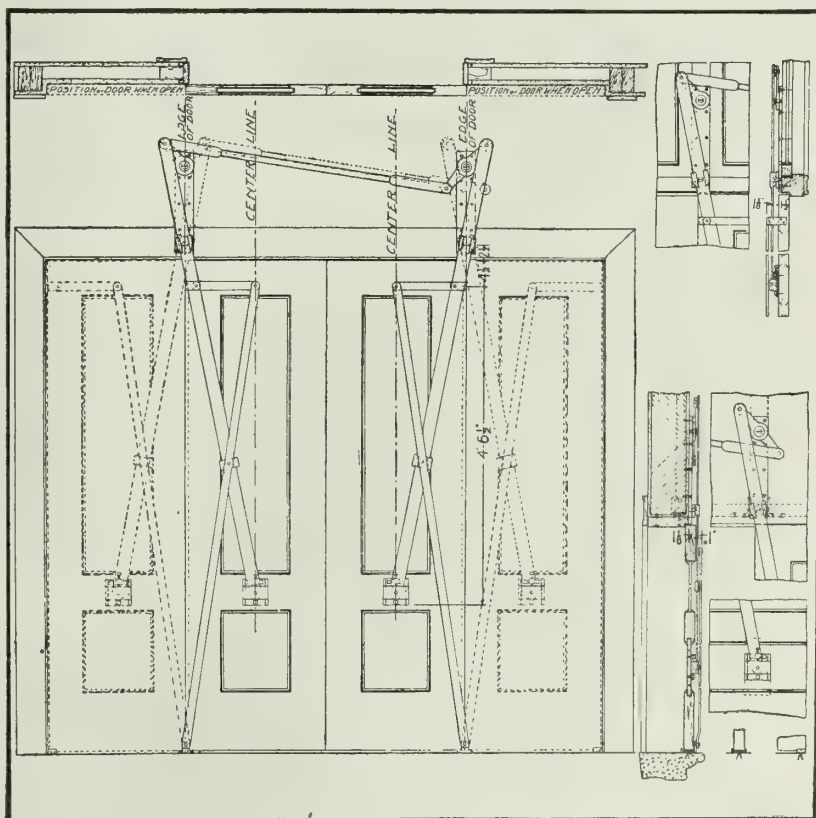
3/8-IN. AND 1/4-IN. SCALE DETAILS OF "NO-TRAC" (REVERSE) NON-AUTOMATIC HANGER APPLIED TO TWO-WAY DOORS

On "Regular" hanger, crank arm is at top of pendulum, as shown on details of two-speed doors

can be no operation where a bearing turns through a one-half revolution illustrates this simplicity of principle.



3/8-IN. SCALE DETAILS OF "NO-TRAC" HANGER APPLIED TO TWO-SPEED DOORS



3/8-IN. SCALE DETAILS OF "NO-TRAC" HANGER (REGULAR) APPLIED TO SINGLE DOOR

On "Reverse" hanger, crank arm is at bottom of pendulum

# HUNT, HELM, FERRIS & CO.

Manufacturers of Garage Door Equipment

99 Hunt Street  
HARVARD, ILL.

## Products.

GARAGE and BARN DOOR HANGERS.

Star Barn Equipment, Star Litter Carriers, Harvester Haying Tools, Hardware Specialties.

## Adaptability.

Especially designed for use on all types of garages.

Many different kinds of garages are being erected and the architect or contractor who investigates and decides on a standard type suitable for any structure he may erect, does away with trouble and insures satisfaction for his customer.

## Construction and Operation.

Construction calls for three doors, one acting as a service door hung separately on "T" hinges, and the other two connected in series and suspended from a hanger operating in a tubular track attached to the wall above. A special Cannon Ball adjustable garage hanger is attached at the end of the center door and travels back and forth in the tubular track as the doors open or close. A mere touch opens or closes the doors.

A heavy bracket and permanent spring in conjunction with the center bracket support the track. As the doors fold and slide back, this spring expands, permitting them to be folded flat against the wall regardless of the thickness of the doors. The moment they are stopped, the spring holds them firmly in place, making it impossible for wind to blow the doors against the incoming car.

## Advantages.

Since the garage houses several hundred or thousand dollars' worth of property, as the case may be, the hanging must be strictly weatherproof. Doors when open must be automatically held back so that a gust of wind will not whip them against the entering car. Non-sag doors insuring a tight connection, retaining heat and keeping out wind, rain and weather are also essential.

The Cannon Ball combination (folding-sliding) garage door set has been evolved to meet these requirements. When the doors are open they are automatically held in place by the patented spring bracket which supports the end of the track. A simple adjustment prevents the door sagging. The folding-sliding doors come inside, taking up a minimum of space and folding flat against the building. Like all Cannon Ball hangings, this garage set is frictionless, quiet, easy operating and durable.

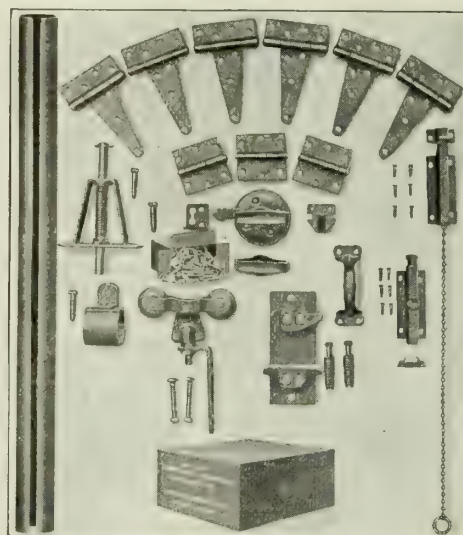
Snow and ice can never block the opening since the doors fold in and the tight closure in conjunction with the easy operation make it the ideal equipment for use under all conditions.

## How Supplied.

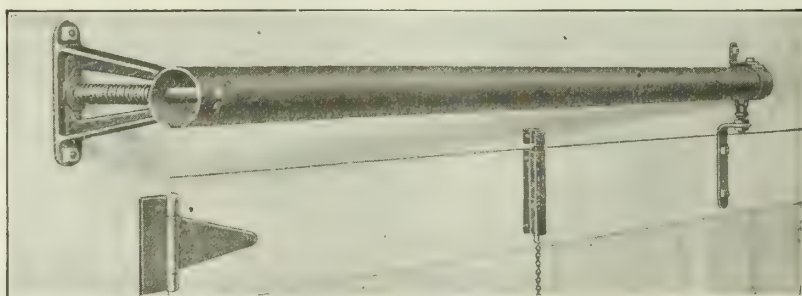
Sets come complete as shown, packed in box, ready for use.



CANNON BALL COMBINATION GARAGE DOOR SET IN USE



CANNON BALL COMBINATION (FOLDING-SLIDING) GARAGE DOOR SET  
Items complete



DETAIL OF SUSPENSION OF THE FOLDING-SLIDING DOORS



470 East Starr Avenue  
COLUMBUS, OHIO

AUSTIN, NALLE & Co.  
BOSTON, GREENBOUGH-HEDDINGER Co.  
BUFFALO, MONARCH BLDRS. SUPPLY  
Co.  
BUTTE, D. E. FRYER Co.  
CHICAGO, F. P. SMITH WIRE & IRON  
WORKS  
CINCINNATI, BUILDERS MATERIAL Co.  
CLEVELAND, MCWATTERS & Co.  
DAYTON, GEM CITY BRICK SALES Co.  
DENVER, G. P. HEINZ & Co.  
DETROIT, J. W. ROLLINSON  
GREAT FALLS, D. E. FRYER & Co.

HONOLULU, LEWERS & COOK  
INDIANAPOLIS, G. E. MORING  
KANSAS CITY, CONCRETE PRODUCTS  
Co.  
LOUISVILLE, FIREPROOF APPLIANCES  
Co.  
MILWAUKEE, C. COLNIK MFG. Co.  
NEW YORK, BETZ BROS., INC.  
OMAHA, C. B. KRAUS Co.  
PHILADELPHIA, PHILADELPHIA  
METAL FURNITURE Co.  
ROCHESTER, AMERICAN CLAY & CE-  
MENT CORP.

PORTLAND, ORE., TIMMS-CRESS Co.  
SAN FRANCISCO, C. JORGENSEN Co.  
SEATTLE, D. E. FRYER & Co.  
SPOKANE, D. E. FRYER & Co.  
ST. LOUIS, HICKENLOOPER MATERIAL  
Co.  
ST. PAUL, E. V. WALSH  
SYRACUSE, PARAGON PLASTER Co.  
TACOMA, D. E. FRYER & Co.  
UTICA, AMERICAN HARDWALL PLASTER  
Co.  
WASHINGTON, LALLY-ROHLADER Co.

STANDARDIZED HOLLOW STEEL DOORS for buildings of all characters; INTERIOR METAL TRIM; HOLLOW STEEL DOOR FRAMES of Standard Types, Sanitary and Combination Designs in both heavy and light gauges.

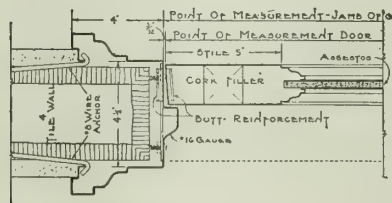
Hollow Steel Smoke Screens; Office Partitions; Elevator Enclosures; special forming, drawing and manufacture of Sheet Steel Shapes.

Door styles and rails made of No. 18 gauge, open hearth, cold rolled, patent leveled, furniture stock steel, reinforced with continuous specially drawn metal key interlocking at all points; all joints acetylene gas welded; cork sound deadener inserted in all rails and styles; panels of No. 20 gauge, open hearth, cold rolled, patent leveled, furniture stock steel, with special  $\frac{1}{4}$ -in. asbestos filler; heavy steel reinforcements, spot welded to door for all hardware units; sash doors provided with special snap-on glazing mould; frames made 3-piece or 1-piece, gas-welded, in gauges Nos. 10 to 18 as required; metal trim is cold drawn No. 18-gauge of any design selected.

Standard sizes of doors, from 1 ft. 4 ins. to 2 ft. 6 ins. in even inches, and from 2 ft. 6 ins. to 4 ft. in even 2 ins., by 7 ft. high by  $1\frac{3}{4}$  ins. thick, can be furnished for prompt shipment and at remarkably low prices.

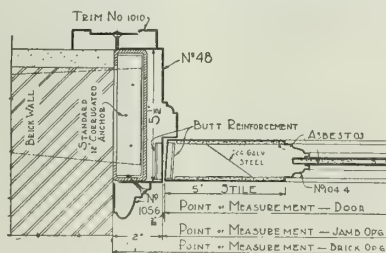
Doors and frames can be shipped promptly to meet Underwriters' requirements for vertical shafts, communicating openings or fire escapes.

When desired, products are finished in any of the flat enamel colors; reproductions of wood grainings or metal finish decorations.



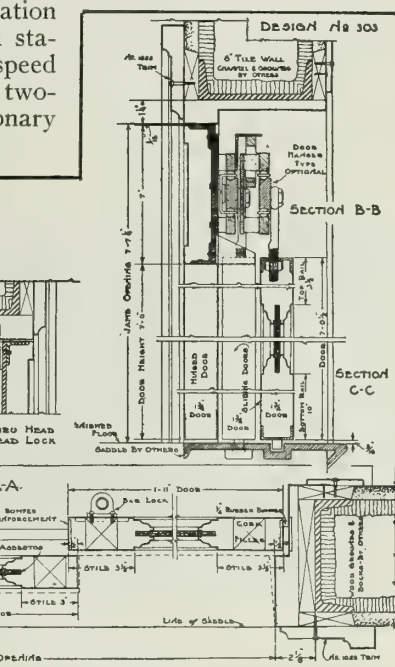
DESIGN NO. 261

Includes an improved type of frame, combining trim, jamb and buck in one unit—a practical and economical construction. May be specified: Solar design No. 261, standard door (mention size) wide by 7 ft. high by  $1\frac{3}{4}$  ins. thick, with Intero No. 16-gauge frame, with wall anchors and foot anchor and separator



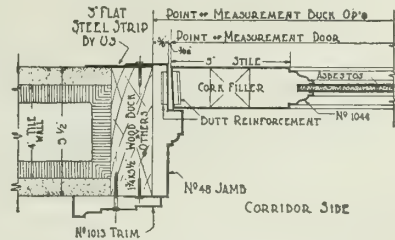
DESIGN NO. 153

Underwriters' labeled door for a Class "B" or vertical shaft opening. May be specified: Solar design No. 153, labeled door (mention width) by 7 ft. high by 1¾ ins. thick, with 1 [or 2] solid, asbestos lined panels, stiles and rails, Sempio No. 48 frame set over No. 12-gauge Underwriters' buck, with anchors, No. 1010 trim one side and No. 1056 closure mould one side



DESIGN NO. 303, ELEVATOR OPENING

A popular arrangement of hollow steel doors with frame. Two or three doors may be used, according to width of opening. Metal panel at top provides for installing hangers and keeping shaft clear. Opening may be specified: One set of 3 [or 2] Solar elevator doors, design No. 303, for opening (mention width); doors 7 ft. high by 1 3/4 ins. [or 1 1/2 ins.] thick, with No. 18-gauge reinforced frame with 7 ins. hollow metal fixed [or swing] reinforced panel to support elevator hardware, No. 1320 trim corridor side, and plain trim shaft side



DESIGN NO. 100

A very popular and inexpensive opening. Frame designed to set over a wooden buck. Unit may be placed in a wide brick wall by substituting scribe mould No. 1056 for the trim. May be specified: Solar design No. 100, 1 solid panel [a 2-panel or sash door may be substituted] door, (mention width) by 7 ft. high by 1½ ins. thick, with No. 48 Sempio frame, No. 1013 trim one side and 3 ins. flat steel strip one side

# ALIGNUM FIREPROOF PRODUCTS CO., INC.

Manufacturers of Fireproof Doors and other Fireproof Products

44 Whitehall Street  
NEW YORK, N. Y.

WESTERN OFFICE: 345 Ohio Building, TOLEDO, OHIO

FACTORY  
SOUTH RIVER, N. J.

## Products.

ALIGNUM FIREPROOF SWINGING AND SLIDING DOORS.

## Description of Alignum.

Alignum is manufactured in moulded form and in slabs from fireproof mineral components, amalgamated under hydraulic pressure. It possesses every good characteristic of wood; it is strong, yet resilient; it is worked the same as wood, and finished with practically the same materials.

Like wood, it is warm and agreeable to the touch; in fact, it is a still better insulator of heat and sound. Alignum is not subject to decay; does not swell, shrink or crack; is not friable, and nails may be driven nearer the edge than in hardwood. Its weight is greater, but the use of thinner sheets and hollow construction brings the weight of the finished product down close to that of wood.

There is no deteriorating action between Alignum and steel, nor any corrosion of steel surfaces bonded to it in the process of manufacture, not even when exposed to conditions of high humidity for long periods.

It can be effectively reinforced with wire mesh for extra strength. When covered with sheet metal, the metal is so bonded to the Alignum that it never buckles or becomes wavy, but remains permanently as true and flat as when made on the plates of the hydraulic press.

The Department of Buildings of New York City, and the Underwriters' Laboratories, Inc., have subjected it to the severest fire and water tests, and, as a result, Alignum and Alignum products have the general approval of these authorities.

## Distinctive Features of Alignum Doors.

All-Alignum doors are not only fireproof, but still possess every good feature of wood doors.

All-Alignum doors can be finished practically the same as any wood door, and this finish, because of the absence of surface joints and the permanence of Alignum as a material, lasts better than on wood doors.

Metal clad Alignum doors have surfaces which remain so true and flat, that in appearance they can hardly be distinguished from wood doors.

Metal clad Alignum doors are practically free from metallic sound, as the steel is so solidly backed up and bonded to Alignum over its entire surface, that it is not free to vibrate, and thereby reveal its metallic nature.

These are only a few of the many features of Alignum fireproof doors.

## All-Alignum Flush Door.

Alignum is made into this form of door more than into any other, because it is more economical to produce and is, therefore, the lowest price door manufactured by this company.

It has no exterior metal surfaces except the narrow steel shoe around the edges, and, therefore, embodies the advantages of Alignum in the highest degree.

Its construction is shown in the drawings; and since the surface sheets are united to the ribbed core

with a fire resisting glue between true press plates, it is made straight and true, and remains so.

It is excellent in appearance, the slightly raised edges preventing the cold severity of a perfectly plain surface. Where a panel effect is desired, it can be obtained by the use of suitable mouldings, making it a flush panel door.

**LABELED DOOR**—When constructed according to the drawings, it is not an approved door, although it answers every requirement for a thoroughly fireproof door; but when the underwriters' label is required, corrugated steel sheets are placed in the interior spaces.

## All-Alignum Paneled Door.

This door has two outstanding features: (1) The panels are the exposed parts of a full size door sheet; (2) there are no joints in what would, in a wood door, be the stiles and rails, for each of the two sides is cut from one solid slab of Alignum, with openings for the panels.

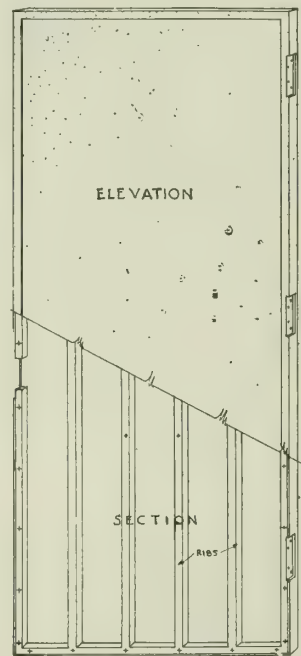
## Metal Clad Alignum Door.

This is a labeled door, to which the drawings on this page apply, except that the exterior surfaces are covered with sheet steel.

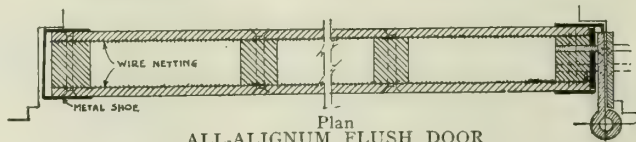
The close bond between the steel and its backing practically eliminates metallic sound, and prevents the metal from buckling or becoming wavy through changes in temperature.



White Flush Door



Elevation



ALL-ALIGNUM FLUSH DOOR



### Alignum Sliding Fire Wall Door.

Official tests have shown this metal clad door to be superior in fireproof qualities to most of the types of doors heretofore used for large openings in fire walls.

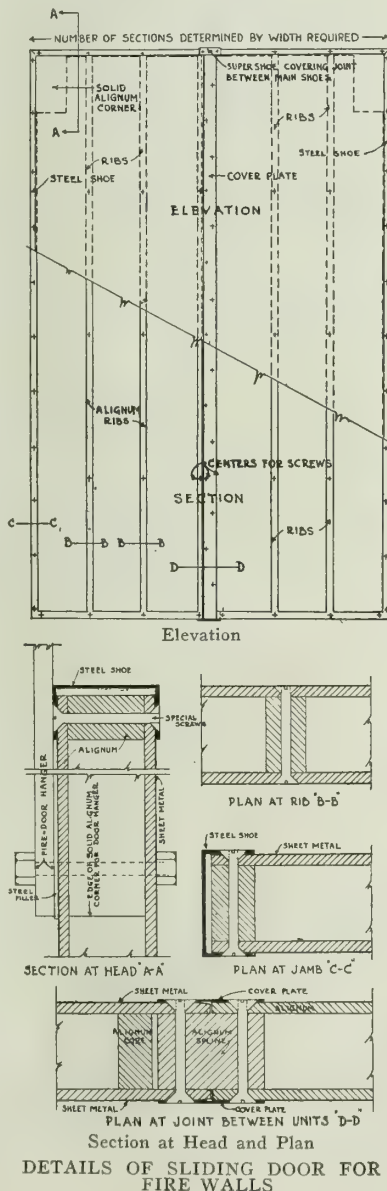
In general, it has proved in comparative tests to be a strong door, less apt to warp, a better barrier to the passage of flame or smoke, and exceptionally effective as a heat insulator. It suffers no serious loss of strength when submitted to severe fire tests, a property in which it is far superior to fire doors with built-up wood cores.

The underwriters also classify this door as durable and easy to maintain, which will be readily understood from what has already been pointed out in connection with Alignum as a product and the metal clad Alignum door, for the Alignum fire wall door is made up of one or more units, each unit being in every respect the equal of the regular metal clad Alignum door.

Those who have had to contend with the shipping, carting and erecting of 1-piece doors of large size, weighing several hundred pounds each, will quickly appreciate the advantages of a door that goes from the factory to the door opening in sections weighing 100 to 150 lbs. each. Such a door can be placed on any freight car, and any wagon can haul it. The sections can be carried through any door opening, and two men, instead of six, can handle it up to the point of setting the door on its tracks. It is the only approved door which has this advantage.

The sectional construction introduces no offsetting disadvantages, for the door is actually strongest at the joints. The drawings make this clear. They show that at each joint there is a spline, permanently a part of one section and slips into the adjoining section like a tongue. Steel plates cover the entire joint; a super-shoe of steel reinforces it at top and bottom, and the bolts pass clear through every part composing the joint, which, as a result, is the strongest part of the door, and 100% efficient in a fire test.

At the job, the door is put together in a few minutes, as it is completely assembled at the factory, all necessary holes drilled and parts properly marked down for shipment.



DETAILS OF SLIDING DOOR FOR FIRE WALLS

### Attachment of Hardware.

ALL-ALIGNUM AND METAL CLAD ALIGNUM DOORS—Any standard lock or butts can be applied.

ALIGNUM SLIDING FIRE WALL DOORS—Any standard hardware for 2-ply fire doors can be applied.

### Sizes.

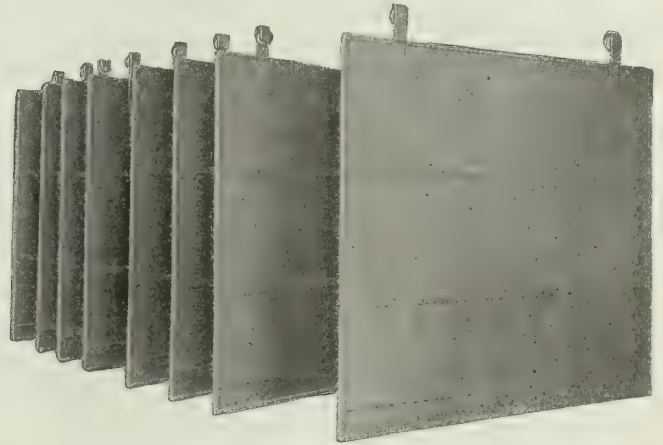
ALL-ALIGNUM AND METAL CLAD ALIGNUM DOORS—Made in standard sizes ranging from 2 ft. 6 ins. to 3 ft. 9 ins. wide and from 6 ft. to 9 ft. high; while the standard thickness is 1½ ins. for the All-Alignum and 2 ins. for the metal clad door. Special sizes or styles made to order.

ALIGNUM SLIDING FIRE WALL DOORS—The standard maximum width per section is 3 ft. 10 ins., the standard maximum height 9 ft. 9 ins., the standard thickness 2 ins. Any practical width or height can be built up out of sections; a door 10 ft. wide, for instance, consisting of 3 sections. The limit to size, if any, would be imposed by the underwriters' requirements.

### Government Recognition.

Illustration shows part of a shipment of steel clad Alignum fire doors for the United States Government, which is using hundreds of doors made by this company.

Since these doors had to be thoroughly fireproof, and at the same time able to endure trying weather conditions, great care was exercised in making a selection, and the Alignum door was adopted only after a comprehensive study of the various types of fire doors had convinced the Government's experts that Alignum doors possessed, more than any others, the desirable features.



ALIGNUM DOORS MADE FOR U. S. GOVERNMENT

### Deliveries.

Advantages in methods of manufacture enable the company to start deliveries on any standard Alignum doors generally two weeks from receipt of complete information. This does not apply when special finishes are required.

### Exhibition of Samples.

Samples of Alignum fireproof doors are on exhibition at the Architects Samples Co., 101 Park Avenue, New York, N. Y.

### Catalogue.

Catalogue contains complete detailed information on every type of Alignum door and other Alignum fireproof products. It will be sent to those interested in a fireproof door which, although offered decidedly on the basis of quality, can be manufactured at very favorable prices on account of certain advantages in methods.

# CENTRAL METALLIC DOOR CO.

Manufacturers of Hollow Metal Doors and Trim

GARY, IND.

CHICAGO OFFICE: BUILDING MATERIAL EXHIBIT, INSURANCE EXCHANGE BUILDING

## Products.

STANDARD HOLLOW METAL DOORS, approved by the Underwriters' Laboratories, Inc.; INTERIOR METAL TRIM and METAL PARTITIONS.

## Construction.

Doors are made of No. 18-gauge material, fitted with accurately drawn metal moulding of same gauge, so interlocked with other members as to secure maximum rigidity and strength. Mouldings are accurately mitred and fitted, and all joints welded by the acetylene process, insuring a perfectly finished product. Glass panels are fitted with removable metal glass stops. Proper reinforcements are applied for fastening, finishing and operating hardware.

## Types.

We have facilities for manufacturing all standard types of doors, and special doors, including entrances, vestibules, elevator enclosures, etc. Panel designs glass or metal, furnished as desired.

## Frames and Trim.

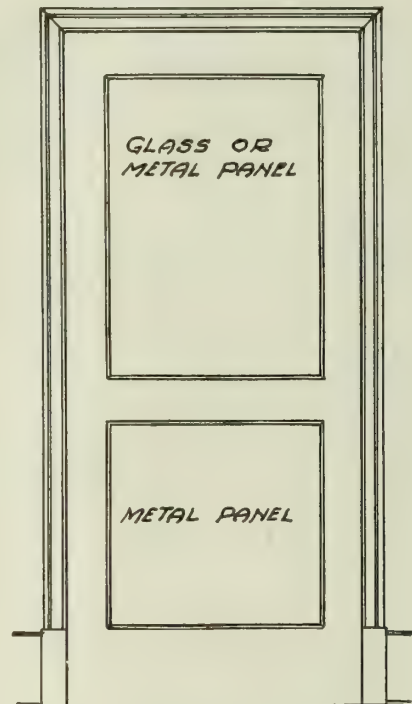
Jamb casings of No. 18-gauge metal for mounting over wood bucks are furnished with doors where required. We are also prepared to manufacture steel subframes of No. 12-gauge material, and special one-piece frames for walls of any construction or thickness. Finishing trim of up-to-date designs furnished as required for door opening, borrowed lights, and interior partitions.

## Finish.

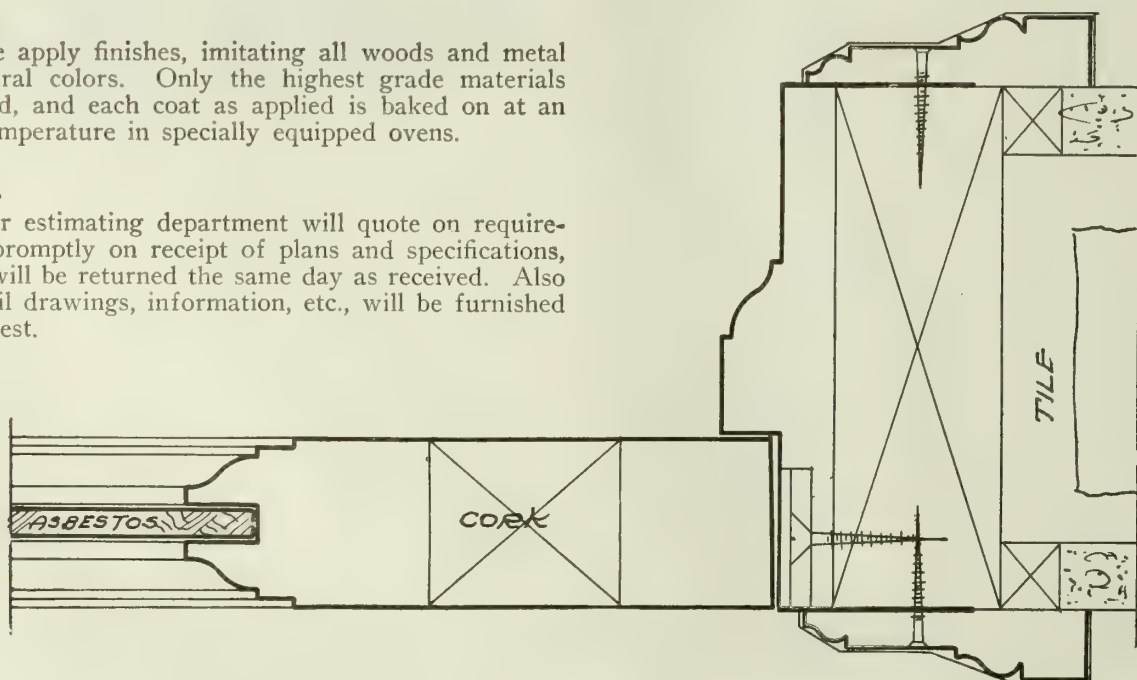
We apply finishes, imitating all woods and metal in natural colors. Only the highest grade materials are used, and each coat as applied is baked on at an even temperature in specially equipped ovens.

## Service.

Our estimating department will quote on requirements promptly on receipt of plans and specifications, which will be returned the same day as received. Also all detail drawings, information, etc., will be furnished on request.



METAL DOOR  
Approved by Underwriters' Laboratories, Inc.



PLAN OF JAMB



# DAHLSTROM METALLIC DOOR COMPANY

CABLE ADDRESS:  
"DAHLSTROM, JAMESTOWN"

EXECUTIVE OFFICES AND FACTORIES  
JAMESTOWN, N. Y.

BRANCH OFFICES IN NEW YORK AND CHICAGO  
REPRESENTATIVES IN PRINCIPAL CITIES

## Products.

HOLLOW METAL DOORS, PARTITIONS and TRIM in Steel, Iron, Brass and Bronze.

COLD DRAWN METAL MOULDINGS and PRESSED SHAPES for ornamental work, bank fixtures, counter screens, elevator enclosures and special work.

## Services.

Architects are invited to make use of the Dahlstrom service, which is of an extensive and comprehensive character. This company's aim is:

To promote the use of Dahlstrom hollow metal products in a practical way to *complete* the fireproofing of any building, in other respects fireproof.

To produce the most economical combination of correct design with practical construction.

To supply complete information regarding approved methods and best practices of the art, including full details and clear specifications covering each division of work.

To furnish promptly a detailed estimate of cost of the contemplated work, based on accurate records of production costs in the various departments, eliminating guesswork.

To submit for approval, before fabrication, complete submission details, each sheet showing the construction, assembling, and detailed measurements of the work; also showing the hardware selected to be fitted, and the class of finish desired.

To execute promptly in an efficient manner all orders to the satisfaction of the customer, and to insure delivery of work at the time required.

When desired, installation of work in a building will be included in the contract. The work will then be carefully fitted and adjusted in place under the supervision of an experienced foreman, insuring satisfaction. As Dahlstrom products are factory finished and the different parts fitted, time will be saved by having the building cleaned before starting to install the work and there will be less danger of damage to finished material.

Interest in the hollow metal work furnished by this company does not cease on completion of the contract, for it is ready at any time to render further service or to advise regarding the proper care and adjustment of the work.

## Adaptability.

Dahlstrom products are especially adapted for installation in loft and office buildings, theaters, clubs, schools, hospitals, banks, hotels, apartment houses, residences, ships and railroad cars.

## Description.

Dahlstrom products include all necessary interior trim, of which doors are but a part. They include everything necessary for completing the interior fireproofing of a building, such as doors and trim, partition window sash and frames, casings, picture mouldings, wainscoting, chair rails and the like; in fact, Dahlstrom



TRADE-MARK

products are made to replace wooden doors and trim ordinarily used.

Among the many new improvements recently adopted, the following may be of particular interest:

Finished heavy metal unit frames, eliminating the use of separate bucks. Simplified construction and adjustable solid contact fastenings of metal partitions. Three-point gravity lock and closing device, with or

without panic bar attachment. Oxy-acetylene seam welding, also electric butt and spot welding. Concealed fastenings of casings and other trim.

The use of ingot rust resisting iron, treated in a new rustproofing process, for work exposed to the elements, thus insuring longer life to such work.

**BRONZE WORK**—Dahlstrom bronze doors and trim are made from heavy gage cold rolled bronze plates (not less than No. 14-gage for stiles and rails of doors), and all construction plates and reinforcements within the doors are of ample thickness to insure maximum strength and permanency.

Architects' designs are carefully followed and all details executed in an artistic manner. Specifications and illustrations of standard designs furnished on request.

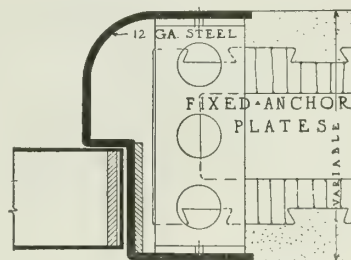
**UNIT-FRAMES**—Dahlstrom unit-frames (Mann Patent) of the socket or built-in type for doors and windows are fully protected by patent rights. The DAHLSTROM METALLIC DOOR COMPANY has the sole manufacturing rights under the original patents and is prepared to render efficient service in supplying the building trades with metal combination buck and jamb frames in standard forms similar to the sketch shown.

These frames are made of heavy sections, formed from cold rolled sheet steel, and may be adapted to any special condition. The weight of the metal used varies from No. 16 to No. 10 U. S. Standard according to the condition met. Frames formed of the heavier gages are eligible to Underwriters' label service.

Anchor plates are provided to engage in the masonry joints, thus insuring the maximum of strength and permanency as well as the minimum of labor and expense of installation.

The miters of the frames are process welded, thus insuring rigid and tight joints which can not open up. The frames when shipped from the factory are provided with spreaders, and when delivered at the building are ready for installation. This eliminates the use of expensive labor, as it is only necessary to properly place them in their intended positions and complete the masonry around them.

Unit-frames are especially recommended for use



DAHLSTROM UNIT-FRAMES  
(MANN PATENT)

in hospital and school buildings where a sanitary flush wall finish is desirable.

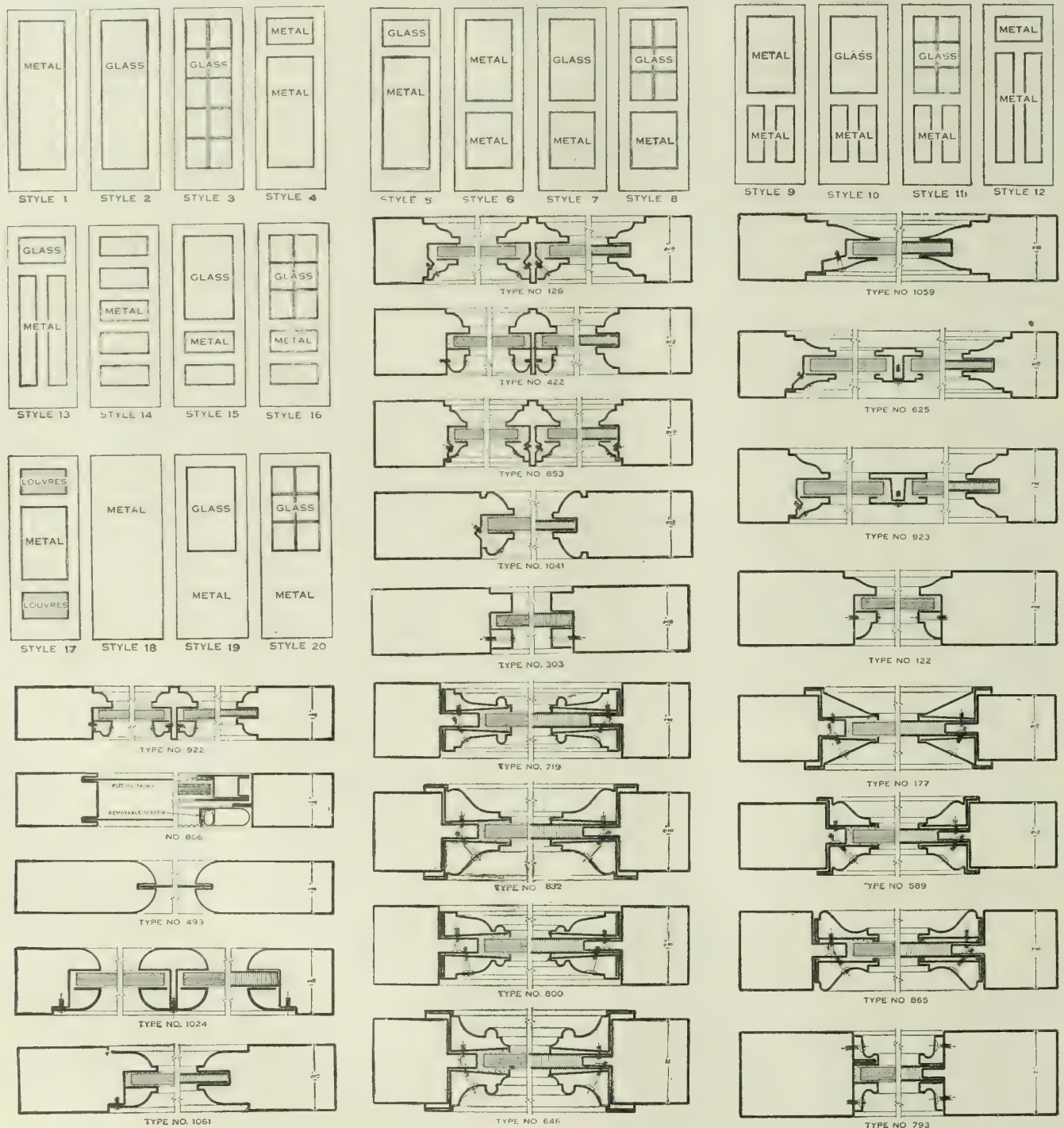
Literature and drawings, showing the use of Dahlstrom unit-frames suitable for various wall conditions, will be mailed to interested parties on request.

**THREE-POINT LOCK**—One of the requirements of the Board of Fire Underwriters is that swinging fire doors for stair halls and similar locations must be locked at not less than 3 points, to prevent the doors from warping away from the frames in case of fire, which would allow the flames to pass through. The multiple gravity latch is another Dahlstrom perfected product of unusual merit, entirely contained within the hollow metal doors. This locking device is approved by the Underwriters' Laboratories, Inc., and a booklet with full description will be sent on request.

**PANIC BAR AND CHECKING DEVICE**—An improved panic bar can be furnished in connection with the 3-point locking device; also a checking device, for use on automatically closing double doors, to prevent the service door from closing until the opposite door is in place in the opening. Both of these devices are Dahlstrom developments.

### Styles and Types of Doors and Mouldings.

The illustrations show a number of general styles of doors, as well as standard and special types of panel mouldings, which have been numbered for ready reference. In ordering doors, it is only necessary to specify the style of doors, and types; thus: Style 5, type 126, in addition to the size of opening, width of jamb, and whether casings or staff mouldings are wanted for one or both sides.



STYLES AND TYPES OF DAHLSTROM HOLLOW METAL DOORS  
Including standard and special types of panel mouldings



### Finish.

The superior finish for which the Dahlstrom products are noted is the result of the most careful selection of the ingredients used in the enamel, the chemical properties of which have been carefully tested for fine and lasting qualities. This chemical perfection of ingredients, together with expert workmanship and careful baking of each coat of the enamel, insures a durable, elastic finish that is satisfactory in every way. Natural wood or metallic finishes are reproduced in a perfect manner in any color. Plain color finishes can be made to harmonize with any decorative scheme desired.

Upon request a sample piece of steel treated in the Dahlstrom standard process will be sent, from which can be gained a fair idea of the elasticity of the finish. The steel can be bent and re-bent without the finish showing any cracks or peeling off, and will withstand, without visible effect, the blows of a hammer.



STEEL DOOR FINISHED IN MAHOGANY

### Hardware.

To facilitate quick delivery and avoid undue delay, hundreds of samples of standardized hardware have been obtained from different manufacturers so that all ordinary demands for samples can be met. Thus a suitable model is almost sure to be found in the sample room of this company, from which the hollow metal work can be fitted and time saved.

### Tests and Approval.

The National Board of Fire Underwriters of Chicago have tested and approved these products, and their labels of inspection are furnished when desired.

The Building Departments of the larger cities in the United States have also given their approval.

### Quality and Cost.

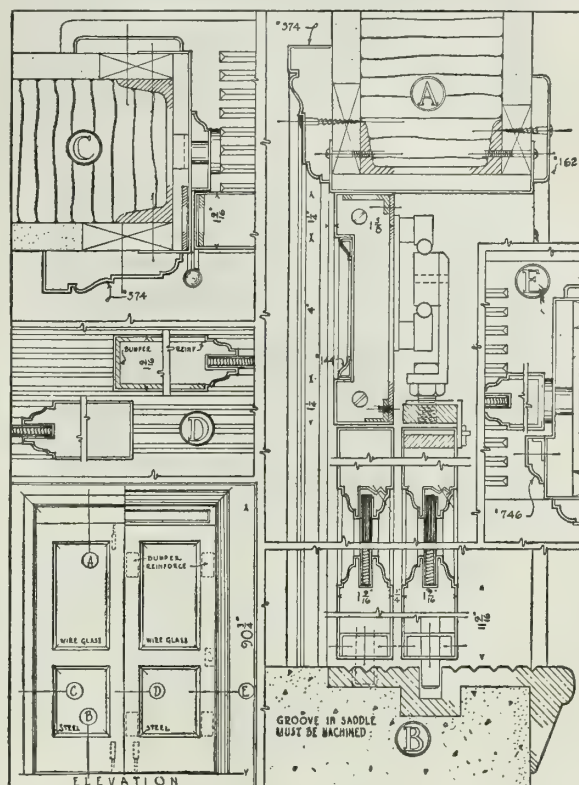
The Dahlstrom products are well known for their superior quality, only first class materials and expert workmanship entering into their manufacture.

A semblance of the Dahlstrom products can be produced at a lower cost, but the inferiority of the cheaper grade, to the Dahlstrom make, is marked.

### Specifications.

Complete specifications of hollow metal work consist of 25 or more sub-divisions. By indicating the

class of work under consideration, an architect will receive, on request, complete specifications covering the different parts, including finish. This company is ready to offer suggestions for specifications covering any special feature desired.



SPECIMEN DETAILS OF DAHLSTROM METAL ELEVATOR DOORS

### Mouldings and Shapes.

The special features and advantages of the Dahlstrom line of cold drawn metal mouldings and shapes are now so well known as to need no further comment. A request will bring an indexed catalogue showing 1500 different mouldings and shapes.

### Experience and Facilities.

The DAHLSTROM METALLIC DOOR COMPANY is the pioneer and leader in the hollow metal fireproof door and trim industry. The Dahlstrom factories are the largest of their kind in the world, completely equipped, and the large annual production insures lowest possible manufacturing cost.

### Portfolio of Details.

A Portfolio of Details of Hollow Metal Construction, which is free to any practising architect, covers a wide range of methods used. It is a handy ready reference volume for the architect's library, and represents the result of the best thought on this subject.

### Specimen Work.

There are hundreds of buildings of different classes in all parts of the country where Dahlstrom products have been installed. On request, stating the class of building interested in, a list of near-by buildings will be sent, where the work can be inspected.

# HOWELL, FIELD & GODDARD, INC.

Metal Covered Doors, Windows and Interior Finish, Steel Bucks and Trim

Review Avenue, Young and Gilbert Streets

LONG ISLAND CITY, N. Y.

Telephones: Office and Factory, Hunters Point 1901 and 1902

## Products.

METAL COVERED DOORS; ACME COMBINED STEEL BUCK and JAMB, for doors and windows; ALL-STEEL COMBINED BUCK, JAMB and TRIM; SANITARY STEEL HOSPITAL BUCKS; ALL-STEEL PORTABLE HOUSES.

Metal Covered Doors and Windows of all types; Interior Metal Trim; Underwriters' Fire Doors of all types.

## Information and Service Department.

Architects and owners with problems on underwriter or insurance requirements regarding location, or manner of installing fireproof doors and windows, may write this company and it will be pleased to furnish specifications and details covering all requirements.

To facilitate the manufacture and sale of these products, and to assist architects in selecting and specifying the material best suited to their requirements, distinguishing trade-names have been given to the different types of doors manufactured.

## Standwell Metal Covered Doors (Patents Pending).

In the Standwell construction, the metal covering of stiles and rails is of tubular form, entirely covering wood cores. This metal is joined to panel metal by welding, making the basic construction of the door one-piece, and assures effective fire retardation irrespective of any superimposed panel arrangement. Intermediate rails and muntins are nailed, screwed or soldered to the basic construction and do not detract from fire retarding qualities.

Panel moulds are preferably of drawn steel, but metal covered or wood moulds could be used. These moulds are screwed or nailed in place.

The basic construction is a door of one-panel type, and the more panels superimposed, the more costly the door.

The joints between stiles and rails are locked by a patent process (see section B-B below) assuring the strongest joint it is possible to produce; these joints, being filled with solder in the process, are polished over and are practically invisible.

The Standwell method of construction allows the

metal surfaces of the stiles and rails at joints to be flush without the use of any plastic filler.

All metal carefully selected for quality and freeness from waves and buckles, and of most efficient gage (Nos. 26 to 22 as required). This means that in the Standwell construction, the doors could stand up in service even if the wood core was removed.

Standwell doors are particularly suited for vertical shaft, fire escape, corridor and partition openings wherever underwriters' labels are required.

## All-steel Combined Bucks, Jambs and Trim.

Bucks of this type, as shown in Figs. 2, 3, 4 and 5, can not be excelled for beauty, strength and durability, or economy.

They are easily installed at the building, and eliminate the necessity of using rough bucks, separate jambs and plaster grounds.

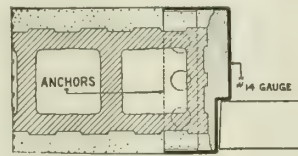


FIG. 2. SANITARY HOSPITAL BUCK

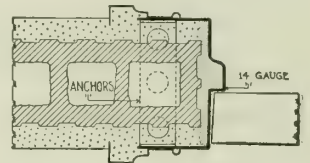


FIG. 3. STEEL BUCKS WITH MOULDED STEEL

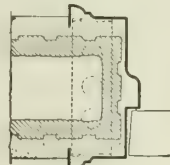


FIG. 4. SPECIAL MOULDED STEEL BUCKS

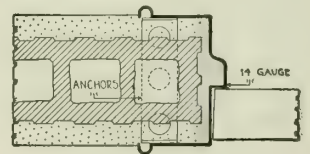


FIG. 5

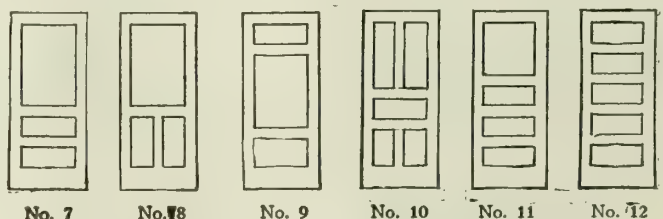
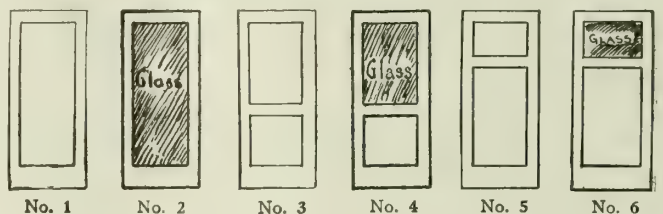


FIG. 6. TYPICAL DESIGNS FOR METAL COVERED DOORS  
Doors of the Standwell type are made in designs 1 to 6, inclusive; and miscellaneous kalamein doors, in designs 1 to 12, inclusive

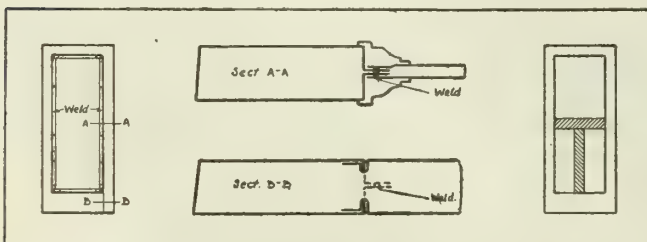


FIG. 1. DETAILS SHOWING CONSTRUCTION OF THE STANDWELL DOOR



**Acme Bucks.**

Combined buck and jamb, covered on all sides with kalamein iron, add to the fireproof qualities of a building and avoid the necessity of rough bucks and plaster grounds, making a distinct saving.

See Figs. 7, 8 and 9.

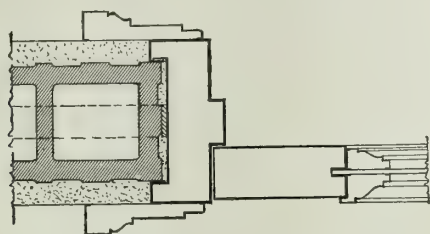


FIG. 7. ACME BUCK AND SIMPLEX DOOR

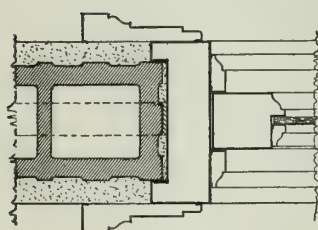


FIG. 8. ACME BUCK AND SASH

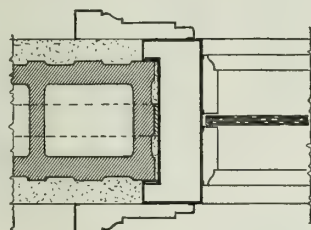


FIG. 9. ACME PARTITION FRAME

**Underwriters' Labels.**

Panel doors for vertical shaft openings of Standwell type will be labeled for single doors up to 48 ins. wide, and for pairs up to 72 ins. wide.

Glass opening doors for corridor and room partitions of Standwell type will be labeled without limitation in size, and with or without wire glass panels. Glass not to exceed 36 ins. in either dimension.

Glass opening doors for fire escapes of Standwell type will be labeled for single doors 48 ins. wide, and for pairs 72 ins. wide. Each light of wire glass not to exceed 720 sq. ins. exposed surface.

Glass opening doors can not be labeled by any manufacturer for use in vertical shaft openings.

Doors can be labeled regardless of frame; but in order to obtain the maximum insurance credit, doors must be hung in a manner approved by the local underwriters having jurisdiction.

Standwell labeled doors, when hung to steel bucks, as shown in Figs. 2, 3, 4 and 5, or to channel or angle iron frames, as approved by the underwriters, when equipped with approved hardware, will procure the lowest insurance rate obtainable.

**Portable Steel Buildings.**

This company manufactures all-steel portable buildings for all purposes, such as garages, storage buildings, contractors' houses and living houses for workmen.

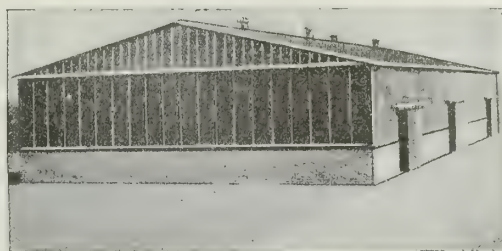
Doors and windows are arranged to be interchangeable from one location to another.

All parts are interchangeable and can be erected by unskilled labor without cutting or fitting any of the parts.

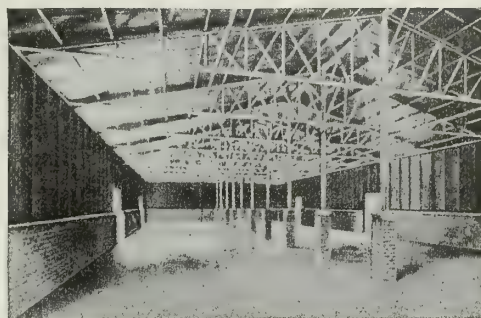
Buildings have double walls with air space, making them warm in winter and cool in summer.

All of our buildings are guaranteed weathertight.

Write for complete data.



Exterior View



Interior View

PORTABLE STEEL STORAGE BUILDING

**A Few Noteworthy H. F. G. Installations.**

Astor Court Apartments, Broadway and 89th Street, New York City, Chas. A. Platt, Architect

Apartment, Fifth Avenue and 63rd Street, New York City, Starrett & Van Vleck, Architects

Astor Trust Company, Fifth Avenue and 42nd Street, New York City, Montague Flagg, 2nd, Architect

Arnold Constable Building, Fifth Avenue and 40th Street, New York City, James T. Bartley, Architect

William Penn Hotel, Pittsburgh, Pa., Janssen & Abbott, Architects

Hotel Traymore, Atlantic City, N. J., Price and McLanahan, Architects

20-story Office Building, 18 East 41st Street, New York City, George and Edward Blum, Architects

16-story Office Building, 38th Street and Madison Avenue, New York City, Jardine, Hill & Murdock, Architects

20-story Hotel Pennsylvania, Seventh Avenue and West 33rd Street, New York City, McKim, Mead & White, Architects

23-story Office and Loft Building, 40th Street and Madison Avenue, New York City, Starrett & Van Vleck, Architects

23-story Office Building, Court and Remsen Streets, Brooklyn, N. Y., Starrett & Van Vleck, Architects

17-story Berkley Arcade Office Building, 15 West 44th Street, New York City, Starrett & Van Vleck, Architects

Winfield Building, 40th Street and Fifth Avenue, New York City, Jardine, Hill & Murdock, Architects

17-story Apartment, 420 Park Avenue, New York City, Warren & Wetmore, Architects

Cleveland Leader Building, Cleveland, Ohio, Chas. A. Platt, Architect

East Ohio Gas Company's Building, Cleveland, Ohio, Wm. B. Tubby, Architect

Nassau County Courthouse, Mineola, L. I., N. Y., Wm. B. Tubby, Architect

Filene Building, Boston, Mass., D. H. Burnham Co., Architects

Missouri State Capitol, Jefferson City, Mo., Tracy & Swartwout, Architects

Missouri State Athletic Association, St. Louis, Mo., Wm. B. Ittner, Architect

Trans-Mississippi Terminal Building, New Orleans, La., Favrot & Livandais, Architects

Union Terminal Building, Dallas, Tex.

# INTERIOR METAL MANUFACTURING COMPANY

## Hollow Metal Doors and Interior Trim

EXECUTIVE OFFICES AND WORKS

JAMESTOWN, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., Astor Trust Building, 501 Fifth Avenue    WASHINGTON, D. C., Commercial National Bank Building  
SALES OFFICES IN PRINCIPAL CITIES

### Products and Services.

HOLLOW METAL UNDERWRITERS' LABELED FIREPROOF DOORS; SANITARY METAL DOOR FRAMES; INTERIOR METAL TRIM (to meet all conditions); ELEVATOR DOORS and ENCLOSURES; METAL PARTITIONS and WAINSCOTING; COLD DRAWN MOULDINGS, in Steel, Brass, Bronze or Copper.

Bronze Entrance Doors, Metal Bank Counter Fronts, Bronze Mausoleum Doors, etc.

Contracts are solicited in any part of the United States and Canada, and products will either be furnished f.o.b. factory, or erected complete at the building. Large or small contracts are assured equally prompt handling.

### Interior and Exterior Views.

A large number of interior and exterior views of work installed by the company throughout the country will be submitted to those interested, on application. These views cover many varied conditions and plainly demonstrate how "Interior" work looks when in place.

### Facilities and Co-operation.

This organization, with its modern factory buildings, its up-to-date machinery and its large force of skilled workers under constant expert supervision, is prepared to fabricate a line of products of the highest character, to meet any requirements and in accordance with architects' drawings, or its own designs.

Architects and builders are invited to freely consult the engineering department regarding construction possibilities and relative costs. Suggestive drawings and specifications, adapted to suit special conditions, as well as standard detail sheets, will be gladly furnished.

While the range of moulding dies on hand is very extensive, special dies can be promptly made to details when necessary.

### Official Indorsement.

"Interior" doors, as well as other products of this company, are constructed in conformance with the requirements of the National Board of Fire Underwriters, and will be so labeled when desired.

### "Interior" Hollow Metal Doors, Casings, etc.

**METALS**—The steel used is first grade metal furniture stock or open hearth sheet steel, full pickled, full cold rolled, re-annealed, patent leveled, re-squared and oiled. All bronze used is first grade, composed of 90% copper and 10% alloy.

**DOOR CONSTRUCTION**—"Interior" doors are designed for maximum strength and minimum weight (Fig. 1). No. 18-gauge sheet metal is used and this is re-



TRADE-MARK

inforced with channel and angle members at all intersections. Stiles and rails are welded together by the homogeneous process, rendering all joints invisible. Asbestos lining is used in all panels, and either cork or asbestos in rails and stiles. All parts where hardware is to be applied are properly reinforced. The results of the detailed care exercised in the selection of materials and in the construction, are doors which experience has

shown capable of withstanding severest fire and service tests.

**DOOR CASINGS AND JAMBS**—These are constructed of No. 18-gauge metal. The mitered corner joints are welded so they are invisible and permanently inseparable. Side and head jambs are shipped knocked down, providing for their proper adjustment to the rough openings in the building.

**HARDWARE**—Hanging stiles of doors and adjacent jambs are reinforced and cut to receive hardware from templates furnished by hardware contractor. Hardware itself is later applied by this company, when furnished.

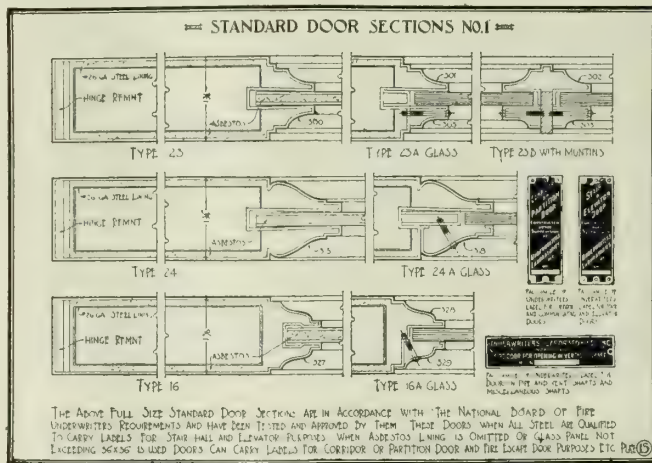


FIG. 1. SECTIONAL DETAILS SHOWING TYPICAL DOOR CONSTRUCTION

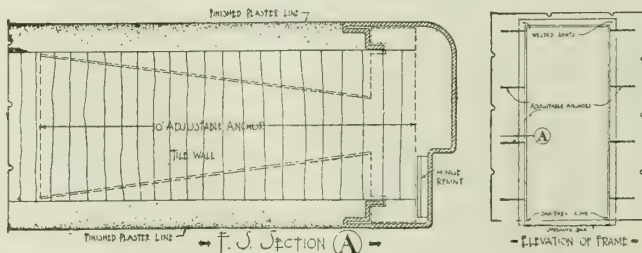
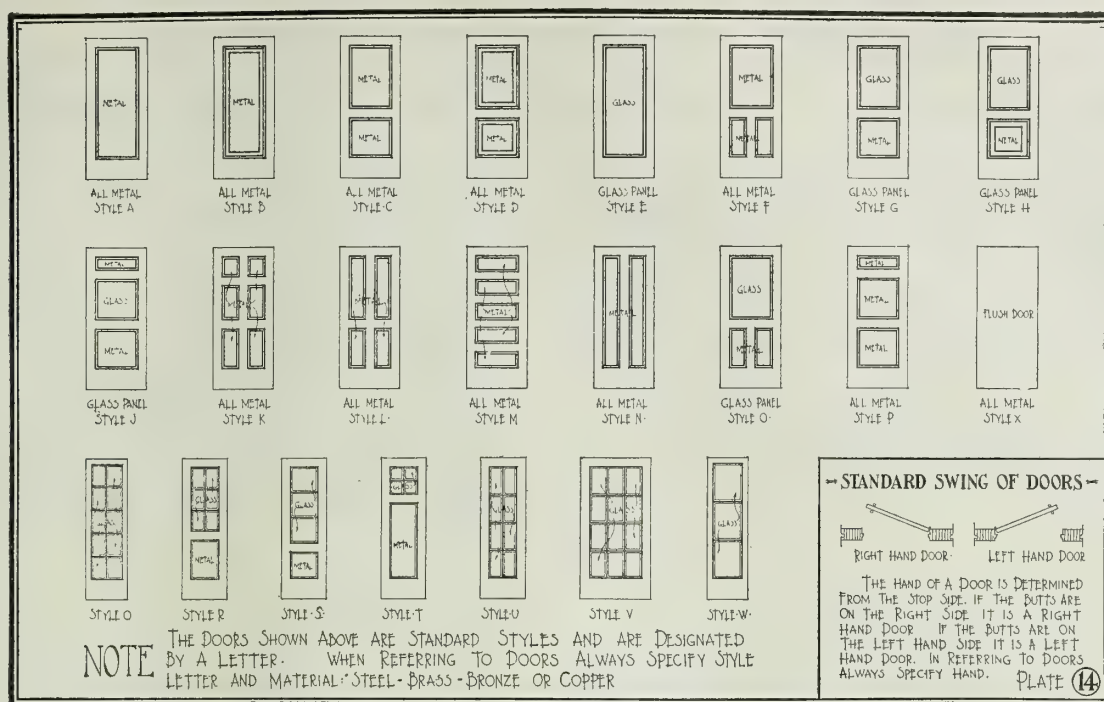


FIG. 2. ELEVATION AND SECTIONAL DETAIL OF SANITARY METAL DOOR FRAME





STANDARD STYLES OF "INTERIOR" HOLLOW METAL DOORS  
(Sample sheet from our Engineering Manual)

### Elevator Doors and Enclosures.

For fire protection of elevator shafts in office buildings, apartment houses, etc., hollow metal elevator enclosures, fitted with any style of elevator door and equipped with any standard lock or safety device, are constructed to meet all requirements of design or construction. Panels in doors may be either metal or wire glass; the former, however, being recognized by the underwriters as more effectively fireproof.

### Partitions and Wainscoting.

Metal partitions are constructed to meet any requirements, with or without glass panels. The construction is similar to that of the doors.

Wainscoting is easily erected by means of our patented lock anchor, therefore taking down and re-erection are easy and inexpensive.

### Interchangeable Partitions.

Can be installed strictly in accordance with architect's layout, and at any later date, rearranged to suit other conditions, or to meet the requirements of new tenants. This change can be brought about without cutting or fitting. An ordinary carpenter can reset these partitions at any desired angle.

Built in sections from 1 ft. 6 ins. to 5 ft. and larger, in multiples of 6 ins., if desired. This particular construction is so mechanically made that it can be taken down and put up repeatedly without damage to the finish.

Complete specifications and illustrations on request.

### Cold Drawn Metal Mouldings.

These mouldings are made of steel, brass, bronze and

copper, in a large range of designs. Profiles are precise in curves and sharp in bends; the surfaces are smooth and true. Their strength and lightness adapts them to every variety of architectural use. Drawn in lengths up to 40 ft.; usual shipping lengths, however, are from 10 to 20 ft.

### Engineering Manual.

An Engineering Manual of "Interior" Hollow Metal Construction, a few plates from which are shown here, and which illustrates all stock mouldings and many recommended types of constructions, will be sent on request of architects and builders.

### References.

"Interior" metal products may be seen in the following prominent buildings:

- Astor Trust Building, 42d Street and Fifth Avenue, New York, Montague Flagg, Architect; Cauldwell-Wingate Co., Contractors
- American Express Building, 65 Broadway, New York, Aspinwall & Tucker, Architects
- Municipal Building, New York, McKim, Mead & White, Architects
- Detroit Evening News Building, Detroit, Albert Kahn, Architect; George A. Fuller Co., Contractors
- Weld County Court House, Greeley, Colo., W. N. Bowman, Architect; Seerie & Varnum, Contractors
- Bonwit-Teller (New Stores), New York, Howell & Stokes, Architects; Cauldwell-Wingate Co., Contractors
- Lord & Taylor Building, 39th Street and Fifth Avenue, New York, Starrett & Van Vleck, Architects; E. Brookes & Co., Contractors
- New Municipal Building, Wilmington, Del., Palmer & Hornbostel, Architects
- Ticket Booths, Railings and Miscellaneous Hollow Metal Work for New York Municipal Corporation
- Brooklyn Rapid Transit Co. Subway Stations

# RELIANCE FIREPROOF DOOR CO.

Manufacturers of Fire Retardant Specialties of Metal Covered Woodwork

OFFICE AND FACTORY

TELEPHONE:

GREENPOINT, 2211, 2212

West Street, Greenpoint Avenue and Milton Street

BROOKLYN, N. Y.

REPRESENTATIVES

PHILADELPHIA, PA., F. J. WILSON Co., Land Title Building  
WASHINGTON, D. C., C. A. HOFFERBERTH, Woodward Building

CHICAGO, ILL., M. R. DUFFY, 708 Security Building  
ST. LOUIS, MO., ST. LOUIS SALES Co., Chemical Building  
BOSTON, MASS., JAMES GLASS Co., 167 Congress Street  
CLEVELAND, OHIO, WM. H. GEIS & Co., 342 Anisfield Building

PITTSBURGH, PA., ALL STEEL EQUIPMENT Co., 400 Union Arcade Building

ROCHESTER, N. Y., BUILDING SPECIALTIES Co., 176 Clinton Avenue

FORT WORTH, TEX., J. B. NEWHALL & Co.

HOUSTON, TEX., MANUFACTURERS SALES Co., 18 Fifth Street

CINCINNATI, OHIO, BUILDERS MATERIAL Co., 310 Johnston Building

ATLANTA, GA., BEAULLIEU & APPLEWHITE, Third National Bank Building

JACKSONVILLE, FLA., L. SMITH, Box 1151

TOPEKA, KANS., TOPEKA FOUNDRY & IRON WORKS

## Products.

METAL COVERED DOORS, WINDOWS and INTERIOR FINISH, in Bronze, Copper, Sempermerus, Kalamein and Galvanized Iron and Furniture Steel drawn over white pine and hardwood cores.

## Metals Used.

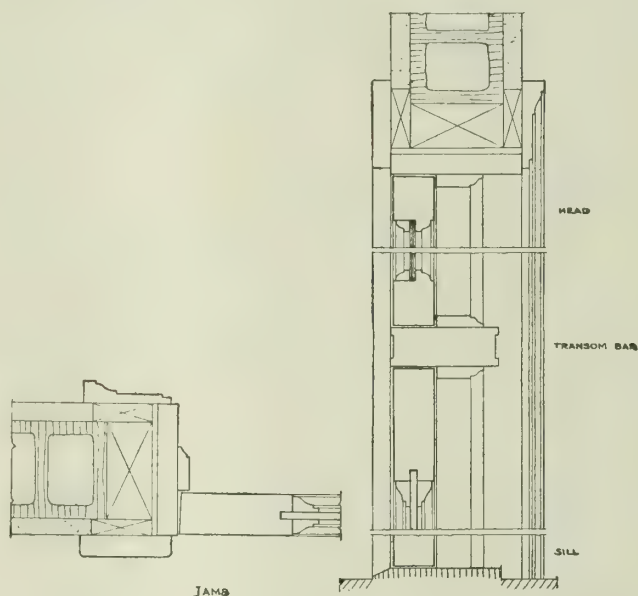
Bronze from Nos. 16 to 26 gage; copper from 14 to 24 oz. to the sq. ft.; sempermerus, kalamein and galvanized iron, Nos. 22 to 28 gage; furniture steel, Nos. 12 to 22 gage.

## Underwriters' Kalamein Doors.

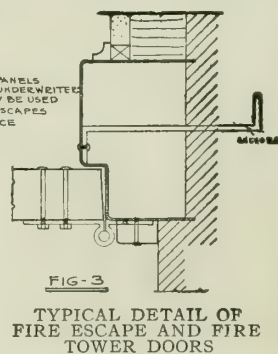
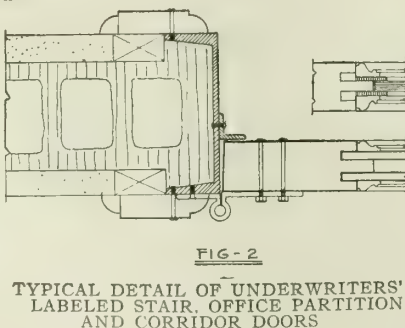
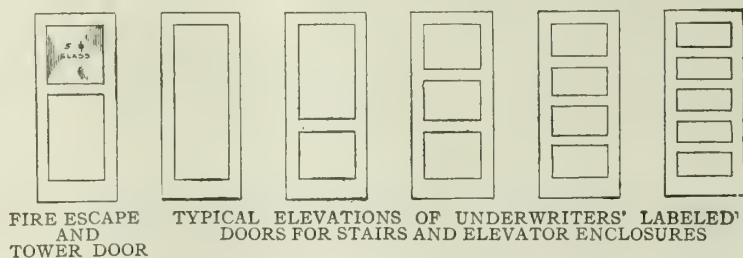
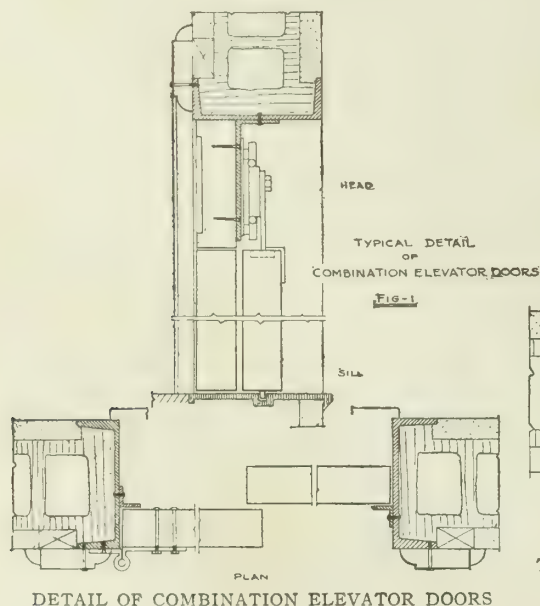
Our underwriters' kalamein doors, for elevator shafts, stairways, corridors and partitions, fire escapes and fire tower openings, when installed in accordance with the following specifications and details (Figs. 1, 2 and 3), will procure a minimum insurance rate for the building and contents.

**SPECIFICATIONS—Stair and Elevator Doors—**  
Labeled for single doors up to 48 ins. wide and in pairs up to 72 ins. wide; made with solid panels hung in channel iron of No. 12-gage steel frames with 5 by 5-in. surface butts, mortise cylinder locks and  $\frac{3}{4}$ -in. throw bolt; stair doors should be made self-closing, either by coil spring or door check, the latter preferable

as shown by Fig. 2; combination slide and swing elevator doors shown by Fig. 1.



DETAIL OF METAL COVERED DOOR JAMBS AND TRANSOM, WITH WOOD BUCKS





*Fire Escape and Tower Doors*—Labeled for the same size openings as stair and elevator doors, and can be constructed to receive wire glass, not exceeding 5 sq. ft., hung in the same manner as stair doors, shown by Fig. 3.

*Corridor and Partition Doors*—Constructed to receive 8 sq. ft. of wire glass and bearing the underwriters' label, may be hung to metal covered jambs when stair and elevator doors are labeled.

**PRICES**—Prices furnished on receipt of schedule covering the following data (unless plans and specifications are furnished to the company):

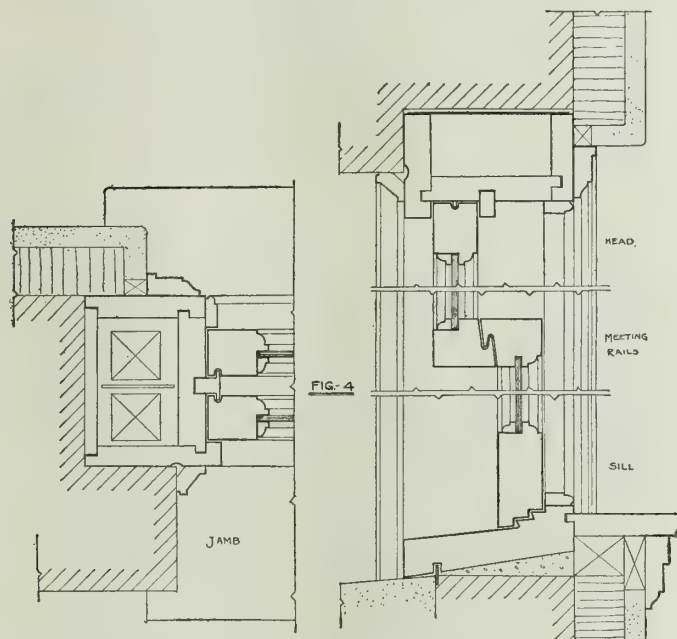
*Doors*—Size and style of each.

*Jambs*—Width and thickness required.

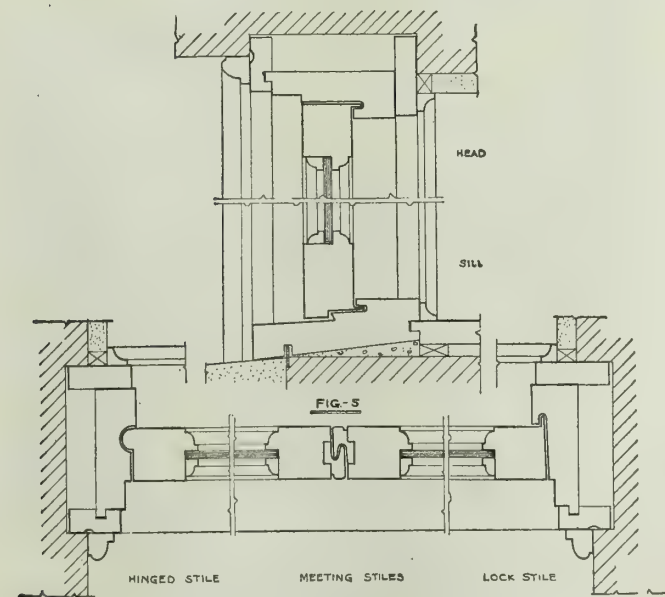
*Casing*—Moulded or flat; stating width, and whether one or both sides of opening.

### Double Hung and Casement Kalamein Windows.

Reliance double hung and casement kalamein windows, with integral weatherstrips, Figs. 4 and 5,



TYPICAL DETAIL OF DOUBLE HUNG WINDOWS, SHOWING INTEGRAL WEATHER STRIPPING



TYPICAL DETAIL OF CASEMENT WINDOWS, SHOWING INTEGRAL WEATHER STRIPPING

have proved to be the most weathertight window manufactured, besides being the most easy and noiseless in operation.

### Facilities.

The manufacturing plant, containing 40,000 sq. ft. floor working space and equipped with improved wood and metal working machines, many of which have been specially designed and built, essential to the requirements of producing high class metal covered woodwork, is prepared and in a position to produce superior work in this line, and orders of any size can be promptly executed. None too large.

### Catalogue.

The 1917 Catalogue, which contains a partial list of past performances and a more complete outline of details of doors, windows, trim and mouldings, will be sent on request.

### References.

Buildings, location and architects:

#### PARTIAL LIST OF RECENT OPERATIONS

McAlpin Hotel Addition, Broadway and 34th Street, New York, N. Y., Warren & Wetmore  
 Griswold Hotel, Cleveland, Ohio, M. Jeffery  
 Mohican Hotel, New London, Conn., H. J. Hardenberg  
 Miami Medical College, Cincinnati, Ohio, Samuel Hannaford & Sons  
 Mt. Sinai Hospital, 5th Avenue and 100th Street, New York, N. Y., Arnold W. Brunner  
 Woolworth Store, Washington, D. C., C. M. Wilson  
 Fox Department Store, Bridgeport, Conn., Cass Gilbert  
 Cartier Shop, 651 Fifth Avenue, New York, N. Y., W. W. Bosworth  
 High School, Highland Park, Mich., W. D. Butterfield  
 High School, Camden, N. J., Paul A. Davis, 3rd  
 Central Baptist Church, Madison Avenue and 92d Street, New York, N. Y., Walter Cook  
 Osborne Hall, 416 East 26th Street, New York, N. Y., Parish & Schroeder  
 Boys Club, 10th Street and Avenue A, New York, N. Y., Townshend, Steinle & Haskell  
 American Tobacco Co., San Juan, P. R., F. B. Hatch  
 Bush Terminal Show Room Building, West 42nd Street, New York, N. Y., Helme & Corbett  
 Chamber of Commerce, Pittsburgh, Pa., Lee & Piper  
 Jones-Laughlin Addition, Pittsburgh, Pa., MacClure & Spahr  
 Euclid Building, Cleveland, Ohio, Geo. B. Post & Sons  
 Post Dispatch Building, St. Louis, Mo., Barnett, Haynes & Barnett  
 Interstate Commerce Building, Washington, D. C., Milburn, Heister & Co.

#### PARTIAL LIST OF PRESENT OPERATIONS

Commodore Hotel, 42nd Street and Lexington Avenue, New York, N. Y., Warren & Wetmore  
 Penn Harris Hotel, Harrisburgh, Pa., W. L. Stoddart  
 O'Henry Hotel, Greensboro, N. C., W. L. Stoddart  
 Broadmoor Hotel, Colorado Springs, Colo., Warren & Wetmore  
 Studio Apartment, 2 West 67th Street, New York, N. Y., Rich & Mathesius  
 Free Public Library, Philadelphia, Pa., Horace Trumbauer  
 Public Library, Detroit, Mich., Cass Gilbert  
 Smithsonian Institute, Washington, D. C., Chas. A. Platt  
 Boys Latin School, Cleveland, Ohio, E. T. P. Graham  
 Franklin Trust Co., Philadelphia, Pa., DeArmond, Ashmead & Bickley  
 Bank Building, Cortland, N. Y., Holmes & Winslow  
 Rhode Island Hospital Trust Co., Providence, R. I., York & Sawyer  
 Post Office, New Haven, Conn., Jas. Gamble Rogers  
 Lit Bros. Store, Philadelphia, Pa., Simon & Bassett  
 Railroad Terminal, Richmond, Va., John Russell Pope  
 Madison Concourse, Madison Avenue and 45th Street, New York, N. Y., Warren & Wetmore  
 New Jersey Zinc Co., Maiden Lane and Front Street, New York, N. Y., H. J. Hardenberg  
 I. O. O. F. Building, Washington, D. C., W. S. Plager  
 Bausch & Lomb Building, Rochester, N. Y., Turner Construction Co.  
 Boiler Plant, Lexington Avenue and 43d Street, New York, N. Y., New York Central R. R. Engineering Department

# THE RIESTER & THESMACHER COMPANY

Manufacturers of Fireproof Windows and Doors

1512-1526 West 25th Street  
CLEVELAND, OHIO

## Products.

R & T HOLLOW METAL and TIN CLAD FIREPROOF WINDOWS, with the "Sure Shot" Pivoted Top and Bottom Lock; R & T HOLLOW METAL FIREPROOF DOORS.

Doors, of various types, all metal or with panels of clear or wired glass; Tin Clad Doors; Fireproof Metal Windows; Metal Trim; Skylights; Cornices; Sheet Metal Construction in Tin, Copper and Iron, for architectural and building purposes.

## Underwriters' Approval.

The R & T hollow metal fireproof doors and windows are manufactured under the supervision of the Underwriters' Laboratories, Inc., and, when specified, bear their labels.

## Laboratories' Window and Door Fire Tests.

The windows are built into a section of brick wall between a fire room and an observation room. In fire room, flames from twenty-four 2-in. gas outlets play upon the windows during a full hour; temperature often reaches 1800° Fahr.—almost sufficient to fuse glass. When flames are turned off, window is removed and is subjected to an immediate water test—a 60-lb. pressure through a fire hose. Doors are similarly tested. When windows and doors meet these fire requirements a certificate of test is issued to the manufacturer, with authority to use the label of the Laboratory—a guarantee of fireproofing qualities—under the constant supervision of Laboratory inspectors.

## Facilities.

The company's plant is extensive, occupying 50,000 sq. ft. of floor and yard space; 90% of the plant and of the time of the organization is devoted to the build-

ing of fireproof windows and doors—the chief business—all orders being executed without delay. Practical mechanics in sheet metal work, of lifelong experience, are in charge of the manufacturing departments; modern machinery turns out the work economically; and personal supervision is responsible for repeated specifications received continuously from satisfied architects throughout the country.

## R & T Hollow Metal Fireproof Windows.

Weatherproof and fireproof. Each order is practically a special job; windows fit perfectly: tight, rigid and solid; they work easily when raised, lowered or swung open.

TYPES—The R & T construction can be applied to any of the following types of windows in most general use, or to any variation thereof:

Type	
WA	Stationary sash
WB	Double hung, non-reversible sashes
WD	Counterbalancing sashes
WE	Stationary lower, pivoted upper sashes
WF	Pivoted lower and pivoted upper sashes
WG	Pivoted lower and stationary upper sashes
WH	Hinged window (hinged side, sill or head to open in or out as desired)
WI	Single pivoted sash
WM	Mullioned window

Each type can be made to fit any style of an opening.

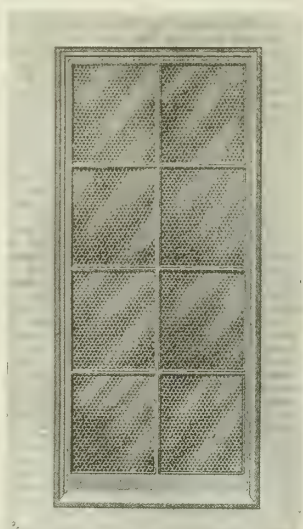
MATERIAL and CONSTRUCTION—In all types, window frame is built of No. 22 gage and sash of No. 24 gage galvanized iron. For details of construction, see accompanying sectional view of a double hung window. Before a shipment, every detail of each window is carefully approved by the inspector of the Underwriters' Laboratories, Inc., and the company's own examiners.

WIRE GLASS—Furnished in any style approved by the National Board of Fire Underwriters. For factories and warehouses, the "hammered" and "ribbed" styles are usually installed; for office doors and windows, the "polished" and "maze" (opaque) types are generally used.



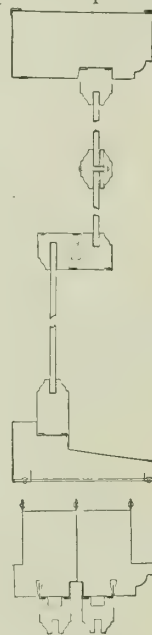
DOUBLE HUNG AND NON-REVERSIBLE SASH

Most common type in use. Upper and lower sashes meet as shown in cross section view in opposite column. 1, 2, 4 or 6 panes to the sash as desired. Fireproof and weatherproof



STATIONARY SASH

Installed in factories, etc., where it is necessary to have window openings permanently closed to keep out dust, dampness or draughts. Fireproof and weatherproof



CROSS SECTION SHOWING WEATHER-PROOF CONSTRUCTION OF DOUBLE HUNG AND COUNTER-BALANCING SASH



COUNTERBALANCING SASH

Both sashes move in opposite directions at same time, providing ventilation at top and bottom



**HARDWARE**—Locks and catches on double hung and pivoted windows are designed and patented by the company.

The "Sure-shot pivoted top and bottom lock," used on R & T pivoted windows, is patented; lock catches and holds securely whether window falls shut from an opening of an inch or two or from full width; no rebound, *as the catch works instantly* whether window is closed tightly or with a slam; for unlocking, the same pull on chain that opens the windows unlocks both top and bottom locks in the "Sure-shot."

Nothing to get out of order.

**FINISH**—All R & T windows are shipped with a priming coat of paint on the outside, and on the inside whether specifications call for it or not.



CROSS SECTION SHOWING WEATHERPROOF CONSTRUCTION OF PIVOTED SASH AND "SURE SHOT" LOCK

arrangements wanted, can be supplied in accordance with the architect's specifications.

### Measurements for R & T Windows and Doors.

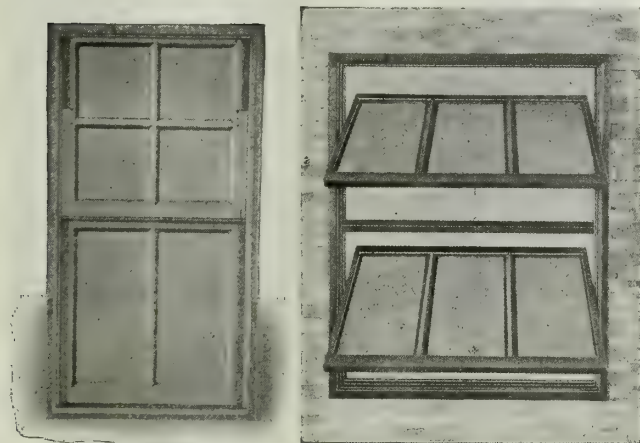
State type, kind of glass, with sketches showing specification data as follows:

**FOR WINDOWS**—Width of opening between walls; height of opening between sill and lintel or arch; thickness of wall.

**FOR DOORS**—Height of opening from floor to lintel or arch; height of lintel; width of opening; thickness of wall, headroom above opening.



R & T ALL METAL DOOR  
With imitation grained wood finish

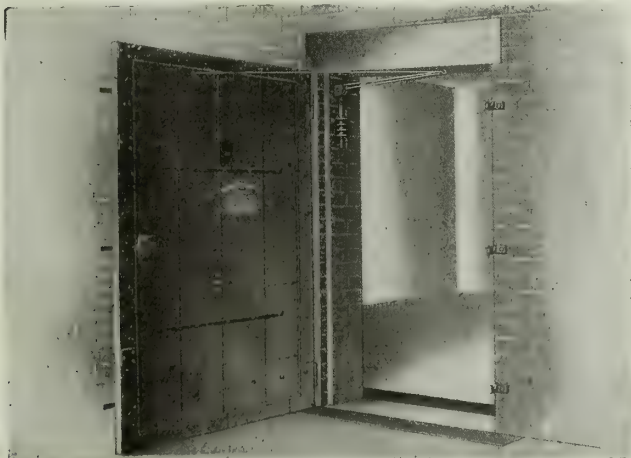


STATIONARY LOWER, PIVOTED UPPER SASH

PIVOTED UPPER AND LOWER SASHES

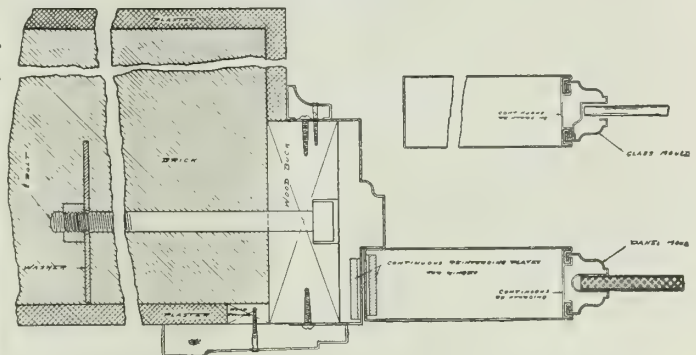
### R & T Fireproof Doors.

Any desired combination of metal panels, clear glass or wired glass panels, in the particular shapes, types, or

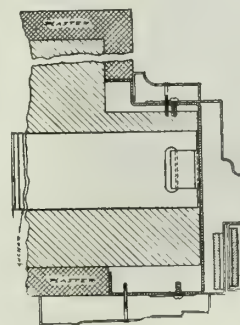


SINGLE SWING FIREPROOF DOOR

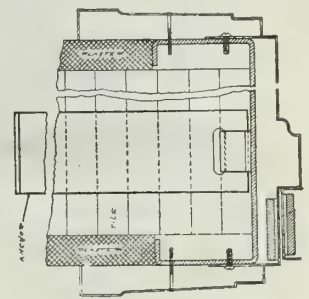
Also made with single incline slide, single level slide, etc.



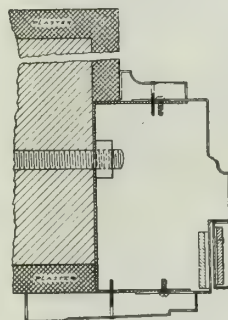
Full Size Detail of Jamb with Wood Buck Construction



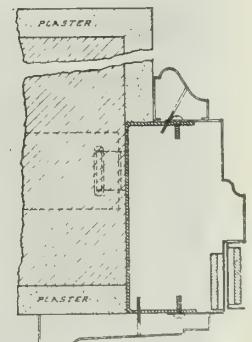
Used with No. 14 Iron Buck Construction



Used with No. 12 Iron Buck Construction



Used with No. 14 Iron Buck Construction



Used with No. 14 Iron Buck Construction

DETAILS SHOWING R & T JAMB USED WITH VARIOUS TYPES OF BUCK CONSTRUCTION

FREDERICK LUNDIN, PRESIDENT

FERNANDO J. LE BEAU, MANAGER

# NATIONAL AUTOMATIC DOOR CO.

Insurance Exchange Building

CHICAGO, ILL.

MAIN PLANT, GARY, IND.

## Products.

"PANIK-PRUFE" AUTOMATIC STEEL DOORS for emergency exits; HOLLOW METAL DOORS and TRIM. Approved by Underwriters' Laboratories, Inc.



TRADE-MARK

## Steel "Panik-Prufe" Doors.

These are a distinctive type of hollow steel door construction for all emergency exits in theaters, halls, churches and public buildings. They can be opened from the inside, even though they are securely locked on the outside. No hardware, such as panic bars and other safety devices, is necessary to open them.

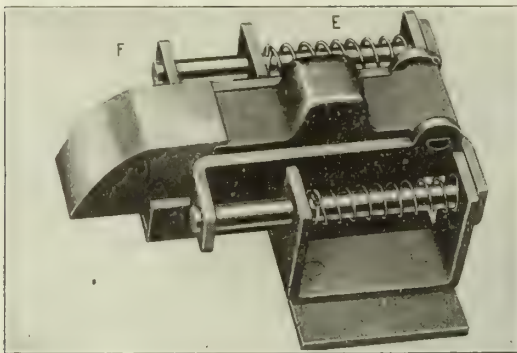
CONSTRUCTION—The door proper consists of two steel shells with the operating mechanism concealed between them. The inner or room-side shell is so hung in connection with the operating device, that a slight pressure of the hand on any portion of its surface immediately releases the latch bolts, and allows the door to swing open instantly. The entire room-side surface of the door controls directly the operating mechanism in such a manner that it insures a prompt response at all times. The mechanism can be depended on in every case of emergency.

Not only the doors, but also steel frames, jamb cas-

ings and metal trim are furnished when they are desired.

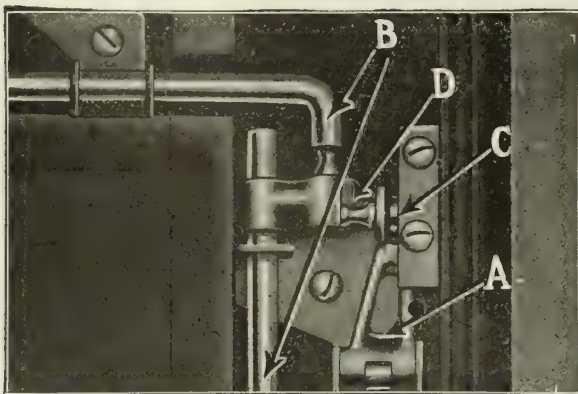
When automatic "Panik-Prufe" doors are used for both entrance and exit purposes, they are fitted with cylinder locks, knobs and suitable trim. The cylinder of the lock controls the exterior knob; the inner knob is at

all times free. These hardware fittings do not interfere in any way with the working of the "Panik-Prufe" features; they do not prevent a slight pressure on the surface of the inner or room-side panel from immediately releasing the bolts, even though the door is securely locked on the outside.



EMERGENCY LOCKING LATCH

Pressure on any part of door engages latch at "E" releasing bolt



ENCLOSED PRESSURE TRANSMISSION MECHANISM

Transmission by series of rocker arms "A" and connecting rods "B," connection being made by 4 panel hooks "C"

Outer Steel Shell  
Removed Showing  
Operating MechanismFinished Door, No Operating  
Mechanism Visible

"PANIK-PRUFE" AUTOMATIC STEEL DOOR  
Approved by Underwriters' Laboratories, Inc.

## Hollow Metal Doors and Trim.

The NATIONAL AUTOMATIC DOOR CO. manufactures a complete line of hollow metal doors, fully approved by the Underwriters' Laboratories, Inc., and also produces interior metal trim of all kinds.

## Panel Designs.

Both the "Panik-Prufe" and the standard hollow doors are furnished in all panel designs. When glass panels are provided, they are held in place by removable glass stops.

## Finishes.

When desired, materials are finished to imitate the various woods that are used for interior trim, or they are finished to imitate other metals.

The finishes are baked on at an even temperature. Each coat is baked separately when it is applied.

Only materials of the highest grade are used.

## Co-operative Service.

If requested, the company will furnish promptly catalogues, descriptive matter, details and estimates. The engineering department will gladly co-operate in every possible way with architects and builders.



# THORP FIRE PROOF DOOR CO.

"Thorp-Richardson" Doors and Finish; Bronze and Copper Entrances

1600-1616 Central Avenue  
MINNEAPOLIS, MINN.

REPRESENTATIVES IN FIFTY PRINCIPAL CITIES

## Products.

Manufacturers of "THORP-RICHARDSON" FIRE-PROOF DOORS and FINISH for all classes of fireproof buildings, public and private; also, BRONZE and COPPER ENTRANCES.

## In General.

The THORP FIRE PROOF DOOR CO. is the pioneer in this line of work, and all effort and energy are devoted to this work alone. The Thorp Finish has been developed to the point where the architect can safely specify for any purpose.

Thorp Doors make each room, floor or apartment a separate fireproof unit. Stairways and elevator shafts are also guarded by the Thorp Finish, and if consistently used, there can be no spread of fire beyond the rooms or unit in which the fire originates.

## Construction.

Thorp Doors are made on the basis of the underwriters' standard: A 3-ply built-up pine core, asbestos lined and metal covered. By special processes all metal is locked or welded, and the two sheets are locked

together on all *four* edges of the door. No dependence is placed on a mortise-and-tenon joint or lag screws to hold the door or parts together, and the metal covering on each side is so made as to be one sheet.

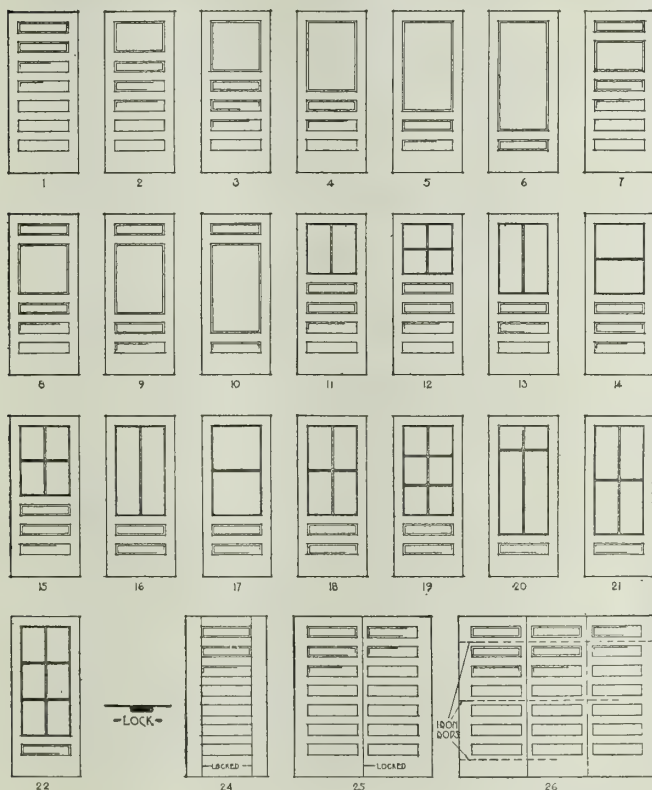
Thorp Standard Detail Doors are covered with single sheets of No. 24 gauge metal, panels sunk by hydraulic pressure with single sheet to each side.

Thorp Special Detail Doors, to the architect's design, are made of Nos. 24 or 20 gauge metal, with mouldings as an integral part of stiles; rails and panels assembled with flush welded joints.

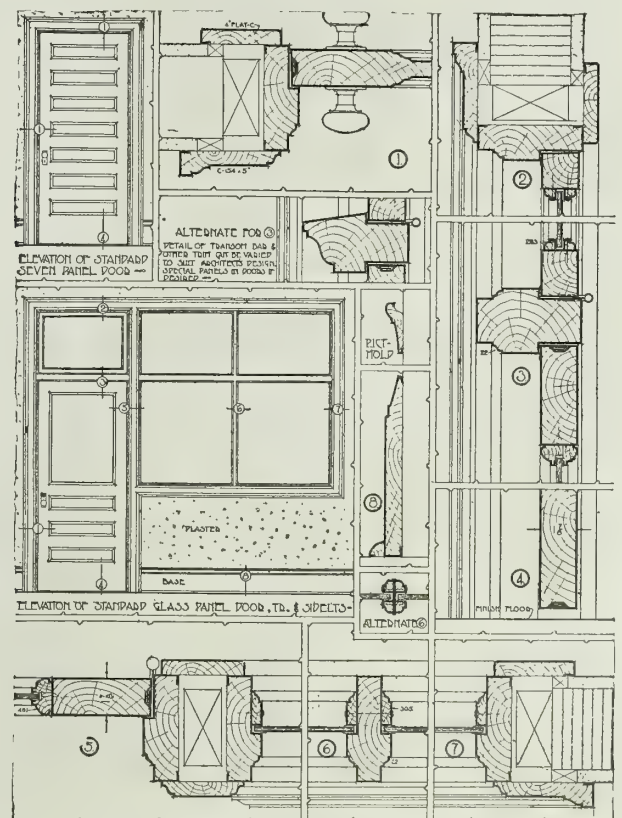
Any of the natural wood finishes are carefully followed as to grain and shade; or the white enamel for hospitals. A very popular finish is our standard old copper duplex plate on special steel.

## Entrance Doors.

Thorp Doors in bronze and copper make the most handsome, durable and economical entrances. Either No. 18-gauge or No. 18-oz. metal is used, and the entrances may be as elaborate and ornamental as desired.



DETAILS OF THORP STANDARD DETAIL DOORS, GLASS PANELS, TRANSOMS, SIDE LIGHTS  
Thorp Detail Doors made to any design

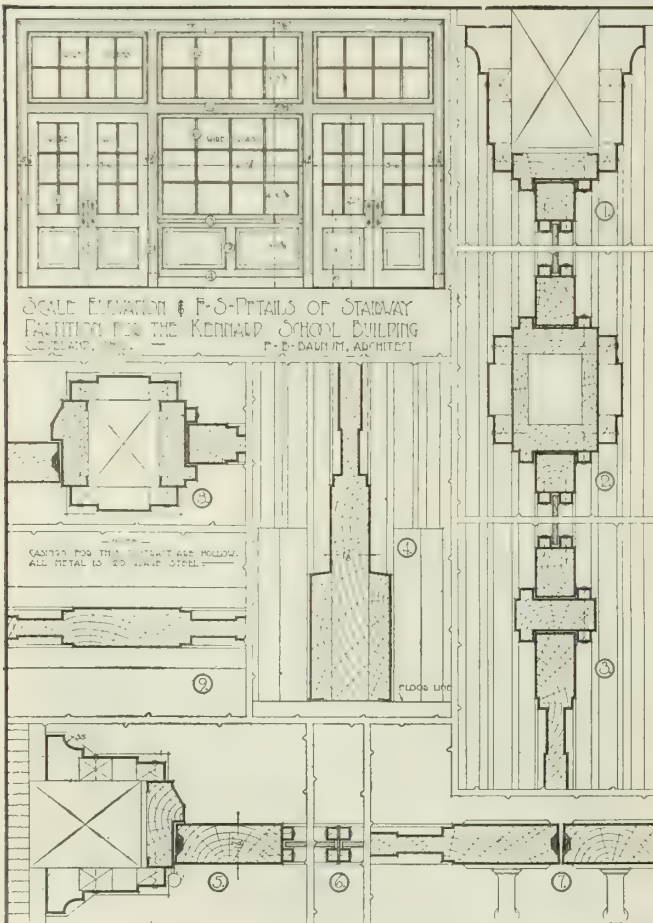




JEFFERSON COUNTY SAVINGS BANK, BIRMINGHAM, ALA.  
WM. C. WESTON, Architect

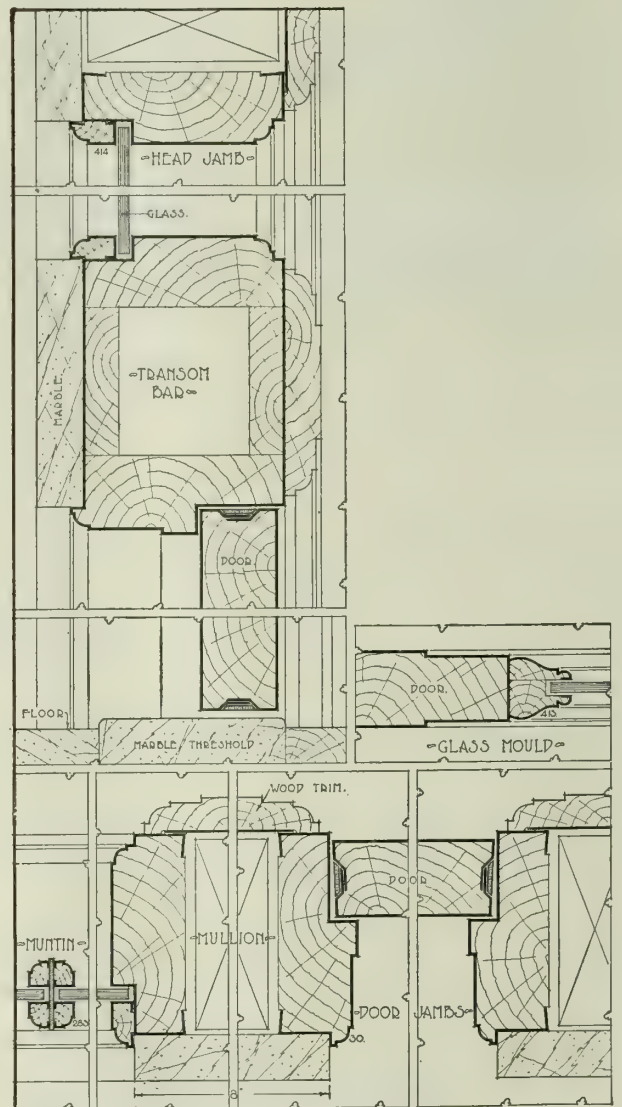


A CORRIDOR IN JEFFERSON COUNTY SAVINGS BANK,  
SHOWING DOORS



SCALE ELEVATION AND DETAILS OF STAIRWAY PARTITION  
FOR THE KENNARD SCHOOL BUILDING, CLEVELAND, OHIO

SWEET'S CATALOGUE



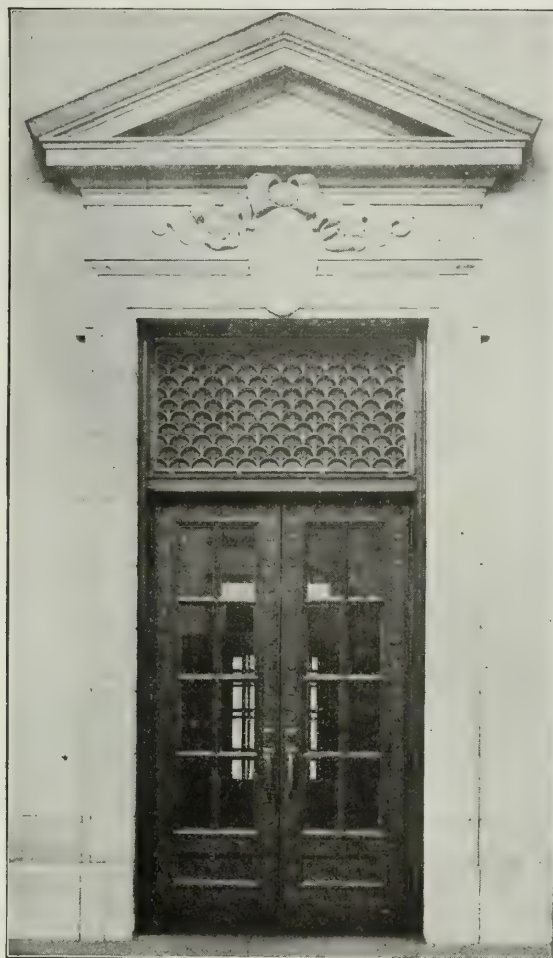
DETAILS OF CORRIDOR DOORS AND PARTITIONS, JEFFERSON  
COUNTY SAVINGS BANK

Continued on next page





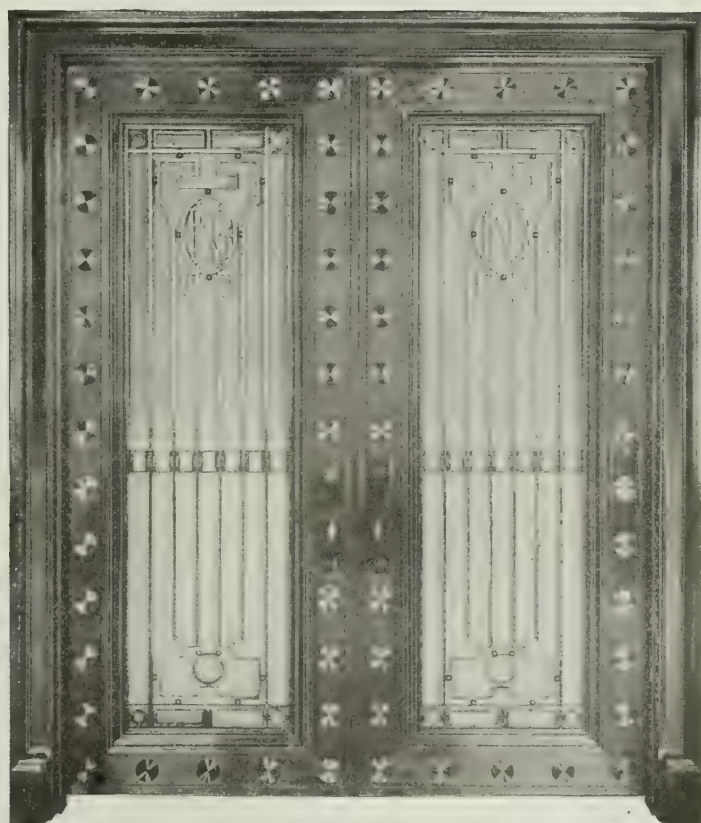
GERMAN-AMERICAN NATIONAL BANK, PEKIN, ILL.  
HEWITT & EMERSON, Architects



GATEWAY, PARK BUILDING, MINNEAPOLIS, MINN.  
HEWITT & BROWN, Architects



ENTRANCE, U. S. POST OFFICE, FRANKFORT, IND.



BRONZE ENTRANCE, EXCHANGE NATIONAL BANK,  
LITTLE ROCK, ARK.  
• CHAS. L. THOMPSON, Architect



# THE EDWARDS MANUFACTURING CO.

INCORPORATED 1901

Rolling Steel Doors and Shutters, Black and Galvanized

CINCINNATI, OHIO

LESTER G. WILSON, CONSULTING ENGINEER AND PATENTEE

## BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 81-83 Fulton Street  
PHILADELPHIA, PA., Land Title Building  
DALLAS, TEX., 1635-39 Pacific Avenue  
ATLANTA, GA., 170 Peachtree Street  
PORTLAND, ORE., 17 Ainsworth Building

PITTSBURGH, PA., 1501 Oliver Building  
BALTIMORE, MD., 7 Clay Street  
LOS ANGELES, CAL., 1610 North Spring Street  
BOSTON, MASS., 6 Beacon Street  
BIRMINGHAM, ALA., 1920 Third Avenue

### Products.

ROLLING STEEL DOORS and SHUTTERS.

For Sheet Steel Building Material, see pages 418-19; for Steel Lockers and Shelving, see pages 1410-11.

### Rolling Steel Doors.

Doors have been designed by this company's engineer, and successfully constructed for doorways of all sizes up to 40 ft. in width, and for openings over 100 ft. in height.

### Rolling Shutters.

Shutters have been designed for windows and skylights. This company is prepared to manufacture the combination complete, and with wire glass if desired. The rolling shutters are often operated in groups and sometimes by electric motors.

### Special Drawings.

This organization will gladly prepare details and specifications for *all* types of doors and shutters, and so assist owner, architect or engineer to select the best and most economical installation.

### Uses.

Specify Edwards rolling doors and shutters for:

R. R. shops	Jails	Factories
R. R. roundhouses	Banks	Elevators
R. R. freight sheds	Libraries	Craneways
Express buildings	Armories	Power plants
Steamship docks	Gun sheds	Boiler fronts
Grain elevators	Garages	Transformers
Telephone exchanges	Car houses	Subways
Post Offices	Warehouses	Store fronts
Stairways, etc.		
Residences during closed seasons		
Federal, county and municipal buildings		
Office buildings, rear and court windows		
Dampers for heating and ventilating systems		
Rolling partitions for churches and schools		
Cotton mills, compresses and warehouses		

### Standard Applications.

There are a great variety, because almost every building presents different conditions. A few are illustrated below.

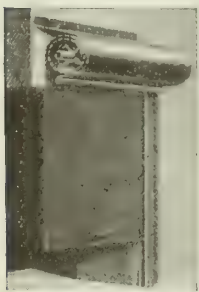


FIG. 1



FIG. 2



FIG. 3



FIG. 4



FIG. 5

INSIDE AND OUTSIDE HANDLE OPERATED ROLLING STEEL DOORS, SHOWING VARIOUS METHODS OF APPLYING



FIG. 6



FIG. 7



FIG. 8

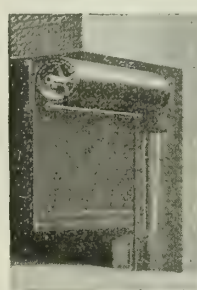


FIG. 9

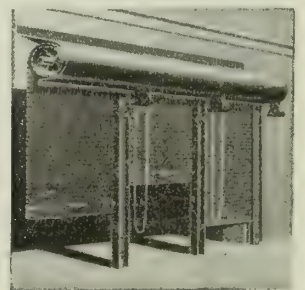


FIG. 10

HEAVY ROLLING STEEL DOORS, CHAIN GEAR OPERATED, SHOWING VARIOUS METHODS OF APPLYING



### Equipment.

All Edwards rolling doors may be equipped, if so ordered, with:

- (1) Patented trolley bridges, for car houses.
- (2) Patented wicket doors, hinged to either side.
- (3) Patented "spring release" mechanism, to cause door to close automatically in case of fire.
- (4) Patented "no-key" padlock, either for hasp on bottom bar, or for operating chain.
- (5) Patented electric motor operation or other special gearing.
- (6) A combination of both. For example, to open and close car house doors in groups of two or more; to open and close craneway doors simultaneously in groups (such as designed by our engineer for The Panama Canal); double chain or crank gearing to operate door from both inside and outside of building.
- (7) Hinged or removable post, to swing up out of the way, or to be removed to a corner.
- (8) Hoods, D-shaped or ornamental; necessary when doors coil outside.

### How to Specify.

Edwards Rolling Doors of *Interlocking Steel Slat*, style [22, 20, 18, 16, or 14] gage, bright [or galvanized], painted, and equipped with grooves and counterbalancing springs, enclosed and protected by hollow shafts. The coils to be covered by galvanized D-shaped hoods; all as arranged in Figures 1 to 11 (selected from opposite page). Fastened as shown on Architect's detail No. .... to wood, steel, concrete or brick. To be erected by the manufacturer [or by the general contractor].

Edwards Rolling Doors of *Corrugated Steel Sheets*, locked together without rivets, black [or galvanized], painted and equipped with grooves, counterbalancing springs enclosed and protected by hollow shafts, also galvanized D-shaped hoods to cover the coils; all as arranged in Figures 1 to 11 (selected from opposite page). Fastened as shown on Architect's detail No. .... to wood, steel, concrete or brick. To be erected by the manufacturer [or by the general contractor].

### Fire Resistance.

Following is report of fire at Locust Street pier of Baltimore & Ohio R. R., Philadelphia, Pa.

"With reference to the fire, this occurred the night of May 10, 1917. Edwards galvanized iron doors enclose the end of an Automobile platform so that the better grade of cars, which it is necessary to leave on the platform over night, can be run into the enclosed end of the platform and the doors lowered to protect them.

"There were six Buick six-cylinder cars on this end of the platform, together with a large pile of lumber. The fire was discovered at midnight and when discovered was burning fiercely and before it was extinguished, completely ruined all of the automobiles and lumber, as well as having burned the entire roof off of the platform.

"On one side of the platform there were box cars loaded with other automobiles, three tracks each. On the other side were Pullman cars which were stored in the yard.

"These cars were only 18 ins. outside of the rolling galvanized iron doors and the paint was slightly blistered, but absolutely no damage done to the cars. If the doors had not been there to protect them, the cars would have been absolutely ruined, as it was a very hot fire.

"The doors remained intact and in position with the exception that the shaft sagged down about 12 ins. in the center from excessive heat and the malleable iron gears were melted and warping in some cases.

"The Railroad Officials state that they are positive that if it had not been for the Edwards galvanized iron doors, very much greater damage would have resulted."

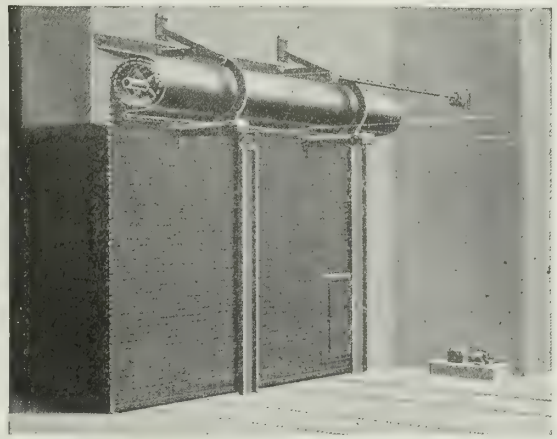


FIG. 11. MOTOR OPERATED ROLLING STEEL DOOR INSTALLED IN CAR HOUSE

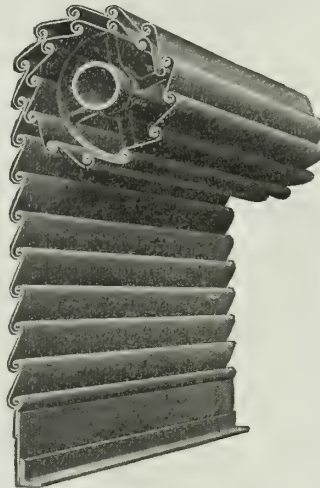


FIG. 12  
SECTION OF INTERLOCKING  
SLAT OF A ROLLING STEEL  
DOOR

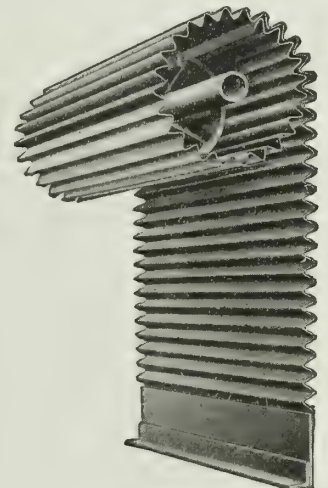


FIG. 13  
SECTION OF CORRUGATED  
SHEET OF A ROLLING  
STEEL DOOR



FIG. 14. EXTERIOR VIEW LOCUST STREET PIER, BALTIMORE & OHIO R.R., PHILADELPHIA, PA., AFTER THE FIRE, MAY 10, 1917

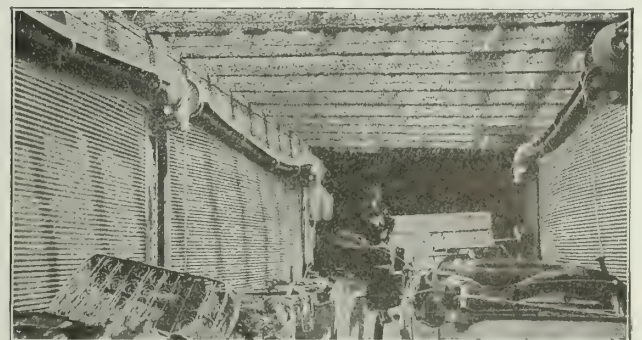


FIG. 15. EDWARDS GALVANIZED IRON DOORS STILL IN SERVICE (1917) AFTER THE FIRE



# CORNELL IRON WORKS

Manufacturers of Rolling Steel Shutters and Doors

TELEPHONES:

CHelsea { 550  
1423  
1424

26th Street and 11th Avenue  
NEW YORK, N. Y.

## Products.

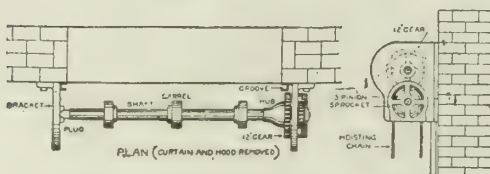
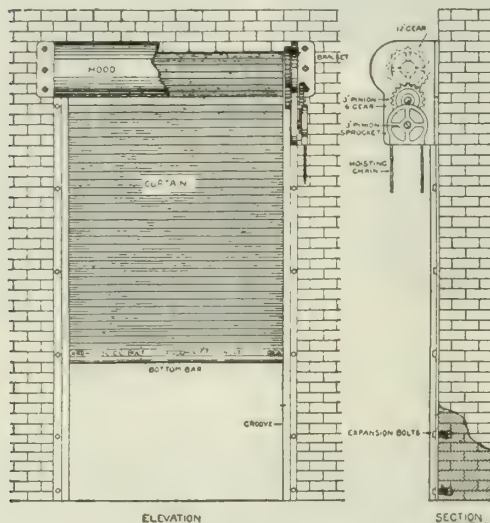
ROLLING STEEL SHUTTERS and DOORS, HAND CHAIN and MOTOR OPERATED, for plants, factories, shipping platforms, garages, wharves and piers, warehouses, elevator shafts, store fronts and buildings of all kinds.

## Description.

Material consists of deep corrugated, strong and stiff continuous sheets of flexible open hearth steel. Edges reinforced with malleable shields to take up wear in the side guides.

## Operation.

There are three typical methods of operation:  
SELF-COILING TYPE—Standard for openings up to



DETAILS OF CONSTRUCTION OF CORNELL ROLLING STEEL DOORS

100 sq. ft. Quickest acting construction possible. Operated by handles on bottom bar. Poles with hooks and eye on bottom bar furnished for high openings.

HAND CHAIN AND GEARING TYPE—Standard for openings of over 100 sq. ft. Shaft revolved by endless hand chain acting through single or compound gears.

AUTOMATIC CLOSING TYPE—Controlled by fusible link melting at 150° Fahr.

MOTOR, WORM AND BEVEL GEAR DRIVE—Also used in special cases.

SMALL SWINGING WICKET DOORS—Furnished for large installations.

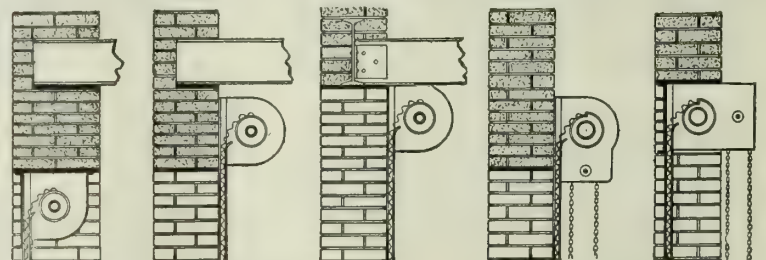
## Advantages.

Our doors present to smoke and flame a continuous sheet of deep corrugated steel. By use of a special die the rigidity of the sheets is increased about 26 times; all parts are reached by the painter's brush, no points or slats to invite corrosion. Repairs, due to accidents, can be made with great convenience.

Installations of 40 years and more speak for the wearing qualities of shutters made by this concern.

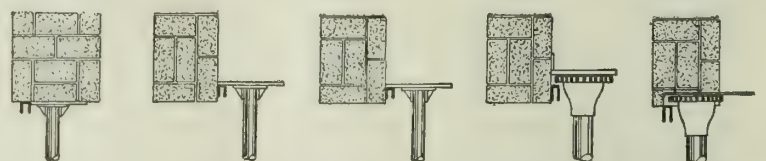
DIAMETER OF COIL FOR VARYING HEIGHTS, WHEN ROLLED UP

Height of opening, ft. ....	8	10	12	14	16	18	20	22	24
Diameter of coil, ins. ....	11½	12	13	15	15½	16	16½	17	17½

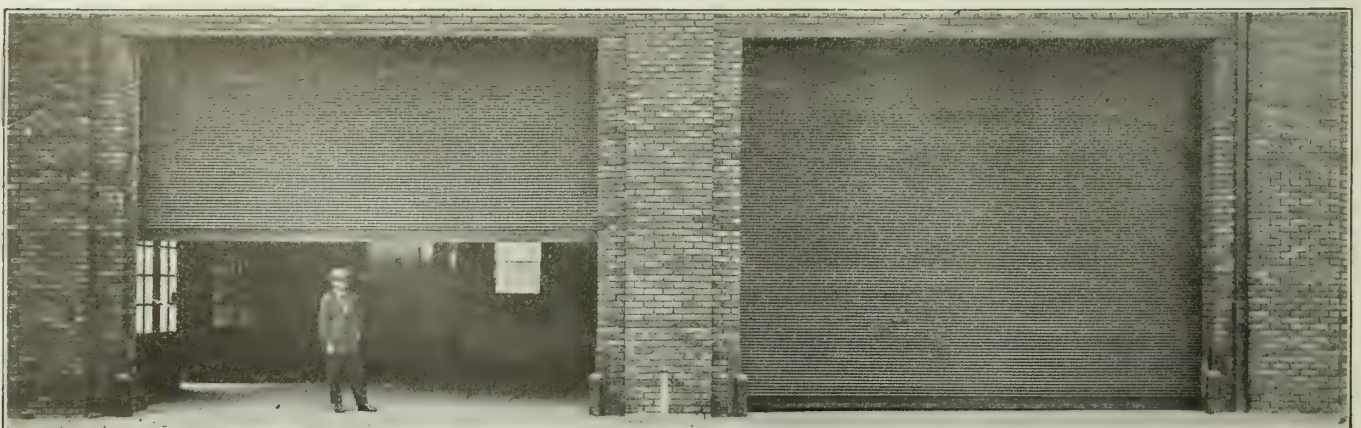


Self-coiling Type

Geared Type



SECTIONS AND PLANS SHOWING VARIOUS LOCATIONS OF ROLLING SHUTTERS AND DOORS, WITH RELATION TO LINTELS AND JAMBS  
Plans show curtains removed



CORNELL ROLLING STEEL DOORS AT BIRMINGHAM, ALA., 18 FT. WIDE



# GUARANTY IRON & WIRE CO.

Fire Doors, Ornamental and Miscellaneous Iron

GENERAL OFFICE AND WORKS  
2847-2851 West Lake Street  
CHICAGO, ILL.

## Products.

### ELEVATOR DOORS.

Meaker Doors, Iron Fire Doors, Folding Doors, Hollow Metal Doors, Tin Clad Doors, Iron Shutters, Rolling Shutters, Slide Up Doors, Passenger Elevator Doors, Warehouse Doors, Fire Wall Doors, Fireproof Stairs, Wire Enclosures, Elevator Enclosures and Elevator Cabs.

## Quality.

The numerous features and advantages of our counterbalance elevator door immediately appeal to both architect and owner.

It is labeled by the National Board of Fire Underwriters, carrying with it a full rating of insurance.

A special feature of this door is the trucking device, which permits a truck of any size or load to pass over without disturbing the door in the least.

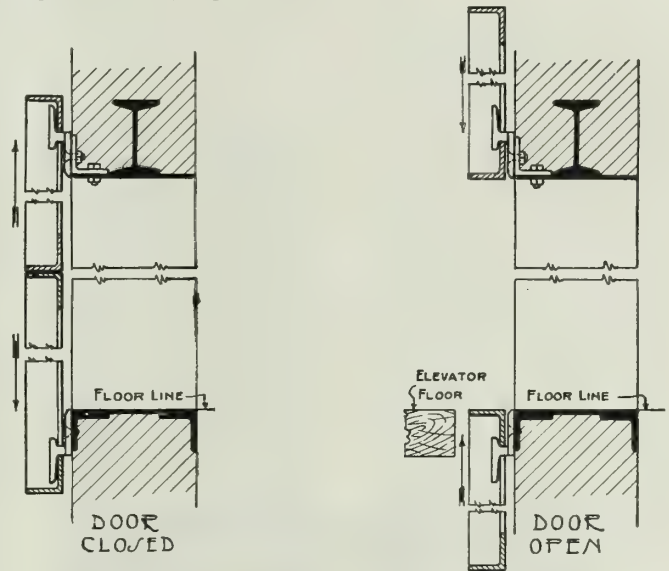
All work is first inspected at our shop and then sent to the job to be put up in a first class manner. The illustrations below will give an idea of the lightness and durability of this door.

## References.

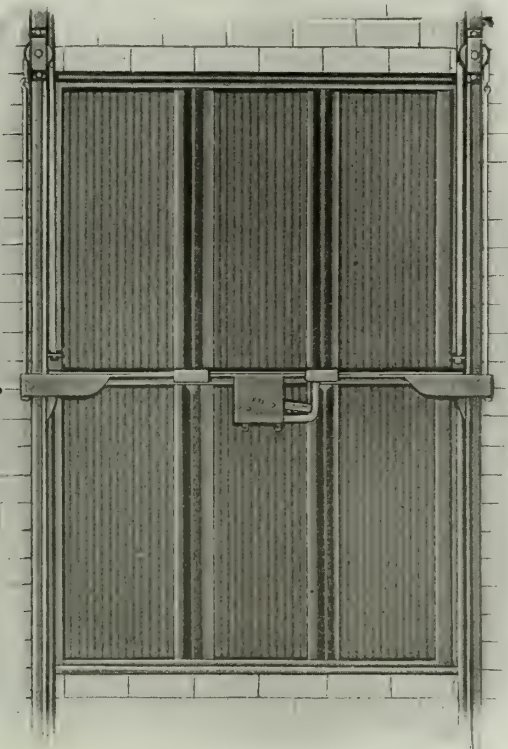
Following is a partial list of buildings where our work has been installed:

Harrison and State Building, Chicago, Ill.  
Three Arts Building, Chicago, Ill.  
Rosenthal Building, Chicago, Ill.  
North Side Boys Club, Chicago, Ill.  
Art Craft Building, Chicago, Ill.  
Wroe Building, Chicago, Ill.  
Marshall Field Garage, Chicago, Ill.

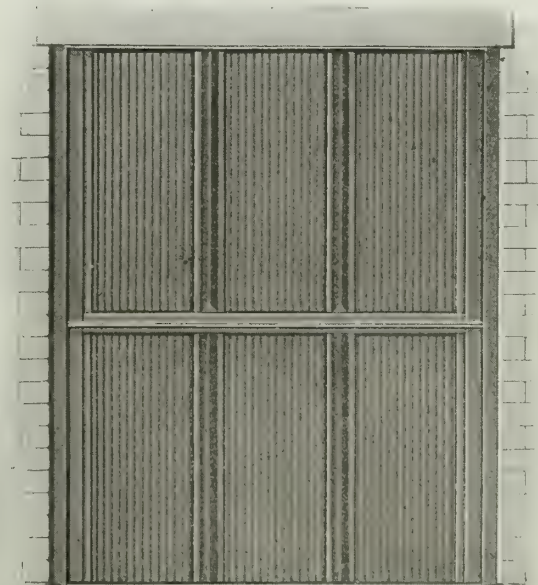
Chicago Tribune Color Press Building, Chicago, Ill.  
South Shore Country Club, Chicago, Ill.  
Carter Apartment Building, Chicago, Ill.  
Armour Garage and Gymnasium, Chicago, Ill.  
Capitol Building, Madison, Wis.  
Lyon & Healy Building, Chicago, Ill.  
Winston Building, Chicago, Ill.  
U. S. Post Office, Wichita, Kan.  
Beloit Y. M. C. A. Building, Beloit, Wis.  
Great Southern Life Building, Louisville, Ky.  
Marks Building, Madison, Wis.  
C. W. Sherwood, Regina, Saskatchewan, Canada  
Home for the Aged, Minneapolis, Minn.  
Reading Hotel, Reading, Pa.  
Clay Pool Hotel, Indianapolis, Ind.  
American Trust & Savings Bank, Cedar Rapids, Iowa  
Montgomery Ward Building, Chicago, Ill.  
Capitol Building, Springfield, Ill.



CROSS SECTION DETAILS OF ELEVATOR DOOR



ELEVATOR DOOR—SHAFT SIDE



ELEVATOR DOOR—FLOOR SIDE

## GEO. W. JOHNSON MFG. CO.

Manufacturers of Standard Underwriters' Labeled Automatic Fire Doors

ST. LOUIS, MO.

KANSAS CITY, MO.

### Products.

STEEL ROLLING DOORS and SHUTTERS; COUNTER-BALANCED TRUCKOVER ELEVATOR DOORS.

Automatic Tin Clad Sliding Fire Doors, Tin Clad Hinged Fire Doors and Shutters, Dufold Doors, Boiler Plate Doors and Shutters, Wood Rolling Partitions, Iron Stairs and Fire Escapes.

### Steel Coil Doors.

Steel coil doors provide protection for openings of any size; occupy the minimum amount of space and have a smooth finished appearance from either side of the wall.

Our doors are made of flexible corrugated steel, galvanized. The corrugations are short and deep, giving the maximum resistive power against wind pressure.

No. 100, PUSH UP—Spring counterbalanced, operated by hand. For nominal openings.

No. 100A—Spring counterbalanced, automatic closing. For nominal openings.

No. 110, CHAIN HOIST—Spring counterbalanced, operated by means of endless chain. For large openings. This type is fitted with roller bearings when desired.

SPECIAL FEATURES—Our automatic attachments

with two fuse links, one placed at the ceiling line and the other at the opening, are superior to the old style attachments with link only at the opening.

Experience has demonstrated that the ceiling link alone has released doors where fire occurred, for in many cases the link at the opening was still intact after fire was extinguished.

### Elevator Truckover Doors.

The most practical freight elevator door on the market. Serves the purpose of a fire door and elevator safety gate combined, cutting off draft at each floor.

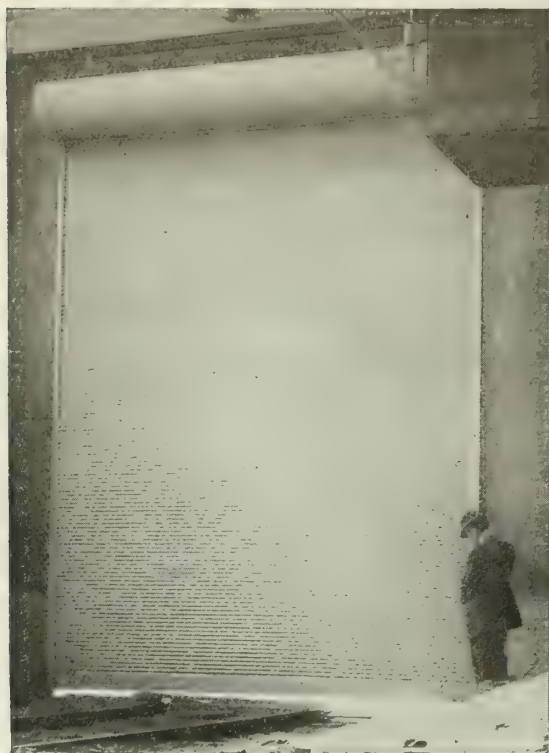
The Johnson patented trucking bar is pivoted and conforms to location of elevator platform. If it is below sill level, this bar automatically adjusts itself to the proper angle, giving a smooth surface for trucks, even with small wheels, to pass over without jar or damage to contents.

Another important feature is the interlocking guides, which prevent danger of heavily loaded trucks striking door from room side when closed and forcing same out of guides. Such accidents have occurred when doors were equipped with only plain guides, resulting in contents of truck falling into shaft.

Doors are substantially made and are durable. No weights or springs are required, as one door counterbalances the other with simple and perfect mechanical operation.

Doors work easily, and can be equipped with safety attachments.

Write for more particulars and details.



NO. 110. STEEL COIL DOOR INSTALLED ON TRACK OPENING



ELEVATOR TRUCKOVER DOOR



# SAINO FIRE DOOR & SHUTTER CO.

ESTABLISHED 1899

MAIN OFFICE AND FACTORY

2025 Elston Avenue  
CHICAGO, ILL.

## Products.

SAINO ALL-METAL FIRE DOORS (Patented) for warehouses, freight houses, roundhouses and factories; COUNTERBALANCE ELEVATOR DOORS.

All-metal Shutters, Compound Slide-up, and Jack Knife Doors, Stairway Doors; Rolling Steel Shutters; Kalamein Doors; Fire Door Hardware; Grain Spouts for Elevators.

## Construction.

Saino fire doors are two walls of crosslaid No. 22 United States gage corrugated galvanized steel, with air chambers and asbestos between. Patented telescopic channels and joints provide for expansion and contraction.

## Underwriters' Approval.

Approved by Underwriters' Laboratories and Factory Mutual Laboratories. Accepted and recommended by national, state and municipal authorities.

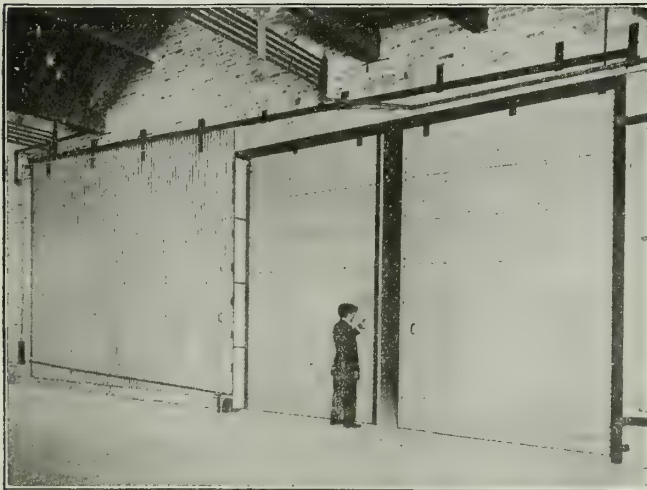
**Saino**  
SHEET METAL  
FIRE DOOR  
TRADE-MARK

Recognized by Chicago Board of Underwriters with double insurance credits over tin clad and No. 12 iron fire doors when installed on both sides of fire wall.

## Advantages.

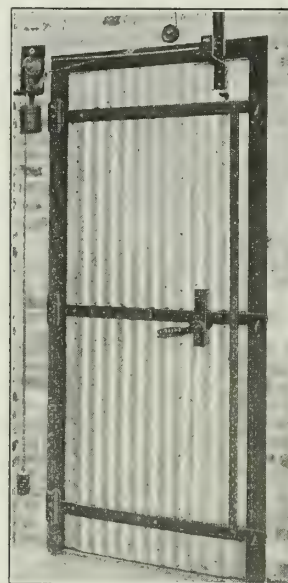
Saino doors outlast buildings in which they are installed.

In nineteen years' experience the company has never replaced a door destroyed by fire, rust or rot. Saino doors are absolutely non-combustible. They are about half the weight of standard tin clad doors, and the average cost erected is no more. They save the enormous rust and dry rot cost common to other fire doors and shutters.



LARGE SAINO SLIDING FIRE DOORS INSTALLED IN MONTGOMERY WARD & CO.'S NEW MILLION DOLLAR WAREHOUSE, CHICAGO, ILL.

Over 100 Saino fire doors installed in this building



SAINO AUTOMATIC SWING FIRE DOOR

Flush in angle frame

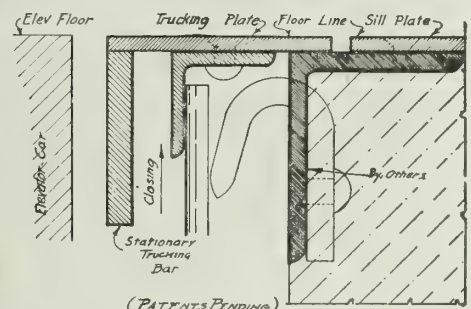


SAINO CLASS "C" DOOR

In angle frame



SAINO COUNTERBALANCE ELEVATOR DOORS INSTALLED IN PLANT OF WAGNER ELECTRIC MANUFACTURING CO., ST. LOUIS, MO.  
CONDON COMPANY, Structural Engineers



DETAIL OF TRUCKING DEVICE FOR COUNTERBALANCE DOORS

Forms support for trucking as solid as door sill itself. Trucking plate attached to upper edge of lower panel rests, when door is open, on door sill and a stationary bar. Ends of bar supported by wall of elevator shaft. Sill recessed to receive trucking plate, giving a smooth, solid surface for trucking

# THE KINNEAR MANUFACTURING CO.

Steel and Wood Rolling Doors, Shutters and Partitions  
COLUMBUS, OHIO

## BRANCH OFFICES

BOSTON, MASS., 85 Water Street  
PHILADELPHIA, PA., Wesley Building, 17th and Arch Streets  
INDIANAPOLIS, IND., 917 State Life Building

CHICAGO, ILL., 1860 C. & C. Bank Building  
CLEVELAND, OHIO, 409 Union Building  
DETROIT, MICH., 709 Ford Building

## AGENCIES

NEW YORK, N. Y.  
CINCINNATI, OHIO  
DENVER, COLO.

ROCHESTER, N. Y.  
ST. LOUIS, MO.  
LOS ANGELES, CAL.

NEW ORLEANS, LA.  
ATLANTA, GA.  
PITTSBURGH, PA.

SPOKANE, WASH.  
MEMPHIS, TENN.  
SEATTLE, WASH.

SAN FRANCISCO, CAL.  
VANCOUVER, B. C.

MONTREAL, CANADA

WINNIPEG, CANADA

## Products.

STEEL ROLLING DOORS and SHUTTERS; WOOD ROLLING DOORS and PARTITIONS; BI-FOLDING DOORS; VERTICAL SLIDING SECTIONAL DOORS; SLIDING FIRE DOORS.

## Kinnear Construction.

In Kinnear steel rolling doors and shutters, the curtains are made of open hearth interlocking steel slats, with malleable iron endlocks; curtain is coiled upon barrel, journaled in cast iron brackets and travels in steel guides at the sides. It is counterbalanced by helical springs, enclosed in barrel. A steel galvanized hood encloses the coil and protects it from the weather.

Wood rolling doors and partitions are made of hard pine, cypress, oak or birch, with ribbons of phosphor bronze.

Folding and vertical sliding doors are constructed either in wood or steel, or wood frame covered with steel.

## Fire Protection.

Steel rolling doors and shutters are valuable fire retardants for the protection of openings in fire walls, vertical shafts and exterior window and door exposures.

Special fire door types bearing the names of "Akbar," "Acme," "Atlas" and "Superior" are constructed under the supervision of the Underwriters' Laboratories, Inc., and are inspected and labeled by their representative at the factory.

## Installation of Rolling Doors.

Two forms of installation are generally used in mounting steel rolling doors and shutters:



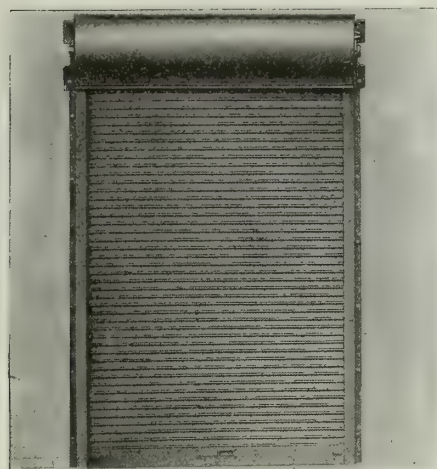
River front, showing wharf doors of steel rolling type



Wagon concourse doors, 22 ft. wide and 17 ft. high, automatic closing

INSTALLATION OF STEEL ROLLING DOORS, REID, MURDOCK & CO., CHICAGO, ILL.





Elevation



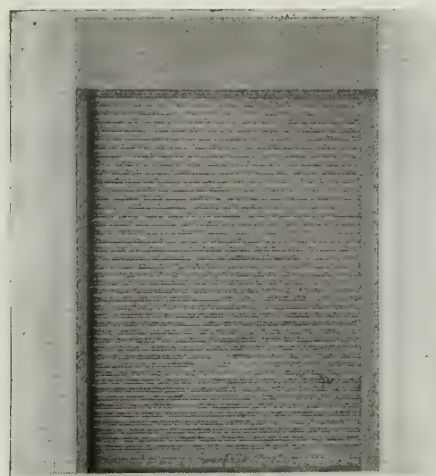
Vertical Section



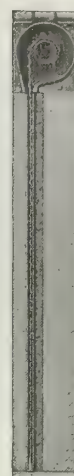
Cross Section

**CONSTRUCTION NO. F. M. 10**

Mounted on face of wall; counterbalanced by springs. Operated manually by handle in bottom bar of curtain. When door is placed on exterior face of wall, hood is inclined to shed water



Elevation



Vertical Section



Cross Section

**CONSTRUCTION NO. B. M. 10**

Mounted in opening; counterbalanced by springs. Manually operated by handle in bottom bar of curtain. Hoods can be paneled to meet special requirements



Elevation



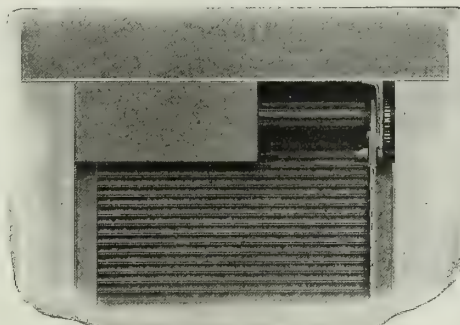
End View



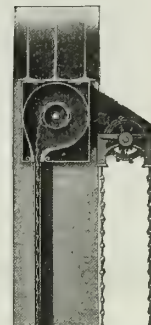
Cross Section

**CONSTRUCTION NO. F. H. 20**

Mounted on face of wall; counterbalanced by springs. Operated by means of endless chain, sprocket and gear



Elevation



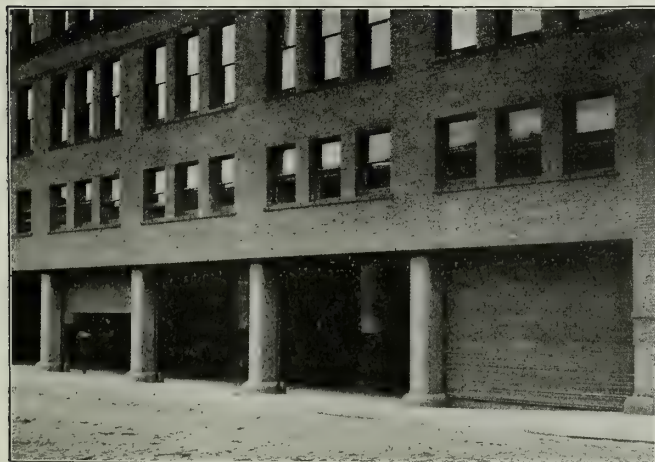
Vertical Section



Cross Section

**CONSTRUCTION NO. B. H. 20**

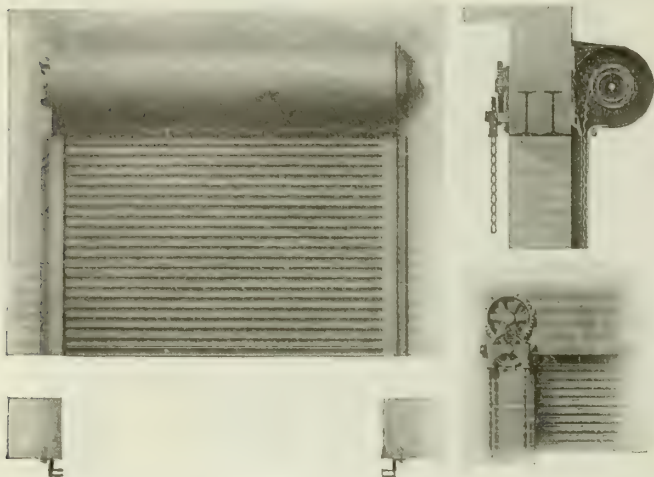
Mounted in opening; counterbalanced by springs. Operated by means of endless chain, sprocket and gear

**BUTLER BROS., CHICAGO, ILL.**

Kinnear steel rolling doors on shipping platforms. Compactness of doors admits of placing openings in close arrangement, making practically the entire side of building available to teams, which greatly facilitates handling of merchandise

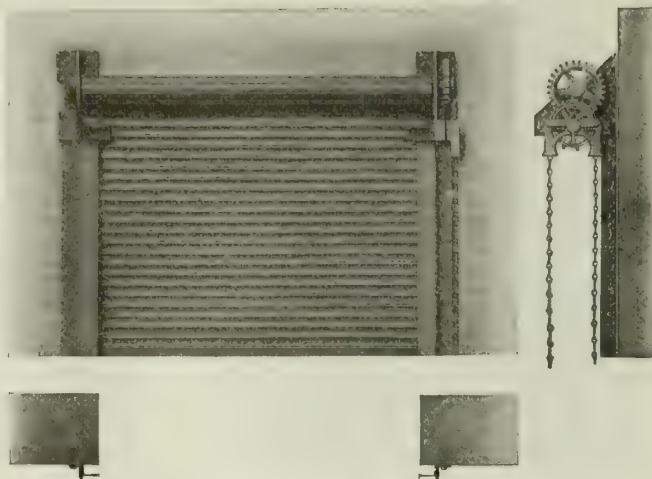
**CURTIS PUBLISHING CO., PHILADELPHIA, PA.**





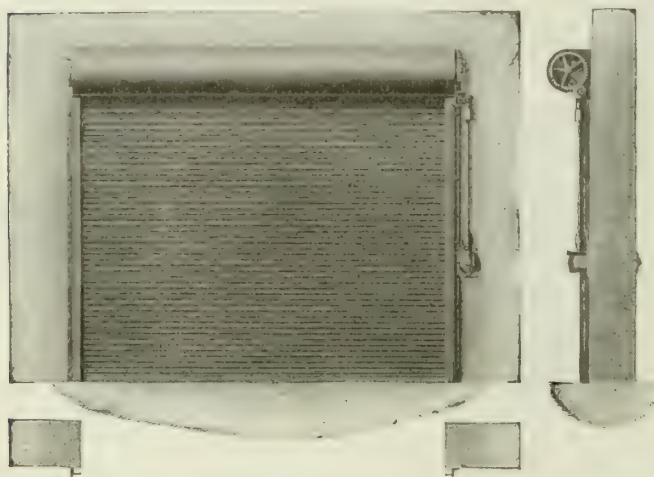
CONSTRUCTION NO. F. H. 61

Door mounted on exterior face of wall. Operated from within building by means of endless chain, sprocket and gear, and by shaft extending through the wall



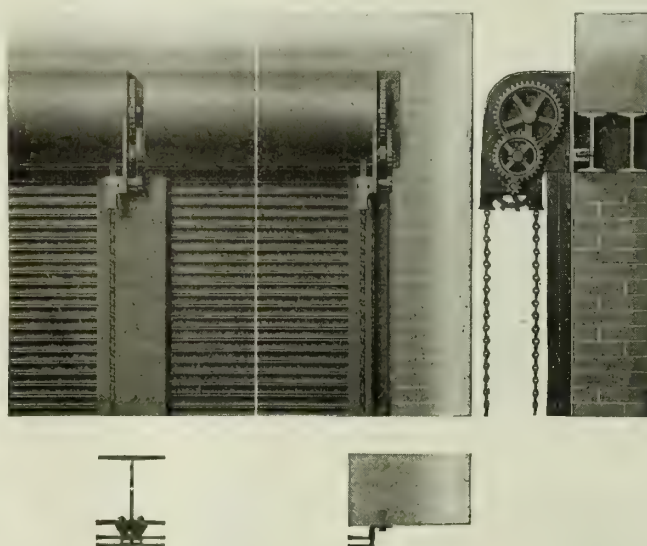
CONSTRUCTION NO. F. H. 30

Mounted on interior face of wall; not furnished with hood. Open type of bracket facilitates erection. After brackets are in place, curtain barrel can be dropped into bearings. Closed brackets necessitate erection of both brackets and barrel together



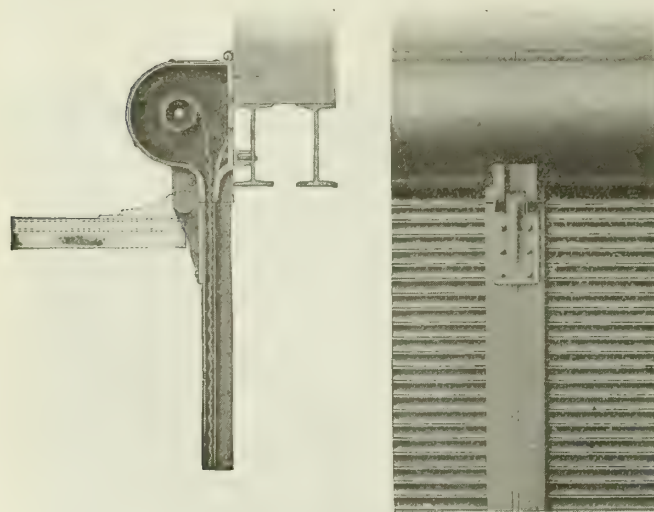
CONSTRUCTION NO. F. C. 20

Mounted on face of wall. Operated by means of crank, imparting movement to the curtain barrel through shaft and suitable gear. Can be made to operate from either inside or outside of building, or both. Operation from one side only is standard arrangement



CONSTRUCTION NO. F. H. 23

Modification of construction No. F. H. 20. A compact design well adapted to large openings, separated by narrow post



INTERMEDIATE MOVABLE POSTS

Wide openings can be frequently more economically closed by a number of small doors, than by a single large one, using between doors, movable posts hinged to brackets. When doors are opened, posts are swung up out of the way by ropes and pulleys



INTERIOR OF PIER 32, SAN FRANCISCO

Steel rolling doors arranged with movable intermediate posts shown above, making entire opening available



### Electrically Operated Door.

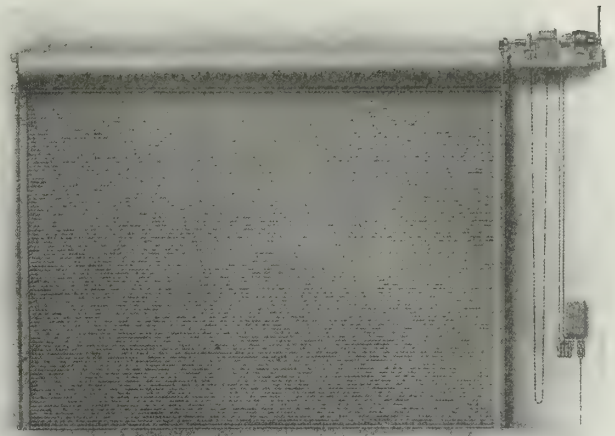
Equipped with Power Unit No. 1. Mounted on platform suspended from roof. Automatic starter, reversing and starting switches mounted on wall at a convenient point.

**CONTROL OF CURTAIN**—The door is automatically stopped by limit switches after it is started and does not require further attention of the operator.

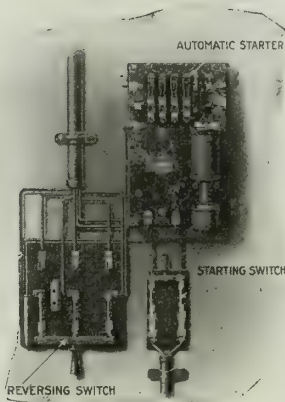
This equipment is essentially power driven. Manual operation intended for emergency only.

Chain must be removed from sprocket when motor is employed.

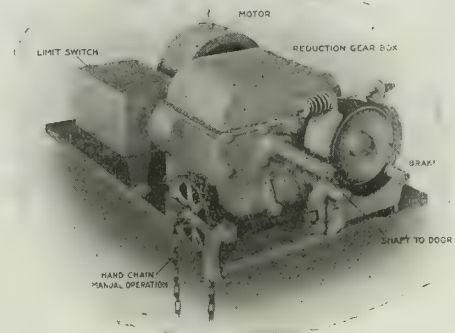
For other arrangements of power units, see general catalogue No. 51.



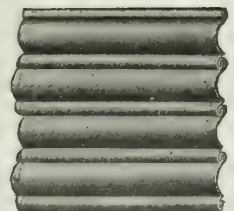
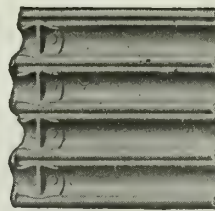
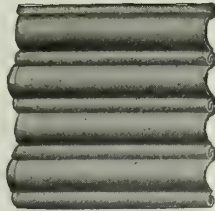
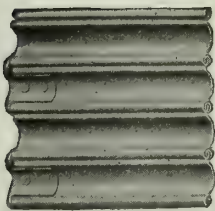
ELECTRICALLY OPERATED DOOR



STARTER AND REVERSING SWITCH



POWER UNIT NO. 1

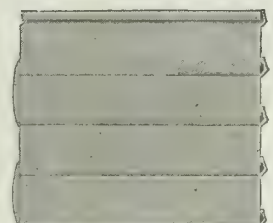
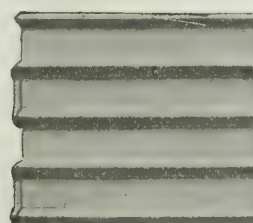
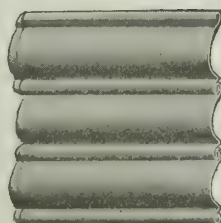
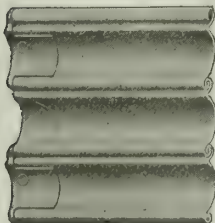


Interlocking Steel Slat No. 2

Illustrations to the left show slat No. 2 fitted with alternate endlocks; those to the right, fitted with continuous endlocks. Slat No. 2 is  $1\frac{1}{8}$  in. wide on centers, depth of crown,  $\frac{3}{8}$  in.

Made in gages Nos. 24, 22, 20, 18 and 16.

Especially adaptable to shutters equipped with mechanical operating device



Slat No. 4

Fitted with alternate endlocks. It is  $2\frac{5}{8}$  ins. wide on centers, depth of crown,  $\frac{7}{8}$  in.

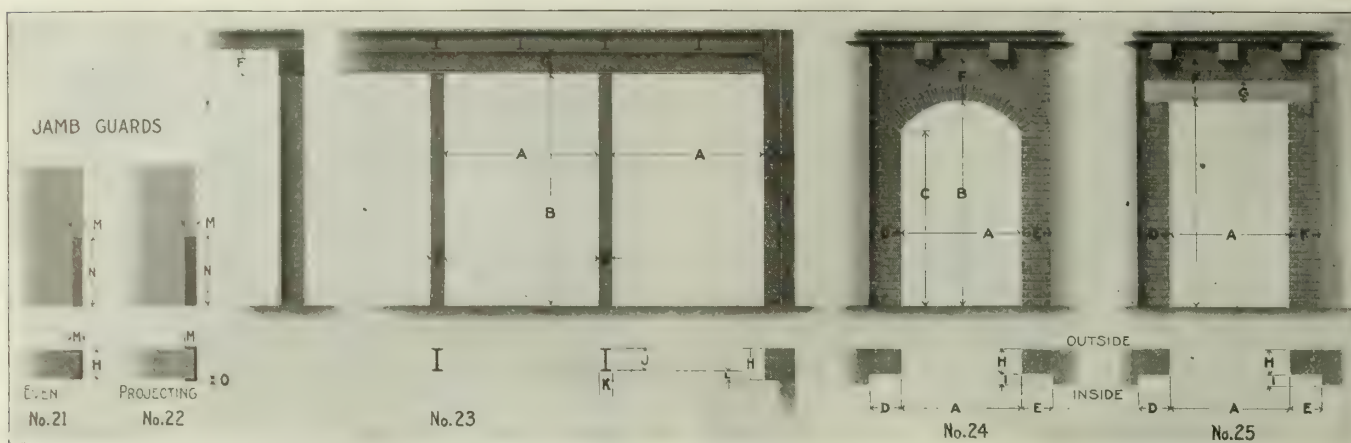
Made in gages Nos. 20, 18 and 16

Slat No. 5

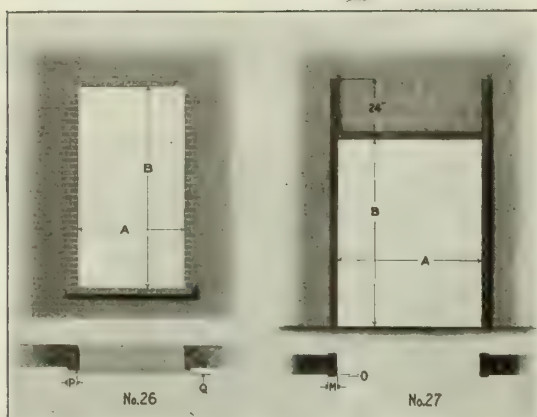
Fitted with alternate endlocks;  $1\frac{1}{8}$  ins. wide on centers, depth of crown,  $\frac{1}{2}$  in. Made in gages Nos. 22, 20 and 18. Especially designed for doors and shutters manually operated by handle in bottom bar. When in perpendicular arrangement, shoulders are brought into rigid alignment

### CONCAVE AND CONVEX SIDES OF INTERLOCKING STEEL SLATS

Kinnear steel rolling doors and shutters are composed of slats illustrated above. Concave and convex sides, and method of interlocking are shown. Note that either side of the interlocking joints sheds water. Malleable endlocks reinforce edges and prevent longitudinal separation. They also provide an excellent wearing surface in the guides



OPENINGS FOR KINNEAR ROLLING SHUTTERS

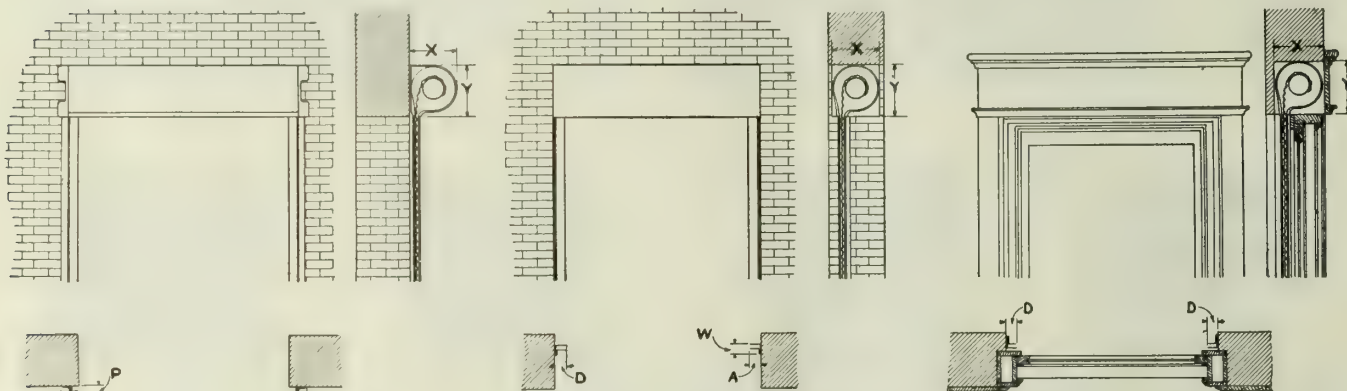


OPENINGS FOR KINNEAR ROLLING SHUTTERS

**Information and Measurements Required.**

Illustrations show essential measurements. In giving information, describe lintel, shapes and sizes of parts composing it, accompanying same with sketch showing cross section. Essential measurements are as follows:

- A*—Width; if door is mounted in opening, give width at top and bottom.  
*B and C*—Height of opening.  
*D and E*—Projection in close proximity to opening.  
*F*—Clearance between top of opening and floor beams, or ceiling.  
*G*—Height of lintel.  
*H*—Thickness of wall.  
*I*—Projection of some part of wall near opening.
- J*—Depth of column; give shape and sizes of parts composing column.  
*K*—Width of column.  
*L*—Distance from column to inner face of wall.  
*M*—Lap of guard.  
*N*—Height of guard.  
*O*—Projection of guard.  
*P*—Lap of guard.  
*Q*—Projection of sill.



PROJECTIONS (Schedule Below)

Above are indicated the salient dimensions of the more ordinary construction of usual sizes of Kinnear steel rolling shutters. View to the left shows shutter placed on face of wall; central view shows shutter placed between jambs, and that to the right shows curtain with concealed coil. The following dimensions are for shutters of height and width indicated

Width 3' 0" to 6' 0"						Width 6' 0" to 10' 0"					Width 10' 0" to 15' 0"					Width 15' 0" to 20' 0"				
Groove depth "D" 2"						Groove depth "D" 2½"					Groove depth "D" 3"					Groove depth "D" 3½"				
Height	X	Y	P	A	W	X	Y	P	A	W	X	Y	P	A	W	X	Y	P	A	W
ft. ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
6 0	12¾	14	2½		3	13½	15	2½		3½	12¾	14	2½		4	12¾	14	2½		4½
8 0	13½	15	2½		3	13½	15	2½		3½	12¾	14	2½		4	12¾	14	2½		4½
10 0	14¼	16	2½		3	14¼	16	2½		3½	12¾	14	2½		4	12¾	14	2½		4½
12 0	14¼	16	2½		3	14¼	16	2½		3½	12¾	14	2½		4	12¾	14	2½		4½
6 0	9½	11	2½	3½	3	10½	12	2½	4	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
8 0	10½	12	2½	3½	3	11¼	13	2½	4	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
10 0	11¾	13½	2½	3½	3	11¾	13½	2½	4	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
12 0	12¾	14	2½	4	3	13½	15	2½	4½	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
14 0	14¼	16	2½	4	3	14¼	16	2½	4½	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
16 0	15¼	17	3½	4	3	15¼	17	3½	4½	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½
18 0	15¼	17	3½	4	3	15¼	17	3½	4½	3½	12¾	14	2½	5	4	12¾	14	2½	7	4½

Schedule is for No. 2 slats. Sizes above division line apply to shutters operated by handle in bottom of curtain. Those below division line apply to shutters operated by endless chain or crank and bevel gear. Dimension "P" applies only to face of wall constructions. Dimensions "W" and "D" only to "between jamb" constructions. Dimension "A" applies only to chain hoist side of hoist operated shutters placed between jambs. Dimension "B" should always be at least 8 ins. wider than width of door opening for moderate sized shutters, and for very large shutters 10 or 12 ins. and more if possible. We do not recommend manually operated construction for curtains of larger area than approximately 100 sq. ft.; chain hoist should be used on larger sizes. Wherever desirable, automatic device may be combined with manually operated construction. Regarding any further details and unusual sizes or special constructions, direct correspondence is suggested.





UNDERWRITERS' LABELS

### Fire Doors and Shutters.

Constructed under the supervision of the Underwriter's Laboratories, Inc., and labeled as above.

**IMPORTANT FEATURES**—Kinnear fire doors and shutters are specially designed for fire protection. Details of construction have been carefully developed. The following are some of the important features:

(1) An auxiliary or inner hood is automatically dropped and closes the space between the barrel and outer hood, thereby preventing the passage of flame over the barrel.

(2) Special endlocks closing the concaved ends of slats and preventing the passage of flame around the edge of the curtain.

(3) Fusible washers employed in the construction of grooves which melt and allow the members composing the grooves to expand without cramping.

(4) Non-corrodible metal used for bearings and contact points of the automatic release.

(5) Single line contact bearings in releasing levers.

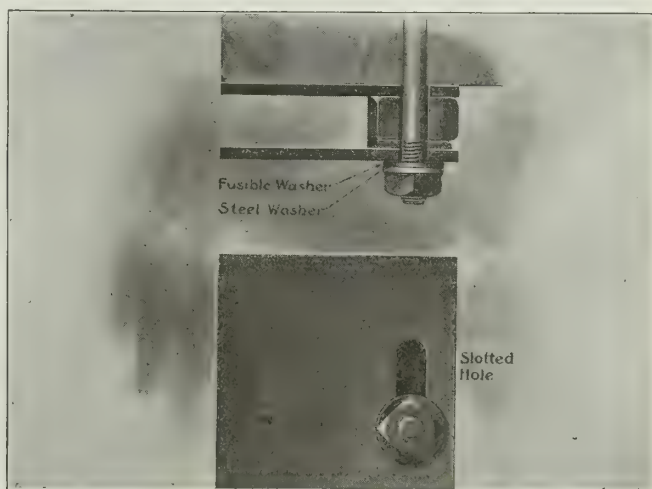
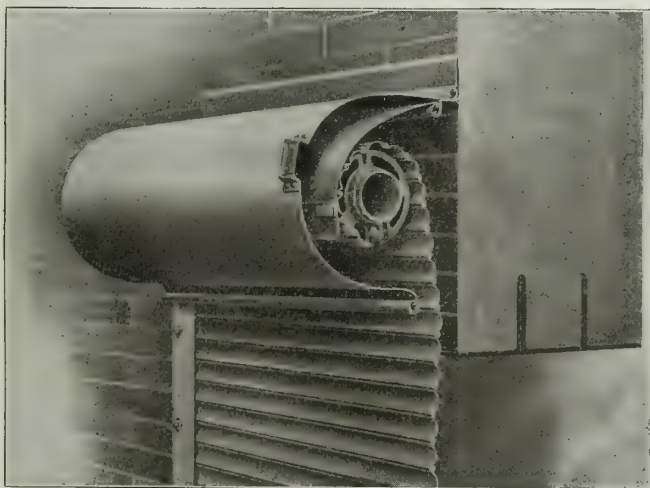
(6) Provision made for expansion of parts for all temperatures up to 2000° Fahr.

(7) Disposition of fusible links, insuring prompt closing.

(8) The enclosure of automatic release, protecting it from the weather.

**SPECIAL EQUIPMENT**—We are prepared to furnish governors controlling the speed of curtain in automatic closure.

**CATALOGUES**—General Catalogue No. 51 and the special Fire Door Catalogue No. 53 illustrate many additional types and their applications. These doors are designed to obtain easy operation in normal service, and are easily opened and reset by a single person after automatic closure.



SALIENT FEATURES OF KINNEAR FIRE DOORS AND SHUTTERS

**Ajax Door for Openings in Fire Walls.**

Approved for openings not exceeding 80 sq. ft. in area, double doors required.

DESCRIPTION—This door is composed of interlocking cellular sections  $2\frac{1}{2}$  ins. thick, assembled on steel frame.

Filled with non-combustible material which does not produce smoke or gas when highly heated.

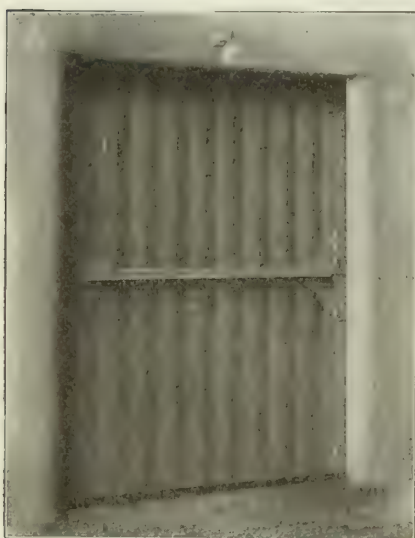
Mounted on track. Overlaps the opening sides and top.

All of the hardware on the door is attached, except hangers, and holes are provided for these.

Manually operated by means of handle, and automatically closed by weight released by fusible links.



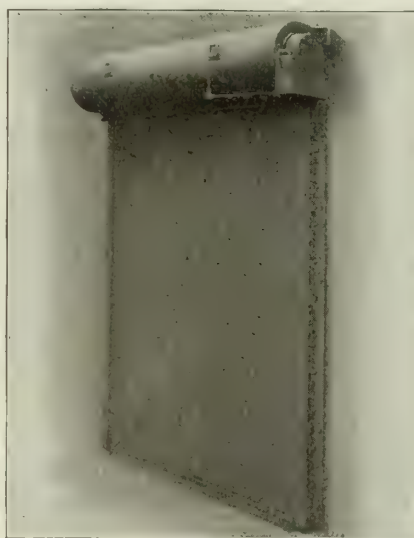
"AJAX" SLIDING DOOR EQUIPPED WITH AUTOMATIC CLOSING DEVICE



COUNTERBALANCED DOOR

Single door for elevator shafts; not exceeding 80 sq. ft. in area. Installed on face of wall inside of shaft.

Manually operated and automatically closed



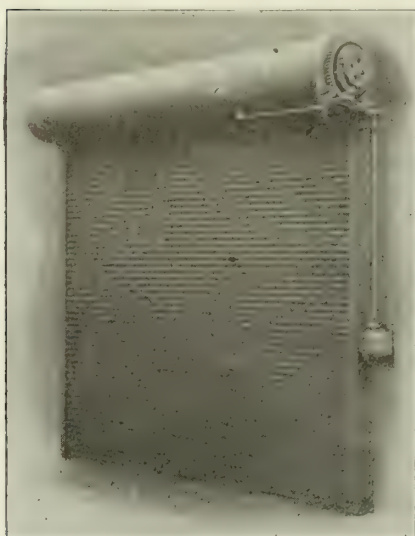
ACME NO. 1

For elevator shafts; opening not to exceed 80 sq. ft. in area. Installed on face of wall. Manually operated by means of handle; automatically closed



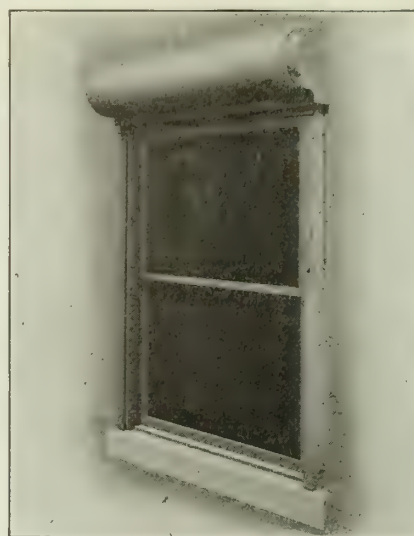
ACME NO. 4

Double doors for fire walls; opening not to exceed 80 sq. ft. in area. Doors mounted in opening. Manually operated by means of handle; automatically closed



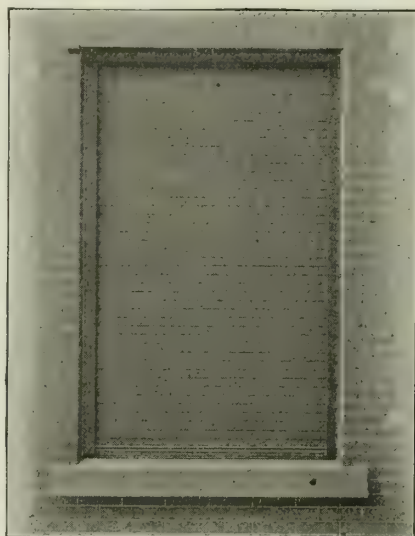
AKBAR NO. 7

Double doors for fire walls; opening not to exceed 80 sq. ft. in area. Mounted on face of wall; mechanically operated by means of crank; automatically closed



SUPERIOR NO. 1

Single shutter for exterior windows; opening not to exceed 10 ft. wide by 10 ft. high. Mounted on face of wall. Normally open; automatically closed. Equipped with governor, controlling speed of the descending curtain



ACME NO. 8

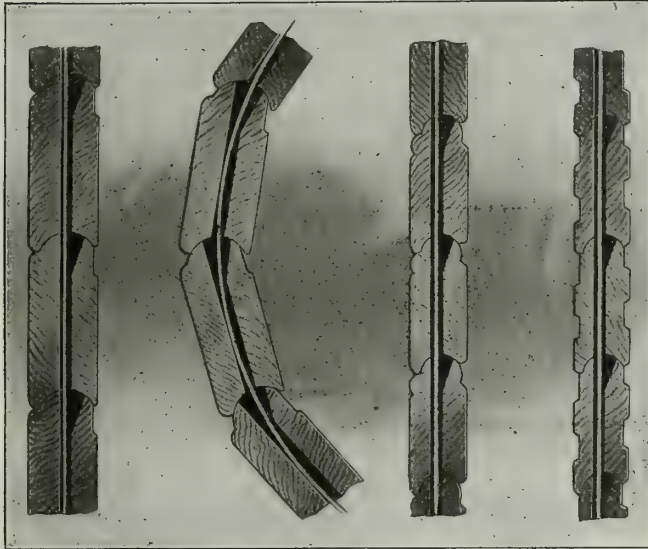
Single shutter for exterior window openings, not exceeding 10 ft. wide by 10 ft. high. Grooves mounted between jambs; coil concealed above head of window. Normally open; automatically closed. Equipped with governor, controlling speed of the descending curtain



**Wood Rolling Doors and Partitions:**

Wood rolling doors and partitions are extensively employed in schools and churches to separate classrooms and subdivide large rooms into smaller units.

They are also used for exterior work in special cases, such as roundhouses, where sulphureous gases and other corrosive agents are present in the atmosphere.



No. 27                      No. 27                      No. 26                      No. 24  
SECTIONS OF WOOD SLATS

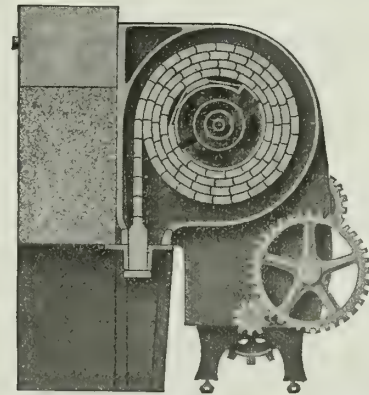
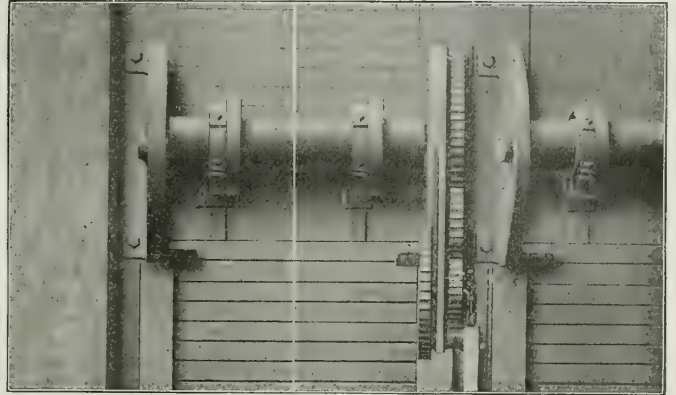
**WOOD SLATS**—Curtains are composed of slats assembled on phosphor bronze ribbons.

Made in long leaf yellow pine, cypress, quarter sawed oak and birch.

In ordering, specify and send sample of finish desired.

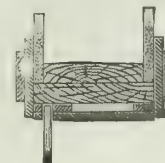
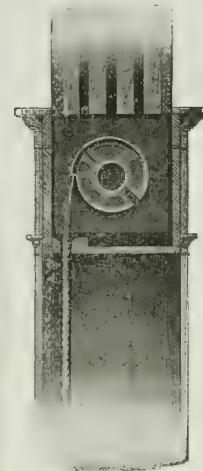
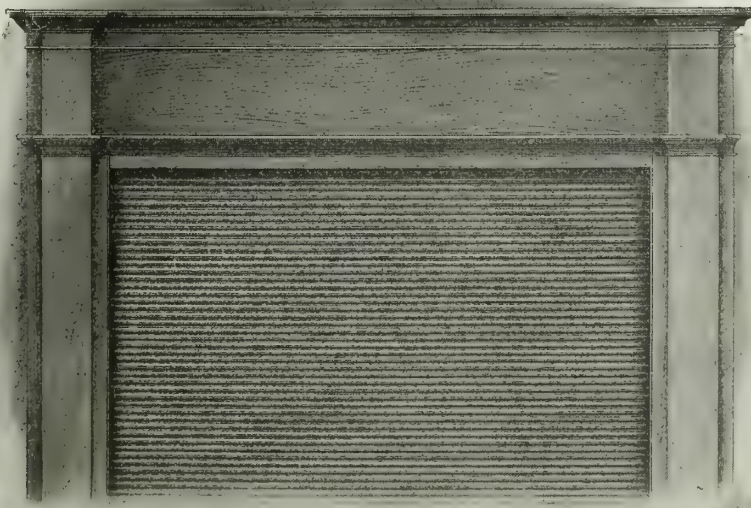
Slats Nos. 24 and 26 are for interior work; slat No. 27 for exterior work.

Illustration shows cross section through slats. The opening through which the ribbon passes is so shaped that, during flexure of the curtain, there is no change in the relative length of the slats or curtain; nor is there any danger of pinching the ribbon.



CONSTRUCTION NO. F. H. W. 22

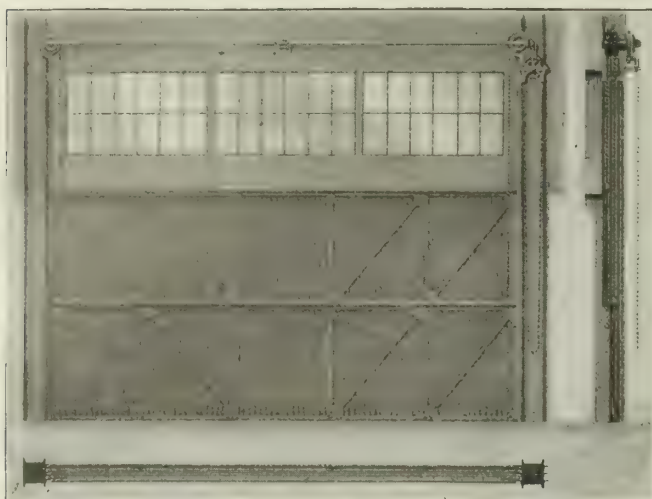
Designed especially for roundhouses. Doors mounted on face of wall above opening; travels in grooves at sides. Counterbalanced by springs; operated by means of endless chain and reduction gear



CONSTRUCTION NO. W. B. M. 10

Application of wood rolling door for interior partition. Coil is concealed under lintel; operated by means of handle in bottom of rail. Mechanical operating devices are arranged for large doors. Can be concealed within the casing. Casing and grooves are not supplied, but should be included in general carpenter work





VERTICAL SLIDING SECTIONAL DOOR

Composed of two or more sections consisting of trussed frame covered with corrugated iron, hung independently with chains, connected with counterbalance weights. Operated by endless chain

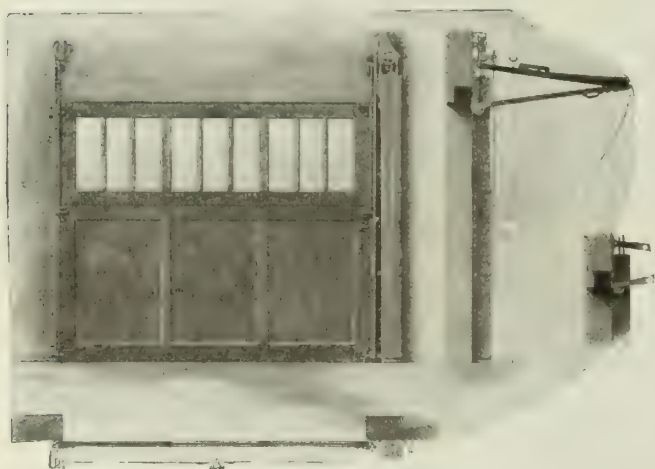


SANTA FE FREIGHT SHED, LOS ANGELES, CAL.

Equipped with Kinnear vertical sliding doors. Interior view showing three positions of the door

### Kinnear Bi-folding Door, Type No. 1.

Door comprises two sections hinged together and supported at center by radial arms pivotally connected to wall brackets. Chains are attached at the bottom which communicate with the counterbalance weight. The bottom of door is fitted with rollers, which travel in guides attached to wall, and transmit the thrust.



BI-FOLDING DOOR, TYPE NO. 1

NORFOLK & WESTERN FREIGHT HOUSE, NORFOLK, VA.  
Installation of Kinnear bi-folding door, type No. 1

TABLE FOR DETERMINING CLEARANCE "C," USING 8" x 9" COUNTERWEIGHT

B—Height of opening in feet	A—Width of opening in feet					
	6	8	10	12	14	16
6	2' 4"	2' 5"	2' 7"	2' 9"	2' 10"	3' 1"
7	2' 4"	2' 5"	2' 8"	2' 10"	2' 11"	3' 1"
8	2' 5"	2' 6"	2' 9"	2' 10"	3' 0"	3' 2"
9	2' 6"	2' 7"	2' 9"	2' 11"	3' 0"	3' 2"
10	2' 6"	2' 7"	2' 10"	3' 0"	3' 1"	3' 3"
11	2' 7"	2' 9"	2' 10"	3' 0"	3' 1"	3' 3"
12	2' 7"	2' 9"	2' 11"	3' 1"	3' 2"	3' 4"
13	2' 8"	2' 10"	3' 0"	3' 1"	3' 3"	3' 5"
14	2' 9"	2' 11"	3' 0"	3' 2"	3' 4"	3' 5"
15	2' 9"	2' 11"	3' 1"	3' 2"	3' 4"	3' 6"
16	2' 10"	3' 0"	3' 1"	3' 3"	3' 5"	3' 7"

Clearance "D," 6". Clearance "E," 18". Clearance "F," 10".  
Example—Required "C" for door 12 ft. wide by 10 ft. high. See intersection of column 12 and line 10, the dimension is 3' 0". This may be reduced by cutting out the floor under counterweight, permitting it to extend below floor level.

Where clearances at top and sides are not available for regular equipment, it is advisable to request information, accompanying the same with details of openings. We will be pleased to furnish drawings showing special attachments applicable to the conditions.

Clearances for types Nos. 2 and 3 sent on application.

PENNSYLVANIA FREIGHT HOUSE, CAMBRIDGE, OHIO  
Installation of Kinnear bi-folding door, type No. 1

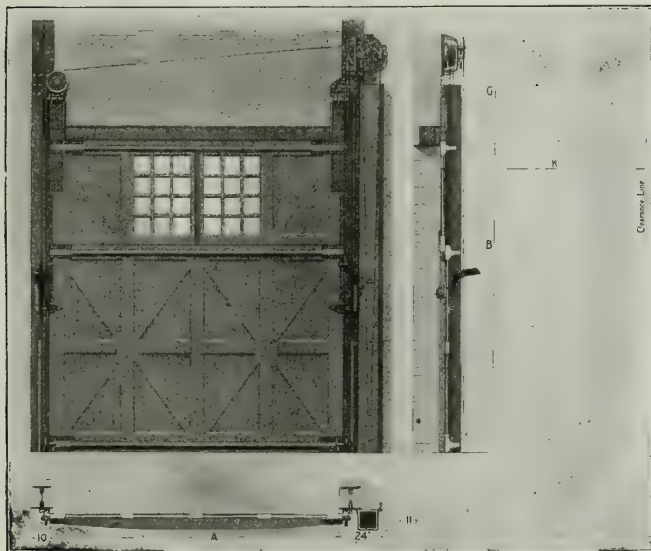


**Kinnear Bi-folding Doors, Type No. 2.**

Especially designed for large openings. Operates with ease and rapidity.

It is unnecessary to "break" door by hand, as is generally done in other types of folding doors; operations of unlocking, "breaking" and raising are accomplished by means of endless chain.

A reversal of these functions occurs when door is closed. In opening, lower section moves upward a distance approximately 18 ins., when hooks on lower section engage reciprocal members on upper section; door then folds radially to a point above opening.



KINNEAR BI-FOLDING DOOR, TYPE NO. 2

B	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"	15'-0"	16'-0"	17'-0"	18'-0"	19'-0"	20'-0"
C	3'-9 $\frac{3}{8}$ "	3'-10 $\frac{1}{8}$ "	4'-0 $\frac{1}{8}$ "	4'-2 $\frac{3}{8}$ "	4'-4 $\frac{1}{8}$ "	4'-5 $\frac{1}{8}$ "	4'-7 $\frac{1}{8}$ "	4'-9 $\frac{1}{8}$ "	4'-11"	5'-0 $\frac{3}{8}$ "	5'-2 $\frac{1}{8}$ "
K	7'-1 $\frac{1}{2}$ "	7'-3"	8'-3"	8'-10"	9'-5"	9'-11 $\frac{1}{2}$ "	10'-6 $\frac{1}{2}$ "	11'-1 $\frac{1}{2}$ "	11'-8"	12'-3"	12'-10"

**DIMENSIONS**—The schedule gives the clearances "C" and "K" for different size openings, using standard construction. The dimension "C" can be reduced either by using different size counterweights or by permitting the counterweights to extend below the floor level.

**ADAPTABILITY**—Suitable for depots, freight houses, docks, warehouses and shops. Especially well adapted

to situations which necessitate providing for lighting the interior.

**MATERIAL AND CONSTRUCTION**—Doors are constructed of wood, flat or corrugated steel. When specified, they are pierced by lights of plain or wire glass fixed in wood or metal frames.

The hardware and framing members are properly proportioned to the size of doors and have ample strength to prevent excessive deflection of the sections when doors are raised.

The structural design and liberal use of material give both strength and durability.

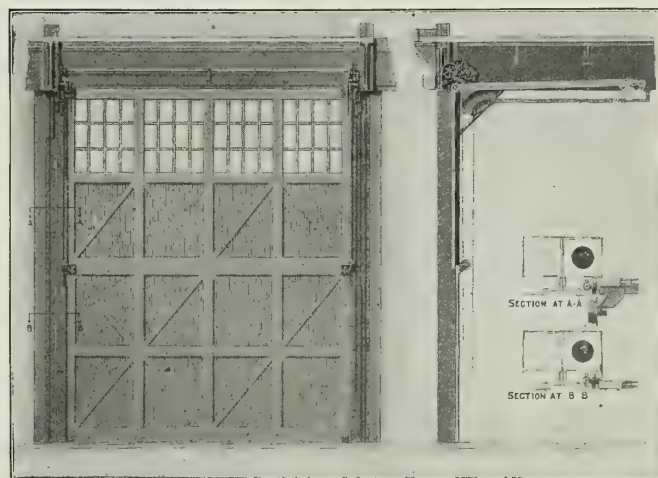
**OPERATION**—Doors are counterbalanced by weights. Operated by mechanism consisting of endless chain and reduction gear. They operate with ease and rapidity.

Types Nos. 2 and 3 are self-breaking and self-locking.

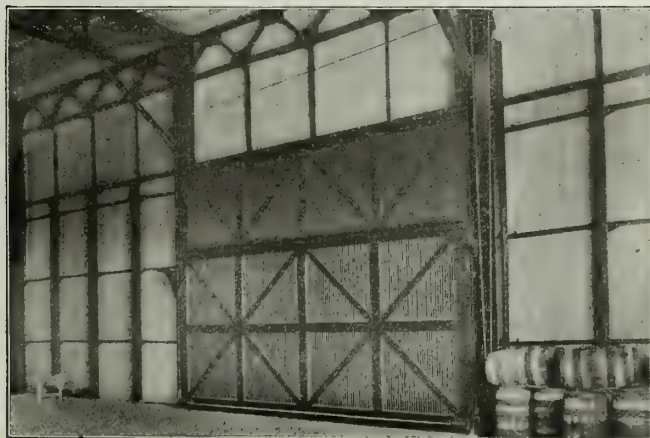
**Bi-folding Door Type No. 3.**

Designed for large openings. Made in two sections.

In operating, the lower section raises to half the height of the opening. The door then breaks and both sections move simultaneously, the lower edges vertically and the upper edges horizontally on suspended tracks, to a position above the opening as shown by phantom lines.



BI-FOLDING DOOR, TYPE NO. 3



INTERIOR VIEWS SHOWING KINNEAR BI-FOLDING DOORS, TYPE NO. 2, IN CLOSED AND OPEN POSITIONS

POWELL EVANS, PRESIDENT

**MERCHANT & EVANS CO.**

ESTABLISHED 52 YEARS (1866-1918)

Manufacturers of Fire Doors and Shutters

PHILADELPHIA, PA.

OFFICES AND WAREHOUSES

PHILADELPHIA  
WHEELING

NEW YORK

CHICAGO

BALTIMORE

ST. LOUIS

ATLANTA

CLEVELAND  
KANSAS CITYWORKS  
PHILADELPHIA  
WHEELING  
CHICAGO**Products.**

EVANS "ALMETL" FIRE DOORS and SHUTTERS (Patent Pending). Fully approved by the Underwriters' Laboratories, Inc., Chicago; the Factory Mutual Laboratories, Boston, and by National, State and Municipal Authorities generally.

For Ventilators, see page 470; for Metal Roofing, see page 420.



TRADE-MARK

FIRE DOORS—Single sliding, double sliding, single swinging, double swinging, vertical sliding, and horizontal lifting.

SHUTTERS—Single swinging, double swinging, single sliding, double sliding.

Suitable for square or arch top openings. Doors and shutters also made on order to tical sliding, horizontal lifting.

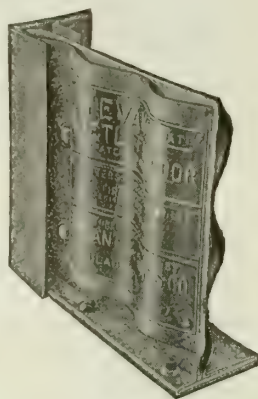
**Service.**

Approximately 250 responsible and experienced contracting and erecting "Licensees" in the principal cities.

Complete installations to meet the requirements of the Underwriters' Inspection Bureaus throughout the United States.

**Construction of Evans "Almetl" Fire Doors.**

A panel of transversely laid standard, 2½-in. corrugated, galvanized, heavy gauge steel, with interlining of asbestos roll board—all securely held in a continuous frame of 3/16 by 2½-in. bar steel. All joints are welded, not riveted or bolted. The frame and ends of panel sheets are protected by a cover binder of heavy galvanized sheet steel, securely riveted to the frame, thus forming an armor to protect the edges of the door from abuse



SHOWING CONSTRUCTION OF EVANS "ALMETL" FIRE DOOR

In riveting the panel sheets to the frame, due provision is allowed for expansion and contraction, without excessive distortion. The crosslaid corrugated panel sheets give maximum strength, with reduction in weight.

The large air passages, between the corrugations of the panel sheets and the asbestos roll board lining, provide, in the "Almetl" door, the greatest possible resistance to the radiation of heat.

**Types.**

The Evans "Almetl" fire doors and shutters are made in the following types:

**Hardware.**

This company furnishes "approved" and labeled hardware, made of either malleable iron or wrought iron, of the following styles:

Round track, flat track, level (straight) track, and drop bracket track; single and double sliding and swinging, vertical sliding, and horizontal lifting.

**Insurance Rebate.**

Maximum reduction in insurance rates is granted for an approved installation of this type of door.

**To Architects.**

The Evans "Almetl" fire door is a marked improvement on the standard tin clad door generally used.

It is of rigid all-steel and asbestos, indestructible construction. No wood to rot, no tin to rust, no seams to open, no thin covering to bruise, no maintenance cost.

Designed and suitable for daily and continuous use, this door has not failed or deteriorated under the most exacting conditions.

The company's Engineering Department is always at the service of architects.



PENNSYLVANIA RAILROAD FREIGHT STATION



# MESSENGER & PARKS MFG. CO.

Fire Doors and Shutters, Skylights and Ventilators

AURORA, ILL.

## Products.

TIN CLAD FIRE DOORS and SHUTTERS; SKYLIGHTS; VENTILATORS.

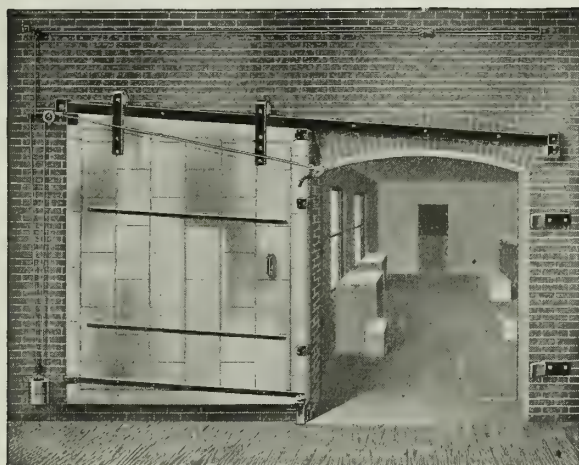
Sheet Metal Work: Cornices, Metal Ceilings, Gutters, Eaves Trough, Conductor Pipe, Roof Trimmings, etc.

Sheet and Angle Iron Specialties to order.

## Standard Tin Clad Fire Doors and Shutters.

Approved and labeled by National Board of Fire Underwriters after exhaustive tests by the Underwriters' Laboratories, Inc.

R-W fire door fixtures are employed. Hardware furnished to meet special requirements.



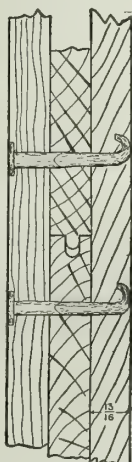
STANDARD TIN CLAD FIRE DOOR

### SPECIFICATIONS—Standard 3-ply (2 $\frac{5}{8}$ -in.)

**Doors**—To be made of 3 thicknesses of boards, dressed to 13/16 in. full, the outside layers vertical, inner layer horizontal; thoroughly fastened together by wrought iron clinch nails not over 8 ins. apart, extending clear through door and clinched on the back, leaving both surfaces of door smooth; double lock joints in tin covering as required under rules of National Board of Fire Underwriters. Weight, 8 lbs. per sq. ft.

**Standard 2-ply (1 $\frac{3}{4}$ -in.) Doors**—To be made of 2 thicknesses of boards, dressed to 13/16 in. full, with one layer vertical and one horizontal; thoroughly fastened together by wrought iron clinch nails not over 8 ins. apart, extending clear through door and clinched on the back, leaving both surfaces of door smooth; double lock joints in the tin covering as required under the rules of the National Board of Fire Underwriters. Weight, 6 lbs. per sq. ft.

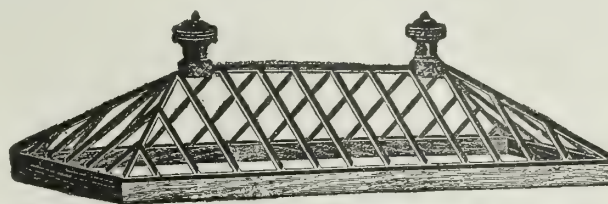
**Standard Fire Shutters**—To be made in same manner as 2-ply (1 $\frac{3}{4}$ -in.) doors and of same thickness.



SECTION OF 3-PLY DOOR  
Clinch nailing

## Galvanized Iron Skylights.

Made complete in any size with ribbed or wire glass, which is packed in separate cases. Provided with condensation gutters and warranted watertight. Plans and estimates furnished for photographers' skylights.



GALVANIZED IRON SKYLIGHT WITH ACORN VENTILATORS

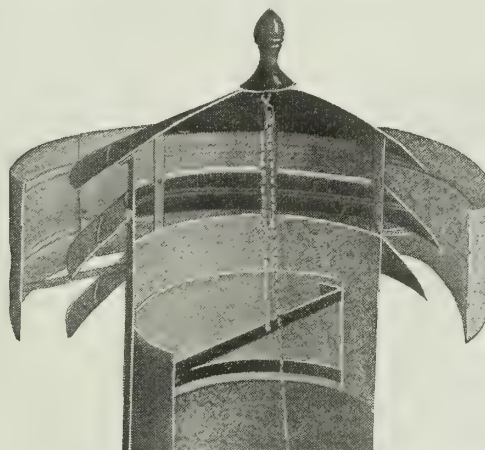
## Acorn Ventilators.

Made from galvanized steel, ingot iron, Toncan metal or copper, and constructed upon scientific principles which give it the greatest and most effective drawing or ventilating power possible in a stationary and stormproof ventilator, for the respective sizes used. For ventilating public buildings, school-houses, churches, warehouses, factories, etc.

Furnished with steel or glass top, also with sliding sleeve damper. Square to round bases made 4 ins. larger than diameter of ventilator.

SIZES ACORN VENTILATORS

Diam., ins.	Area, sq. ins.
6	28.27
7	38.48
8	50.27
9	63.62
10	78.54
12	113.10
14	153.94
16	201.06
18	254.47
20	314.16
24	452.39
30	706.85
36	1,017.88
40	1,256.64
48	1,809.56
54	2,256.37
60	2,827.44



No. 225. Steel Top with Sliding Sleeve Damper, Open



No. 300. With Glass Top  
ACORN VENTILATORS

## Co-operative Service.

Designs and estimates furnished on request.



# J. EDWARD OGDEN COMPANY

Doors for Pier Sheds, Freight Houses, Garages and Industrial Buildings

TELEPHONE:  
RECTOR 4655

147-149 Cedar Street  
NEW YORK, N. Y.

WORKS  
BAYONNE, N. J.

## AGENCIES

MONTREAL, F. BACON & Co., 131 St. Paul Street, W.  
LOS ANGELES, WATERHOUSE & PRICE, 331 East 4th Street  
SAN FRANCISCO, C. ROMAN &

SEATTLE, ROLPH, MILLS & Co., Colman Building  
NEW ORLEANS, OLE K. OLESEN, 822 Perdido Street  
Co., 55 New Montgomery Street

## Products and Services.

MECHANISM and HARDWARE for MECHANICALLY OPERATED DOORS, particularly applicable where continuous line of doors of large size are desired, including OGDEN SINGLE-SECTION DOORS, OGDEN TWO-SECTION DOORS and OGDEN CANOPY DOORS. Special designs are also given careful attention.

This company is more particularly interested in the door hardware or mechanism parts, but will supply door sections, casings, sills, etc., and take charge of and complete installation if desired. Blue prints, advice and valuable information with special design to meet particular conditions will be cheerfully and promptly supplied upon request.

## Special Features.

Ogden doors incorporate the following features:

- (1) Doors are entirely link-supported, supports doing away with necessity of hinges or supporting tracks.
- (2) Automatic break-out. One operation only to open or close.
- (3) Mechanism and design insure against sticking or jamming of door in any position, and Ogden doors can be readily and rapidly opened or closed at any time.
- (4) Absence of any spring device. All doors fully counterweighted.
- (5) Unlimited degree of strength or fire resistance may be incorporated in door section.
- (6) Unsupported area in sheet steel doors may be confined to less than 13 sq. ft.
- (7) All parts of doors are accessible for painting.
- (8) Glass and sash may be installed in any portion of door to the extent desired.
- (9) Sag in door section reduced to minimum by substantial bracing and design. Sag can in no way affect operation of door. Study operation of door carefully.
- (10) Door sections can not blow out of guides.

## Construction.

All mechanism of heavy construction and of the finest materials, designed to last the lifetime of the building. Door sections may be constructed of wood or steel, with or without sheet metal covering, and of any degree of strength, durability or fire resistance desired. All types of Ogden doors are arranged for fully counterweighted balance, it only being necessary for the operator to overcome friction of parts. Doors are designed for one-man operation regardless of size or weight.

## Space Required Around Doors.

While it is desirable that the company be consulted on each installation, it can be stated that any one of the doors illustrated in Figs. 1 to 7 inclusive will require, at the counterweight side of the door, from 18-in. to 24-in. space from door opening, depending upon size of door. On other side of opening not less than 6 ins. is necessary. Minimum space above door head varies from 14 to 18 ins., but it is desirable to have as much height at this point as is available.

Although some illustrations show counterweights inside of columns, for industrial buildings the construction shown in Figs. 1, 2, 3, 4 and 5 is almost exclusively used, and above refers to this form of mechanism.

## Clearance Line.

Clearance lines of these doors provide maximum storage space in building. The two-section door particularly allows freight to be piled closely against it, up to one-half height of doorway. Above that point clearance line is as indicated by Fig. 4. Clearance line for canopy door is nearly identical.

## Ogden Two-section Doors (Patented)—Figs. 1, 2, 3, 4, 5.

These doors are especially adapted for use in pier shed and freight house door openings where it is desirable that merchandise may be piled close up against the door, but still permit its operation.

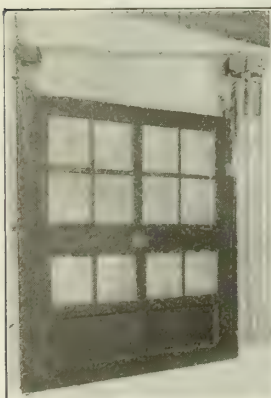


FIG. 1. OGDEN TWO-SECTION DOOR, CLOSED



FIG. 2. OGDEN TWO-SECTION DOOR, HALF OPEN

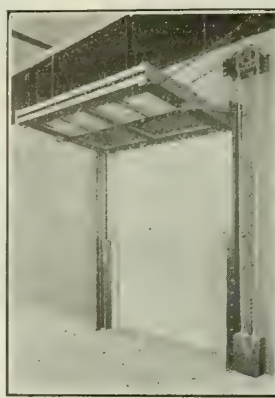


FIG. 3. OGDEN TWO-SECTION DOOR, OPEN

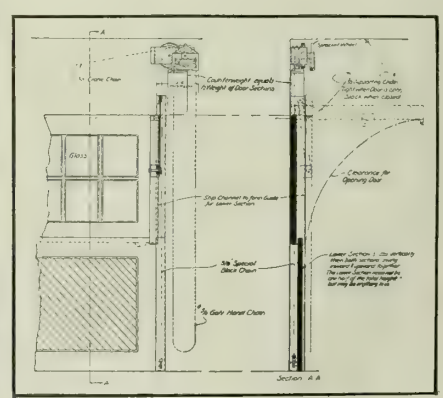


FIG. 4. DETAIL SHOWING CLEARANCE LINE OF OGDEN TWO-SECTION DOOR



The lower half slides vertically over the upper half, as will be noted in the illustrations; then the two sections together swing inward and upward at top to a horizontal position above the level of the door header. When only lower section is raised, ample opening is provided for passage of men and small freight. Opening both sections permits passing the largest freight.

These doors are particularly adapted for use in garages and for driveways and loading platforms in factories. Used in masonry or steel frame buildings, and mechanism takes smallest possible headroom.

### Ogden Single-section Doors (Patented)—Fig. 6.

The single-section door operates on same general principle as the two-section type, and is sometimes preferred. Door can be raised and lowered easily by one man; but, because of its swinging from the vertical while being raised, merchandise can not be piled so close to it as to the two-section door.

The single-section door, also, is adapted for use in garages and for driveways and loading platforms.

### Ogden Canopy Doors (Patented)—Fig. 7.

The canopy door is a modification of the single-section door; and when opened, the lower half projects outside to form a canopy. The lifting chains are attached near the center of door, and links are pivoted about three-quarters up the door. Usually built with the lower half unpaneled on the outside, so as to shed water when opened. Particularly adapted to shipping rooms and similar locations, where material is handled from wagons, and will open over freight piled close to it, the same as the two-section door.

### List of Installations.

#### PIERS AND TERMINALS

Albany, N. Y., Hudson Navigation Co.  
 Baltimore, Md., Commercial and Recreation Pier  
 Boston, Mass., Commonwealth Pier  
 Brooklyn, N. Y., 35th Street Pier  
 Hoboken, N. J., Pier No. 1, Hamburg-American Line  
 Houston Tex., Municipal Terminal  
 Los Angeles, Cal., Dock No. 1, Shed No. 1, San Pedro  
 Montreal, Can., Transit Sheds Nos. 24 and 25  
 New York, N. Y., Chelsea Piers  
 New York, N. Y., Piers Nos. 8, 9, 22, 28, 29 and 42, North River  
 New York, N. Y., Piers Nos. 7, 26, 27, 37 and 42, East River  
 New York, N. Y., 46th, 55th, 56th and 57th Street Piers, North River  
 Panama Canal, Pier No. 7, Cristobal, and No. 18, Balboa  
 Philadelphia, Pa., Piers Nos. 38 and 40, South Wharves  
 Philadelphia, Pa., Dock Street Pier and Vine Street Pier  
 Porto Rico, Ponce Pier, Ponce

Providence, R. I., State Pier No. 1  
 Savannah, Ga., Ocean Steamship Co.  
 Seattle, Wash., Port of Seattle Public Docks

#### CAR BARNs AND FREIGHT STATIONS

Cumberland, Md., Western Maryland Railroad Co.  
 Erie, Pa., Buffalo & Lake Erie Traction Co.  
 New York, N. Y., Interboro Rapid Transit Co.  
 Hartford, Conn., New York, New Haven & Hartford R. R. Co.  
 Olneyville, N. Y., New York, New Haven & Hartford R. R. Co.  
 Pawtucket, R. I., New York, New Haven & Hartford R. R. Co.  
 Van Nest, N. Y., New York, New Haven & Hartford R. R. Co.  
 Cedar Hill, Conn., New York, New Haven & Hartford R. R. Co.

#### GARAGES

Baltimore, Md., Requhardt Garage  
 Littleton, N. H., Morrow Garage  
 Newark, N. J., Jehle Garage  
 Newark, N. J., Hay Foundry Company, Plum Point Lane  
 New York, N. Y., Breton Hall Garage  
 New York, N. Y., Department of Water Supply, Gas and Electricity  
 New York, N. Y., 77th Street Garage and 135th Street Garage  
 New York, N. Y., Arfman Garage and Ardsley Garage  
 Union Hill, N. J., Wm. Peters Brewing Co.  
 New York, N. Y., Bryce Garage and 70th Street Garage  
 New York, N. Y., Manhattanville Garage, 130th Street and Old Broadway

#### WAREHOUSES AND INDUSTRIAL BUILDINGS

Akron, Ohio, Firestone Tire & Rubber Co.  
 Baltimore, Md., Rife Building  
 Bayonne, N. J., Standard Oil Co.  
 Bound Brook, N. J., Standard Paint Co.  
 Bradford, Pa., Tuna Mfg. Co.  
 Brooklyn, N. Y., Brooklyn Master Bakers' Association  
 Easton, Pa., Taylor-Wharton Co.  
 Ebensburg, Pa., Elder & Evans  
 Elizabeth, N. J., L. F. Hersh & Bro.  
 Erie, Pa., Erie Stove Co.  
 Iroquois Falls, Ont., Morrow & Beatty  
 Irvington, N. J., H. Kraeutter & Co.  
 Newark, N. J., Standard Oil Co.  
 Newark, N. J., Ford Motor Co.  
 New Haven, Conn., Winchester Repeating Arms Co.  
 New York, N. Y., Eagle Pencil Co.  
 New York, N. Y., Times Annex Building  
 Philadelphia, Pa., Crucible Steel Co.  
 Portage, Pa., E. M. Derrick  
 Sharon, Pa., A. Wishart & Sons  
 South Fork, Pa., South Fork Lumber & Crate Co.  
 Sparrows Point, Md., Bethlehem Steel Co.  
 Terre Haute, Ind., C. C. Smith & Sons  
 Weehawken, N. J., Hackensack Water Co.

Several installations also made for the United States Government Aviation and Dirigible Hangar Sheds, and for the Navy Department.



FIG. 7. OGDEN CANOPY DOOR



FIG. 5. VIEW OF UPPER DECK, VINE STREET PIER, PHILADELPHIA, PA., SHOWING OGDEN DOORS IN VARIOUS POSITIONS

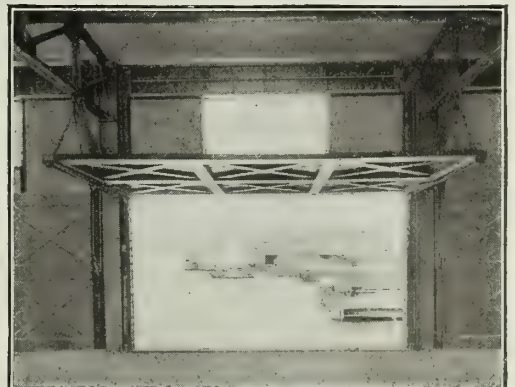


FIG. 6. VIEW OF OGDEN SINGLE-SECTION DOOR IN RAISED POSITION



# THE PEELE COMPANY

Manufacturers of Elevator and Warehouse Fireproof Doors

TELEPHONES:

STAGG 365, 366, 367

Stewart Avenue, Harrison Place near Flushing Avenue  
BROOKLYN, N. Y.

## BRANCHES

BOSTON, 18 Tremont Street, Telephone, Main 1350

CHICAGO, 133 Washington Street, Telephone, Franklyn 68

CLEVELAND, 508 Caxton Building, Telephone, Main 2158

AGENCIES IN ALL PROMINENT CITIES IN THE UNITED STATES AND CANADA

## Products.

PEELLE COUNTERBALANCE TRUCKABLE FIREPROOF ELEVATOR DOOR.

PEELLE TEL-CO-DOR.

PEELLE CANOPY FOLDING DOOR.

PEELLE ELECTRO-MECHANICAL INTERLOCKING DEVICES.

PEELLE SAFETY AUTOMATIC CLOSING DEVICES.

Peelle Self-closing Fireproof Dumbwaiter Doors.

## Services.

Our engineers are prepared to assist clients in the selecting of proper and most economical equipment to suit special conditions and requirements.

## Peelle Counterbalance Truckable Door (Patented).

Manufactured exclusively by this company, this door is constructed under the direct supervision of the Underwriters' Laboratories and bears their label, and is approved and highly recommended by the Building Departments and State Labor Bureaus.

**DESCRIPTION**—Peelle counterbalance doors open up and down from the center, and as each part has to travel only half the opening, the clear opening is given instantly. The two halves balance one another, and are operated by heavy flexible chains running over double radial ball bearing pulleys, making their operation very easy.

**TYPES OF PANELS**—Peelle doors can have any type of panels, either wood, metal covered, or all-metal,

as specified. The panels are set and bolted into rigid angle and T-iron frames.

**TRUCKING SILL**—The upper edge of the lower panel is reinforced so that when the Peelle door is open, it presents a solid sill between the building floor and the elevator car (see illustration).



TYPE K-1 PEELE DOORS IN THE GIMBEL BROS. DEPARTMENT STORE, NEW YORK, N. Y.

With kalamein built-in dummy panels Peelle doors can be furnished in materials and finish to harmonize with any surroundings, and with or without wire glass panels

**STANDARD SPECIFICATIONS FOR PEELE COUNTERBALANCE TRUCKABLE DOORS**—To specify Peelle Counterbalance Doors, employ this set of specifications.

To all openings in the freight elevator shaft, except as otherwise noted, furnish and install in complete working order Peelle patented counterbalance truckable doors, as manufactured by THE PEELE COMPANY, Stewart Avenue and Harrison Place, Brooklyn, N. Y.

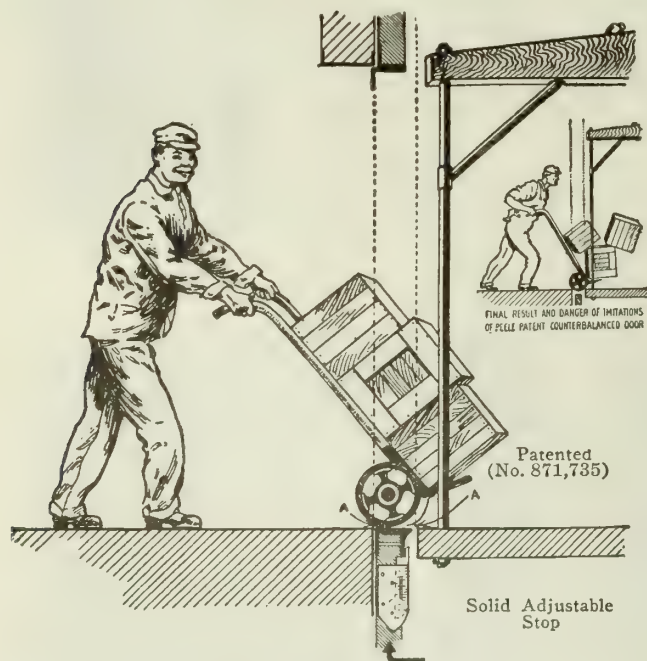
1. (a) These doors are to be made of two thicknesses of white pine covered with best grade I C terne tin, set and bolted into angle iron frames with reinforced corners, hung on ½-in. turnbuckle rods and No. 5 Morton steel chain running over 4½-in. double race ball bearing pulleys, and operating on the inside of the hatch on antifriction shoes working in substantial steel guides.

or

(b) These doors are to be made of No. 18 gage corrugated steel, riveted into steel frames, reinforced with binder bars and dovetail shoes, hung on ½-in. turnbuckle rods and No. 5 Morton steel chain running over 4½-in. double race ball bearing pulleys, and operating on the inside of the hatch on antifriction shoes working in substantial steel guides.

or

(c) These doors are to be made of two thicknesses of white pine covered with best grade I C terne tin, again covered with smooth kalamein iron tightly drawn, set and bolted into angle iron frames with reinforced corners, hung on ½-in. turnbuckle rods and No. 5 Morton steel chain running over 4½-in. double race ball bearing pulleys, and operating on the inside of the hatch on antifriction shoes working in substantial steel guides. Each door is to be laid out into ... panels in each half. Provision to be made for glazing as per detail.



PEELLE TRUCKABLE ELEVATOR DOOR

Note special adjustable stop which firmly binds door, when open, to building sill. This is the only counterbalance door that fills gap between car and building floor firmly and perfectly flush with building sill. Peelle corrugated steel elevator door has additional similar binding and supporting devices at center or at more frequent intervals, according to size of door and amount of trucking it is to be subjected to. Running chains are not used in the support of Peelle doors, when open. The Peelle patented truckable feature has been infringed, and users should beware of imitations



2. The hanger bar at the upper surface of the lower panel is to be reinforced and extended beyond the panel frame, to rest on solid adjustable stops riveted to the guide rails so that all weight is removed from the turnbuckle rod and chain when the door is opened, and to permit of continuous trucking upon the smooth sill thus formed. The door shall sustain a maximum load of ..... lbs.

3. The door on the ..... floor is to be arranged with a lock and key to enable it to be opened from the floor side; all other doors shall open from the shaft side only.

4. All doors to be constructed and erected in accordance with the rules and regulations of the National Board of Fire Underwriters and all local Boards having jurisdiction.

5. All doors to be guaranteed by the sub-contractor against defects in workmanship and material for a period of one year from date of installation.

6. (a) These doors are to be manual opening and closing.

(b) These doors are to be manually operated and equipped with electric interlocking devices which shall prevent the elevator car from leaving the floor until all doors are first closed and locked. (If elevator is to be controlled by a pull-rope, add the following sentence: Install in complete working order one Peelle electric solenoid clutch in each elevator shaft, which is to grip the shipper cable when any door is opened.)

(c) These doors are to be manual opening, but equipped with improved automatic closing devices manufactured by THE PEELE COMPANY, which render each door automatic closing by the action of the car leaving the floor in either direction. These machines are to have no contact with the elevator car except when the door is opened, and are to be so arranged as to close the door automatically in case of fire. Equip each door with weight cushion devices to prevent the doors from slamming as they close.

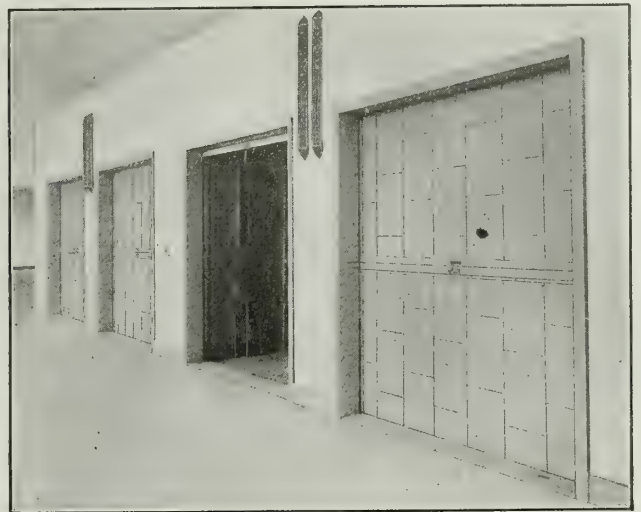
7. Web strap closers shall be supplied on all manually operated doors exceeding 6 ft. 6 ins. in height.

NOTE—Standard price of a complete equipment will be cheerfully quoted to architects or engineers before specifying.

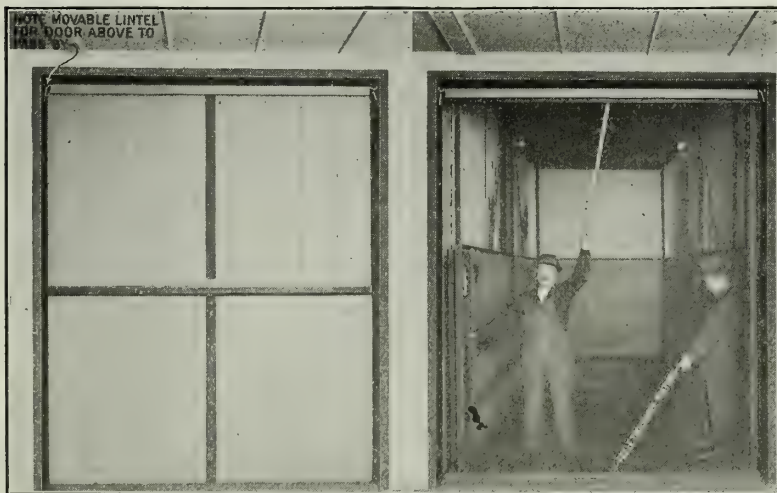
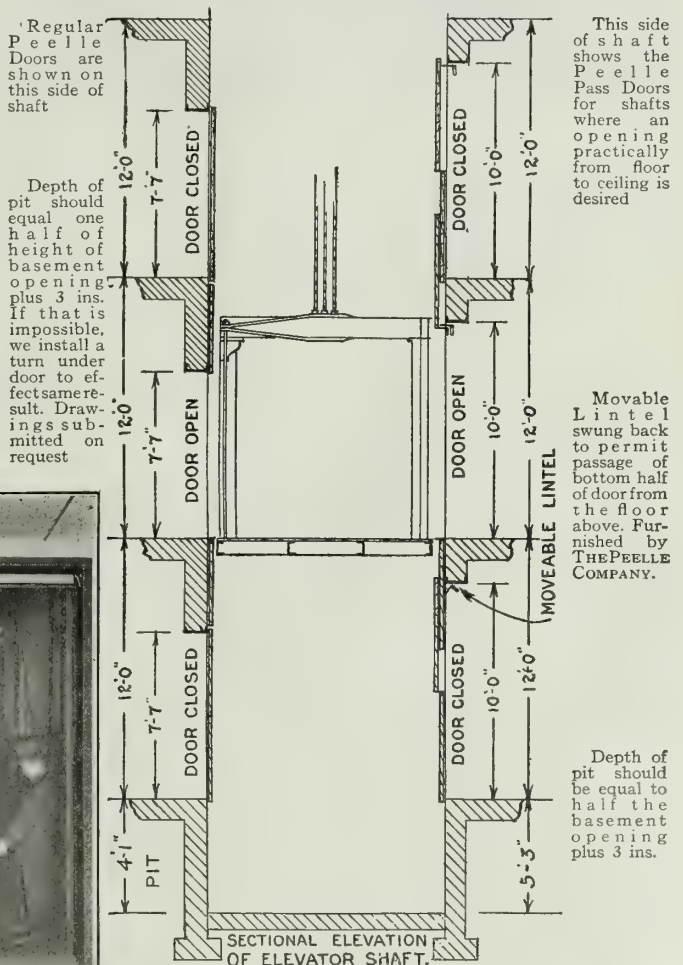
### Peelle Pass Door Construction.

When it is desired for garage elevators, etc., that height of openings be practically from floor to ceiling, the Peelle pass door can be used. (See adjoining details.)

This is a most effective solution for fire and general safety problem in connection with garage and warehouse elevator openings. Practically every prominent garage



TYPE R-6, PEELE FREIGHT ELEVATOR DOORS IN ALBERMARLE LOFT BUILDING, NEW YORK, N. Y.  
65 Peelle doors installed in this building



Doors Closed

Doors Open

TYPE L-2 PEELE PASS DOORS IN HULBERG'S GARAGE, 231 ST. NICHOLAS AVENUE, AT 122D STREET, NEW YORK, N. Y.

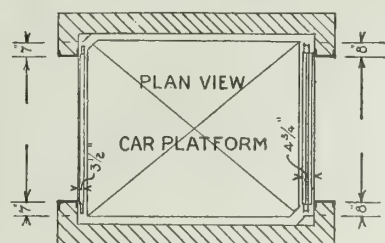
These doors give entire height of opening; are easy to operate; use no counterweights

TESTIMONIAL—To my sorrow, I installed imitation Peelle doors in my garage at the above address and after only eleven months' use, I had to discard them because they were constantly out of repair and gave me a great deal of trouble.

After investigation I decided to install Peelle doors [as shown in above picture], and now find them to be very substantial and satisfactory in every respect. I will be glad to have your prospective clients call and see how nicely Peelle doors operate.

Very truly yours,

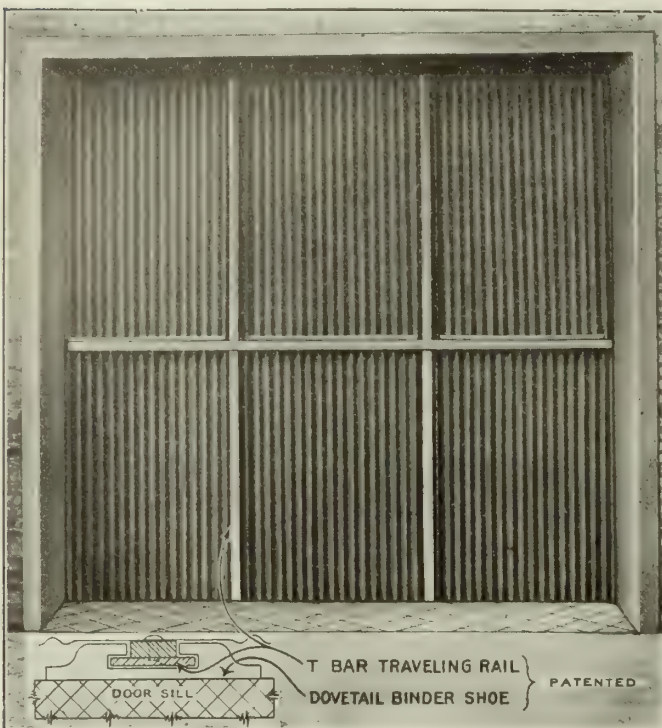
HULBERG'S GARAGE,  
FRED HULBERG, Owner.



PLAN AND ELEVATION OF PEELE DOORS  
Left half indicates Regular Door; right half Peelle Pass Door

Peelle Pass Doors must have 8 ins. clear on each side of opening for rails and hardware





TYPE C-5 PEELE CORRUGATED STEEL COUNTERBALANCE TRUCKABLE DOOR (PATENTED)

Showing No. 20 gauge corrugated steel panels

Note dovetail feature shown in detail, one of many important features used on Peelle doors only. Peelle T-bar traveling rails, operating in the Peelle binder shoes, fastened at sill and lintel, hold door securely to wall when same is open, closed or partly open, and prevent buckling through rough treatment. These T-rails are spaced 3' 0" apart.

Peelle antifriction binder shoes, in addition to guiding T-bar traveling rails, assist, when the door is open, in supporting trucking feature

in New York City, and other cities, is equipped with Peelle pass elevator doors. Call on us for further information.

### Installation Data, Peelle Doors.

For ideal construction, channel iron jambs should be provided. In case of hollow tile construction, channel jambs should run from floor to ceiling. THE PEELE COMPANY *does not furnish jambs, sills, stationary lintels or trim.*

**NOTE**—*Shaft must be flush, with no projecting sills or lintels.*

MEASUREMENTS FOR REGULAR PEELE DOORS

Height of door openings	Floor line to floor line	Height of door openings	Floor line to floor line
5 ft. 6 in.	8 ft. 10 in.	7 ft. 6 in.	11 ft. 10 in.
6 ft.	9 ft. 7 in.	7 ft. 9 in.	12 ft. 3 in.
6 ft. 3 in.	10 ft.	8 ft.	12 ft. 7 in.
6 ft. 6 in.	10 ft. 4 in.	8 ft. 3 in.	13 ft.
6 ft. 9 in.	10 ft. 9 in.	8 ft. 6 in.	13 ft. 4 in.
7 ft.	11 ft. 1 in.	8 ft. 9 in.	13 ft. 9 in.
7 ft. 3 in.	11 ft. 6 in.		

The above table applies only to the regular door. In order to have a high doorway where the ceilings are low, see our special Peelle pass door, indicated in illustration on preceding page

### References, Peelle Elevator Doors.

The following are a few buildings in which the freight elevators are equipped with Peelle doors. The asterisk (\*) prefix denotes that they are the largest or highest buildings of their kind in the world:

- \*Hoboken Terminal Buildings, Hoboken, N. J.
- \*Austin Nichols Grocery Warehouse, Brooklyn, N. Y.
- \*Robert Gair Concrete Buildings, Brooklyn, N. Y.

- \*Woolworth Office Building, New York, N. Y.
- \*McAlpin Hotel, New York, N. Y.
- \*Herald Square Loft Building, New York, N. Y.
- \*Equitable Office Building, New York, N. Y.
- \*Auerbach Candy Warehouse, New York, N. Y.
- John Wanamaker Department Stores, New York, N. Y.
- Hill Publishing Co., New York, N. Y.
- Susquehanna Mills Building, New York, N. Y.
- Albemarle Building, New York, N. Y.
- Murray Hill Investing Building, New York, N. Y.
- Burton Bros. Warehouse, New York, N. Y.
- Abercrombie & Fitch Building, New York, N. Y.
- Finck Building, New York, N. Y.
- Mail Service and Loft Building, New York, N. Y.
- Lord & Taylor Department Store, New York, N. Y.
- \*Warner Corset Factories, Bridgeport, Conn.
- Standard Oil Co., numerous cities
- Ford Motor Building, numerous cities
- General Electric Co. Factories, numerous cities
- American Can Co. Factories, numerous cities
- Otis Elevator Co., numerous cities
- American Ever Ready Co. Building, Long Island City, N. Y.
- \*Loose-Wiles Biscuit Building, Long Island City, N. Y.
- Great Atlantic & Pacific Tea Co., New York, N. Y., and Jersey City, N. J.
- Hyatt Roller Bearing Co. Buildings, Harrison, N. J.
- U. S. Government Buildings, Denver, Boston, Washington, Philadelphia, and numerous other cities
- Osgood Bradley Building, Worcester, Mass.
- Sturtevant Merrick Building, Springfield, Mass.
- American Cigar Co., Hartford, Conn.
- Shartenberg Robinson Building, New Haven, Conn.
- Winchester Repeating Arms Co., New Haven, Conn.
- United States Tire Co., New York, N. Y., and Boston, Mass.
- Boston Terminal & Refrigerating Co., East Boston, Mass.
- Snead-Power Building, Louisville, Ky.
- United Grocery Warehouse, Jacksonville, Fla.
- A. Booth & Co., St. Paul, Minn.
- Canadian Pacific Railroad Co., numerous cities in Canada
- Strawbridge & Clothier, Philadelphia, Pa.
- Smaltz Building, Philadelphia, Pa.
- Electric Storage Battery Co., Philadelphia, Pa.
- Victor Talking Machine Co., Camden, N. J.
- Baltimore Tobacco Warehouse, Baltimore, Md.
- Joseph Bancroft & Sons Co., Wilmington, Del.
- Southern Railway Freight House, Atlanta, Ga.
- Krippendorf-Dittman Shoe Factory, Cincinnati, Ohio
- Union Storage Warehouse, Dayton, Ohio
- Dennis Kelly Wholesale Grocery, Columbus, Ohio
- Scott Brothers Co., Cleveland, Ohio
- Huron Road Fireproof Building, Cleveland, Ohio
- Standard Mfg. Co., Erie, Pa.
- Sears, Roebuck Warehouse, Seattle, Wash. and Chicago, Ill.
- Stripling Department Store, Fort Worth, Tex.
- B. R. & P. Railroad Warehouse, Rochester, N. Y.
- Eastman Kodak Co., Rochester, N. Y.
- Kaufmann & Baer Department Store, Pittsburgh, Pa.
- J. N. Adam Co. Buildings, Buffalo, N. Y.
- Robinson-Locke Building, Toledo, Ohio
- All Buildings of Denny Estate, Pittsburgh, Pa.
- Kahn Tailoring Co., Indianapolis, Ind.
- Miller-Parrott Baking Co., Terre Haute, Ind.
- \*Bingham Hardware Co., Cleveland, Ohio
- Federal Warehouse, Peoria, Ill.
- Pacific Coast Shredded Wheat Co., San Francisco, Cal.
- Baltimore & Ohio R.R. Warehouses, New York, N. Y.



BUSH TERMINAL BUILDINGS, BROOKLYN, N. Y.

Largest industrial buildings in the United States. Over 1,500 Peelle truckable doors Type R-6 are installed in these buildings alone.

The Peelle doors in the latest building are being equipped with the Peelle electro-mechanical interlocks, which are approved by all State, City and Fire Departments





PEELLE TEL-CO-DOR INSTALLED IN BUILDINGS OF THE REMINGTON ARMS CO., ILION, N. Y.

### Peelle Tel-Co-Dor (Patented).

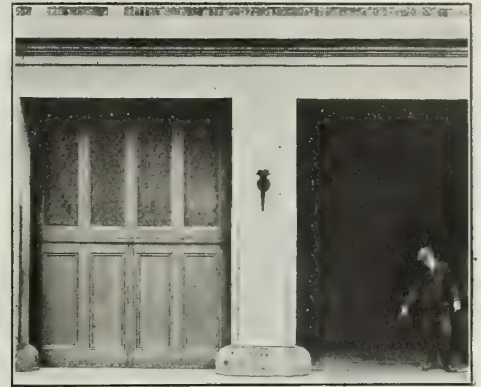
This door is adaptable for protecting openings for exterior doorways in freight and warehouses, for openings in fire wall, and can also be used, when specially required, for freight elevator shaft openings, where it is impossible for the doors to slide up and down.

The Peelle Tel-Co-Dor can be made with all types of panels, reinforced with Peelle patented T-bar traveling rails and dovetail binder shoes, and is made in two sections, with the two-speed operating device,



PEELLE COUNTERBALANCE TRUCKABLE DOORS FOR EXTERIOR OPENINGS (PATENTED)

Peelle doors are giving excellent service for exterior openings to elevators, especially for garages, etc. Doors of plain surface can be furnished, or with paneling to harmonize with architecture of building. Peelle doors give entire height of opening instantly



making each panel telescope the other. This door is very light and durable, is approved by the Mutual Insurance Companies, and is labeled by the National Board of Fire Underwriters. Requires 4¾-in. sill for installation.

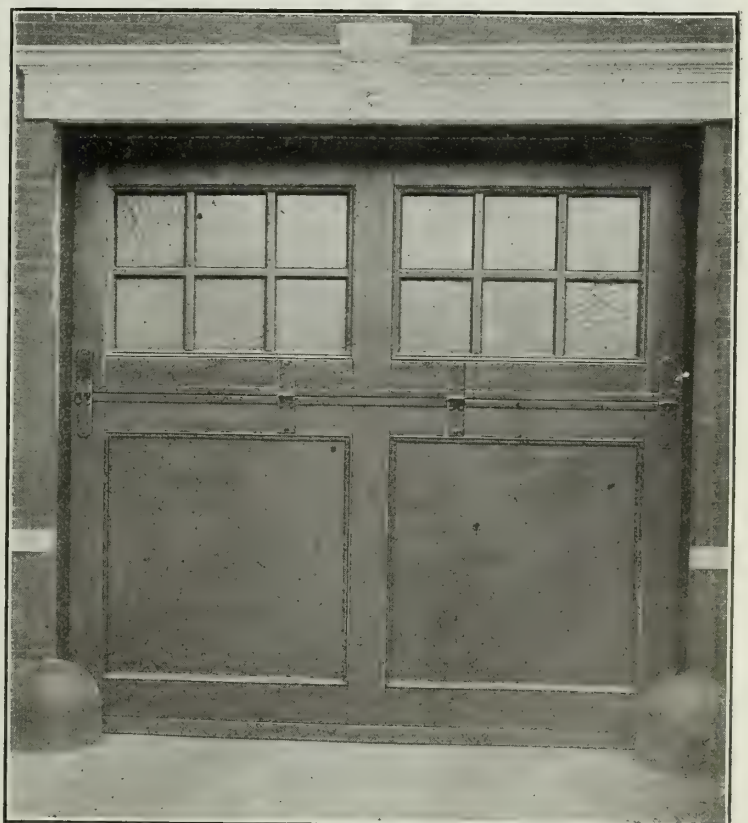
### Peelle Canopy Folding Door.

This door is operated by the Peelle endless chain system, setting in motion the Peelle compound gear hoist and turning the main shaft, to which 14-in. drums are keyed. These drums wind up the cable attached to either side of the door and cause it to lift evenly without binding. The counterweights are guarded and every detail is carefully executed.



PEELLE CANOPY FOLDING DOOR (PATENTED)

Viewed from inside. Showing rigid and simple construction, economy of space and convenience of operation



PEELLE CANOPY FOLDING DOOR (OUTSIDE)

As installed in Dillman's garage. Can be made with any type of panels desired. A very desirable exterior garage and warehouse door



# VARIETY MANUFACTURING COMPANY

Manufacturers of All Kinds of Fireproof Doors

Sacramento and Carroll Avenues

CHICAGO, ILL.

## AGENTS, UNITED STATES

BUFFALO, N. Y.  
CLEVELAND, OHIO  
DALLAS, TEX.  
DENVER, COLO.  
DETROIT, MICH.

INDIANAPOLIS, IND.  
KANSAS CITY, MO.  
LOS ANGELES, CAL.  
MILWAUKEE, WIS.  
NEW YORK, N. Y.

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OMAHA, NEBR.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.  
PORTLAND, ORE.

ST. LOUIS, MO.  
SAN FRANCISCO, CAL.  
SEATTLE, WASH.  
SPOKANE, WASH.  
TACOMA, WASH.

## AGENTS, CANADA

CALGARY, ALBERTA

WINNIPEG, MAN.

VANCOUVER, B. C.

MONTREAL, QUE.

### Products.

CROSS HORIZONTAL FOLDING DOORS.

ART METAL FIREPROOF DOORS AND TRIM.

STEEL ROLLING DOORS AND SHUTTERS.

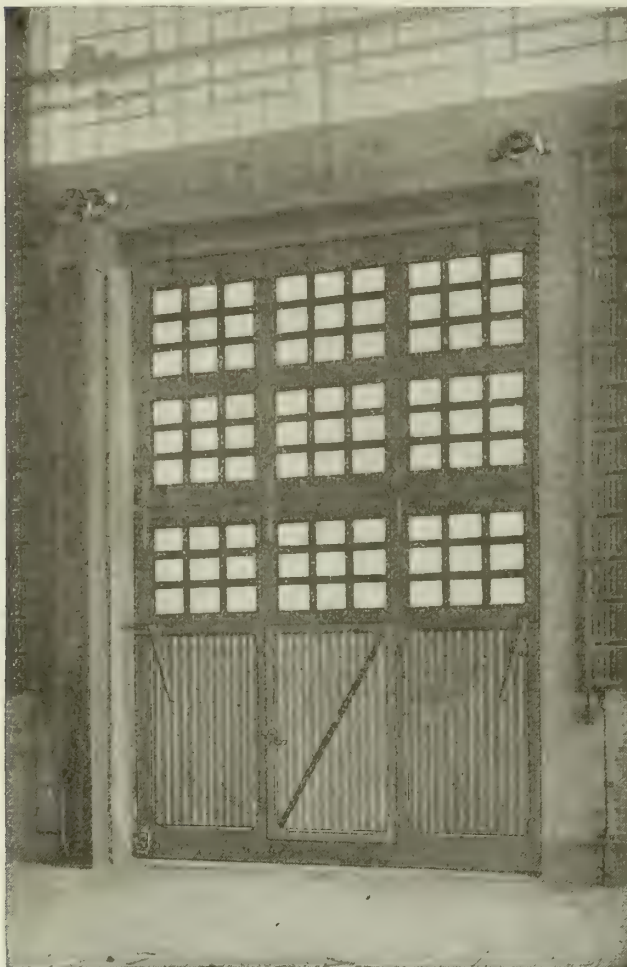
UNDERWRITERS' IRON FIRE DOORS.

Semiart Metal Doors and Frames, Tin Clad Fire Doors (all kinds), Vamanco Freight Elevator Doors, Varclad Freight Elevator Doors, Hardware for all Fire Doors; Blacksmith and Wrought Iron Work; Contractors for Light Structural Work.

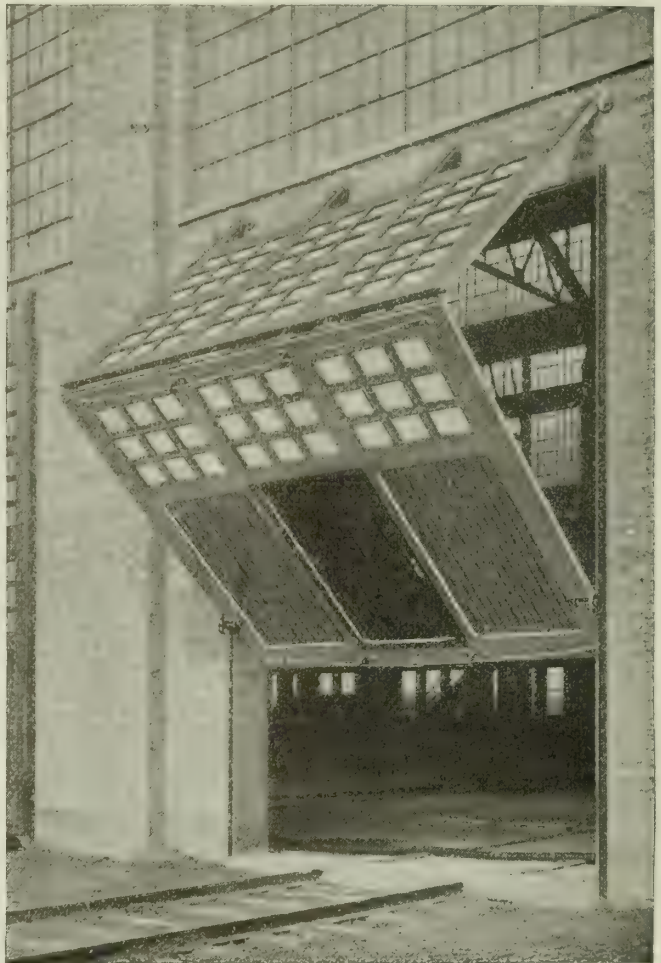
### Cross Horizontal Folding Doors.

For use in garages, railway and freight houses, car shops, warehouses, docks, power plants, etc.

ADVANTAGES—Simple; easily operated. Made of any material or combination of materials. No limit to size or weight. Glass, installed in upper panel, takes place of transom. Entire mechanism in full view. Can be repaired by any mechanic. Cost of maintenance practically nothing. Occupy no valuable space, either opened or closed. (Illustrated below and on following page.)



Interior View



Exterior View

ONE OF 31 CROSS HORIZONTAL FOLDING DOORS, CHICAGO & NORTHWESTERN R. R. SHOPS, CHICAGO, ILL.

Doors are 14 ft. wide by 18 ft. high. Canopy type: Door on outside and operated by chain hoist on inside of building. Glass panels in upper half and part of lower half. Also wicket door



### Art Metal Fireproof Doors and Trim.

We manufacture art metal and Kal-O-Mine fireproof doors and trim for office buildings, theaters, hotels, hospitals, public buildings, stores, residences, etc.

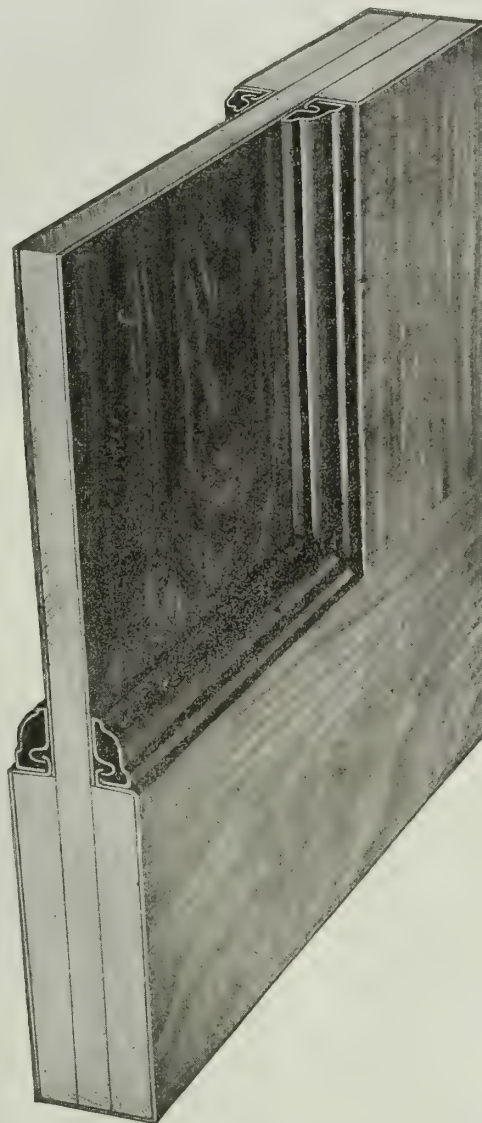
**CONSTRUCTION**—Doors, frames and trim are made of No. 20 furniture steel. All parts of door are interlocking, which gives a rigid strong structure without bolts or screws. Frames are adjustable in or out, and when placed in brick or tile walls have adjustable anchors for easy erection. Trim and panel mouldings are made in large number of styles and shapes.

**ADVANTAGES**—These doors obtain lowest insurance rate; are sanitary, fireproof, and everlasting; can be finished to imitate any wood or other material; have interlocking joints, obviating screws, bolts and rivets; and are no more expensive than high class wood doors.

**APPROVAL** — Doors, frames, trim and hardware have been approved by the Underwriters' Laboratories of the National Board of Fire Underwriters after thorough examination and tests. They are regularly inspected and labeled at our factory for openings in stair and elevator shafts, corridors, partitions and exterior walls.

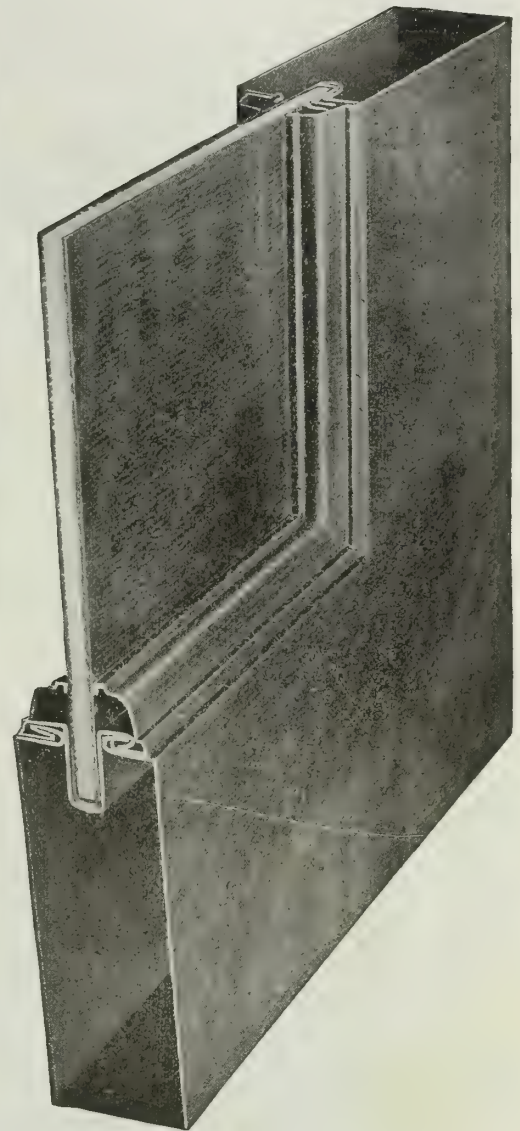
**INFORMATION DESIRED**—In writing for estimates or placing orders, please state:

- (1) *Finished* thickness and wall construction.
- (2) Swing of doors, by sketch.
- (3) Net opening size; if threshold, give height.
- (4) Style number.
- (5) Hardware desired; also, locks.
- (6) Finish desired, with sample, if necessary.



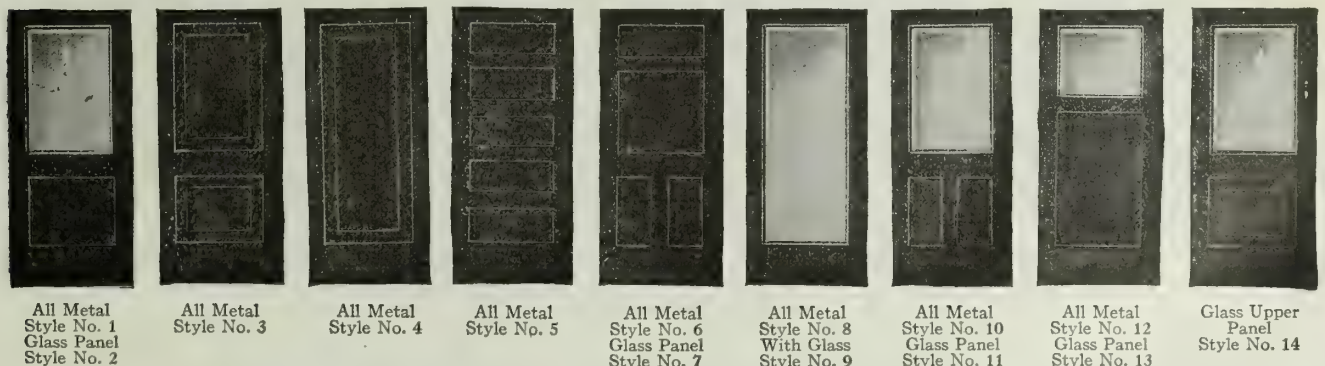
CORNER SECTION OF VARIETY KAL-O-MINE ART DOOR

This door can be furnished in mahogany, oak, walnut or any other finish desired



CORNER SECTION OF VARIETY HOLLOW ART METAL DOOR

Oak finish moulding, stiles, rails and panels are interlocked together without use of screws, bolts or rivets. This door can be furnished in mahogany, oak, walnut or any other finish desired



EXAMPLES OF VARIOUS STYLES VARIETY ART METAL FIREPROOF DOORS



**Steel Rolling Doors and Shutters.**

Our steel rolling doors and shutters are made entirely of steel. They are composed of steel interlocking slats that coil above opening, being counterbalanced by springs. Ends of slats travel up and down in grooves bolted at each side of opening.

**INSTALLATION**—Doors are placed to coil above the opening or under the lintel. They require 3 ins. to 5 ins. sideroom and 15 ins. headroom for openings 12 ft. high or less, and 1 in. headroom additional per foot of height above this.

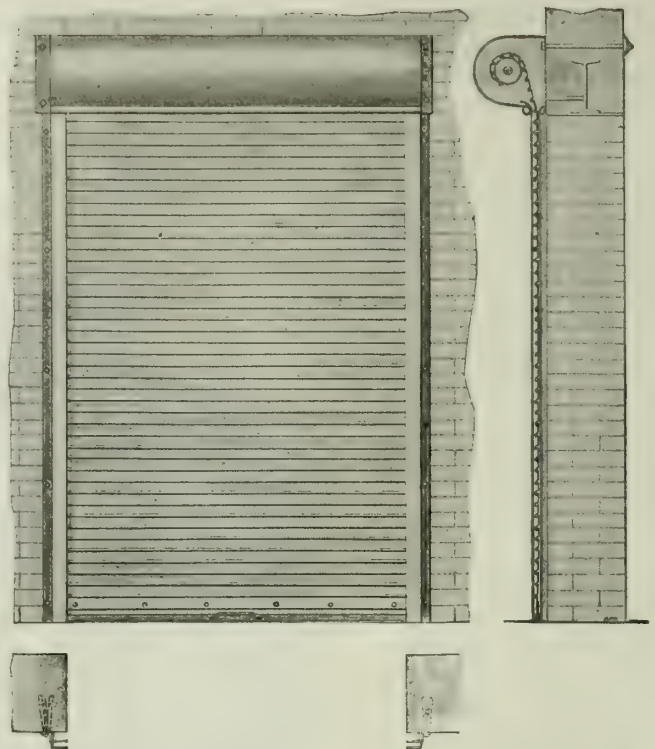
**OPERATION**—Doors may be operated by hoist, gearing, or simply by hand, to suit any conditions. If used as fire doors they can be equipped with automatic closing device, when specified.

**ADVANTAGES**—These doors are classed among the best fire retardants for window, door, partition, elevator shaft, and fire wall openings. They are neat in appearance, occupy very little room, and if properly cared for will last for years. Doors are easily erected. Blue prints and instructions are sent with each shipment.

**APPROVAL**—Our doors and shutters are included in the approved list issued by the National Board of Fire Underwriters, and are regularly inspected and labeled by the Underwriters' Laboratories, Inc.

**ILLUSTRATIONS**—The illustrations, here and on following page, show only a few of our many installations and constructions. We shall be pleased to furnish information for special requirements.

**CATALOGUE**—Sent on request.



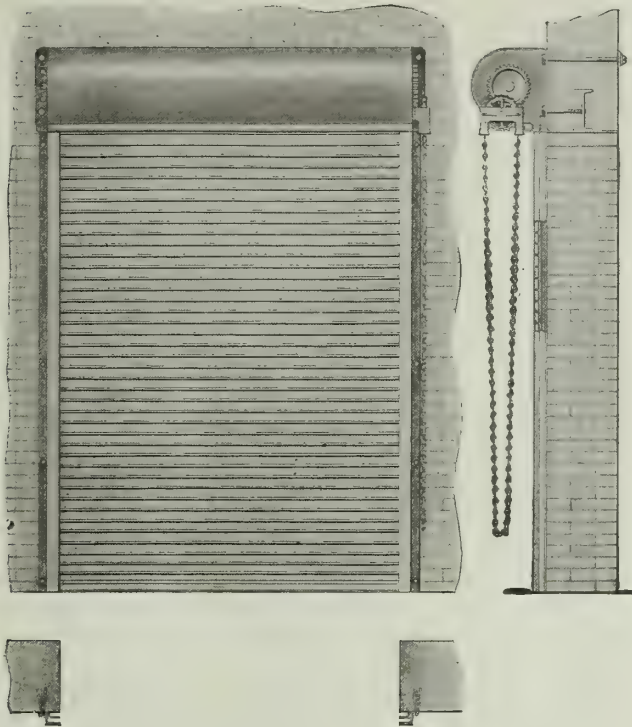
NO. 20 DOOR MOUNTED ON FACE OF WALL, COILING ABOVE OPENING, MANUAL OPERATION  
Recommended for openings not over 100 sq. ft.



LINE OF ROLLING DOORS ON STREET RAILWAY BARN  
Total, 24 doors, each 11 ft. wide by 18 ft. high

Slats are rolled channel shaped, affording greatest strength with least material; have a close, tight joint practically proof against smoke, fire and weather. Ends of slat are reinforced with end lock, which prevents longitudinal separation, takes the wear, and reduces friction in grooves. Either side of slat sheds water.  
No. 2 slats constructed of No. 20- or 22-gauge steel, either galvanized or black, and No. 4, a much heavier slat, of No. 16- or 18-gauge steel  
A—Smooth side of No. 2 Interlocking Slat. B—Flanged side of No. 2 Interlocking Slat, two-fifths full size



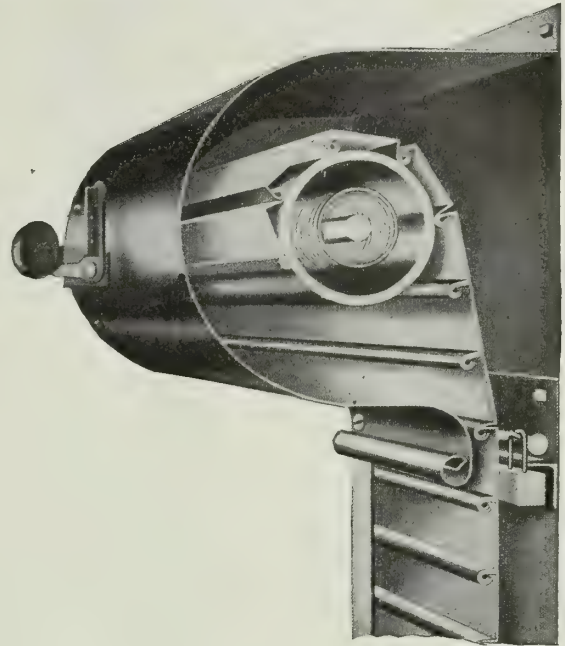


NO. 20 DOOR SHOWING ELEVATION, ALSO SIDE VIEW OF CHAIN HOIST

This construction is for use on small and large openings where automatic Underwriters' doors are not required, being generally used on shipping platform openings in freight houses, garage entrances and outside openings.

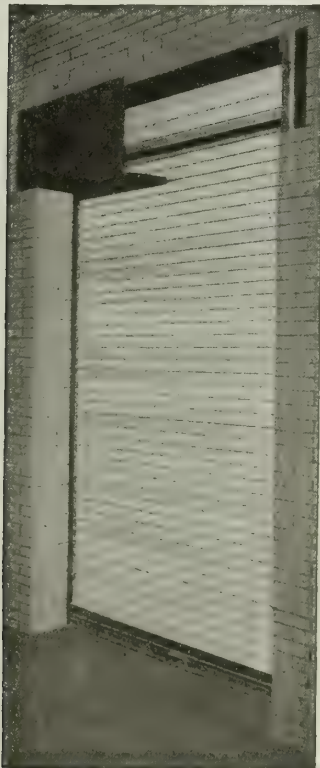
**UNDERWRITERS' LABORATORIES, INC.**  
 INSPECTED  
**FIRE DOOR FOR OPENING IN VERTICAL SHAFT**  
 No. S 5775

UNDERWRITERS' LABEL



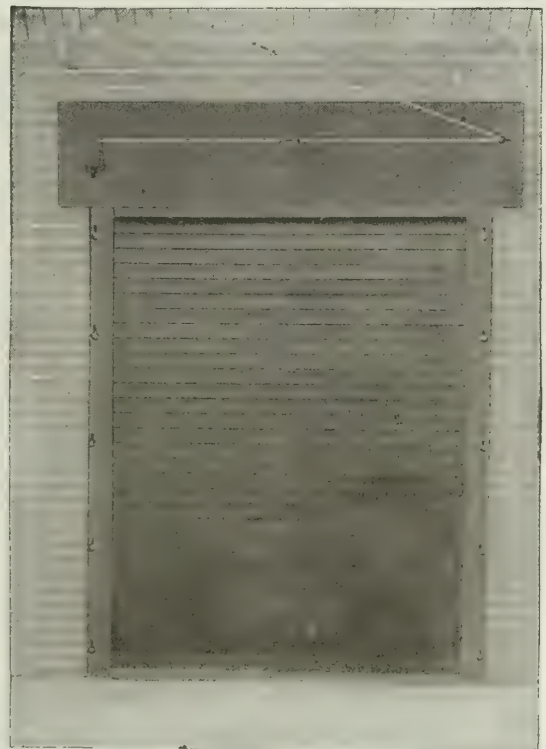
DETAILS OF STEEL ROLLING DOORS FOR ELEVATOR SHAFTS, ETC.

Constructed to meet the requirements of National Board of Fire Underwriters



NO. 33-2 ROLLING FIRE DOOR FOR STAIR AND ELEVATOR OPENINGS

Installed between jambs, coiling under lintel. Hood partly cut away to show coil. Operation is manual and automatic



NO. 33-3 ROLLING FIRE DOOR FOR FIRE WALL OPENINGS

Installed one door on each side, between jambs, coiling under lintel. Operation is manual and automatic

ESTABLISHED 1876

INCORPORATED 1903

REINCORPORATED 1914

**THE J. G. WILSON CORPORATION**

SUCCESSORS TO THE JAS. G. WILSON MFG. CO.

Manufacturers of Rolling Doors and Shutters in Steel, Wood, Bronze

TELEPHONE, VANDERBILT 1875-76  
CABLE, "LYDIAN, NEW YORK"8 West Fortieth Street  
NEW YORK, N. Y.FACTORY ADDRESS  
MAIL AND TELEGRAPH: NORFOLK, VA.

## BRANCH OFFICES

CHICAGO, ILL., H. B. DODGE & Co., McCormick Building  
PHILADELPHIA, PA., L. H. MYRICK, Heed BuildingPITTSBURGH, PA., H. H. CHARLES, Bessemer Building  
ATLANTA, GA., J. M. VAN HARLINGEN, Candler Building

## AGENCIES

BUFFALO, N. Y.  
CINCINNATI, OHIO  
DENVER, COLO.  
EL PASO, TEX.  
FORT WORTH, TEX.HOUSTON, TEX.  
LOS ANGELES, CAL.  
MINNEAPOLIS, MINN.  
NEW ORLEANS, LA.  
OKLAHOMA CITY, OKLA.  
ROCHESTER, N. Y.ST. LOUIS, MO.  
SALT LAKE CITY, UTAH  
SAN FRANCISCO, CAL.  
SEATTLE, WASH.  
SPOKANE, WASH.  
WASHINGTON, D. C.CALGARY, CAN.  
MONTREAL, CAN.  
VICTORIA, CAN.  
LONDON, ENG.  
WELLINGTON, N. Z.**Products.**

"WILSON" STEEL ROLLING DOORS and SHUTTERS, Corrugated Steel and Interlocking Slat Types; SALAMANDER ROLLING SHUTTERS; WOOD ROLLING DOORS; SLIDING SWING DOORS.

ROLLING FIRE DOORS for ELEVATOR and STAIRCASE OPENINGS; DOORS for GARAGES.

For Wood Rolling Partitions, Folding Partitions, Wardrobes, and Wood Block Flooring, see pages 774-77; for Venetian Blinds and Awnings, and Diffuselite Blinds, see pages 804-05.

**Experience and Co-operative Service.**

The standards of construction of "Wilson" products have been progressively developed during a period of nearly 40 years of manufacturing experience. This fact, together with the high records of service which can be shown for "Wilson" doors and shutters, offers effective assurance of their superiority.

While it is hoped that the data provided herewith will effectually assist in the full study of any door and window problem, and in making all necessary provisions for installation of the specified products, the experience and mass of scientific data in possession of this company are also gladly put at the disposal of users of this book.

**"Wilson" Steel Rolling Doors and Shutters.**

DOUBLE EDGE CORRUGATED STEEL TYPE—This door is simple, strong, durable and efficient, and will stand a great deal of hard, rough service. It is built of a heavy corrugated steel, is free from crevices for secret corrosion, and is easily repaired or painted by any ordinary mechanic. Retains its shape under intense heat.

This construction is adapted for doors and shutters up to 150 sq. ft., and is especially recommended for freight and warehouse service.

INTERLOCKING SLAT TYPE—Interlocking slat doors and shutters are made in two styles, Style 1 for usual openings or openings exposed to high winds, and Style 2 for extra large openings. They are neat in appearance, efficient in operation, and provide an effective fire retardant construction.

This construction is adapted for doors and shutters up to 200 sq. ft. for Style 1 and 300 sq. ft. for Style 2.

FIRE DOORS FOR EXTERIOR OPENINGS—These are of the corrugated or interlocking slat types, counterbalanced by means of helical springs, mounted on face of wall, overlapping at sides and top, and are manually operated.

This construction is adapted for doors and shutters, for openings up to 100 sq. ft. For size limitations in connection with underwriters' labeled installations, see following page.

FIRE DOORS FOR VERTICAL SHAFTS (ELEVATOR AND STAIRCASE OPENINGS), CORRIDOR AND ROOM PARTITIONS AND FIRE WALLS—These are automatic closing, counterbalanced, interlocking slat doors, used singly for vertical shaft, corridor and room partition openings, and in pairs on fire walls. Provided with baffle plate for closing opening between curtain and bottom angle of hood. For limitations in size for underwriters' labeled installations, see "Official Indorsement," on next page.

**"Wilson" Wood Rolling Doors and Shutters.**

These doors are made of wood slats fitted together with rule joints, edge to edge, and threaded upon bands of bronze metal running from top to bottom about 18 ins. apart. Each band is riveted to the top slat and attached at the bottom to a strong spiral spring anchor of phosphor bronze concealed in the baseboard or bottom bar. The spring keeps the slats firmly fitted together. Will withstand any amount of hard wear.

Openings to admit light can be provided in the slats, when required, in the shape of wire glass panels.

**"Wilson" Salamander Patent Rolling Shutters.**

This rolling shutter is guaranteed to be thoroughly fireproof and superior as a heat retardant to any shutter on the market. Is made of wood slats of various thicknesses covered with bronze or steel sheet metal, and has a padding of asbestos between the wood and the metal covering. Especially recommended for store fronts, and other openings up to 200 sq. ft.

**"Wilson" Sliding Swing Doors.**

These doors are made of wood in various thicknesses, with or without glass panels, and are covered with metal when so desired. They are very easily operated by hand or chain gear, and can be fitted with automatic closing device and self-acting bolts. Especially recommended for exterior openings up to 150 sq. ft. in piers, garages, etc.

**Construction Details.**

For construction details of "Wilson" doors, see SWEET'S ENGINEERING CATALOGUE, Fourth Edition, pages 346-51.



**Official Indorsement.**

"Wilson" rolling steel fire doors are indorsed and labeled by the National Board of Fire Underwriters, Inc., for the following services:

**OPENINGS IN FIRE WALLS**—For openings not exceeding 80 sq. ft.; doors on both sides of wall; doors mounted on face of wall, only: construction, "Wilson" Interlocking Slat, Arrangement No. 1.

**OPENINGS IN VERTICAL SHAFTS (STAIRWAY AND ELEVATOR OPENINGS)**—For openings not exceeding 8 ft. by 10 ft.: construction, "Wilson" Interlocking Slat No. 2, Arrangement No. 1.

**DOOR OPENINGS IN CORRIDOR AND ROOM PARTITIONS**—Openings not exceeding 8 ft. wide by 10 ft. high: construction, "Wilson" Interlocking Slat, Arrangement No. 1.

**OPENINGS IN EXTERIOR WALLS**—Openings not to exceed 10 ft. in width and 10 ft. in height: construction, "Wilson" Galvanized Corrugated Steel, Self-coiling, or Interlocking Slat No. 2, Arrangement No. 1.

**Installation, etc.**

Most "Wilson" work can be installed by workmen of ordinary skill in the various building trades. Drawings and full directions for fitting are furnished with each shipment. This company, however, prefers to install its own work and then to assume full responsibility.

Doors and shutters are manually operated in any one of three ways: by a handle on the bottom bar (smaller doors and shutters: spring-balanced); by chain gear; or by a bevel gear actuated by a crank which provides means of operation from either side.

Doors and shutters of any form of operation can be fitted with motors to work by electricity, and can also be equipped with worm gear mechanism for operation singly or in groups. A wicket door (maximum size, 2 ft. by 5 ft.) can be placed in any "Wilson" rolling door.

**"Wilson" Standards.**

THE J. G. WILSON CORPORATION, in developing the "Wilson" rolling doors and shutters to withstand the most exacting use, have evolved standards of manufacture upon which the "Wilson" reputation for indestructibility, and ease in operation, rests. These products are guaranteed, and the following descriptions are submitted as *standards of manufacture*, the compliance with which will secure best results and provide equitable conditions in estimating.

**NOTE**—The following descriptions are not intended as specifications to be used by the architect, but merely as indications of what is meant by each type of door. Thus he will be able to use the specification form in next column.

**CORRUGATED STEEL ROLLING DOORS**—**Doors**—Wilson's corrugated galvanized sheets, No. 23 U. S. gage (before galvanizing) "self-coiling" (for doors, 8 ft. by 8 ft. or less), chain geared (for doors larger than 8 ft. by 8 ft.), hoods (necessary if shutter coils outdoors, otherwise optional).

**Sheets**—To be best open hearth hot galvanized steel with deep corrugations, so that the shutter will coil in reasonably small space, and without danger of cracking. Edges of sheets to be reinforced and protected by malleable iron shields.

**Springs**—Of flat band or helical wire type, so selected as to counterbalance the shutter at all positions.

**Gearing**—Where necessary, to be of cast iron type with malleable iron journals and galvanized hand chain. Extra large doors to be equipped with ball bearings.

**Hoods**—Of No. 24-gage galvanized sheets, with as few joints as possible, reinforced where necessary with steel angles.

**INTERLOCKING STEEL ROLLING DOORS**—**Doors**—Wilson's Interlocking No. 1, or Wilson's Interlocking No. 2, galvanized slats; No. 22 or 20 U. S. gage for No. 1, No. 22, 20, 18, or 16 U. S. gage for Nos. 2 to 4, "self-coiling" (for doors about 6 ft. by 8 ft. or less), chain geared (for doors about 6 ft. by 8 ft. or greater), hoods (necessary if shutter coils outdoors, otherwise optional).

**Slats**—To be of cold rolled steel, electrogalvanized and formed into an S-shaped section. Ends of slats to be reinforced and protected by malleable iron shields.

**Springs**—To be of helical wire type contained in steel pipe shafts, so selected as to counterbalance the shutter at all positions.

**Gearing**—Where necessary, to be of cast iron type with malleable iron journals and galvanized hand chain. Extra large doors to be equipped with ball bearings.

**Hoods**—Of No. 24-gage galvanized sheets, with as few joints as possible, reinforced where necessary with steel angles.

**UNDERWRITERS' APPROVED AND LABELED STEEL ROLLING DOORS**—For services indicated under "Official Indorsement."

**Interlocking Slat Type**—Construction, Underwriters labeled, Arrangement No. 1, self-coiling; mounted on face of wall; counterbalanced by helical spring in shaft; manually operated; automatic closing through fusible link and spring release; provided with internal baffle plate; steel hood; cast iron brackets. Interlocking slat curtain to extend into grooves  $1\frac{1}{2}$  ins. for openings 6 ft. or less in width and 2 ins. for openings 6 to 8 ft. in width, and to be provided with end locks to take up wear, maintain tightness in joints between slats, prevent lateral motion and act as fire stops. Slats of best open hearth galvanized steel, No. 16 U. S. gage for openings in fire walls, No. 20 U. S. gage steel for openings in vertical shafts (stairway and elevator openings) and for corridor and room partitions. Bottom bar provided with sliding locking bolts.

**Corrugated Steel Type**—Galvanized corrugated sheet steel, No. 23 U. S. gage (before galvanizing); mounted on face of wall; self-coiling; counterbalanced by helical spring in shaft; manually operated; automatic closing through fusible link and spring release; provided with fire stops and steel hood; cast iron brackets; bottom bar provided with sliding locking bolts.

**WOOD ROLLING DOORS AND SHUTTERS**—Made of rule joint slats about  $1\frac{1}{8}$  ins. thick, strung on bronze bands which are fitted with bronze anchor springs, located on bottom bar to accommodate swelling or shrinkage of wood slats. Operated by means of chain gear, when applied to large openings, and by handles on bottom bar, on small openings. Counterbalanced by helical springs operated by means of spur gear or chain. Ratio of gearing designed to insure quick and easy operation. No hoods required when doors are applied inside of building.

**SALAMANDER ROLLING DOORS**—Constructed of bronze or steel sheathed slats with an asbestos padding between wood slats and the metal sheathing. Slats are connected or joined together by means of continuous hinges running from top to bottom, spaced on about 12-in. centers, each slat being individually riveted to the hinges. Doors counterbalanced by helical springs, operated by means of chain, worm or bevel gear to suit conditions; motor operation, if desired.

**SLIDING SWING DOORS**—Constructed of heavy wood frames, either paneled or filled with glass. Fitted with small wicket door when desired. When used for fire protection they are covered with sheet metal and fitted with fusible links for closing automatically. Doors are counterbalanced by helical springs, operated by means of handles, or by chain or bevel gearing.

**Suggested Specification Form.**

**DESCRIPTION**—For the various openings in this building so marked or indicated on blue prints (described in list herewith), [state whether wicket doors are required] (wicket doors can not be supplied in a label door), furnish [and completely install] rolling doors [shutters] of the types called for. Upon openings not in excess of size sanctioned by the National Board of Fire Underwriters all steel types shall bear the label of the Underwriters' Laboratories, Inc., and larger steel doors shall be in all essentials similar to those bearing labels, except that manufacturers' standards for increase in size, which shall conform to best practice, shall be followed. This contract to include all guides, anchor devices, bolts, [hoods], [padlocks, as indicated], hardware, etc., complete. Doors (describe them) shall be automatic closing in case of fire.

**ERECTION**—The doors [shutters], with the exception of the finished painting (shop coat only applied by maker), to be erected and left in complete and satisfactory working order by the manufacturer of the doors [by.....], who shall arrange with the various other contractors to follow the detail blue prints to be furnished by the manufacturer, and to build in all bolts or other parts furnished by latter.

**SPECIAL FINISH**—To openings (describe them) the doors proper [or shutters] shall be full galvanized, and left unpainted; all guides and hood, etc., to be painted.

**Note:** Painting specifications should provide for all necessary finished painting. Some architects and engineers prefer to leave the door proper heavy galvanized and to paint only the guide, hood, etc.; but the Underwriters recommend that all parts be thoroughly painted with mineral paint or graphite paint in linseed oil.



# AMERICAN STEEL WINDOW COMPANY

Manufacturers of Solid Steel Windows

CHICAGO HEIGHTS, ILL.

DISTRICT SALES OFFICES

SEATTLE, WASH.  
ST. LOUIS, MO.  
DES MOINES, IOWA  
SAN FRANCISCO, CAL.

GRAND RAPIDS, MICH.  
PITTSBURGH, PA.  
KANSAS CITY, MO.  
MILWAUKEE, WIS.

ST. PAUL, MINN.  
SALT LAKE CITY, UTAH  
OMAHA, NEBR.  
CINCINNATI, OHIO

RICHMOND, VA.  
DENVER, COLO.  
BOSTON, MASS.

## Products.

AMERICAN STEEL UNIT PARTITIONS.  
AMERICAN SOLID STEEL DOORS.  
AMERICAN SOLID STEEL CASEMENTS.  
AMERICAN SOLID STEEL UNDERWRITERS' SASH.  
American Solid Steel Side Wall Sash.  
American Continuous Monitor Sash.

## American Steel Unit Partitions.

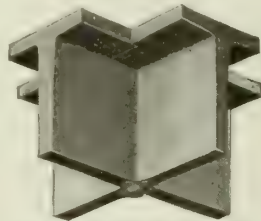
Built entirely of heavy sections rolled from open hearth steel with all cross joints, kick plates, etc., solidly welded. Individual units are exceptionally rigid and all mullions, door frames, etc., are of heavy square structural tubing of exceptional weight and strength.

All intersections are made with the American joint solidly welded by the oxy-acetylene process.

American Type 9 solid steel partition units can be built of any dimensions or heights required and to exactly fit any space arrangement, and while standard interchangeable units are desirable, partitions built in exact accordance with architects' plans can always be furnished without increase in cost or delay in manufacture.

Type 9 partition units can be removed and re-erected at any time and in any new arrangement without disturbance to glass or the use of special tools. Not only can any entire line be thus removed, but any individual unit may be taken out to allow of the substitution of a door, etc., without the disturbance of adjacent units.

These partitions are finished in a special battle-ship gray priming coat before shipment, and may be painted any color desired after erection, and when so desired, can be furnished before shipment with a special enamel finish in a wide range of colors.



THE AMERICAN JOINT  
Oxy-acetylene welded. All  
surfaces exposed for inspection  
and painting

**DOORS ON TYPE 9 PARTITIONS**—American tubular doors of any size or type may be incorporated in any partition without change or alteration in adjacent units. Swing doors are hung on 2½-in. square tubular frames, which take the place of the standard tubular mullion, the frame being completed by a square tube at head arranged when necessary to receive fixed or swinging transom unit.

Sliding doors are carried in the same manner, the entire track structure being attached to a heavy plate and angle girder which is carried through to adjacent mullions. All doors can be provided with electric or pneumatic operators, the entire operating mechanism being carried on the partition.

Swing doors are regularly furnished with mortise lock entirely concealed in the tubular stile and equipped with bronze handles and are hung on special steel butts. Sliding doors are equipped with special solid bronze flat key locks with bronze grips. Foot bolts, etc., furnished when required. American doors are fully described in Bulletin No. 14, sent on request.

**INTERCHANGEABLE UNIT SECTIONS**—These units are universally interchangeable, any number or combination of unit with the necessary mullions fitting into exactly the same space as one unit of the same number of panes, the necessary clearance, etc., for an actual fit being built into the individual units. At the same time, any door unit or combination of door units with partition units can replace units of the same number of panes wide.

By the use of these units, with the special end sleeve connections providing for a maximum space of 6 ins. between the end of the run and the wall, any length or arrangement of partitions may be built up of units that are universally available for future rearrangement, either as to location of runs or of individual door openings.

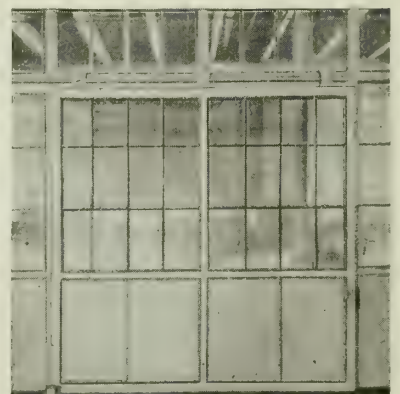
In laying out a run of partitions of this kind, simply select units that will most nearly fill the space and make up the difference with the end sleeve connections, which may be furnished to any width up to 6 ins.



PARTITION WITH SINGLE SWING  
DOOR



FOLDING DOOR PARTITION



PARTITION WITH DOUBLE SLIDING  
DOORS





SHOWING PART OF INSTALLATION OF AMERICAN UNIT PARTITIONS AND DOORS IN OVERLAND STORES, ST. PAUL, MINN.

Door openings may be of the following clear heights when less than the total height of the unit as per tabulation on this page, with the sash members in the doors properly lined up with those in adjacent partition units.

SWING DOORS	SLIDING DOORS
24" kick plate, 6' 11 1/8", 8' 8"	24" kick plate, 8' 4 1/2", 10' 7 1/8"
30" kick plate, 7' 4 5/8", 8' 8"	30" kick plate, 8' 10 1/2", 10' 6 7/8"
36" kick plate, 6' 3 1/4", 7' 11 5/8"	36" kick plate, 9' 4 1/2", 11' 7 1/8"
42" kick plate, 6' 9 1/4", 8' 5 5/8"	42" kick plate, 8' 2 1/2", 9' 10 1/2"
48" kick plate, 7' 3 1/4", 8' 5 5/8"	48" kick plate, 8' 8 1/2", 10' 4 1/2"

Glass is invariably 22 ins. high and a maximum of 16 ins. wide.

Glass not furnished unless specified.

Doors and all other details are the same as in other Type 9 units.

It will be noticed that any door unit shown on this page will exactly fill the space of the partition unit or will fill such space with addition of a 1-pane or 2-pane unit.

HEIGHT OF UNITS

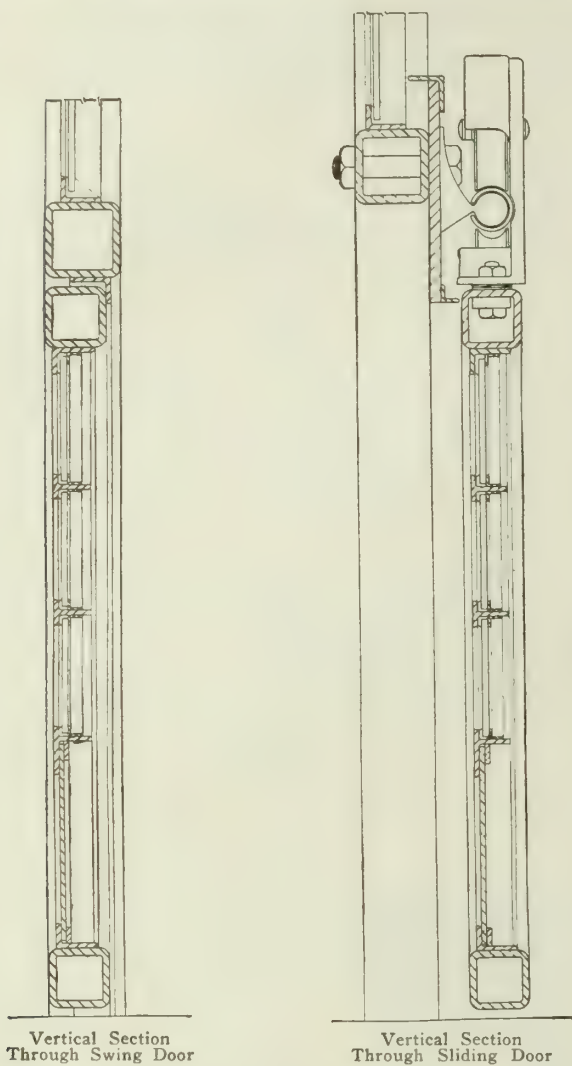
Kick plate	No. of panes	Height
24"	1	3'- 9 3/8"
	2	5'- 5 5/8"
	3	7'- 2 1/8"
	4	8'- 10 1/2"
	5	10'- 6 7/8"
30"	1	4'- 3 3/8"
	2	5'- 11 3/4"
	3	7'- 8 1/8"
	4	9'- 4 1/2"
	5	11'- 0 7/8"
36"	1	4'- 9 3/8"
	2	6'- 5 3/4"
	3	8'- 2 1/8"
	4	9'- 10 1/2"
	5	11'- 6 7/8"
42"	1	5'- 3 3/8"
	2	6'- 11 3/4"
	3	8'- 8 1/8"
	4	10'- 4 1/2"
	5	12'- 0 7/8"
48"	1	5'- 9 3/8"
	2	7'- 5 3/4"
	3	9'- 2 1/8"
	4	10'- 10 1/2"
	5	12'- 6 7/8"

Width of units.....	S F	S1	S2	S3	S4	S5	S6
Widths center to center of mullions...	0'-10"	1'-5"	2'-10"	4'-3"	5'-8"	7'-1"	8'-6"
Widths between mullions.....	0'-8"	1'-3"	2'-8"	4'-1"	5'-6"	6'-11"	8'-4"
Maximum practicable height.....	12'-6 7/8"	12'-6 7/8"	12'-6 7/8"	12'-6 7/8"	12'-6 7/8"	12'-6 7/8"	10'-10 1/2"



DIAGRAMS OF INTERCHANGEABLE UNIT SECTIONS

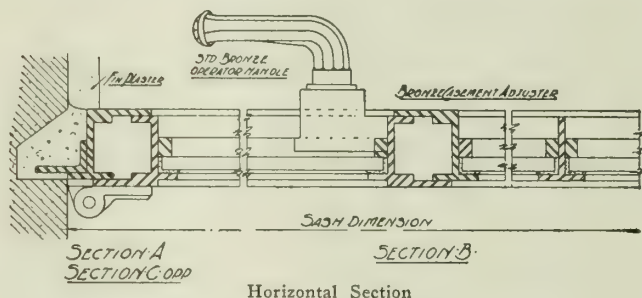
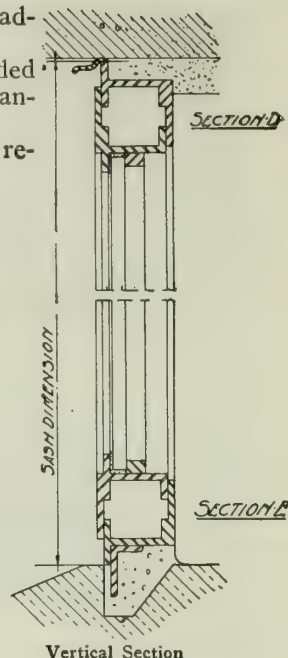
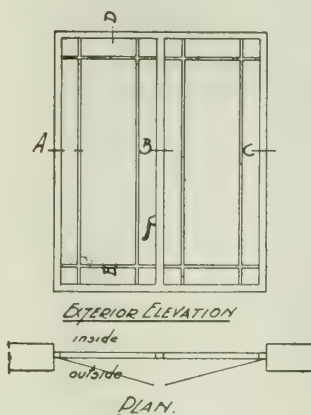
Maximum sizes of units are fixed by considerations of shipment. Any height may be combined with any width as long as one dimension is kept below 8 ft. Mullions may be carried to any height above top of partition. Track construction for sliding door is carried on independent sustaining girder which may be attached to any unit. Units may be ordered simply by the type number as marked on diagrams, but swing of doors should be clearly specified



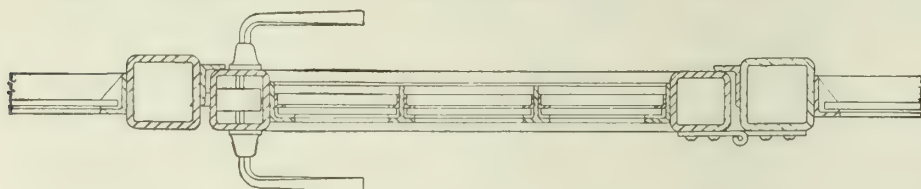
WINDOW COMPANY'S bronze adjuster bars.

All joints of sash are welded and ground down in a workman-like manner.

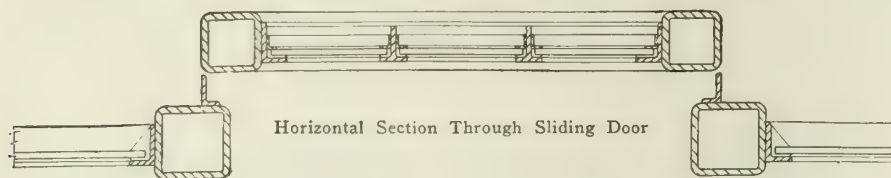
Further particulars on request.



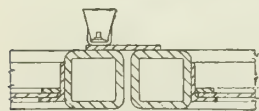
DETAILS OF AMERICAN STEEL CASEMENT  
American bronze casement adjuster and AMERICAN STEEL WINDOW COMPANY'S internal operator used



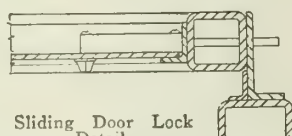
Horizontal Section Through Swing Door



Horizontal Section Through Sliding Door



Double Swing Door at Meeting Rail



Sliding Door Lock Detail

DETAILS OF AMERICAN STEEL UNIT PARTITION

### American Solid Steel Casements.

Equipped with AMERICAN STEEL WINDOW COMPANY'S special lock, which is arranged with 2 or more camming points as may be required by the height of the sash. This lock is entirely concealed with the exception of the handle, which makes a very neat arrangement.

This sash is also equipped with AMERICAN STEEL

### American Solid Steel Sash.

Made from special specification open hearth steel bars of heavy special sections. All cross joints oxy-acetylene welded. Positive action double weathering on all ventilators;  $\frac{3}{8}$ -in. glazing rabbets. Ventilators of all types, with any type or method of operation.

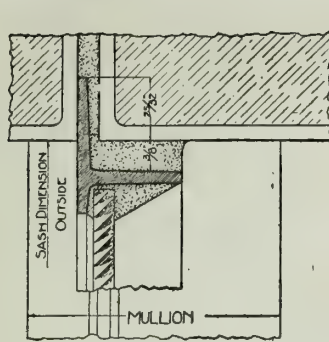
**SPECIAL CONSTRUCTION**—Equipped to handle unusual steel window, partition or door construction to meet special conditions or conform to desired architectural effect. Work of this class handled in exceptionally short time and at reasonable cost.

**MANUFACTURE AND SHIPMENT**—American windows are made from interchangeable standard parts, and users are not limited to "standard" sizes of ventilation arrangements. Sash of any dimensions or type furnished without delay or extra cost.

**HARDWARE**—American positive gravity cam latch provides absolutely automatic locking of ventilators when closed, and perfect weathering contact. American spring catch of heavy construction used without keeper.

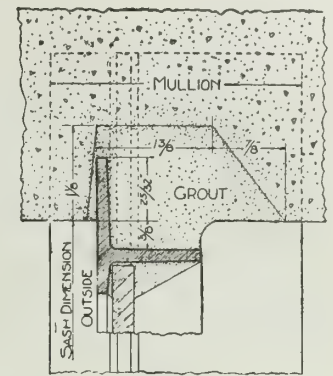
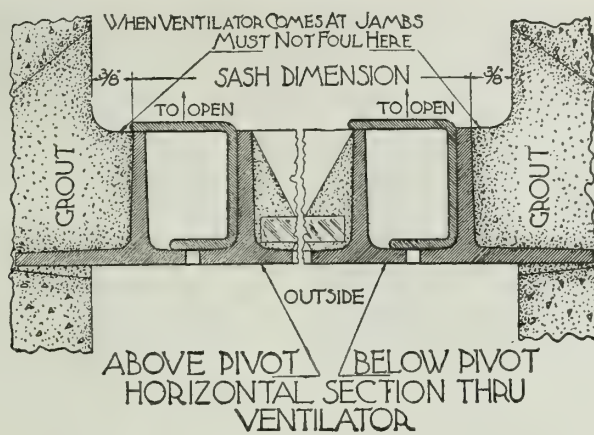
All American hardware is of bronze or malleable iron. No stamped or sheet metal parts are used on any part of the American window or its operating devices.





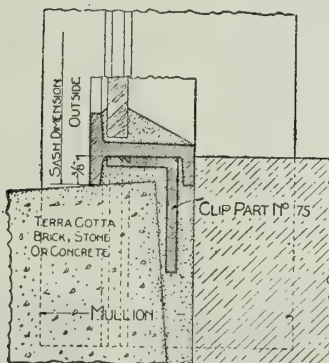
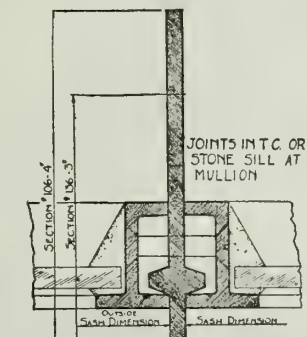
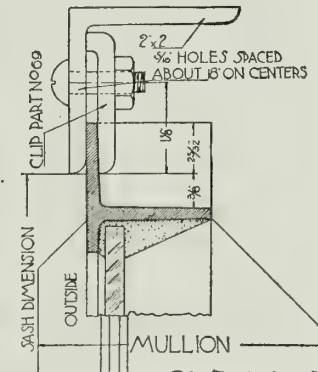
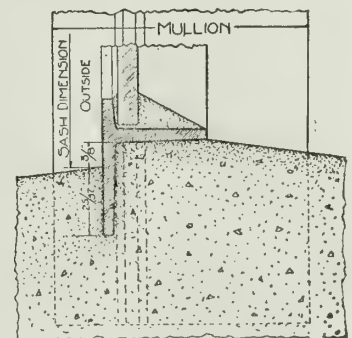
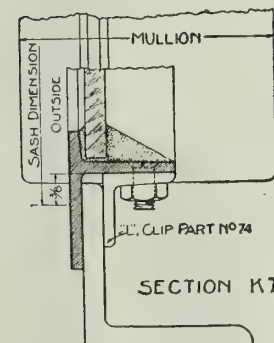
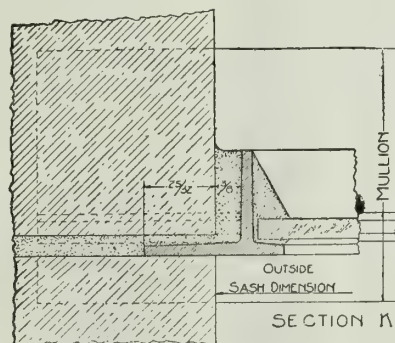
SECTION K8

Head Connection Steel Lintel



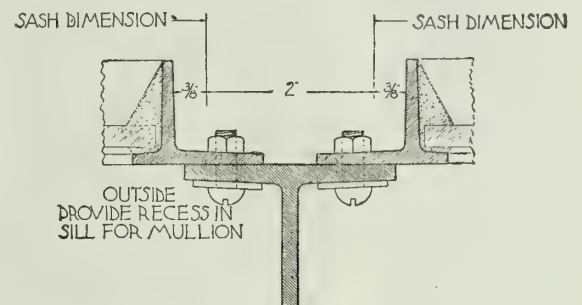
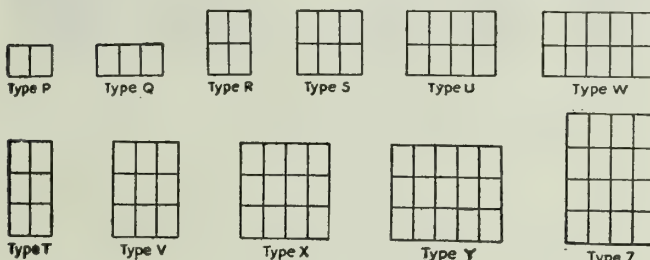
SECTION K2

Head or Jamb Connection Concrete

SECTION B4  
Sill ConnectionSECTION 1'-0" HEIGHT LIMIT 10'-0"  
SECTION 1'-10" HEIGHT LIMIT 14'-0"  
Standard Plate MullionsSECTION K3  
Head or Jamb Connection  
Structural SteelSECTION K4  
Sill Connection ConcreteSECTION K7  
Sill Connection Structural  
Steel

Jamb Connection Brick

INSTALLATION DETAILS OF AMERICAN STEEL SASH

SECTION L3  
Standard "T" Mullion

VENTILATOR TYPES

No. of lights high	HEIGHT OF EACH LIGHT IN INCHES							
	M-16"	O-17"	Q-18"	S-19"	V-20"	X-21"	Z-22"	XB-23"
SASH DIMENSION								
1	1'-5 1/4"	1'-6 1/4"	1'-7 1/4"	1'-8 1/4"	1'-9 1/4"	1'-10 1/4"	1'-11 1/4"	2'-0 1/4"
2	2'-9 3/8"	2'-11 3/8"	3'-1 3/8"	3'-3 3/8"	3'-5 3/8"	3'-7 3/8"	3'-9 3/8"	3'-11 3/8"
3	4'-2"	4'-5"	4'-8"	4'-11"	5'-2"	5'-5"	5'-8"	5'-11"
4	5'-6 3/8"	5'-10 3/8"	6'-2 3/8"	6'-6 3/8"	6'-10 3/8"	7'-2 3/8"	7'-6 3/8"	7'-10 3/8"
5	6'-10 3/4"	7'-3 3/4"	7'-8 3/4"	8'-1 3/4"	8'-5 3/4"	8'-9 3/4"	8'-13 3/4"	9'-2 3/4"
6	8'-3 3/8"	8'-9 3/8"	9'-1 3/8"	9'-5 3/8"	10'-0 3/8"	10'-4 3/8"	10'-8 3/8"	10'-12 3/8"
7	9'-7 7/8"	10'-2 7/8"	10'-6 7/8"	11'-1 7/8"	11'-5 7/8"	11'-9 7/8"	12'-3 7/8"	12'-7 7/8"
8	10'-11 1/8"	11'-6 1/8"	12'-0 1/8"	12'-4 1/8"	13'-0 1/8"	13'-4 1/8"	13'-8 1/8"	14'-2 1/8"
9	12'-4 3/4"	13'-1 3/4"	13'-5 3/4"	14'-0 3/4"	14'-4 3/4"	14'-8 3/4"	15'-2 3/4"	15'-6 3/4"

Tabulated data on this page covers over all heights and widths of American sash for a variety of glass sizes. The dimensions as shown are the clear wall openings and include an allowance for the necessary clearance to provide for variation in dimensions, etc., when the window is installed. Single units should not ordinarily exceed 54 sq. ft. in area, or 7 ft. 6 ins. in least dimension.

No. of lights wide	WIDTH OF EACH LIGHT IN INCHES											
	A-10"	B-10 1/2"	C-11"	D-11 1/2"	E-12"	F-12 1/2"	G-13"	H-13 1/2"	I-14"	J-14 1/2"	K-15"	L-15 1/2"
SASH DIMENSION												
1	0'-11 1/4"	0'-11 3/4"	1'-0 1/4"	1'-0 3/4"	1'-1 1/4"	1'-1 3/4"	1'-2 1/4"	1'-2 3/4"	1'-3 1/4"	1'-3 3/4"	1'-4 1/4"	1'-4 3/4"
2	1'-9 3/8"	1'-10 3/8"	1'-11 3/8"	2'-0 3/8"	2'-1 3/8"	2'-2 3/8"	2'-2 3/8"	2'-3 3/8"	2'-3 3/8"	2'-4 3/8"	2'-4 3/8"	2'-5 3/8"
3	2'-8 3/8"	2'-9 3/8"	2'-11 3/8"	3'-0 3/8"	3'-1 3/8"	3'-2 3/8"	3'-2 3/8"	3'-3 3/8"	3'-3 3/8"	3'-4 3/8"	3'-4 3/8"	3'-5 3/8"
4	3'-6 3/8"	3'-8 3/8"	3'-10 3/8"	4'-0 3/8"	4'-1 3/8"	4'-2 3/8"	4'-2 3/8"	4'-3 3/8"	4'-3 3/8"	4'-4 3/8"	4'-4 3/8"	4'-5 3/8"
5	4'-4 3/8"	4'-6 3/8"	4'-8 3/8"	5'-0 3/8"	5'-1 3/8"	5'-2 3/8"	5'-2 3/8"	5'-3 3/8"	5'-3 3/8"	5'-4 3/8"	5'-4 3/8"	5'-5 3/8"
6	5'-3 3/8"	5'-5 3/8"	5'-7 3/8"	6'-0 3/8"	6'-1 3/8"	6'-2 3/8"	6'-2 3/8"	6'-3 3/8"	6'-3 3/8"	6'-4 3/8"	6'-4 3/8"	6'-5 3/8"
7	6'-1 3/8"	6'-3 3/8"	6'-5 3/8"	7'-0 3/8"	7'-1 3/8"	7'-2 3/8"	7'-2 3/8"	7'-3 3/8"	7'-3 3/8"	7'-4 3/8"	7'-4 3/8"	7'-5 3/8"
8	6'-11 3/8"	7'-3 3/8"	7'-5 3/8"	8'-0 3/8"	8'-1 3/8"	8'-2 3/8"	8'-2 3/8"	8'-3 3/8"	8'-3 3/8"	8'-4 3/8"	8'-4 3/8"	8'-5 3/8"
9	7'-10 3/8"	8'-2 3/8"	8'-4 3/8"	9'-0 3/8"	9'-1 3/8"	9'-2 3/8"	9'-2 3/8"	9'-3 3/8"	9'-3 3/8"	9'-4 3/8"	9'-4 3/8"	9'-5 3/8"

# THE WILLIAM BAYLEY COMPANY

## Steel Sash For Industrial Buildings

### SPRINGFIELD, OHIO

BRANCH SALES OFFICES

NEW YORK, 303 Fifth Avenue  
Telephone, Madison Square 7483

CHICAGO, 6 North Michigan Avenue  
Telephone, Central 2612

Sales Agencies in 35 American Cities

BOSTON, Oliver Building  
Telephone, Fort Hill 5048

### Products.

WINDOWS, with all varieties of Pivoting and Sliding Ventilation, suited to all kinds of semifinished buildings; CONTINUOUS and other forms of MONITOR WINDOWS; STEEL and GLASS SIDE WALLS and PARTITIONS; WINDOW OPERATORS; STEEL DOORS.

### Experience.

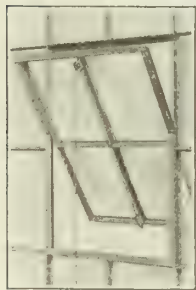
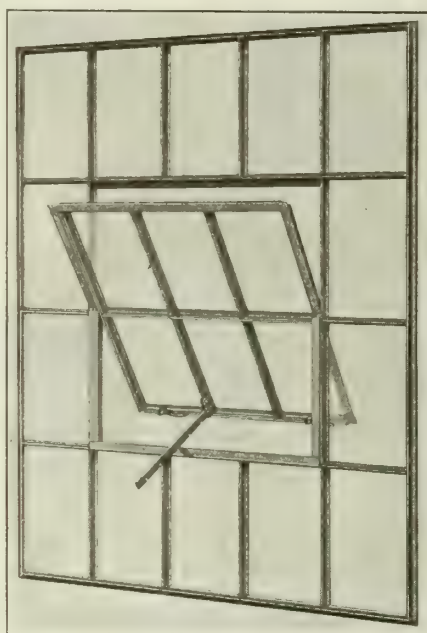
Bayley-Springfield merits are backed by 37 years of continuous manufacturing experience and 8 years of solid bar sash manufacturing experience. Bayley-Springfield steel sash have been installed in almost every American city and in many foreign countries.

Write for list of installations and illustrated descriptive booklets.

### Bayley-Springfield Stock Units.

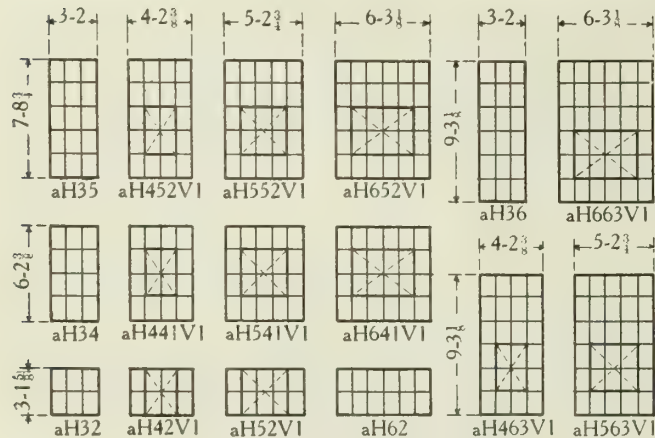
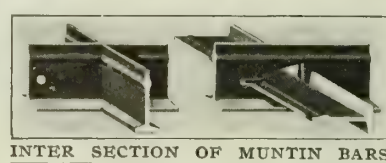
Ten-day shipments. 27 kinds and sizes. Unventilated units, not included in diagram, same as ventilated units included. This page, and the drawings and 2 uppermost cuts on the next page, refer to these stock units, the use of which not only saves time, but saves money.

Glass 12 by 18 ins., except in vents. Corner panes are 11 by 17 ins. and center panes, if any, 12 by 17 ins. Vents are center pivoted (CP). Vent control is as indicated. Lock bars (TE), glazing springs (K), and necessary bolts are included. Mullions (M5), 1 in. longer than sash height dimension given, are furnished. Painted with one shop coat of red oxide.



TYPICAL STOCK UNITS AND VENTS

See description following

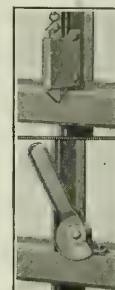
BAYLEY-SPRINGFIELD STOCK UNITS  
27 kinds and sizes

INTER SECTION OF MUNTIN BARS.

LOCK BAR TE, — THE STANDARD CONTROL FOR ACCESSIBLE VENTS.  
PUSH BAR G20 — USED FOR POSITIONING VENTS TO DESIRED OPENING WHEN CAM H IS USED FOR FASTENING THEM SHUT.



HINGE.  
SPRING  
CATCH — STANDARD CONTROL FOR INACCESSIBLE VENTS.  
CAM H.

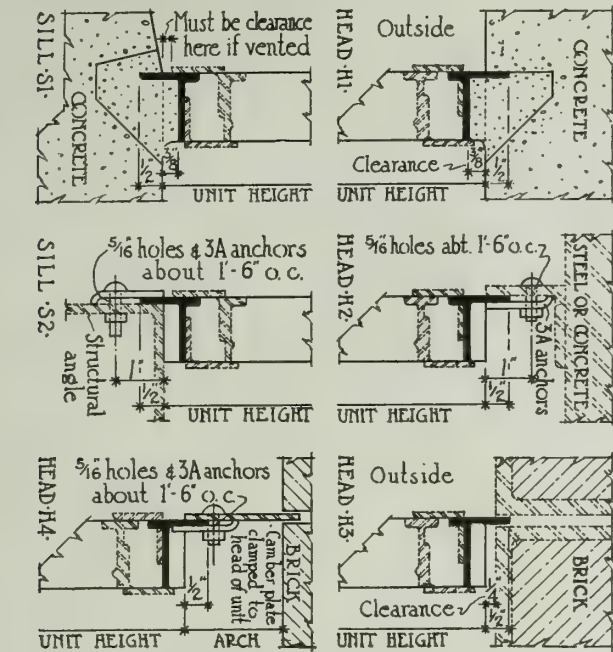


BAYLEY-SPRINGFIELD INTERSECTION AND HARDWARE IN DETAIL

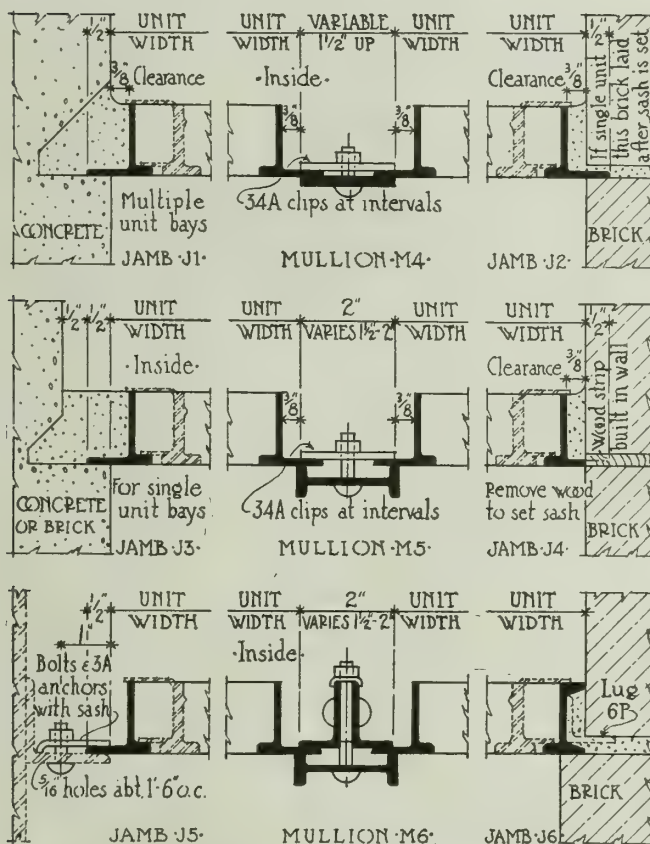
DATA ON STOCK UNITS ASSEMBLED INTO BAYS

Widths of bays, mullions 2 ins. each									
Panes total	No. of units	Panes in units use either column	Dimensions ft. ins.	Panes total	No. of units	Panes in units use either column	Dimensions ft. ins.	Panes total	No. of units
6	2	3 each	6 6	17	3	6-5-6	18	1	1
7	2	3-4	7 6 1/2	17	5	3-4-3-4-3	18	6 3/4	6 3/4
8	2	4 each	8 6 3/4	18	3	6 each	19	1 3/8	1 3/8
9	2	5-4	9 7 3/8	18	4	3-6-6-3	19	4 1/4	4 1/4
9	3	3 each	9 10	18	5	4-3-4-3-4	19	7 1/8	7 1/8
10	2	5 each	10 7 1/2	19	5	3-4-5-4-3	20	7 1/2	7 1/2
10	3	3-4-3	10 10 3/8	20	4	5 each	21	5	5
11	2	5-6	11 7 3/8	20	5	3-5-4-5-3-4	21	7 3/8	7 3/8
11	3	3-5-3	11 10 3/4	21	5	4-5-3-5-4	22	8 1/4	8 1/4
12	2	6 each	12 8 1/4	22	4	6-5-5-6	23	5 3/4	5 3/4
12	3	3-6-3	12 11 1/8	22	5	5-4-4-4-5	23	8 5/8	8 5/8
13	3	5-3-5	13 11 1/2	23	5	4-5-5-5-4	24	9	9
14	3	5-4-5	14 11 7/8	24	4	6 each	25	6 1/2	6 1/2
15	3	5 each	15 10 1/4	24	5	4-6-4-6-4	25	9 3/8	9 3/8
16	3	6-4-6	16 17 0 5/8	24	6	4 each	26	0 1/4	0 1/4
16	4	3-5-5-3	17 3 1/2	25	5	6-4-5-4-6	26	9 3/4	9 3/4

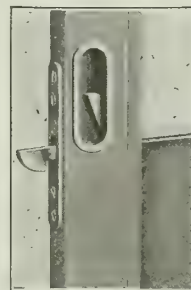




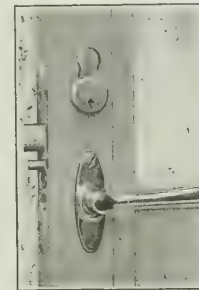
BAYLEY-SPRINGFIELD WINDOWS, TYPICAL INSTALLATIONS



SECTIONAL DETAILS SUGGESTIVE OF APPROVED INSTALLATION



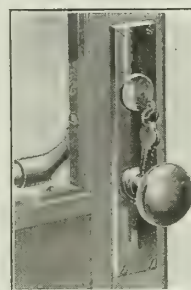
Lock No. 64



Lock No. 51



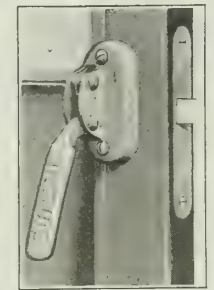
Lock No. 52



Lock No. 55

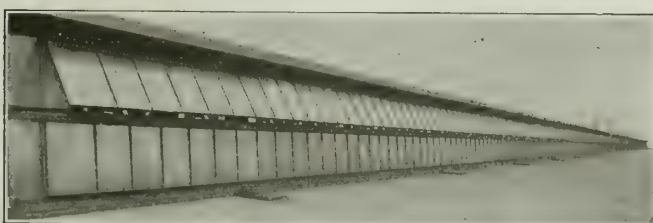


Door Corner  
DOOR PARTS

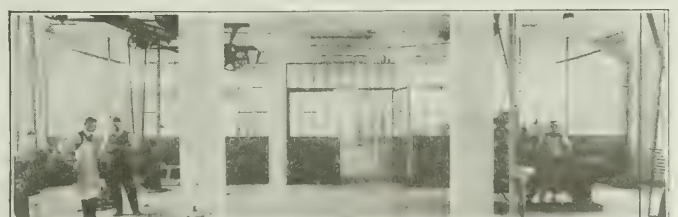


Lock No. 54

Quality and adaptability effectively combined



BAYLEY-SPRINGFIELD CONTINUOUS WINDOW  
Write for booklet



BAYLEY-SPRINGFIELD DOORS AND PARTITIONS  
See details above

# DETROIT STEEL PRODUCTS COMPANY

Manufacturers of Solid Steel Windows

2250 East Grand Boulevard  
DETROIT, MICH.

BRANCH OFFICES AND DISTRIBUTING AGENTS IN ALL PRINCIPAL CITIES

## Products.

FENESTRA SOLID STEEL WINDOWS, including:

SIDE WALL SASH, for modern industrial buildings.

VERTICALLY SLIDING SASH, for offices, schools and similar classes of buildings.

CONTINUOUS MONITOR SASH, for sawtooth, monitors and other roof construction.

CONTINUOUS OPERATOR, for opening sash in sawtooth and monitor roof construction.

Also, Fenestra Solid Steel Casements, for high grade office buildings and factories; Fenestra Solid Steel Doors, single and double; Fenestra Solid Steel Partitions.

Fenestra Solid Steel Casements, for high grade office buildings and factories; Fenestra Solid Steel Doors, single and double; Fenestra Solid Steel Partitions.

## Adaptability.

Fenestra is adapted to all types of industrial buildings, built of brick, stone, concrete, terra cotta or steel.

## Advantages.

Fenestra gives maximum natural light; perfect ventilation without draft and absolute weather protection. It is easy to operate, does not stick, warp or rust; gives protection against fire from within and without; reduces upkeep cost; heightens the architectural beauty of buildings so equipped and is easier to glaze than other windows.

## Mechanical Construction.

Fenestra bars are rolled from solid, first quality, low carbon steel to a depth of  $1\frac{3}{8}$  ins., accurately and



TRADE-MARK  
(Reg. U. S. Pat. Off.)

plainly machined in specially designed machines and with specially designed tools.

Unusually strong, because made of solid, rolled steel; not built up, assembled or wired together.

## The Joint.

Bars are continued from jamb to jamb head to sill and interlocked at all points of intersection by the patented interlocking Fenestra joint. This interlocked joint, from which less than 20% of the metal is removed, increases the strength of the sash and its resistance to wind pressure.

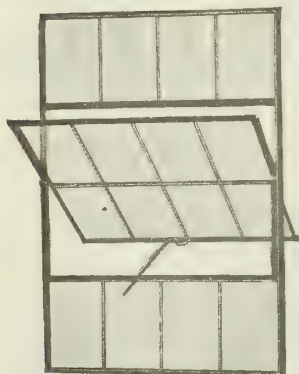


THE JOINT

## Ventilators.

Ventilators are weathertight when closed and weather protecting when open. All ventilators are equipped with a special channel weathering at head, jamb and sill, which forms a continuous two point flat contact all around. This weathering is electric spot-welded to the vent.

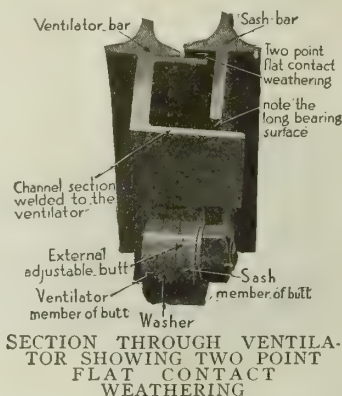
Ventilators can be quickly removed from sash when desired. Are easily operated in any kind of weather.



A STANDARD UNIT OF  
FENESTRA SIDE WALL SASH  
Largely used in industrial buildings



FENESTRA CONTINUOUS CENTER  
PIVOTED SASH  
Recommended for monitor and sawtooth roof  
constructions

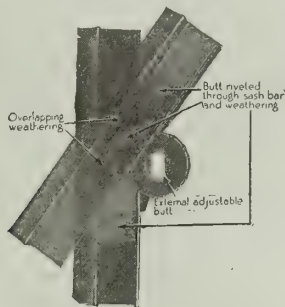




### Butt.

The Fenestra butt is guarded against loosening by being double riveted through sash bar and weathering. The mere turning of a nut allows ventilators to be removed from the sash at will.

The butt is well weathered, the channel section on the fixed portion of the sash being bent inward a trifle to permit the channel section on the ventilator to over-



THE BUTT

lap it as the ventilator closes. This forms a flat contact and an overlapping protection against driving rain or a storm. A washer between the ventilator and side sections of the butt form an aperture by means of which condensation forming along the upper part of the ventilator finds passage to the sill.

### Cam Latch.

The Fenestra cam latch, which is an exclusive feature of Fenestra sash is used on ventilators within reach of the floor. It is a solid steel drop forging attached to



THE CAM LATCH

the sill bar of the ventilator by a solid rolled "Z" bar bracket. As the ventilator closes, this cam latch rides up over the sash weathering and falls on the inside, automatically and securely locking the window.

### Mullions.

Combination of units are made by the use of special rolled flat surface Tee bar mullions which are slotted in either wing to correspond to the slots in the jamb bars of the sash. Slight variations in the width of bays can be taken up at the mullion.



TEE BAR MULLIONS

### Prices.

Exact prices depend on construction of building and the use of standard types and sizes. Estimates are gladly submitted upon receipt of plans or rough sketches of openings to be filled.

### Shipment.

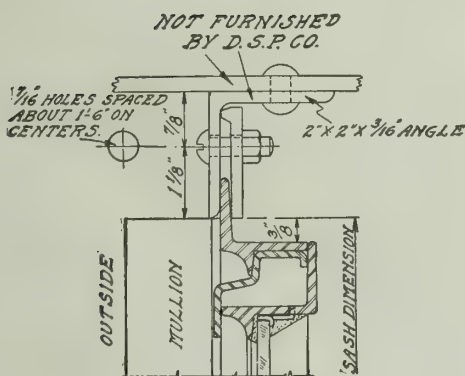
Unusually prompt shipment can be made if preferred stock types and sizes are specified.

### Warehouse Stock.

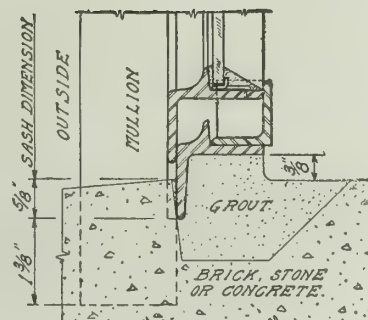
Stock sizes of Fenestra are held in warehouses waiting for immediate shipment. A list of warehouses and the stock in each will be sent on request.

### Literature.

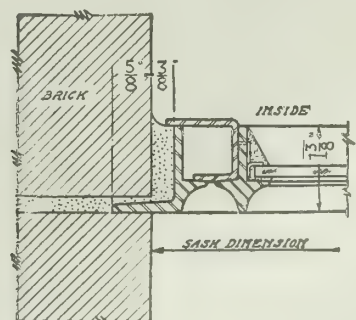
Special literature dealing with the various types of Fenestra windows and with Fenestra in certain types of buildings will be sent on request.



Head Section with Steel Lintel



Sill Section using Brick, Stone or Concrete



Jamb Section in Brick

TYPICAL INSTALLATION DETAILS OF FENESTRA

# TRUSCON STEEL COMPANY

(TRUSSED CONCRETE STEEL COMPANY)

Manufacturers of Steel Windows

YOUNGSTOWN, OHIO

ATLANTA, GA.  
BALTIMORE, MD  
BOSTON, MASS.  
BUFFALO, N. Y.  
CHICAGO, ILL.  
CINCINNATI, OHIO  
CLEVELAND, OHIO  
COLUMBUS, OHIO  
DALLAS, TEX.

DAYTON, OHIO  
DENVER, COLO.  
DES MOINES, IOWA  
DETROIT, MICH.  
EL PASO, TEX.  
INDIANAPOLIS, IND.  
KANSAS CITY, MO.  
LOS ANGELES, CAL.  
LOUISVILLE, KY.

MILWAUKEE, WIS.  
MINNEAPOLIS, MINN.  
NEW YORK, N. Y.  
NORFOLK, VA.  
OKLAHOMA CITY, OKLA.  
OMAHA, NEBR.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.  
PORTLAND, ORE.

ROSWELL, N. M.  
ST. LOUIS, MO.  
SALT LAKE CITY, UTAH  
SAN ANTONIO, TEX.  
SEATTLE, WASH.  
SPOKANE, WASH.  
SYRACUSE, N. Y.  
TOLEDO, OHIO  
WASHINGTON, D. C.

## Products.

All types of TRUSCON STEEL WINDOWS, including Pivoted Side Wall Sash, Continuous Sash, Sliding Sash, Partitions, Doors, etc.

For Reinforcing Steel, Metal Lath, Inserts, etc., see pages 217-19.

## Service.

This company's specialists co-operate fully with engineers, architects, owners and contractors in selecting the proper window for any condition.

## Truscon Steel Windows.

The members of Truscon steel windows consist of deep, heavy, solid, one-piece sections rolled from special new billet steel. The sections are designed to have great strength, thorough weatherproofness, and neat appearance.

The joint is a special dovetail miter, which interlocks the bars, making them continuous in both directions and giving greatest strength to the window.

Ventilators have a heavy reinforced frame, double contact weathering, strong, neat appearing pivot hinges and easily operated durable hardware. Glazing is by special spring steel wire clips.



TRADE-MARK

## Truscon Continuous Sash.

The improved method of support, consisting of continuous bearing, eliminates hinges, evenly distributes the weight throughout its length, and provides an absolutely weathertight contact, with no openings above the sash for rain or snow to enter.

The sill member is heavy and rigid, providing a wide flange for attachment of operator and weathertight contact at sill.

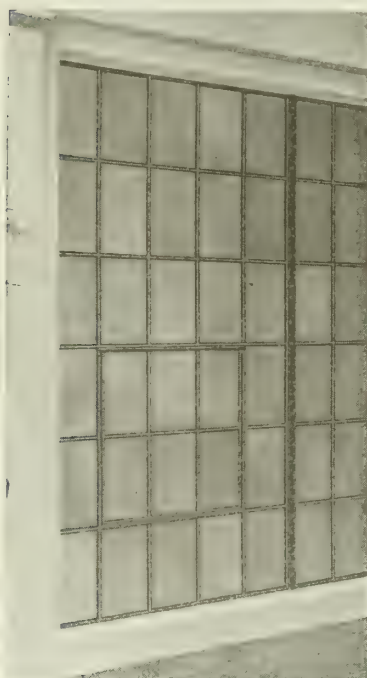
Joints are mortise and tenon, welded by the oxy-acetylene process.

Truscon continuous sash has exceptional stiffness and rigidity. Glazing is by special spring clips.

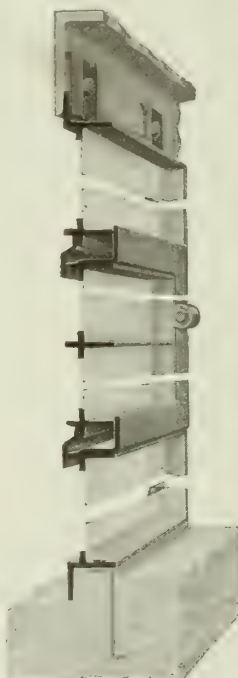
STANDARD SIZES OF TRUSCON CONTINUOUS SASH

Sash number	Height of sash	Height of opening	Glass size
No. 3	3'-0"	2'-10 1/2"	23 3/4" x 32 3/4"
No. 4	4'-0"	3'-10 1/2"	23 3/4" x 44 3/4"
No. 5	5'-0"	4'-10 1/2"	23 3/4" x 56 3/4"
No. 6	6'-0"	5'-10 1/2"	23 3/4" x 68 3/4"

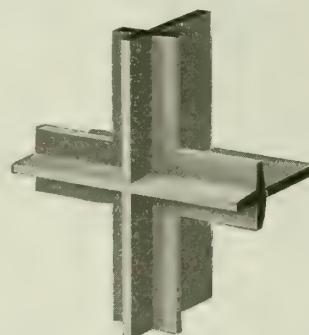
Units are designed for a truss spacing of 20 ft. on centers. Various units can be combined to fit any length of run.



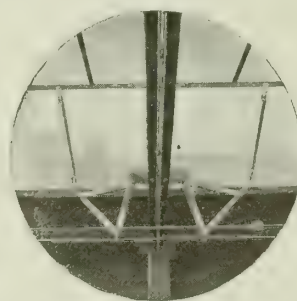
Clean-cut Architectural Lines of Truscon Steel Windows



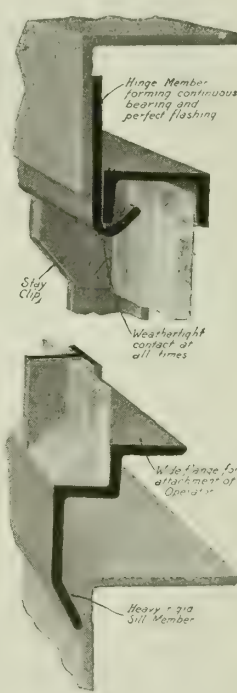
Sectional Perspective of Truscon Steel Windows



Mitered Dovetail Joint of Truscon Steel Windows



Truscon Operator for Continuous Sash



Sectional Perspective of Truscon Continuous Sash

DETAILS OF TRUSCON STEEL WINDOWS



### Truscon Operator for Continuous Sash.

This operator has great power combined with ease of operation and is ideally adapted for controlling heavy top hung sash. It is of the tension type, with lever arms, continuous connecting rods and operating station. The toggle arrangement of the operating arms gives the Truscon operator 60% to 100% additional power.

### Stock Units of Truscon Steel Windows.

30 types and 60 sizes of Truscon steel windows are carried in stock, meeting practically all building requirements. The use of stock windows insures quick shipment, low cost and speedy building.

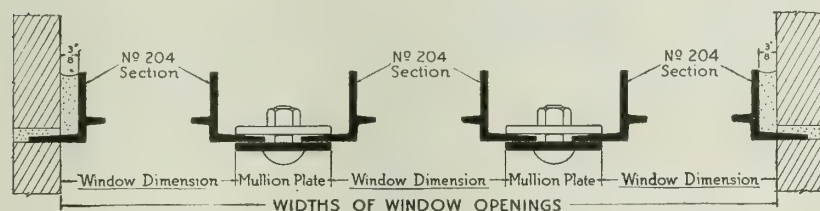
Accompanying diagrams and tables show stock units and combinations of them.

### Semi-stock Units.

In semi-stock windows the ventilators are carried in stock, and frames around the ventilators are made to order. Ventilators are stocked in many types and in 6 glass sizes. Any size of window opening and any amount of ventilation can be obtained.

### Other Types of Sash.

Our complete line of Truscon steel windows and United steel sash includes vertically pivoted sash, counterbalanced sliding sash, steel and glass partitions, steel doors, steel fire windows and other special types.



WIDTHS OF WINDOW OPENINGS OF STOCK UNITS

32	32-1-6-0	42	42-1-8-0	52	52-1-6-0
33	33-1-6-1	43	43-1-8-1	53	53-1-6-1
34	34-1-6-1	44	44-1-8-1	54	54-1-6-1
35	35-1-6-1	45	45-1-8-1	55	55-1-6-1
36	36-1-6-1	46	46-1-8-1	56	56-1-6-1

STOCK UNITS OF TRUSCON STEEL WINDOWS

Ventilators (indicated by crossed dash lines) are horizontally pivoted 2 ins. above center.

**Important Note**—Stock units are made in two glass sizes: 12 by 18 ins. and 14 by 20 ins. 12-in. widths of glass can be used only with 18-in. heights of glass. 14-in. widths of glass can be used only with 20-in. heights of glass. For any one window opening, 12 by 18-in. glass sizes can not be combined with 14 by 20-in. sizes.

### Window Handbook.

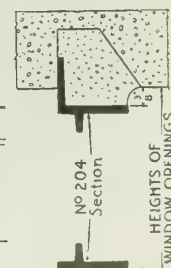
Large Truscon Steel Window Handbook contains complete details, tables and information. Sent free on request.

WIDTHS OF WINDOW OPENINGS USING STOCK UNITS

Widths of openings		Total number of lights wide	Number of units	Mullion plate
12" x 18" glass	14" x 20" glass			
3'-2"	3'-8"	3	1	.....
4'-2 3/8"	4'-10 3/8"	4	1	.....
5'-2 3/4"	6'-0 3/4"	5	1	.....
6'-6 1/2"	7'-6"	6	2	2 1/2"
6'-6 1/2"	7'-6 1/2"	6	2	2 1/2"
6'-7"	7'-7"	6	2	2 1/2"
8'-6 3/4"	9'-10 3/4"	8	2	2 1/2"
8'-7 1/2"	9'-11 1/4"	8	2	2 1/2"
8'-7 3/4"	9'-11 3/4"	8	2	2 1/2"
9'-10"	11'-4"	9	3	2 1/2"
9'-11"	11'-5"	9	3	2 1/2"
10'-0"	11'-6"	9	3	2 1/2"
10'-7 1/2"	12'-3 1/2"	10	2	2 1/2"
10'-8"	12'-4"	10	2	2 1/2"
10'-8 1/2"	12'-4 1/2"	10	2	2 1/2"
10'-10 3/8"	12'-6 3/8"	10	3	2 1/2"
10'-11 3/8"	12'-7 3/8"	10	3	2 1/2"
10'-10 3/8"	12'-8 3/8"	10	3	2 1/2"
11'-10 3/4"	13'-8 3/4"	11	3	2 1/2"
11'-11 3/4"	13'-9 3/4"	11	3	2 1/2"
12'-0 3/4"	13'-10 3/4"	11	3	2 1/2"
12'-11 1/8"	14'-11 1/8"	12	3	2 1/2"
13'-0 1/8"	15'-0 1/8"	12	3	2 1/2"
13'-1 1/8"	15'-1 1/8"	12	3	2 1/2"
13'-2"	15'-2"	12	4	2 1/2"
13'-3 1/2"	15'-3 1/2"	12	4	2 1/2"
13'-5"	15'-5"	12	4	2 1/2"
13'-11 1/2"	16'-1 1/2"	13	3	2 1/2"
14'-0 1/2"	16'-2 1/2"	13	3	2 1/2"
14'-1 1/2"	16'-3 1/2"	13	3	2 1/2"
14'-11 7/8"	17'-3 7/8"	14	3	2 1/2"
15'-0 7/8"	17'-4 7/8"	14	3	2 1/2"
15'-1 7/8"	17'-5 7/8"	14	3	2 1/2"
15'-2 3/4"	17'-6 3/4"	14	4	2 1/2"
15'-4 1/4"	17'-8 1/4"	14	4	2 1/2"
15'-5 3/4"	17'-9 3/4"	14	4	2 1/2"
16'-0 1/4"	18'-6 1/4"	15	3	2 1/2"
16'-1 1/4"	18'-7 1/4"	15	3	2 1/2"
16'-2 1/4"	18'-8 1/4"	15	3	2 1/2"
16'-6"	19'-0"	15	5	2 1/2"
16'-8"	19'-2"	15	5	2 1/2"
16'-10"	19'-4"	15	5	2 1/2"
17'-3 1/2"	19'-11 1/2"	16	4	2 1/2"
17'-5"	20'-1"	16	4	2 1/2"
17'-6 3/4"	20'-2 3/4"	16	5	2 1/2"
17'-6 1/2"	20'-2 1/2"	16	4	3"
17'-8 3/4"	20'-4 3/4"	16	5	2 1/2"
17'-10 3/8"	20'-6 3/8"	16	5	3"
18'-6 3/8"	21'-4 3/8"	17	5	2 1/2"
18'-8 3/8"	21'-6 3/8"	17	5	2 1/2"
18'-10 3/8"	21'-8 3/8"	17	5	2 1/2"
19'-4 1/4"	22'-4 1/4"	18	4	2 1/2"
19'-5 3/4"	22'-5 3/4"	18	4	2 1/2"
19'-7 1/4"	22'-7 1/4"	18	5	2 1/2"
19'-7 1/2"	22'-7 1/2"	18	4	3"
19'-9 1/2"	22'-9 1/2"	18	5	2 1/2"
19'-10"	22'-10"	18	6	2 1/2"
19'-11 1/2"	22'-11 1/2"	18	5	3"
20'-0 1/2"	23'-0 1/2"	18	6	2 1/2"
20'-3"	23'-3"	18	6	3"
20'-7 1/4"	23'-9 1/4"	19	5	2 1/2"
20'-9 1/2"	23'-11 1/2"	19	5	2 1/2"
20'-11 1/2"	24'-1 1/2"	19	5	3"
21'-5"	24'-9"	20	4	2 1/2"
21'-6 1/2"	24'-10 1/2"	20	4	2 1/2"
21'-7 1/2"	24'-11 1/2"	20	5	2 1/2"
21'-8"	25'-0"	20	4	3"

HEIGHTS OF WINDOW OPENINGS USING STOCK UNITS

Heights of openings		Number of lights high
12" x 18" glass	14" x 20" glass	
3'-1 1/2"	3'-5 5/8"	2
4'-8"	5'-2"	3
6'-2 3/8"	6'-10 3/8"	4
7'-8 3/4"	8'-6 3/4"	5
9'-3 3/8"	10'-3 1/8"	6



HEIGHTS OF WINDOW OPENINGS OF STOCK UNITS

# DAVID LUPTON'S SONS CO.

## Daylight and Ventilation for Buildings

Allegheny Avenue and Tulip Street  
PHILADELPHIA, PA.

### SALES OFFICES

NEW YORK, N. Y., DAVID LUPTON'S SONS Co., 50 Church Street  
CHICAGO, ILL., DAVID LUPTON'S SONS Co., 743 Insurance Exchange Building  
PITTSBURGH, PA., DAVID LUPTON'S SONS Co., 1415 Oliver Building

CLEVELAND, OHIO, DAVID LUPTON'S SONS Co., 906 Sweetland Building  
DETROIT, MICH., MALCOLM J. McLEOD, Majestic Building  
BOSTON, MASS., DAVID LUPTON'S SONS Co., 141 Milk Street  
WASHINGTON, D. C., DAVID LUPTON'S SONS Co., 405 Wilkins Building  
BALTIMORE, MD., WALTER S. BRAUNS, Munsey Building

### Products.

LUPTON STEEL SASH; PIVOTED FACTORY TYPE, POWER HOUSE TYPE, COUNTERBALANCED TYPE, COUNTERWEIGHTED TYPE. POND CONTINUOUS SASH; POND OPERATING DEVICE; POND TRUSS; LUPTON STEEL PARTITION; LUPTON STEEL TUBE DOORS; LUPTON ROLLED STEEL SKYLIGHT; LUPTON SHEET METAL FIREPROOF WINDOW; WALDMIRE LOUVER; LUPTON STEEL SHELVEING.

### Lupton Service.

Every type of building and every mode of use imposes its own requirements as to lighting, weather protection, temperature control and air renewal.

Buildings in which large amounts of heat or gases are generated demand especial attention to air renewal.

Intensive methods of manufacture, involving high personal skill or the crowding together of many workers, demand the most favorable conditions possible as to air and light.

For these, and similar conditions, we have originated a number of special designs by which both air and light are provided in exceptional degree.

The experience of our engineering department is available to customers, architects and engineers without charge. It is advised that, in all cases, we be consulted before the final plans are made.

The following types of buildings afford examples of Lupton special design:

**MULTI-STORY LOFTS AND FACTORIES**—Where the air space per worker is quite limited, it is desirable to insure ventilation by placing the control of sash openings in the hands of a foreman on each floor. This is best done by placing a line of Pond Continuous Sash in each window opening over Lupton Steel Sash, Counterbalanced Type, and operating a number of such lengths simultaneously by Pond Operating Device. This insures ventilation without admitting rain or snow, and leaves the workmen free to open the counterbalanced sash as may seem desirable.

Where the ventilating requirements are less exacting, the entire window opening may be filled with Lupton Steel Sash, Counterbalanced Type, or with the cheaper Pivoted Factory Type, and opened by the individual workman.

When certain portions of the work require either special accuracy or rapid manual operations, remarkable results may be obtained by performing such operations under a sawtooth roof or Pond Truss on the top floor.

In such cases all operated sash lines of the sawtooth may be controlled simultaneously by Pond Operating Device, Motor Driven.

**MACHINE SHOPS**—These demand ample and uniform overhead light, which may be obtained from a sawtooth, or even better, from a Pond Truss roof. See "Pond Truss."

The latter gives an evenly distributed light over the entire floor area, and is especially suited to areas too large to be properly ventilated by sawtooth construction. A 1-story building with properly designed Pond Trusses, alternating with Pond A-frames, may be of virtually unlimited area, yet perfectly lighted and ventilated throughout.

**FOUNDRIES**—The Pond Truss form of roof provides an extremely rapid change of air over the entire floor area, regardless of its width or length, and gives abundant and uniform light.

**FORGE SHOPS AND ROLLING MILLS**—These develop even greater heat than foundries, but are adequately cooled as well as lighted by Pond Truss.

**GLASS FURNACES**—A modified type of Pond Truss makes it possible to work with comfort in these buildings at all seasons.

**POWER HOUSES**—Pond Truss, Power House Type, with adequate outlets protected by Pond Continuous Sash enables even the largest boiler room to have well lighted firing alleys, and to be comfortably cool at all points on the working floor and bunkers.

The side walls of the boiler and turbine rooms present a dignified and pleasing appearance when equipped with power house type sash, simultaneously operated.

**TEXTILE MILLS**—The weatherproof feature of Pond Continuous Sash, and the fact that it can be operated in lines of exceptional length, make it very desirable for this class of building. For weave sheds the sawtooth is satisfactory. Humidors demand special sash details.

**HOSPITALS AND PUBLIC BUILDINGS**—For these, three types of sash are offered:

(1) Lupton Steel Sash, Counterweighted Type.

(2) Lupton Steel Sash, Counterbalanced Type, with special bronze weathering strips similar to those used in the counterweighted type.

(3) Lupton Steel Sash, Projected Ventilator Type.

All these are satisfactorily weathertight and free from interference with shades and screens.



**Lupton Steel Sash, Pivoted Factory Type (Patented).**

Lupton Steel Sash, Pivoted Factory Type, has certain features which are deemed fundamental, namely: solid 1-piece rolled steel members, joints which resist corrosion and do not impair effective strength of sash, permanently weathertight ventilators and simple glazing. The members of Lupton Sash are specially rolled to give maximum strength without excessive weight. The muntin joints (see illustration) give maximum strength against wind, and are readily protected by painting. The muntins are fitted into frames and solidly riveted.

Ventilators make a close 2-point contact at all sides. Lupton pivots (patented) have shoulders which carry the load of the ventilators and relieve the bronze pins of any strain. These pivots preserve the weathering when the ventilators are closed. Ventilators placed one above the other are operated together by a double arm connection, which closes them tight without slamming. Glass is bedded in putty and held by patented Lupton glazing wedges (see detail); only 2 wedges being required for each light.

Ventilators should not exceed 5 ft. in either width or height, nor have an area greater than 18 sq. ft.

**STOCK SIZES FOR SPECIAL DELIVERY**—For use where quick delivery is essential, Lupton Factory Sash is carried in stock in two glass sizes—12 by 18 ins. and 14 by 20 ins. Units are from 3 to 6 lights wide, and from 2 to 6 lights high. A wide choice of ventilators is given, both single and double. The location of single ventilators may be varied to secure the best ventilating results. Angle section No. 108 is used at sides, top and bottom. When mullions are required, the T-bar type is furnished.

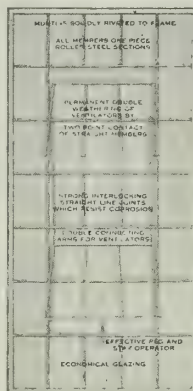
While these stock sash are simply ready-made sizes of the standard Lupton Factory Type, they are recommended only for emergency use, as much better results can usually be had by studying the special ventilating requirements of the building and selecting sash to suit them. Special catalogue gives full information on sizes, etc.

**Lupton Steel Sash, Power House Type (Patented and Patents Pending).**

Lupton Steel Sash, Power House Type, has the following features:

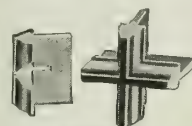
(1) The mullions and imposts are of unusual width for architectural effect and are formed from No. 12-gauge steel plate.

(2) All the sash are pivoted, except those having curved heads.



ASSEMBLY OF LUP-  
TON STEEL SASH,  
PIVOTED FACTORY  
TYPE

Showing double arms  
connecting two venti-  
lators



LUP-  
TON JOINT  
(Patented)



LUP-  
TON GLAZING WEDGE  
(Patented)

Glass  
Glazing wedge tapered  
to fit different  
thicknesses of glass  
Double headed  
rivet to hold  
glazing wedge  
Putty removed  
above to show  
glazing wedge  
and rivet

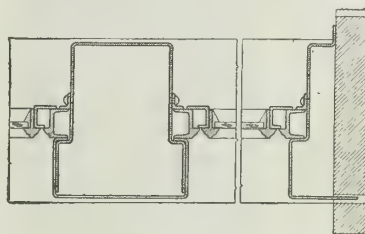
Glass  
Glazing wedge  
Rivet  
Putty



LUP-  
TON STEEL  
SASH,  
POWER HOUSE  
TYPE

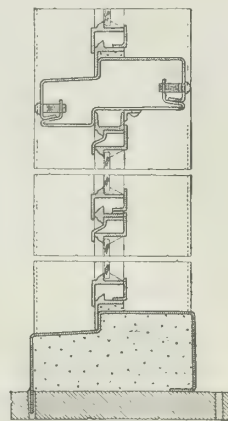
(3) All the sash in each wall are usually operated together. The frames are formed of No. 12-gauge steel plate. The sash members are heavy 1-piece rolled steel sections and are oxy-acetylene welded. Double weathering is provided all around each pivoted sash.

Sizes are made to suit archi-  
tect's specifications.



Horizontal Section, showing Steel Mullion  
and Jamb

LUP-  
TON STEEL SASH, POWER HOUSE TYPE

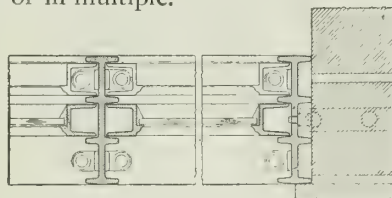


Vertical Section, showing  
Impost and Sill

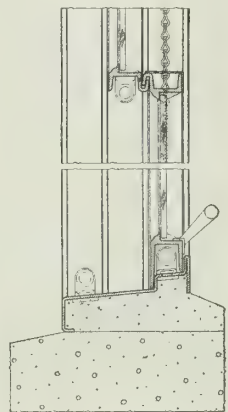
**Lupton Steel Sash, Counterbalanced Type (Patents Pending).**

Lupton Steel Sash, Counterbalanced Type, has the upper and lower sash balanced over a pair of pulleys, so that the upper sash descends as the lower sash is raised. Up to 12 ft. in height the windows are 2-sash high. From 12 to 18 ft. 3 sash are used, the middle one being stationary.

Window units are made up to 7 ft. wide and may be used singly or in multiple.



3-sash High, Horizontal Section, showing  
Mullion and Jamb



Vertical Section, showing  
1-piece Meeting  
Rails and Double Off-  
set of Sill to exclude  
Weather

LUP-  
TON STEEL SASH, COUNTERBALANCED TYPE



LUP-  
TON STEEL SASH, COUNTERBALANCED TYPE  
2-sash and 3-sash high

Heads and sill are formed of No. 12-gauge steel. Jambs and mullions are 1-piece rolled steel sections. Sash members are heavy rolled steel sections, oxy-acetylene welded at the joints. No horizontal muntins are used unless specified (see illustration). Heavy chains and roller bearing pulleys are used. Glazing angle frames are recommended. Wind shields may be added if desired. Sash will be made to bear Underwriters' label if desired, at an extra cost.



**Lupton Steel Sash, Counterweighted Type (Patents Pending).**

In Lupton Steel Sash, Counterweighted Type, each sash is balanced by its own pair of weights. Special weather tightness is insured by having sash run in sheet bronze weathering members attached to the jambs (see detail). Sash members are oxy-acetylene welded. Heavy chains and roller bearing pulleys are used. Glazing angle frames and suitable hardware are included.

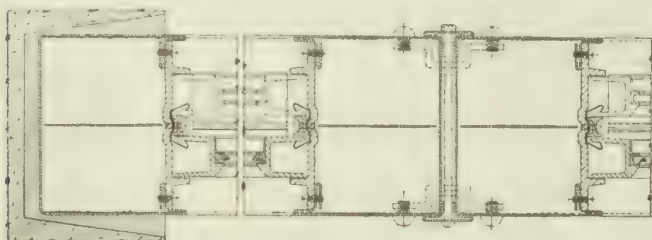


DETAIL OF COUNTERWEIGHTED TYPE SHOWING 1-PIECE MEETING RAILS

The sill is similar to the counterbalanced type



LUPTON STEEL SASH, COUNTERWEIGHTED TYPE



LUPTON STEEL SASH, COUNTERWEIGHTED TYPE

Horizontal section, showing sheet bronze weathering members and mullion and jamb

**Pond Continuous Sash (Patented by Clarke P. Pond and Patents Pending).**

Fully weather protecting when open. Hung under a continuous overhanging angle. At the ends it overlaps stationary storm panels 2 ft. wide. Its 20-ft. sections are connected by expansion caps, which exclude weather while giving flexibility for faulty alignment of structural work.

All the members are rolled 1-piece sections, and are much heavier than ordinary factory sash. They are oxy-acetylene welded at all joints, making each section a permanently rigid unit and preventing glass breakage.



POND CONTINUOUS SASH IN MONITOR

Showing the underlapping glass storm panels at the ends of the lines

**STANDARD SASH HEIGHTS AND GLASS SIZES**

No. 3 sash	3 ft. high	Size of lights, 23 $\frac{3}{4}$ ins. x 2 ft. 8 $\frac{1}{4}$ ins.
No. 4 sash	4 ft. high	Size of lights, 23 $\frac{3}{4}$ ins. x 3 ft. 8 $\frac{1}{4}$ ins.
No. 5 sash	5 ft. high	Size of lights, 23 $\frac{3}{4}$ ins. x 4 ft. 8 $\frac{1}{4}$ ins.
No. 6 sash	6 ft. high	Size of lights, 23 $\frac{3}{4}$ ins. x 5 ft. 8 $\frac{1}{4}$ ins.

**TABLE OF OPENINGS FOR SASH CONTROLLED BY POND OPERATING DEVICE**

No. 3 sash	3 ft. high	45°	26 $\frac{3}{4}$ ins.
No. 4 sash	4 ft. high	45°	35 $\frac{1}{2}$ ins.
No. 5 sash	5 ft. high	41°	40 $\frac{1}{2}$ ins.
No. 6 sash	6 ft. high	36°	44 ins.

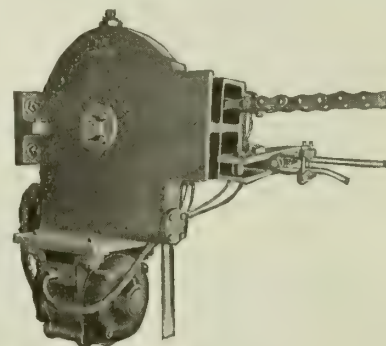
Pond Continuous Sash is controlled by Pond Operating Device, which gives exceptional width of opening with minimum applied power. See table of guaranteed openings.

The structural work required comprises a continuous angle or Z-bar at the head of the sash, and a continuous angle or other member giving a flat surface below the sash. Supporting vertical members, on centers not greater than 10 ft., are required for the sash and operating device. These may be any suitable section. We do not furnish this or any other structural work, or do any punching in structural work. Flashings and roof connections, where required, are furnished by the contractor.

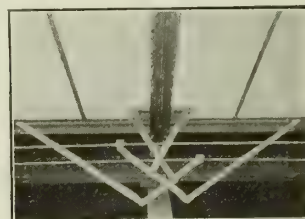
**Pond Operating Device (Patented by Clarke P. Pond and Patents Pending).**

Pond Operating Device is guaranteed to open longer lines of continuous sash to a greater angle with less applied power than any other device. It works on the principle of tension transmission, and applies increasing leverage as the sash is raised. It may be used to control any form of sash in long lines, but its advantages are most conspicuous with top hung sash.

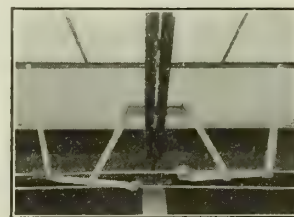
Power is transmitted by 2 lines of steel rods, connected by chains operating over a sprocket at one end and an idler at the other. These rods actuate the sash arms through compound levers, the increasing leverage being due to the varying angles of the levers and sash arms. All hinged connections are bronze bushed. The sprocket is driven by a worm gear and a hand chain. The worm gear is enclosed and runs in oil, hence has minimum friction and requires no attention.



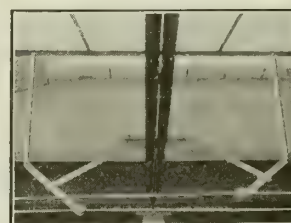
POND OPERATING DEVICE, MOTOR DRIVEN



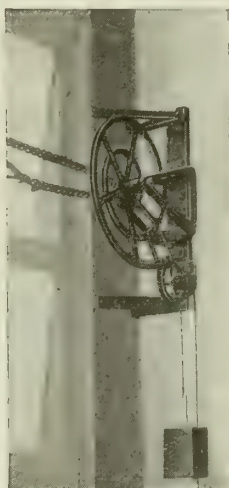
Sash Closed



Sash Partly Open



Sash Fully Open



Spiral and Counterweight used in place of Idler Pulley on Long Lines

SHOWING OPERATION OF POND OPERATING DEVICE



To facilitate the operation of long lines of sash, a spiral and counterweight is used in place of the idler pulley. The varying radius of the spiral is made to balance entirely the varying load of the sash.

Pond Operating Device, Motor Driven, is recommended for extra long lines, or for simultaneous control of several lines. It uses a 3-phase 60-cycle alternating current electric motor specially designed and furnished by us. An automatic cut-out is included, which limits the movement of sash in both directions.

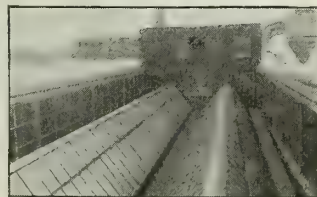
### Pond Truss (Patented by Clarke P. Pond).

We originated Pond Truss to provide maximum lighting and ventilation for foundries, rolling mills, etc., where large amounts of heat or gases are produced. The roof surfaces slope upward to wide outlets protected by lines of Pond Continuous Sash. Fresh air enters by the side walls and drops to the floor, giving a stratum of clean air next to the floor under all circumstances. The form of the outlet sash and the inverted roof prevent cross winds from entering, and there are no pockets in the roof where the heated gases can cool and descend.

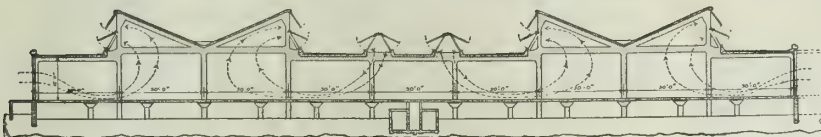
For machine shops and other industrial purposes, Pond Truss construction allows the use of 1-story buildings of practically unlimited width, with perfect light and ventilation throughout. If the building is of extreme width, two or more Pond Trusses in the roof are arranged to alternate with Pond A-frames. The latter are lines of A-shaped frames running the length of the building, on which Pond Continuous Sash are hung. Being located over the low sections between the Pond Trusses, they supply fresh air and light in all weathers.

In industries where certain processes, such as assembling, require unusual skill or many workers, a Pond Truss roof on a multi-story building gives ideal conditions for that work.

We license the use of Pond Truss in buildings where Lupton Products are exclusively used. Its correct use is a matter of ventilating engineering, and each roof is specially designed. Our experience is at the service of customers without charge. We should always be consulted before final plans are made.



A-FRAMES



DOMESTIC ENGINEERING CO. FACTORY, DAYTON, OHIO

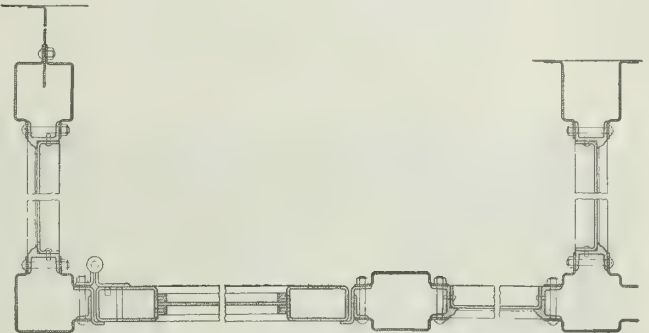
Two Pond Trusses with Pond A-frames between them. Present size of building, 270 by 1000 ft. Intended future size, 870 to 2000 ft. Cross section shows ventilation

### Lupton Steel Partition (Patents Pending).

Lupton Steel Partition consists of units of rolled steel members, set in and supported by heavy plate steel framing. The units are of standard widths, 2, 4, and 6 ft. center to center of mullions, and 8, 9, 10, 11 or 12 ft. high. Each unit has a base of steel plate 4 ft. high; the upper part is glazed or filled with wire screen.

Mullions are set over and conceal standards secured to floor. Both mullions and head rails are formed of No. 14-gauge steel plate to receive partition units.

All units of like size are interchangeable, hence partitions may be re-located, a door set in place of a



LUPTON STEEL PARTITION

Horizontal section, showing interchangeability of section units, including door section. A door may be moved by interchanging it with a standard section



AMERICAN EVER-READY CO., LONG ISLAND CITY, N. Y.

Lupton Steel Partition and Doors in office

solid unit, etc., without disturbing other units. Filler plates are furnished to fill out ends of partition; also to fill between head rails and ceiling if desired.

The door units are 6 ft. wide; the doors themselves are 3 ft. 1 1/8 ins. wide by 7 ft. 8 1/8 ins. high. Standard doors are provided with hinges, mortise cylinder locks and lever handles. Sliding doors are furnished when required, but without hardware unless specially requested. Color painting is not included.





**Lupton Steel Tube Doors.**

These are made with stiles of seamless rectangular steel tube, welded at the corners. The lower part of the door has a steel panel, and the upper part is filled with glass or a steel panel as desired.

These doors are made in all sizes from partition doors up to craneway and locomotive doors, and in many styles suitable for factory or office use.



LUPTON STEEL TUBE DOORS  
Horizontal section showing heavy  
formed steel jambs

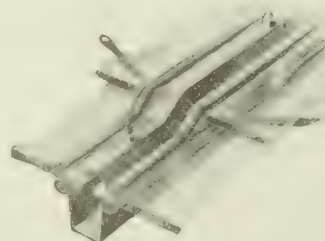
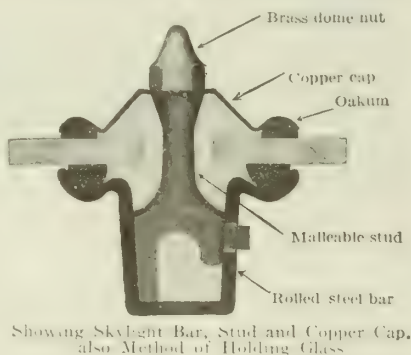


THREE STYLES OF LUPTON STEEL TUBE DOORS

**Lupton Rolled Steel Skylight (Patented by Joah Brogden).**

The construction of Lupton Rolled Steel Skylight prevents breakage of glass, leakage and corrosion. The glass is held between strands of specially saturated oakum, which permits some movement of the glass and eliminates leakage due to drying of putty. All metal parts exposed to weather are non-corroding.

The bar is a 1-piece U-shaped rolled steel section. The cap is copper, and both it and the bar are offset as required for the overlap of the lights. Condensation is carried by the diagonal strands of oakum into the nearest bar, and drained to the roof by drip holes in the copper curb apron.



Assembly of Skylight Bar  
LUPTON STEEL SKYLIGHT

**Lupton Sheet Metal Fireproof Window (Patented).**

These windows are made of galvanized Keystone metal, a copper bearing open hearth steel with remarkable resistance to rust. The frames are No. 22-gauge; sash No. 24-gauge. The members of both frame and sash are assembled by mortise and tenon locked joints.

Complete standard hardware is provided for all types.

Automatic closing devices for double hung windows are furnished when specified. Windows will be made for openings of any size. Single windows wider than 5 ft. and higher than 9 ft. will not bear the Underwriters' label.

**Waldmire Louver (Patented).**

Waldmire Louvers are made of No. 22-gauge galvanized Keystone metal. The slats are spaced 6 ins. on centers, and are made 10 ft. long, requiring vertical supports on centers of 59½ ins., thus providing a 1½-in. lap joint for the slats. Either wood or steel supports may be used.

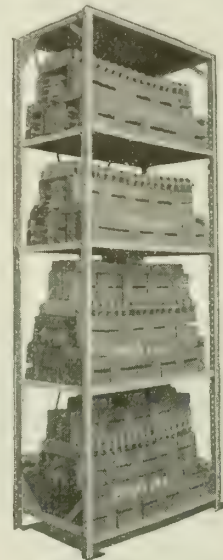
For tobacco barns and drying sheds Waldmire Siding of the same construction is furnished, but made for vertical spacing 12 ins. on centers.



WALDMIRE LOUVER  
Showing also a sectional view

**Lupton Steel Shelving.**

Lupton Steel Shelving is made in open and closed types as the illustrations show, also with open sides and closed back. The open types have uprights of structural T-bars with the top and bottom shelves bolted in place. The intermediate shelves rest on removable supports, for which holes are punched at 1½-in. intervals.



LUPTON STEEL SHELVING  
Open and closed types with test loads

They can be raised or lowered in a few moments without undoing bolts or disturbing contents of other shelves.

In the closed type, the sides and backs form the uprights, and are punched at 1½-in. intervals for the shelf supports.

Compartment dividers and bin fronts are furnished for small articles, and intermediate supports are provided for heavy loads.

**No. 9 Catalogue.**

The No. 9 Catalogue describes the products and shows a number of interesting examples of their use. It will be sent on request.

Separate catalogues describe the stock sash and shelving.



# ANGLE WINDOW AND DOOR CO.

OFFICE AND FACTORY  
50-54 Hudson Street  
BUFFALO, N. Y.

## Products.

FIREPROOF WINDOWS and DOORS in STEEL and BRONZE, for Factories, Schools, Public Buildings, etc., covering Labor and Underwriters' requirements.

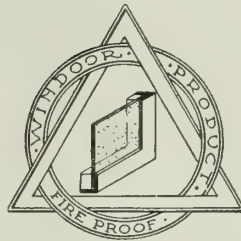
## Advantages.

Economy in maintenance, durability, beauty of finish, simplicity in design, great practical increase of light area and one of the best fire resistants known.

## Description.

Sash made of structural angle iron,  $1\frac{1}{2}$  by  $1\frac{1}{2}$  by  $\frac{1}{8}$  in. mild steel, with welded corners forming a continual frame; hung with steel tape of tested strength. Sash provided with improved wind shields making application of weatherstrips unnecessary. The glass has a reveal of  $\frac{1}{8}$  in. as fire and weather protection.

Jambs, sills and heads are of No. 16-gauge steel free from buckles, with angles and corners formed straight and true. Corners



TRADE-MARK

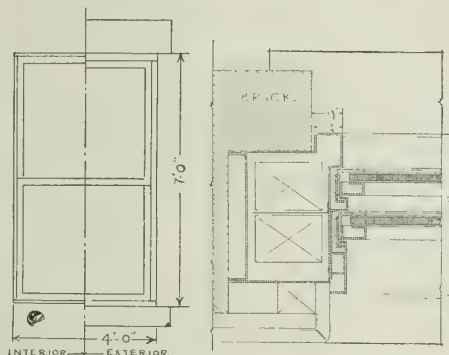
are welded firm and rigid, with sills and heads bolted between jambs. Frame is set perfectly airtight in wall. Sills are filled with cement concrete, insuring weather tightness, and solidity. Doors have flush panels, formed of 2 plates No. 16-gauge, pickled and cold rolled metal furniture steel, edges accurately flanged with suitable concealed reinforcements for butts and other hardware; or framed of  $1\frac{1}{4}$  by  $1\frac{1}{4}$  in. angles similar to sash frames, making a neat design with an exceptionally large area for glass panels.

## Finish.

Color light or dark olive, maroon or black, baked on at high temperature. Hardware to match trims of building.

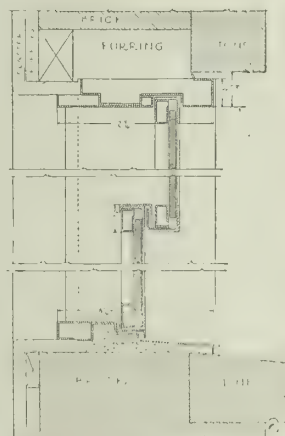


SECTION THROUGH  
ANGLE WINDOW

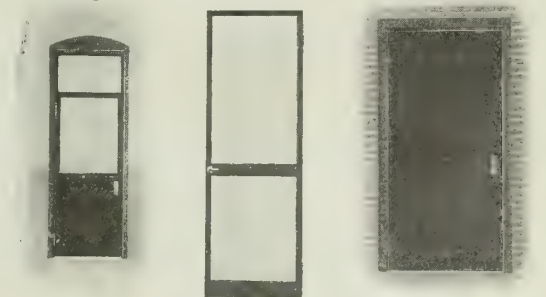


Elevation

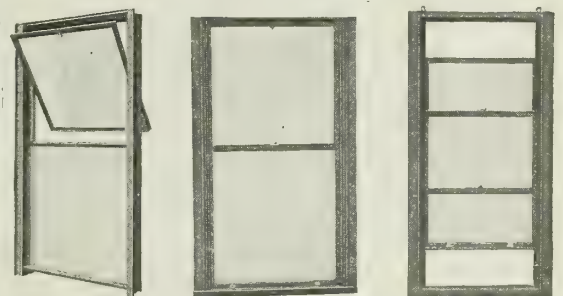
Plan at Jamb



Section of Window  
DETAILED DRAWINGS.  
DOUBLE HUNG WINDOW,  
LABORATORY TYPE



ANGLE STEEL FIREPROOF DOORS



Will not bind, shrink or swell. Glass may be of rough wire, ribbed wire or polished wire plate



Quadruple Mullioned Window, Top Sash Pivoted  
ANGLE STEEL FIREPROOF WINDOWS

ESTABLISHED 1893

# A. C. CHESLEY CO., INC.

Manufacturers of All-metallic and Metal Protected Material for Buildings

TELEPHONE:  
MELROSE 2452

277 Rider Avenue  
NEW YORK, N. Y.

FACTORIES  
277 Rider Avenue  
and 2-10 Canal Place

CLEVELAND

PHILADELPHIA

AGENCIES  
BOSTON

WASHINGTON, D. C.

CHICAGO

## Products.

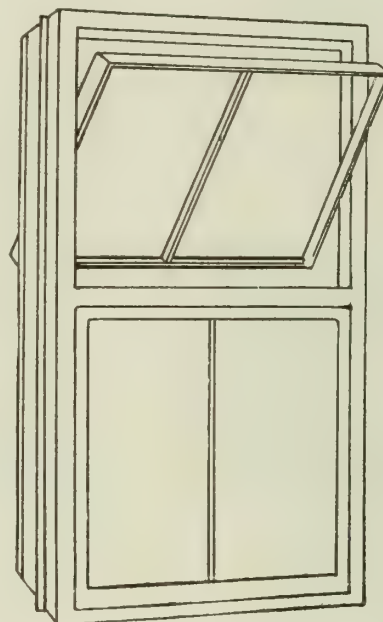
Manufacturers of and specialists in FIREPROOF HOLLOW METAL WINDOWS; KALAMEIN or METAL CLAD WOOD DOORS, TRIM, etc.; REINFORCED ALL-METAL JAMBS and TRIM.

Kalamein or Metal Clad Wood Partitions; Standard Tin Clad Doors; the A. C. Chesley Three-point Latch and Lock for Fireproof Doors.

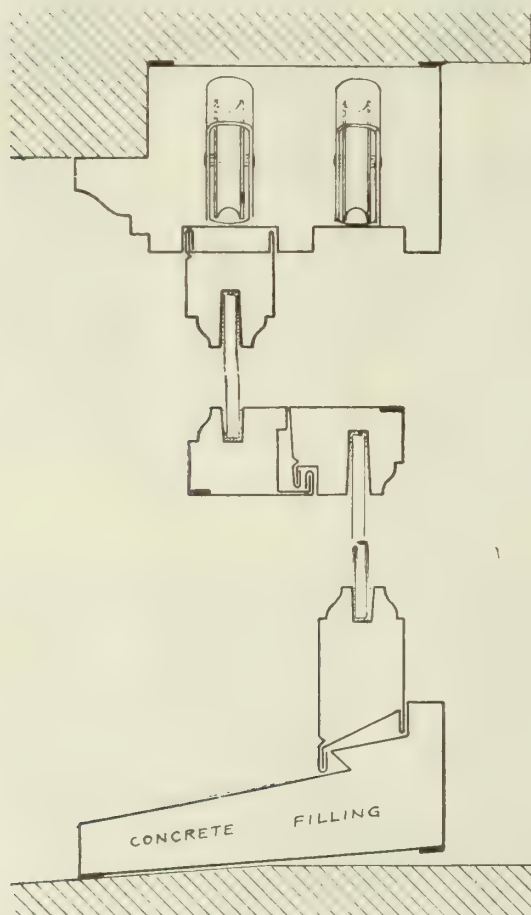
## Fireproof Hollow Metal Windows.

The "Chesley" hollow metal window is simple, firm and substantial in construction, assuring neat appearance, easy operation, and a minimum of upkeep. "Chesley" windows are made in all styles of casement arrangement and all sizes, from own or architect's drawings. They are labeled and approved by the Underwriters' Laboratories as positively fire retarding.

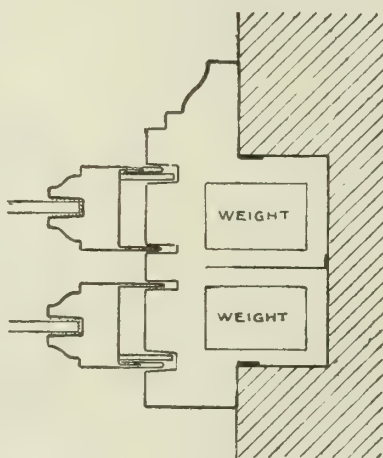
Shipped with or without wire glass, and with one coat of high grade metal protective oxide or iron paint. Blue print details sent on request.



ELEVATION, UNDERWRITERS' STANDARD UPPER PIVOTED LOWER STATIONARY WINDOW



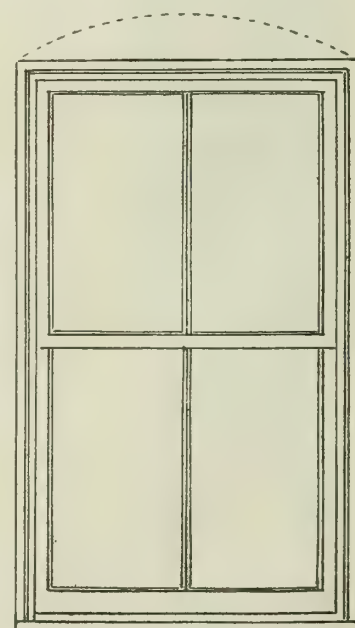
Vertical and Horizontal Sections



Detail

DETAILS FIREPROOF ALL-METAL DOUBLE HUNG WINDOWS

Approved by underwriters



Elevation



Kalamein Stock Doors.

This type of door is manufactured by a standard process which reduces the cost below other makes. There are no bolts, rivets, nails or screws used in its construction, which has resulted in producing a clean, light, strong and non-corrosive article.

This approved door, as used with reinforced metallic frames for all sizes and thickness of openings in elevator shafts, stairways and corridors, can not fail to appeal to all builders of fireproof construction, owing to its simplicity of detail, eliminating the necessity of using metal covered wood bucks, or angle channel iron supports.

This moulded frame, when built in, is complete, and is provided with spring clamps for securing hollow metallic trim, also reinforced top plates to secure kalamein or wood trim to wall.

This arrangement simplifies interior fireproof construction and is especially adapted for brick and concrete walls. The advantages of the system are practicability, economy in cost and speed of erection.

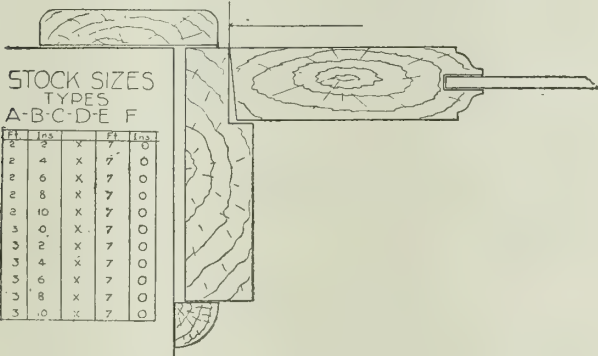
This company also manufactures trim, jambs, etc., by the same process as kalamein doors at a very moderate additional price.

Insurance.

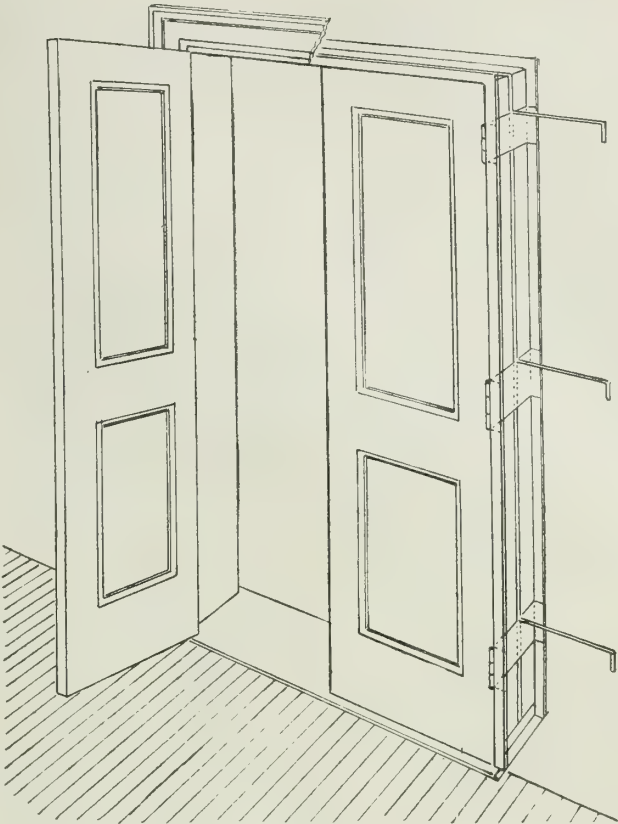
Approved wall construction combined with "Chesley" doors and frames, will secure the lowest rates of insurance and highest degree of safety from fire.

Approval.

"Chesley" products are all approved and labeled by the National Board of Fire Underwriters.



DETAIL OF KALAMEIN STOCK DOORS

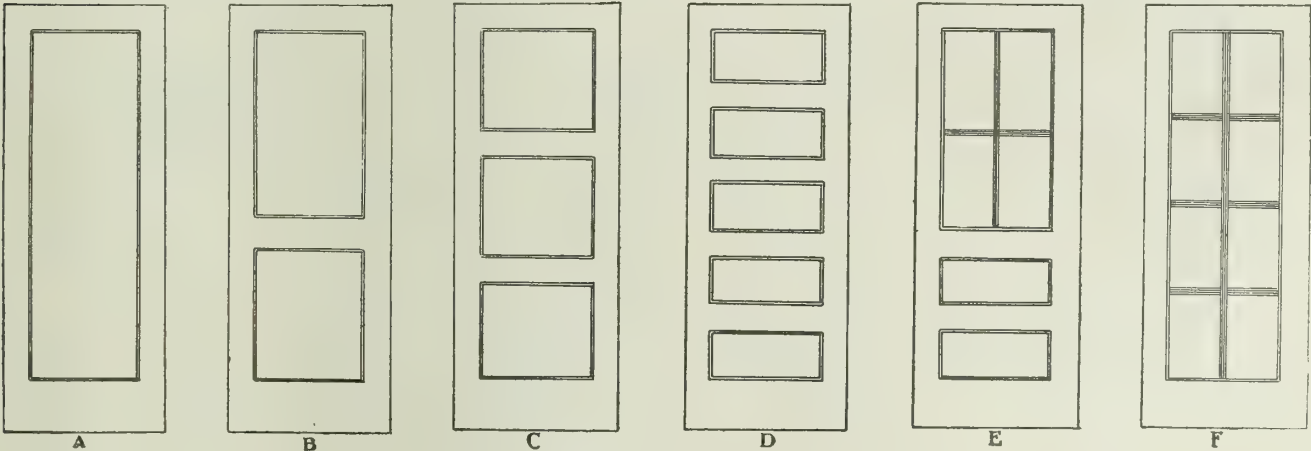


DETAILS KALAMEIN DOOR  
Perspective, showing moulded metal frame with wall anchors for securing hollow metal frame

References.

Below are a few of the prominent buildings wherein "Chesley" material has been installed:

- State Capitol, Albany, N. Y.
- Emigrant Building, Ellis Island, N. Y.
- Columbia College Buildings, New York, N. Y.
- Hall of Board of Education, New York, N. Y.
- Hall of Board of Education, Brooklyn, N. Y.
- Mount Sinai Hospital, New York, N. Y.
- St. Luke's Hospital, New York, N. Y.
- City Hall, New York, N. Y.
- Mount Loretta Convent, Staten Island, N. Y.
- Isabella Heimath, New York, N. Y.
- Official Buildings, Tokio, Japan
- Government Buildings, Honolulu, Hawaii Islands



TYPES OF KALAMEIN STOCK DOORS

# CONSOLIDATED SHEET METAL WORKS

General Sheet Metal Contractors

MILWAUKEE, WIS.  
661-677 Hubbard Street

## Products.

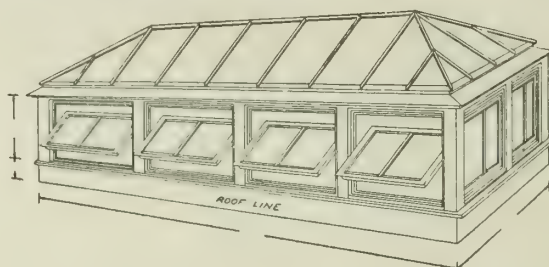
METAL FIREPROOF DOORS and WINDOWS; "CONSOL" APPROVED UNDERWRITERS' FIRE DOORS and WINDOWS; METALLIC SKYLIGHTS and VENTILATORS; GALVANIZED IRON and COPPER CORNICES.

Dormers, Finials, Crestings; Metal, Slate and Tile Roofing.



TRADE-MARK

## Metallic Skylights.



**FIREPROOF VENTILATING SKYLIGHT, WITH PIVOTED SASH**  
Glazed with wire glass, reinforced throughout with angle and bar steel. No wood used. Made in any size with sash that can be operated singly or collectively, to conform with existing conditions. Recommended specially for engine and boiler houses.

## Utility.

These products are suitable for all classes of buildings, city or country; and owing to the method of construction, can be easily erected by the average mechanic.

## Prices.

Quotations will always be the lowest possible for first class workmanship and materials.

## Service, Facilities and Territory.

Service is always right—prompt and guaranteed. This company has not only the necessary factory space, but the best equipment available for manufacturing purposes.

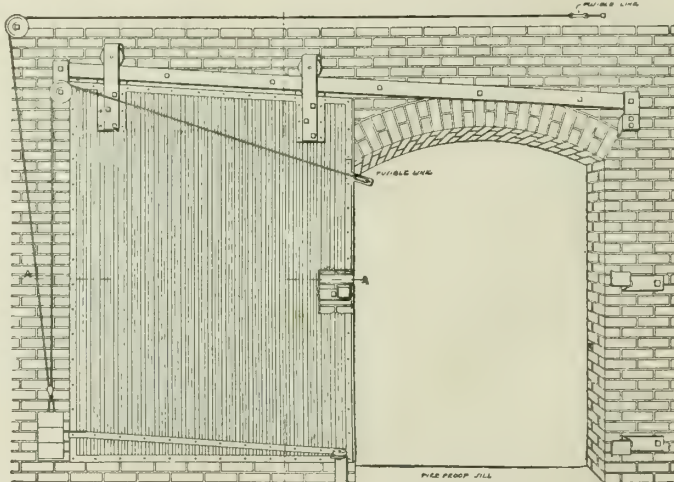
The company is prepared at all times to install its products in any part of the country.

## References.

On request, innumerable references will be given.

## Catalogue and Full Size Blue Prints.

Further information can be obtained by applying for the new illustrated and descriptive catalogue "D" and full size blue prints. Additional information on twin and mullion windows will also be found in Catalogue "D."



"CONSOL" ALL MTL FIRE DOOR  
Sliding type

## "Consol" Windows.

Made in all the required types, in either galvanized iron or copper, strictly in accordance with the specifications of, and approved by, the National Board of Fire Underwriters. They are architectural in design, weatherproof and, in fact, combine safety, economy and efficiency.

**LABORATORY TESTS**—All "Consol" windows required but one test to convince and satisfy the Chicago Laboratories as to their efficiency as a fire retardant. Temperature attained in these tests was above 1800°.

**ILLUSTRATIONS**—On following page are shown a few of the many various types of metal windows manufactured, as per underwriters' specifications, with division of lights as they require them.

**OFFICIAL INDORSEMENT**—All types of "Consol" windows have been approved by the Underwriters' Laboratories of Chicago.

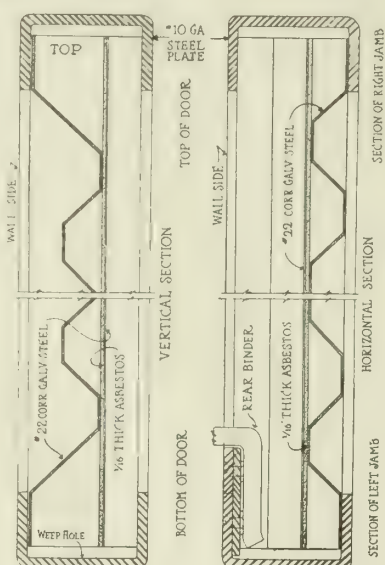
## "Consol" All Mtl Fire Doors.

Furnished in sliding or swinging types. Made of two thicknesses of heavy gage galvanized corrugated iron, interlined with asbestos, reinforced with heavy channel iron, and mitered corners, welded and bolted.

Standard hardware employed, absolutely fireproof, tested and approved by the Underwriters' Laboratories, Inc.

More sanitary than old type fire doors.

Detail drawings furnished and prices quoted on application.

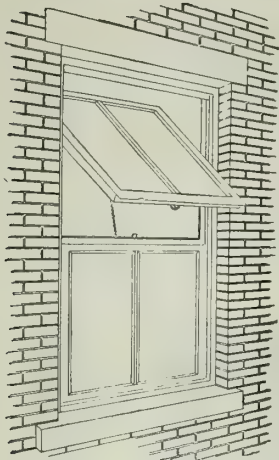


DETAILS OF "CONSOL" ALL MTL  
FIRE DOOR  
One-fourth actual size

## Other Sheet Metal Work.

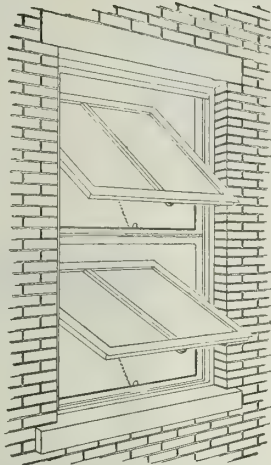
This company is always prepared to furnish skylights, cornices, ventilators, etc., adapted for any and all purposes, throughout the country.



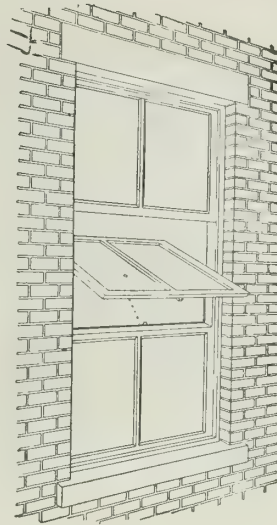


TYPE NO. 2. UPPER SASH  
PIVOTED; LOWER SASH  
STATIONARY

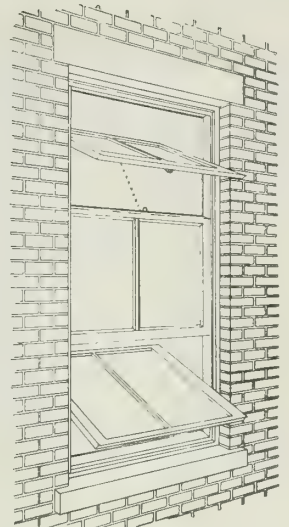
Type No. 9 made up like above with the exception that the lower sash is pivoted, upper sash stationary



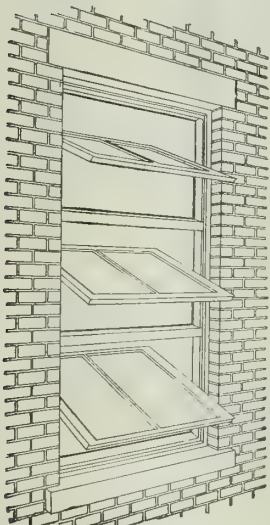
TYPE NO. 3. UPPER AND  
LOWER SASH PIVOTED



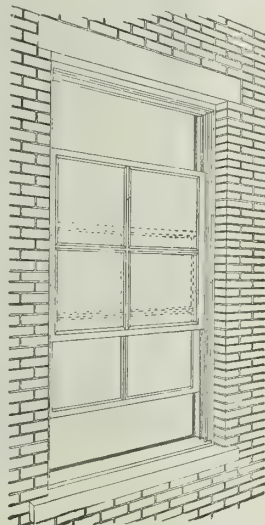
TYPE NO. 4. CENTER SASH  
PIVOTED; UPPER AND  
LOWER SASH  
STATIONARY



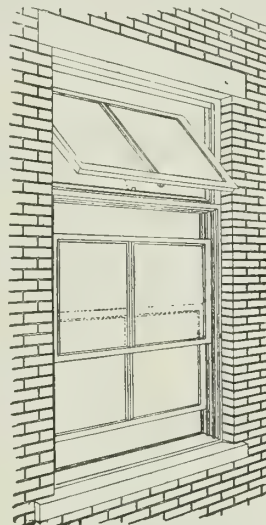
TYPE NO. 5. CENTER SASH  
STATIONARY; UPPER AND  
LOWER SASH PIVOTED



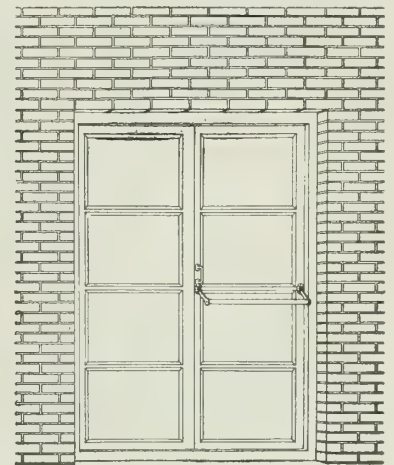
TYPE NO. 6. THREE SASH  
PIVOTED



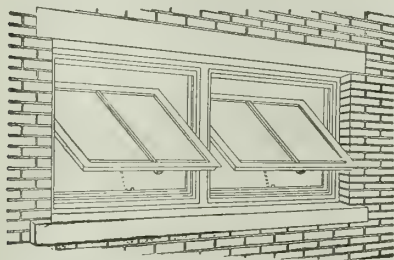
TYPE B. DOUBLE HUNG



COMBINATION PIVOTED  
AND TYPE B. DOUBLE  
HUNG

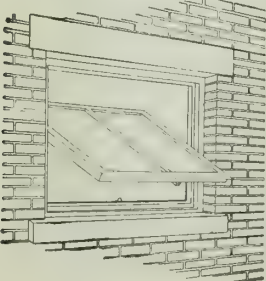


TYPE NO. 30. CASEMENT  
WINDOW

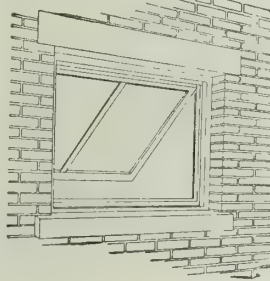


PIVOTED TWIN WINDOWS

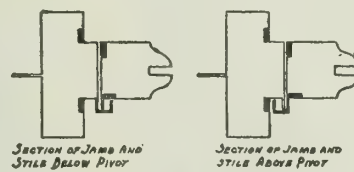
This type equipped with vertical division members, and considerable money can be saved, as I-beams and concreting are eliminated. Also furnished in double hung and other types



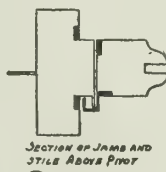
TYPE NO. 1. SINGLE  
SASH PIVOTED



TYPE NO. 20. SINGLE  
SASH PIVOTED



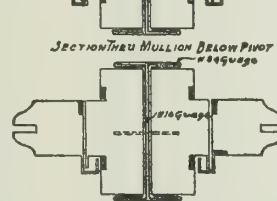
SECTION OF JAMB AND  
STILE BELOW PIVOT



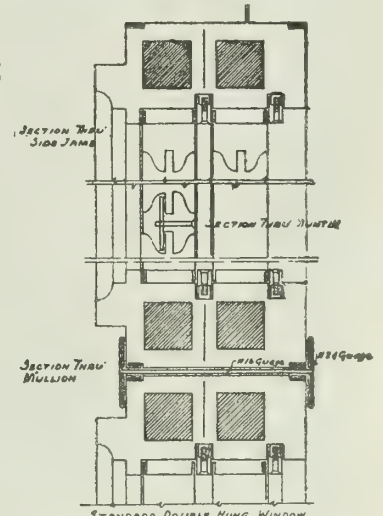
SECTION OF JAMB AND  
STILE ABOVE PIVOT



SECTION THRU MULLION BELOW PIVOT



SECTION THRU MULLION ABOVE PIVOT,  
PIVOTED WINDOW



STANDARD DOUBLE HUNG WINDOW

#### NON-BEARING SHEET METAL MULLIONS

These new mullions can be furnished for either double hung, counterbalanced, pivoted or any other type window. Made and reinforced with No. 16-gage channel iron, eliminating the old type concrete and I-beam construction, increasing glass area of such window openings. Equipped with sleeve binding channel flanges. More pleasing architecturally. With the usual Underwriters' Laboratory service and inspection, these mullions carry their labels

# CRITTALL CASEMENT WINDOW COMPANY

Manufacturers of Solid Steel Casement Windows

GENERAL OFFICE AND WORKS

DETROIT, MICH.

AGENCIES IN ALL PRINCIPAL CITIES

## Product.

CRITTALL SOLID STEEL CASEMENT WINDOWS (Patented) for office buildings, bank buildings, public buildings, churches, university buildings, clubs, hospitals and residences.



## Description.

**STEEL**—Crittall casements are made from best quality rolled steel sections, free from all imperfections and cleaned of all rust and scale previous to painting.

All sections are solid metal—no built-up sections or screwed on strips, which allow interior corrosion, are used.

**WEATHERING**—The design of the section is such that double weathering is obtained at all points without the use of screwed on or pressed on fillets or strips.

**FINISH**—The windows are given 3 coats of baked paint at the factory. Baked enamel is also supplied, when requested; but its use is not recommended, as it is liable to be chipped in handling, and can not be re-surfaced at the building. Baked paint, on the other hand, is flexible and not easily damaged, and allows a finish coat of paint after erection.

**JOINTS**—All joints of the casement and frame are mitered and welded solid, and all brackets and plates for hardware are welded to the casement section. No brazing is used for any purpose.

**HARDWARE**—All hardware is of Crittall design and manufacture, being of solid bronze, which is given a statuary bronze finish, without the use of chemicals or plating.

*Note*—Plated or chemically colored hardware has proved very unsatisfactory, owing to discoloration and the fact that it wears off in spots.

**GLASS**—Glass may be set from either the inside or outside, with putty or with steel glazing stops.

## Guarantee.

Crittall casement windows are guaranteed wind-tight and weathertight under all conditions.

## Catalogue.

Catalogue and details for arranging screens and draperies sent on request. Address Department "S."

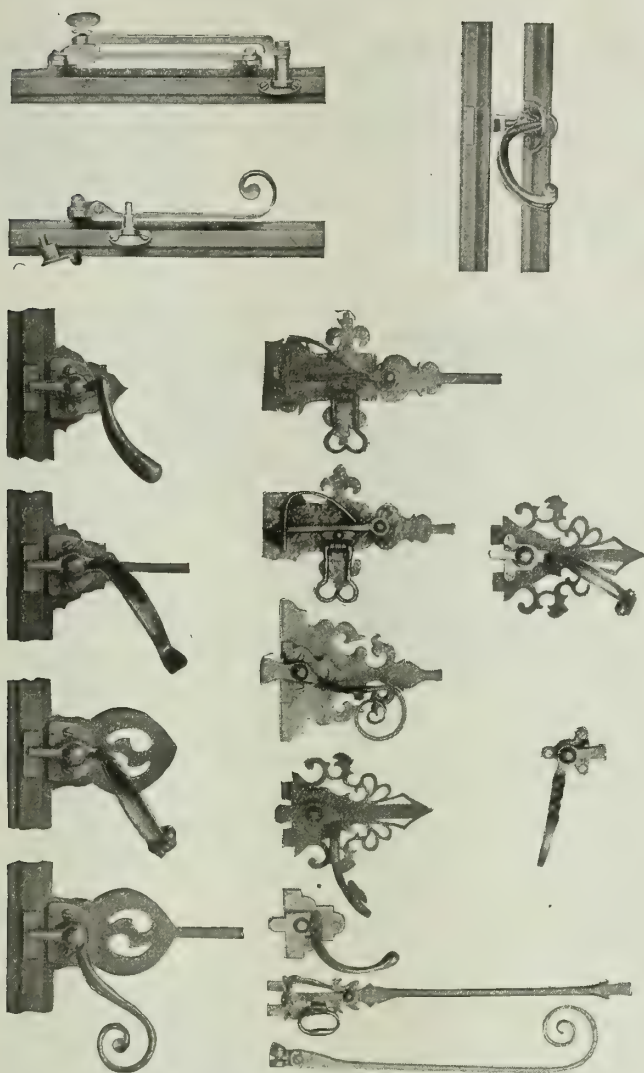


TYPICAL OFFICE BUILDING WINDOW

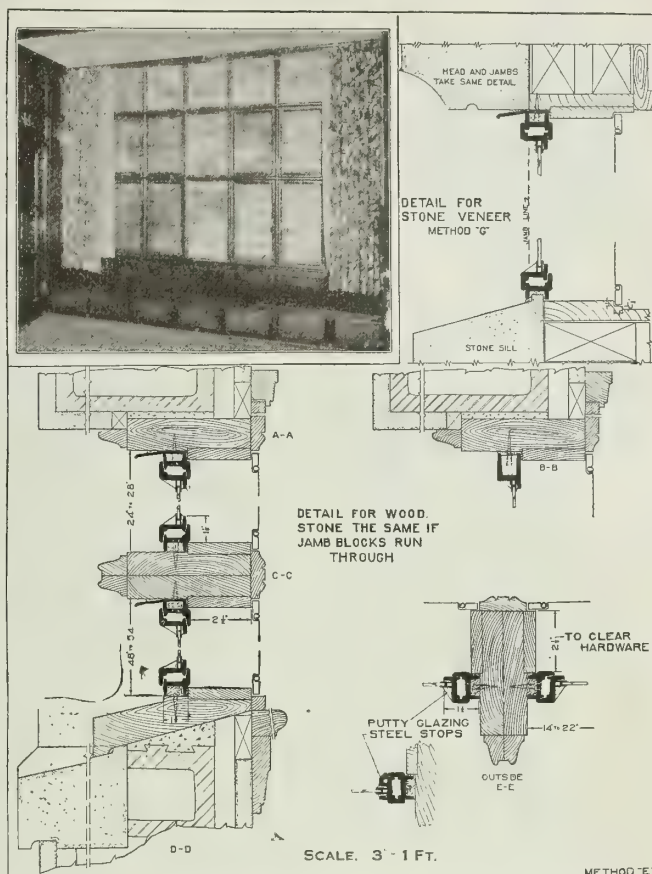


WAYNE COUNTY AND HOME SAVINGS BANK, DETROIT, MICH.  
DONALDSON & MEIER, Architects





A FEW ILLUSTRATIONS OF CRITTALL HARDWARE AS SHOWN IN CATALOGUE NO. 50



SAMPLE PAGE OF CATALOGUE  
Showing details of steel casements set in wood frames or stone veneer  
Note  $\frac{3}{8}$ -in. rebate



MUNICIPAL COURT BUILDING, DETROIT, MICH.  
SMITH, HINCHMAN & GRYLLS, Architects



OPERATING ROOM, BRIDGEPORT HOSPITAL  
E. L. STEVENS, Architect

Crittall casement windows are especially adaptable for operating rooms where narrow sight lines and freedom from projections are primary requisites

## HENRY HOPE &amp; SONS

## Metal Casements, Leaded Glazing and Leadwork

TELEPHONE:  
MURRAY HILL 1514

103 Park Avenue  
NEW YORK, N. Y.

**Products.**

STEEL and BRONZE CASEMENT WINDOWS of universal section, in 3 strengths, to suit size of opening, with reliable HARDWARE.

WROUGHT and CAST LEADWORK, including Heads, Pipes, Gutters, Garden Vases, Cisterns, Finials, Flèches, Etc.

**Steel and Bronze Casement Windows.**

CONSTRUCTION—Each bar is of solid rolled steel, hydraulically straightened and free from distortions. All joints are cut on milling machines and welded solid, as are also brackets and plates for hardware.

HARDWARE—Hinges of heavy solid bronze. Distinctive hardware in bronze to United States Naval Specification and to Hope's patented designs, affording the widest range of ventilation and free use of screens, curtains and shades.

FINISH—Surfaces are cleaned of scale by sand blast and dipped twice in special anticorrosive paint. A finishing coat of special stoved enamel is recommended.

SECTIONS—No. 21 is used for openings more than 6 ft. by 2 ft. 6 ins.

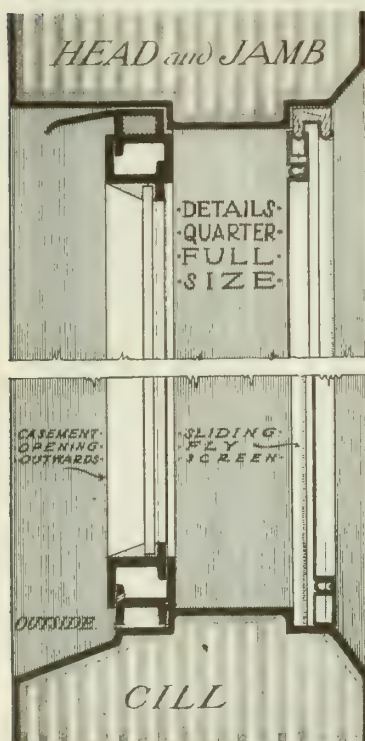
No. 22 is used for openings not more than 6 ft. by 2 ft. 6 ins.

No. 23 is used for openings not more than 5 ft. by 1 ft. 9 ins.

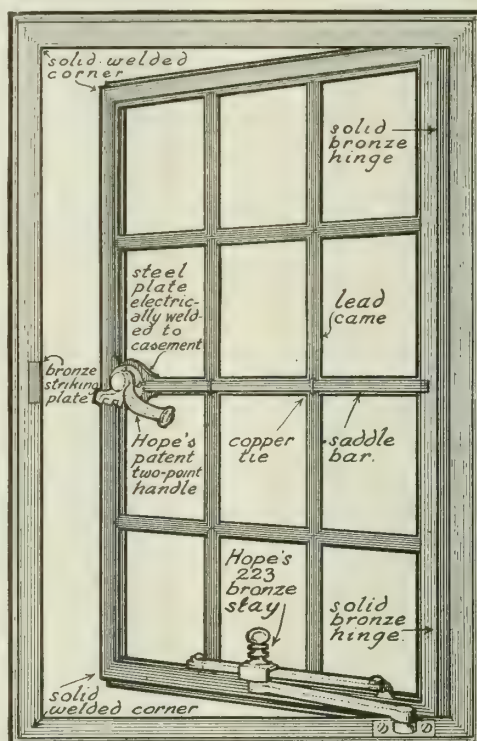
GLAZING—Our casements are designed to glaze from either outside or inside, but we recommend outside glazing as a general rule. Inside glazing is only tolerable where beads are used. Glazing beads of galvanized steel or hardwood are recommended.

LEADED GLASS—The importance of leaded glass being manufactured in the same works and under the same supervision as the metal casements is now well recognized, and our work in this department will be found thoroughly satisfactory.

SETTING—We strongly advise customers to arrange for the setting and glazing of our casements to be done by our own workmen, so that we may be responsible for the entire work.

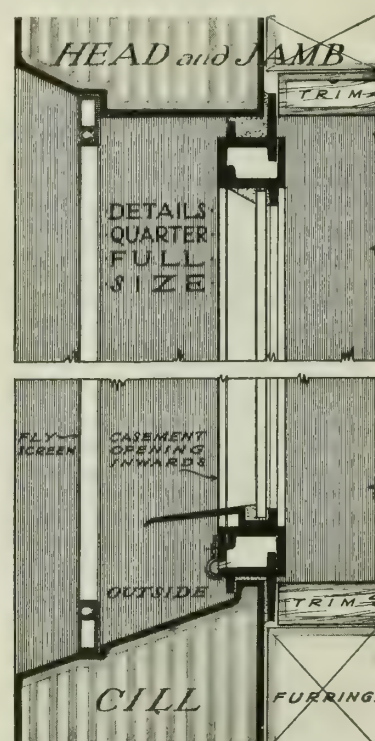


Vertical Section Through Casement Opening Outwards, with Interior Sliding Fly Screens



Showing Exclusive Features of Hope Casement Equipment

DETAILS OF HOPE CASEMENT WINDOWS



Vertical Section Through Casement Opening Inwards, with Exterior Fly Screens



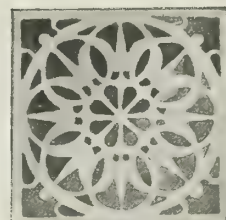


Fret No. 6

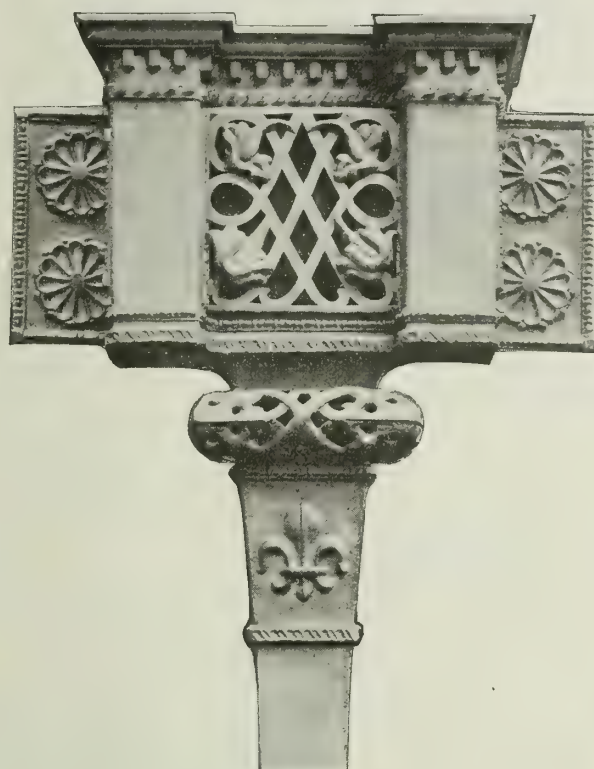
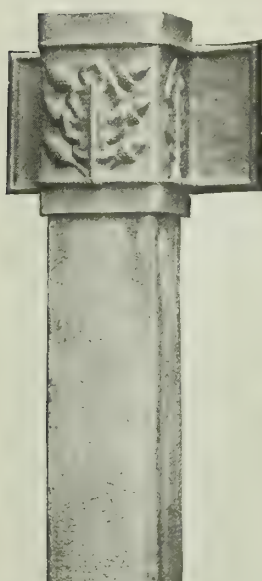
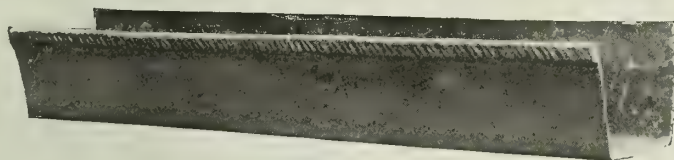
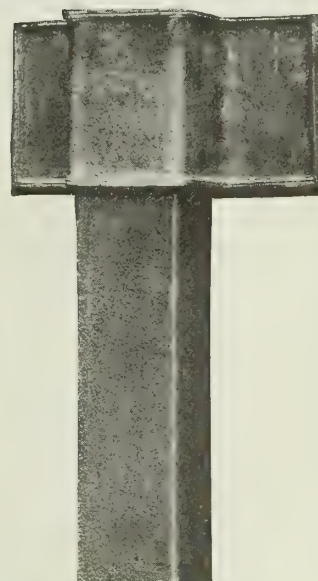
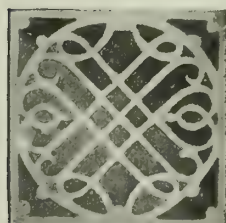
**Hope's Leadwork.**

The illustrations show various examples of wrought and cast leadwork carried out for eminent architects in all parts of the world.

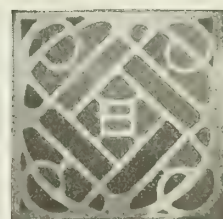
Illustrated catalogues, designs and estimates will be furnished on application.



Fret No. 2

Pipe No. 679  
4 by 3 ins.Head No. 666  
Width over ears, 29 ins.Pipe No. 680  
4¼ by 2¾ ins.Pipe No. 608  
4 by 3 ins.Gutter No. 670  
5 by 4½ ins.Pipe No. 607  
4 by 3 ins.

Fret No. 9

Gutter No. 612  
5½ by 5½ ins.

Fret No. 5

**EXAMPLES OF HOPE LEADWORK**

# INTERNATIONAL CASEMENT CO., INC.

Manufacturers of Solid Rolled Steel Casement Windows

GENERAL OFFICES

JAMESTOWN, N. Y.

NEW YORK OFFICE: Architects Building, 101 Park Avenue

AGENCIES IN ALL THE PRINCIPAL CITIES

FACTORIES: JAMESTOWN, N. Y.; LIVERPOOL, ENG.

## Products.

"INTERNATIONAL" CASEMENT WINDOWS.

Casement Window Hardware, Leaded Glass.

## Materials.

Casements made of solid rolled steel, in all types, opening outwards or inwards; hung on drop forged steel pivots bronze bushed, or on bronze butt hinges; hardware in heavy cast bronze or wrought iron, specially designed by this company.

## Manufacture.

All bars thoroughly straightened; corner joints machine mitered and electrically welded; all surfaces cleaned free from rust or scale; painted 2 coats best lead and oil paint, each separately baked on.

## Special Feature.

"International" casements have three weathering points at head, sides and sill; hence are *guaranteed* to be *weathertight* in the most exposed situations.

## Glazing Beads.

It is far more satisfactory to use steel glazing beads, than ordinary putty glazing, and a series of

moulded steel glazing beads are in stock to select from.

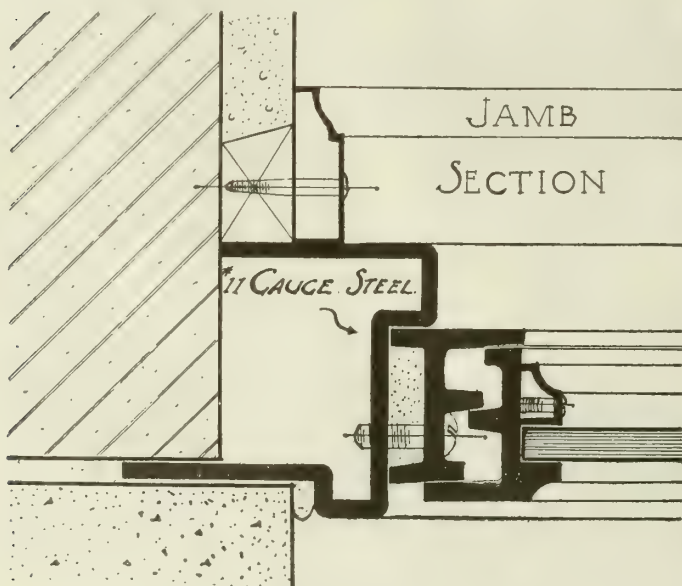
## Illustration.

The INTERNATIONAL CASEMENT CO., INC., has gained considerable reputation for large composite windows for banks, public buildings, office buildings, etc.

The illustration shows a typical bank window; with plan showing "built-in" frame, and casement proper shown set into same. Special attention is called to the "built-in" frame, as it so readily enables the interior trim to be taken care of.

## Catalogue.

Catalogues will be sent on request; and this company is always pleased to submit special estimates and details.



SECTION THROUGH JAMB SHOWING "INTERNATIONAL" BUILT-IN FRAME AND THREE-POINT CASEMENT



"INTERNATIONAL" COMPOSITE WINDOW IN THE NATIONAL BANK OF SAVANNAH, GA.



# THOMAS LEE

Manufacturer of Hollow Metallic Windows and Doors

OFFICE AND FACTORY  
118-132 West Second Street  
CINCINNATI, OHIO

## Products.

LEE LABELED APPROVED HOLLOW METALLIC WINDOWS.

LEE METAL CLAD WOOD DOORS.

LABELED TIN CLAD FIRE DOORS.

For Dampened Ventilators, see page 467.

## Facilities and Experience.

Not only extensive factory space and the best of modern machinery, but all connected with the establishment have had years of practical experience. Prompt shipment of goods is guaranteed to any part of the United States.

## Lee Labeled Windows.

**ADVANTAGES AND SUPERIORITY**—The Lee windows are superior, owing to their simple construction, strength, perfect operation of sash, and general good appearance.

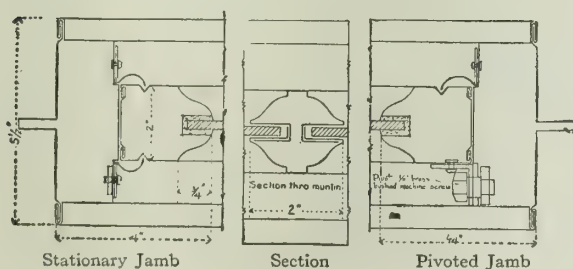
All sash, whether stationary, pivoted or double hung, can be easily set in or taken out of frames. Sash can be glazed by removing outside section and glazing strip of the top rail. No bolts are used in constructing the frame and sash of double hung type.

**ADAPTABILITY**—Lee metal windows are adaptable for use in office buildings, hotels, theaters, factories, or any building in which the window openings must be protected.

**OFFICIAL APPROVAL**—All labeled windows must be made to conform to the sample that has been tested and approved by the National Board of Fire Underwriters.

The following styles of Lee hollow metallic windows are inspected and labeled by the National Board of Fire Underwriters before leaving the factory:

Double hung; top stationary, bottom sliding; single pivoted; double pivoted; stationary; upper pivoted, lower stationary; lower pivoted, upper stationary; hinged at top.



VERTICAL AND HORIZONTAL SECTIONS OF UPPER PIVOTED, LOWER STATIONARY WINDOW

## Lee Labeled Metal Clad Wood Doors.

Lee labeled metal clad wood doors are approved for use in corridors, fire escapes or room partitions. They are constructed of white pine, with asbestos core and galvanized steel covering. Furnished with or without labeled steel frames or wood metal clad frames and trim.

Made with metal or wire glass panels.

## Guarantee.

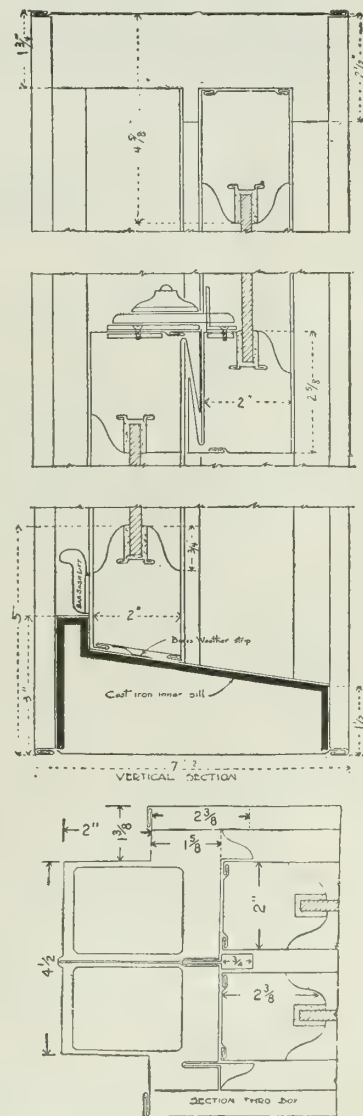
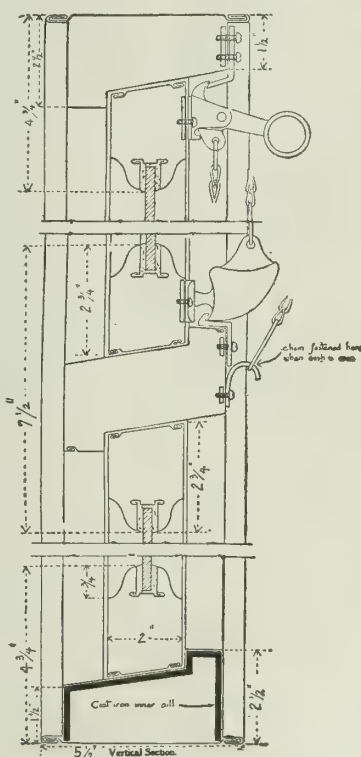
All products are guaranteed to be first class in every respect.

## Prices.

Prices will be quoted on receipt of plans and specifications or a list giving number and sizes of windows and doors wanted.

## Specifications.

Printed directions, showing how to specify these windows and doors and how to provide for them in plans, will be sent to architects on request.



DOUBLE HUNG WINDOW

# McFARLAND-HYDE COMPANY

SUCCESSORS TO J. C. McFARLAND & CO.

## Metal Windows, Doors, and Puttyless Skylights

27th and South Wells Streets

CHICAGO, ILL.

NEW YORK OFFICE, 1123 Broadway

### Products.

Manufacturers of FIREPROOF METAL WINDOWS: Hollow Metal and Rolled Steel; "WILSON REVERSO" REVERSIBLE WINDOWS: Hollow Metal, Rolled Steel and Wood; ART METAL FIREPROOF DOORS and TRIM; "NON-PAREIL" PUTTYLESS SKYLIGHTS.

Sheet Metal Work; Slate and Tile Roofing.

### Fireproof Hollow Metal Windows.

Metal windows in all styles, double hung, pivoted, casement hinged, reversible, etc. Labeled with the Underwriters' Laboratory label.

### The "Wilson Reverso" Window.

**DESCRIPTION**—This is a complete reversible window; each sash completely turns over, closing the entire opening when reversed. This is accomplished by each sash being supported on special hardware, which holds the sash at any desired angle. Can be arranged for 1, 2, 3 or more sash, each above the other in the same plane.

**OPERATION**—By merely releasing the fastener at the sill, each sash can be operated by an outward push, and will remain in whatever position it is placed, no portion of the sash coming inside of the stop line.

**HARDWARE**—All parts of the operating hardware are made of cold drawn steel, which is galvanized after all parts are formed, drilled and countersunk. All parts are riveted together with brass rivets and separated with brass washers, thus preventing rusting. This hardware is equally applicable to wood, hollow metal, or rolled steel sash, and does away with the necessity of weights, chains, and pulleys, eliminating their numerous troubles.

**ADVANTAGES**—*Ventilation*—The company wishes to emphasize the effective ventilation secured without drafts, and the insurance of any desired amount of fresh air from 1% to 100%.

*Cleaning*—As each sash makes a complete revolution, all of the glass can be cleaned from the inside of the building and, during the operation of cleaning the window, opening is entirely closed, leaving no opening for incoming storm or the blowing of papers from desks. This operation also allows all re-glazing to be done from the inside of the building and without removing the sash.

*Saving*—Liability insurance for window cleaners is 12% on payroll, owing to extra hazard. Inside cleaning eliminates this. More windows can be cleaned in a day standing on the floor than on the narrow sill outside,

effecting an additional saving.

*Awning*—By placing a shade on each sash, when the sash are open they will act as ideal awnings, shutting out the hot rays of the sun, but allowing the cool breezes to enter below the shade, and permitting the use of space close to windows. This also gives advantages of light and ventilation which can not be obtained from the old type window.

Particular attention is invited to this feature, that when the shades are drawn over each sash separately and the sash pushed out to serve as awnings, they bar the sunlight, yet obtain perfect ventilation. The reflected heat, which ordinarily comes through the glass and shade, is thus eliminated.

*Weatherstripping*—There is no window made that can be so easily, effectively and inexpensively weatherstripped as the "Wilson Reverso," either in wood or metal. The "Wilson" hollow metal detail is constructed to receive the Athey cloth lined strip.

*Screens*—This window can be thoroughly screened on the inside, no portion of the sash projects inside of stop line to interfere with screens, shades or drapery.

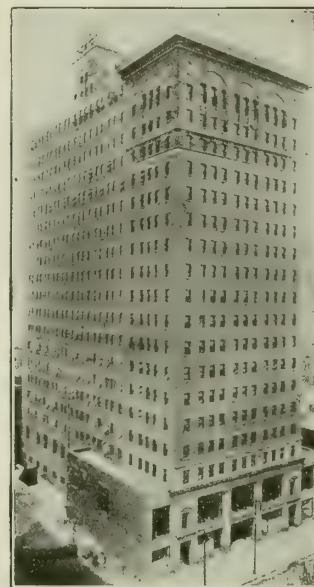
*Stormproof*—During storm the sash can be open to allow a certain amount of ventilation, but it will not admit storm or rain to wet sill, floor or drapery. An ideal window for schools, hospitals, sleeping porches, etc.

*Burglarproof*—The operation of closing this window is such that the top sash projects up into the head, and at the meeting rail the sash interlock. When the sash lock at the sill is fastened, it is impossible to open the window from the outside without breaking the glass; thus making it absolutely burglarproof.

*Rattling*—As each sash closes tight against the stop and does not have the clearance necessary for the old style sliding sash there is no rattle whatever of the sash.

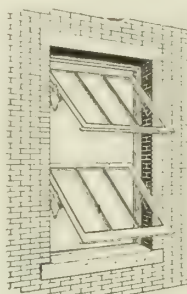
*Annoyance*—As there are no weights or chain required, the annoyance of the continual breakage of the chain is eliminated.

*Mullion*—By the omission of weight boxes, a small frame or mullion can be obtained, thus giving more light and glass area.



Y. M. C. A. HOTEL,  
CHICAGO, ILL.

R. C. BERLIN, Architect  
LANQUIST & ILLSLEY, Contractors  
2000 "Wilson Reverso" windows installed in this building—  
1300 wood and 700 hollow metal



"WILSON  
REVERSO"  
METAL WINDOW



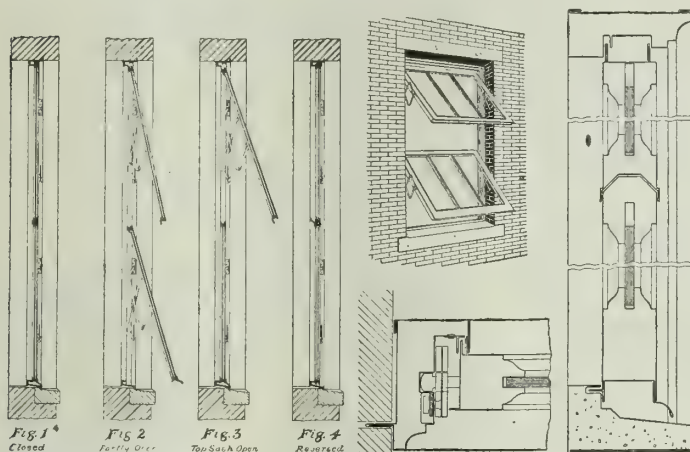
### Rolled Steel Sash.

Particular attention is called to the detail of the rolled steel sash, a high grade finished article and suitable for any class of buildings, hospitals, schools, or office buildings.

In the manufacture of the rolled steel sash, the Athey cloth lined weatherstrip is included in our construction, and, without exception, it is the tightest rolled steel sash on the market. Tight when closed, but allowing 100% ventilation when open.

### Hollow Galvanized Iron Underwriters' Sash.

The "Wilson Reverso" hollow galvanized iron window frame is not only approved by and bears the



VERTICAL SECTION OF ROLLED STEEL "WILSON REVERSO" WINDOW

DETAILS OF HOLLOW GALVANIZED IRON "WILSON REVERSO" WINDOW

Board of Underwriters' label but also bears their casualty label, which gives it their approval as a safety window, wherein all glass is cleanable from the inside of the building, thus saving the hazardous operation of cleaning glass from the outside and reducing the liability insurance of window cleaners.

### Metal Doors and Trim.

Art metal doors for corridors and stairways; also trim and partition work. Our doors bear the Underwriters' Laboratories' label of approval.

**CONSTRUCTION—**Door is made of furniture steel, each piece interlocked in a manner which prevents any portion of the door coming apart, after which it is welded and made perfectly rigid, positively the strongest door on the market.

The special steel formed buck is made to allow for adjustment



HOLLOW STEEL DOOR SHOWING QUARTERED OAK FINISH

and is anchored to masonry with special adjustable anchors, thus allowing the jams to be set perfectly true and plumb after the plastering, no wood of any description being used.

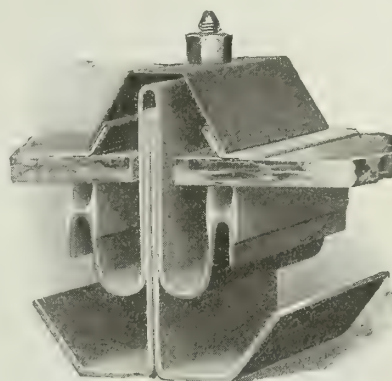
**FINISH—**Doors finished with the baked enamel process, grained to imitate any kind of wood or any of the metal finishes.

**UNDERWRITERS' TRIPLE LOCK—**Made of malleable iron; constructed to slip in through top of door, all concealed except bolts. For single or double doors, with door checks, self-closing and automatic locking without use of springs. For double doors there is an interference device which prevents wrong door closing first. Operated with regular knobs from either side.

Can be provided with cylinder locks to operate from outside.

### "Nonpareil" Put-tyless Skylights.

The "Nonpareil" (patented) is adaptable to any kind of light, or place where a skylight is required. This includes the so-called shingle pattern, also style where lapped glass may be desired.



SKYLIGHT BAR SECTION

### Co-operative Service.

Estimates, details and full information furnished on request. Send plans at our expense.

### References.

Below are mentioned some of the more important buildings in which McFARLAND-HYDE COMPANY products have been used. These contracts represent work to the amount of \$1,000,000.

#### BUILDING, LOCATION AND ARCHITECT

Union Station, Washington, D. C., D. H. Burnham & Co.  
Pennsylvania Terminal, New York, N. Y., McKim, Mead & White  
Rand-McNally Building, Chicago, Ill., Holabird & Roche  
Grand Central Station, New York, N. Y., Reed & Stem and Warren & Wetmore  
Marine National Bank, Buffalo, N. Y., Green & Wicks  
Post Office, New Orleans, La., James Gamble Rogers  
King County Court House, Seattle, Wash., A. W. Gould

#### BUILDINGS EQUIPPED WITH THE "WILSON REVERSO"

Powers Building, Decatur, Ill., Patton, Holmes & Flynn, over 450 wood frames being used  
Bloomington High School, Bloomington, Ill., Arthur Pillsbury, over 200 rolled steel frames used  
Y. M. C. A. Hotel, Chicago, Ill., Robert C. Berlin, over 2000 frames, 1300 wood and 700 hollow galvanized iron Underwriters' windows used  
Lyon & Healy Building, Chicago, Ill., Marshall & Fox, 125 hollow galvanized iron Underwriters' windows used  
Dawes Hotel for Women, Chicago, Ill., Brown & Walcott, 168 wood and 168 galvanized Underwriters' frames

#### BUILDINGS NOW BEING EQUIPPED WITH "WILSON REVERSO"

Illinois Central Office Building, Chicago, Ill., D. F. McLaughlin, 689 wood and 158 galvanized Underwriters' frames  
Y. M. C. A. Building, Cincinnati, Ohio, Elzner & Anderson, wood and galvanized Underwriters' frames  
Citizens National Bank Building, Independence, Kans., Oscar Wenderoth, rolled steel and galvanized Underwriters' frames  
Winfield State Bank, Winfield, Kans., Oscar Wenderoth  
Boone County National Bank, Columbia, Mo.  
Wilson-Hawkins Building, Akron, Ohio  
Robeson Building, Champaign, Ill., Joseph W. Royer  
Lewis Building, Champaign, Ill., Spencer & Son



# MESKER BROTHERS IRON COMPANY

## Fire Retardants

### ST. LOUIS, MO.

#### Products.

HOLLOW METAL WINDOWS; SOLID SECTION STEEL SASH; SOLID SECTION STEEL CASEMENT, COUNTERBALANCED AND DOUBLE HUNG WINDOWS; COMBINATION STEEL AND CONCRETE, SLATE OR MARBLE INTERIOR STAIRS (Patented).

Plate Steel Door Frames or Jambs; Plate Steel Sectional Doors and Shutters (Patented); Metal Covered Wood Core Doors; Fireproof Doors and Shutters; Plate Steel Sash Doors; Steel and Glass Stair and Elevator Enclosures; Steel and Glass Corridor Partitions; Plate Steel Column Guards.

#### Mesker Fireproof Hollow Metal Windows (Plate No. 1).

Approved by National Board of Fire Underwriters

and designed along same lines and contain same amount of glass area as wood windows.

Frames and sash are of No. 24 gage galvanized steel or 20 oz. copper. Supplied inclusive of hardware, sash weights and chains for double hung sash, chains and fusible links for other types and 1/4-in. rough, ribbed, prism or polished wire glass.

Maximum clear opening sizes of windows A, B, C and D 5 ft. by 10 ft. Maximum clear openings sizes of windows H and K 5 ft. by 5 ft. Mullions of twin, triple or quadruple windows are sheet metal, non-bearing (see details). Transoms may be hinged, pivoted or stationary. Transom bars for windows 10 ft. high and under are all sheet metal. Special transom bars for windows exceeding 10 ft. in height require beams and concreting.

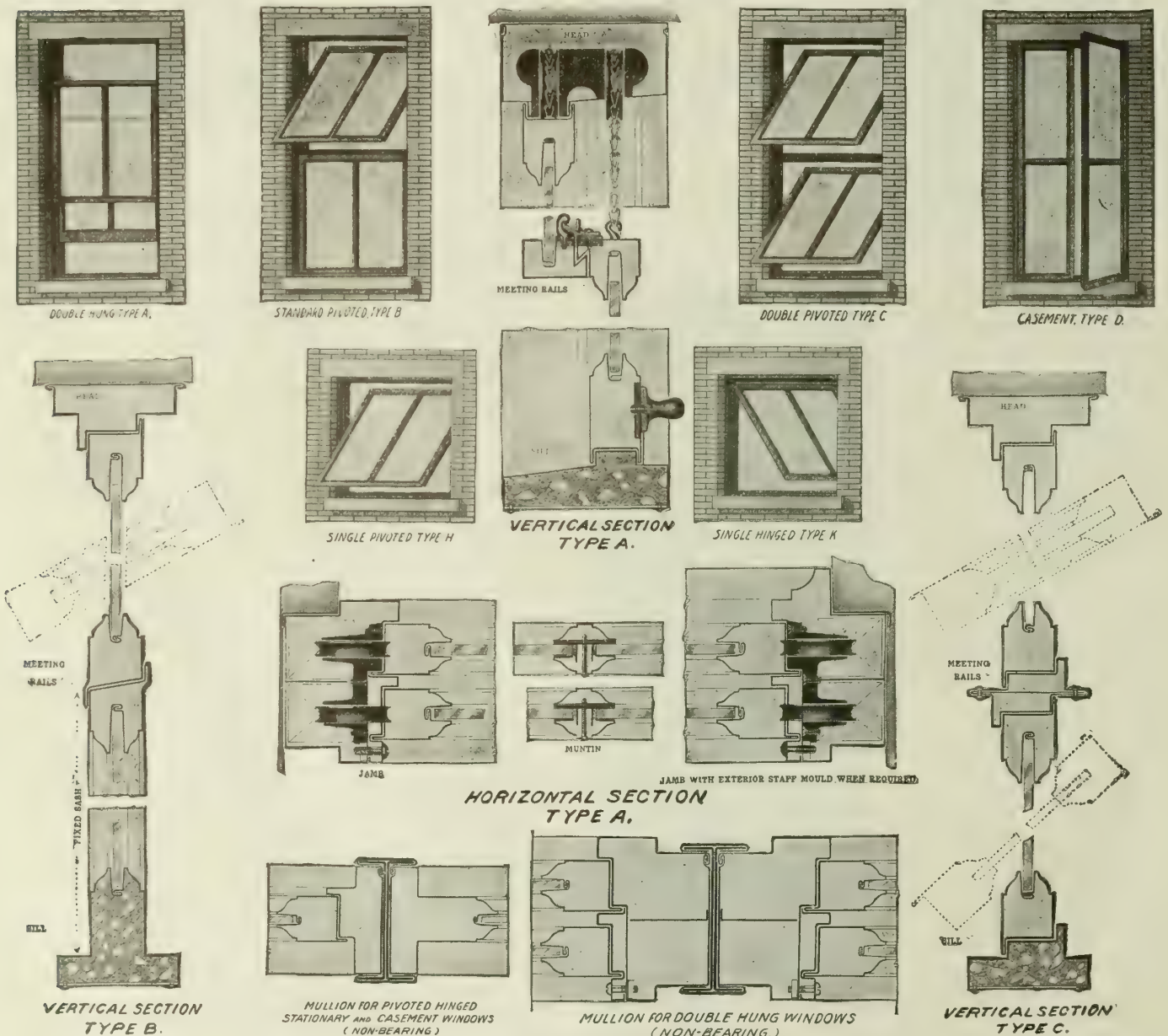


PLATE NO. 1. DETAILS OF MESKER FIREPROOF HOLLOW METAL WINDOWS



### Mesker Patent Steel and Concrete Stairs.

Adapted to schools, theaters, office buildings, apartment houses, store buildings, warehouses, hotels, power-houses, foundries, factory buildings, railroad stations.

**SPECIFICATIONS FOR INTERIOR STAIRS**—Stringers shall be 3/16-in. steel plate, bent in channel form and of width shown on plans.

Treads and risers shall be made of one continuous steel plate No. 12 or No. 13 gage, bent to form as indicated. Treads shall be supported at ends by special clamps, securely bolted to

stringers, with acorn heads on face strings, and shall be filled with concrete or other material by others. (Tread filling 1½ ins. more or less in thickness.)

Platforms or landings, where required, shall be No. 12 or No. 13 gage steel plates, with nosings same as treads and supported on a 2 x 2 x 3/16-in. angle frame, riveted or bolted to stringers, and reinforced with tees not over 2 ft. on centers.

Newels shall be No. 12 gage blue annealed steel, with cast caps and pendants. Newels to be welded at corners, making a continuous one-piece seamless newel.

Railings to be of design indicated on drawings.

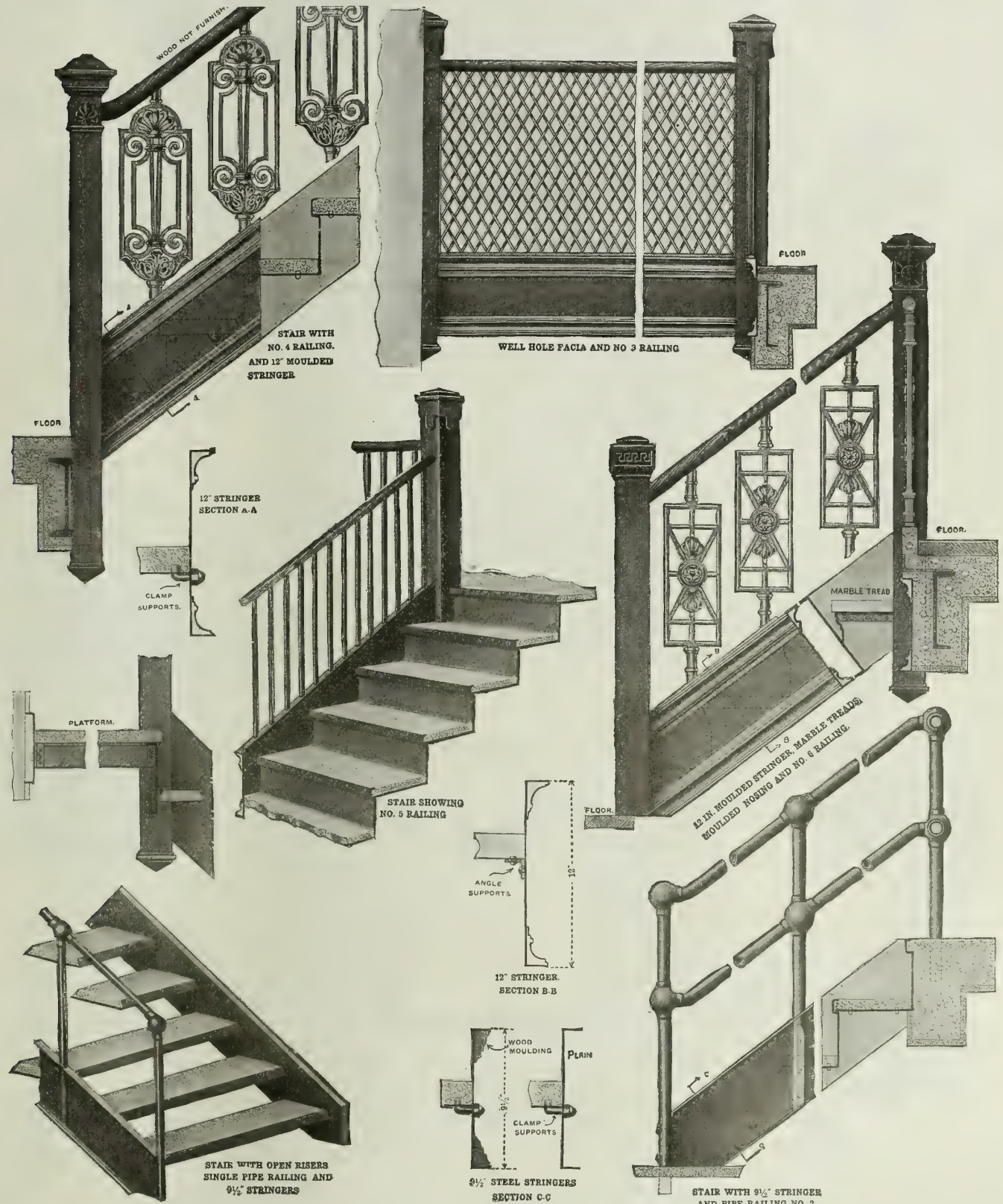


PLATE NO. 2. DETAILS OF MESKER PATENT STEEL AND CONCRETE STAIRS



**Mesker Solid Section Steel Sash.**

Adapted for use in factories, office buildings, etc.

Made of specially designed solid sections, rolled of soft steel from our own rolls. Horizontally or vertically pivoted, top or bottom hinged, casement, counterbal-

anced or of special construction. Ventilating bars are of double contact type, insuring a weatherproof and non-leakable sash. Intersections of muntins are welded on inside edges of flanges, greatly increasing the strength and rigidity of the sash.

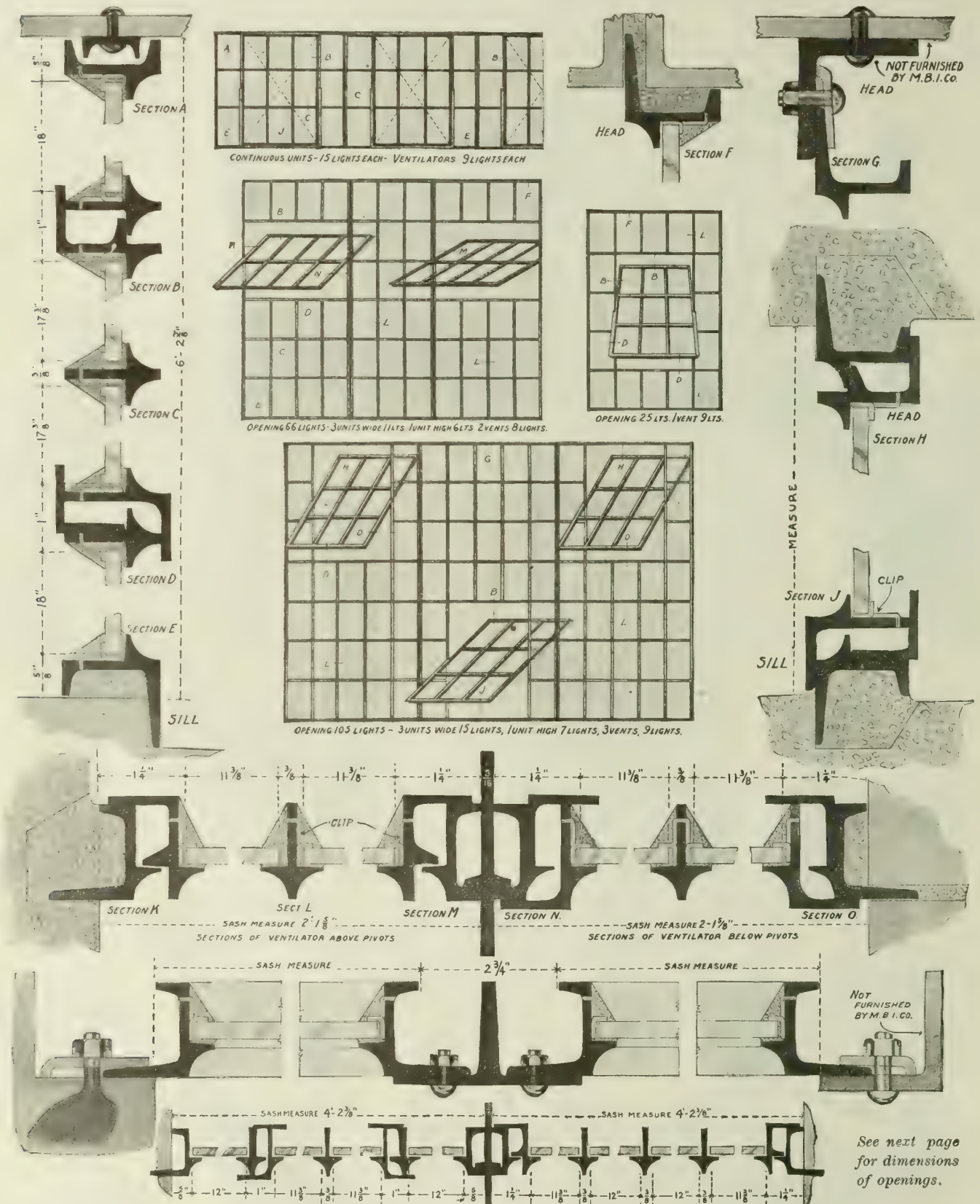


PLATE NO. 3. DETAILS OF MESKER SOLID SECTION STEEL SASH

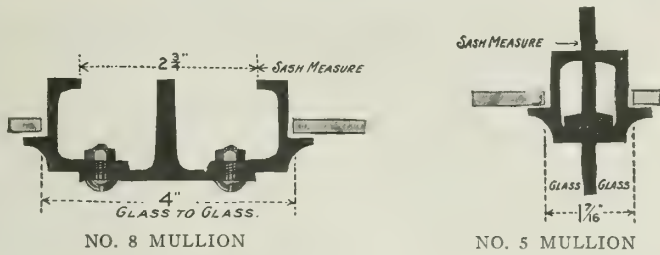
Note unequal legged channel frame bars, which are much heavier and stronger than the angle or equal legged channel frame bars. These units offer a wide scope of combinations, and any number of units may be combined with the use of our special bar and tee mullions. All units shipped separately and must be bolted together in the field. All hardware, anchors, bolts and glazing clips are furnished.



KEY TO FOLLOWING TABLE—First column denotes glass sizes, width or height. Second column, and those following, give sash dimensions. Number of lights, width or height, are represented by figures heading each column.

EXAMPLE—What are the number of lights for an opening 4'2 3/8" x 6'2 3/8", of 12x18 glass? From 12-in. glass column follow until 4'2 3/8" is reached; it shows 4 lights. From 18-in. glass column follow until 6'2 3/8" is reached; it shows 4 lights. Hence the opening has 4 lights wide and 4 lights high—16 lights.

EXAMPLE—What are dimensions of opening for 12x18 glass, 4 lights wide and 4 lights high? From 12-in. glass column follow until the column 4 lights is reached; it shows width 4'2 3/8". From 18-in. glass column follow until the column 4 lights is reached; it shows height 6'2 3/8". The opening dimensions, therefore, are 4'2 3/8" x 6'2 3/8".



DIMENSIONS OF MESKER'S STEEL SASH UNITS

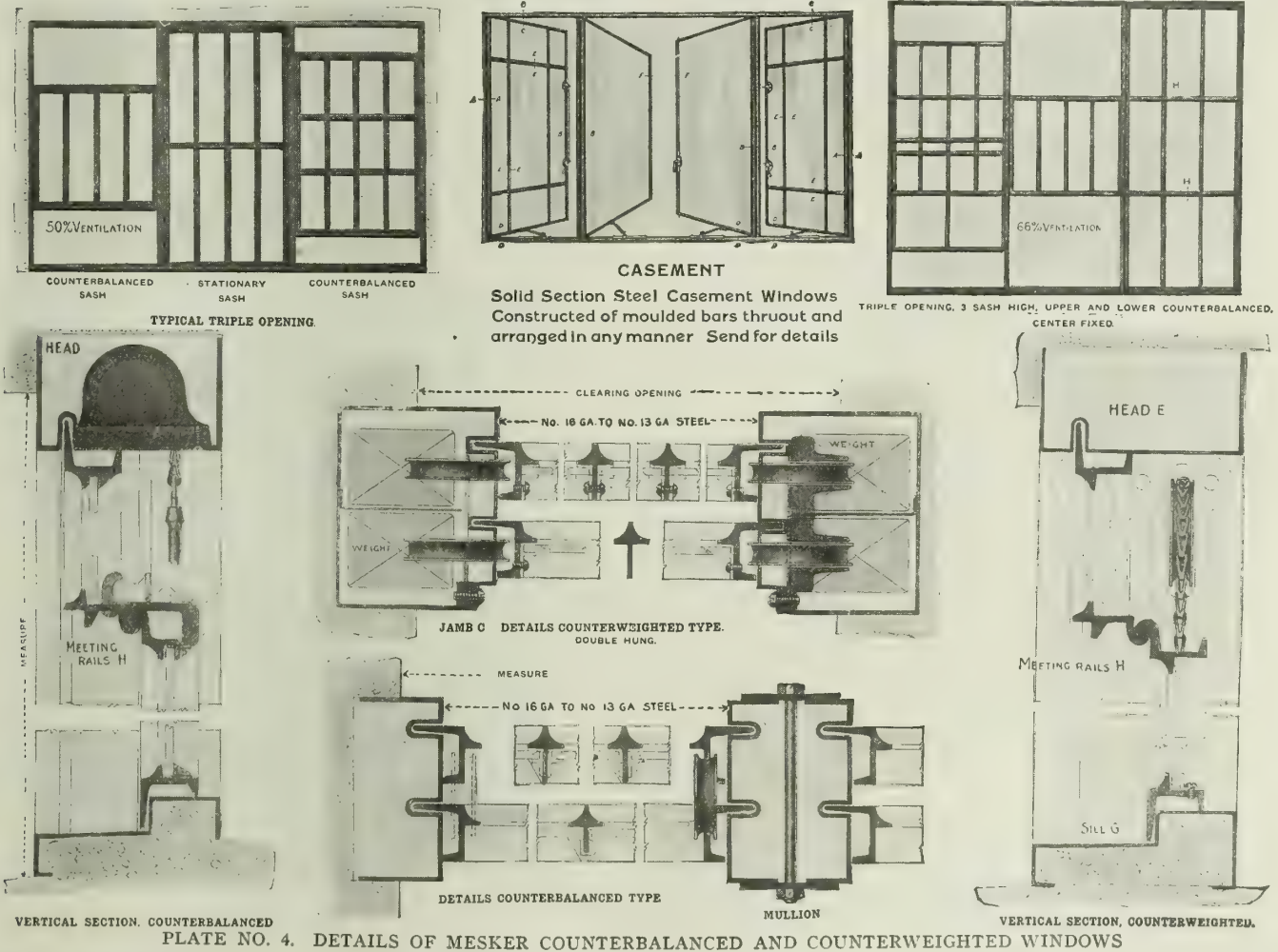
SIZES OF GLASS IN INCHES	ONE UNIT.									TWO UNITS.												THREE UNITS.												FOUR UNITS.											
	NUMBER OF LIGHTS, WIDTH OR HEIGHT.									NUMBER OF LIGHTS.												NUMBER OF LIGHTS.												NO. OF LIGHTS.											
	1	2	3	4	5	6	7	8	9	6	7	8	9	10	11	12	9	10	11	12	13	14	15	16	17	18	16	17	18	19	20														
10	0-11 $\frac{1}{4}$	1-9 $\frac{3}{8}$	2-8 $\frac{3}{8}$	3-6 $\frac{3}{8}$	4-4 $\frac{3}{8}$	5-3 $\frac{3}{8}$	6-1 $\frac{1}{2}$	7-11 $\frac{3}{8}$	7-10 $\frac{3}{8}$	5-6 $\frac{3}{8}$	6-5 $\frac{3}{8}$	7-3 $\frac{1}{2}$	8-1 $\frac{1}{2}$	9-0 $\frac{1}{2}$	9-10 $\frac{3}{8}$	10-9	8-5 $\frac{1}{2}$	9-3 $\frac{3}{8}$	10-2 $\frac{1}{4}$	11-0 $\frac{3}{8}$	11-11	12-9 $\frac{3}{8}$	13-7 $\frac{1}{2}$	14-6 $\frac{3}{8}$	15-4 $\frac{1}{2}$	16-2 $\frac{3}{8}$	14-9 $\frac{3}{8}$	15-8 $\frac{3}{8}$	16-6 $\frac{1}{2}$	17-4 $\frac{3}{8}$	18-3 $\frac{1}{2}$														
12	1-1 $\frac{1}{4}$	2-1 $\frac{3}{8}$	3-2 $\frac{3}{8}$	4-2 $\frac{3}{8}$	5-2 $\frac{3}{8}$	6-3 $\frac{3}{8}$	7-3 $\frac{3}{8}$	8-3 $\frac{3}{8}$	9-4 $\frac{3}{8}$	6-6 $\frac{3}{8}$	7-7 $\frac{3}{8}$	8-7 $\frac{3}{8}$	9-7 $\frac{3}{8}$	10-8 $\frac{3}{8}$	11-8 $\frac{3}{8}$	12-9	9-11 $\frac{3}{8}$	10-11 $\frac{3}{8}$	12-0 $\frac{3}{8}$	13-0 $\frac{3}{8}$	14-1	15-1 $\frac{3}{8}$	16-1 $\frac{3}{8}$	17-2 $\frac{3}{8}$	18-2 $\frac{3}{8}$	19-2 $\frac{3}{8}$	17-5 $\frac{3}{8}$	18-6 $\frac{3}{8}$	19-6 $\frac{3}{8}$	20-6 $\frac{3}{8}$	21-7 $\frac{3}{8}$														
14	1-3 $\frac{3}{4}$	2-5 $\frac{3}{8}$	3-8 $\frac{3}{8}$	4-10 $\frac{3}{8}$	6-0 $\frac{3}{8}$	7-3 $\frac{3}{8}$	8-5 $\frac{1}{2}$	9-7 $\frac{3}{8}$	10-10 $\frac{3}{8}$	7-6 $\frac{3}{8}$	8-9 $\frac{3}{8}$	9-11 $\frac{3}{8}$	11-1 $\frac{3}{8}$	12-4 $\frac{3}{8}$	13-6 $\frac{3}{8}$	14-9	11-5 $\frac{3}{8}$	12-7 $\frac{3}{8}$	13-10 $\frac{3}{8}$	15-0 $\frac{3}{8}$	16-3	17-5 $\frac{3}{8}$	18-7 $\frac{3}{8}$	19-10 $\frac{3}{8}$	21-0 $\frac{3}{8}$	22-2 $\frac{3}{8}$	20-1 $\frac{3}{8}$	21-4 $\frac{3}{8}$	22-6 $\frac{3}{8}$	23-8 $\frac{3}{8}$	24-11 $\frac{3}{8}$														
16	1-5 $\frac{1}{2}$	2-9 $\frac{3}{8}$	4-2 $\frac{3}{8}$	5-6 $\frac{3}{8}$	6-10 $\frac{3}{8}$	8-3 $\frac{3}{8}$	9-7 $\frac{3}{8}$	10-11 $\frac{3}{8}$	12-4 $\frac{3}{8}$	8-6 $\frac{3}{8}$	9-11 $\frac{3}{8}$	11-3 $\frac{3}{8}$	12-7 $\frac{3}{8}$	14-0 $\frac{3}{8}$	15-4 $\frac{3}{8}$	16-9	12-11 $\frac{3}{8}$	14-3 $\frac{3}{8}$	15-8 $\frac{3}{8}$	17-0 $\frac{3}{8}$	18-5	19-9 $\frac{3}{8}$	21-1 $\frac{3}{8}$	22-6 $\frac{3}{8}$	23-10 $\frac{3}{8}$	25-2 $\frac{3}{8}$	22-9 $\frac{3}{8}$	24-2 $\frac{3}{8}$	25-6 $\frac{3}{8}$	26-10 $\frac{3}{8}$	28-3 $\frac{3}{8}$														
18	1-7 $\frac{3}{4}$	3-1 $\frac{3}{8}$	4-8 $\frac{3}{8}$	6-2 $\frac{3}{8}$	7-8 $\frac{3}{8}$	9-3 $\frac{3}{8}$	10-9 $\frac{3}{8}$	12-3 $\frac{3}{8}$	13-10 $\frac{3}{8}$	9-6 $\frac{3}{8}$	11-1 $\frac{3}{8}$	12-7 $\frac{3}{8}$	14-1 $\frac{3}{8}$	15-6 $\frac{3}{8}$	17-2 $\frac{3}{8}$	18-9	14-5 $\frac{3}{8}$	15-11 $\frac{3}{8}$	17-6 $\frac{3}{8}$	19-0 $\frac{3}{8}$	20-7	22-1 $\frac{3}{8}$	23-7 $\frac{3}{8}$	25-2 $\frac{3}{8}$	26-8 $\frac{3}{8}$	28-2 $\frac{3}{8}$	25-5 $\frac{3}{8}$	27-0 $\frac{3}{8}$	28-6 $\frac{3}{8}$	30-0 $\frac{3}{8}$	31-7 $\frac{3}{8}$														
20	1-9 $\frac{3}{4}$	3-5 $\frac{3}{8}$	5-2 $\frac{3}{8}$	6-10 $\frac{3}{8}$	8-6 $\frac{3}{8}$	10-3 $\frac{3}{8}$	11-11 $\frac{3}{8}$	13-7 $\frac{3}{8}$	15-4 $\frac{3}{8}$	10-6 $\frac{3}{8}$	12-3 $\frac{3}{8}$	13-11 $\frac{3}{8}$	15-7 $\frac{3}{8}$	17-4 $\frac{3}{8}$	19-0 $\frac{3}{8}$	20-9	15-11 $\frac{3}{8}$	17-7 $\frac{3}{8}$	19-4 $\frac{3}{8}$	21-0 $\frac{3}{8}$	22-9	24-5 $\frac{3}{8}$	26-1 $\frac{3}{8}$	27-10 $\frac{3}{8}$	29-6 $\frac{3}{8}$	31-2 $\frac{3}{8}$																			
22	1-11 $\frac{3}{4}$	3-9 $\frac{3}{8}$	5-8 $\frac{3}{8}$	7-6 $\frac{3}{8}$	9-4 $\frac{3}{8}$	11-3 $\frac{3}{8}$	13-1 $\frac{3}{8}$			11-6 $\frac{3}{8}$	13-5 $\frac{3}{8}$	15-3 $\frac{3}{8}$	17-1 $\frac{3}{8}$	19-0 $\frac{3}{8}$	20-10 $\frac{3}{8}$	22-9	17-5 $\frac{3}{8}$	19-3 $\frac{3}{8}$	21-2 $\frac{3}{8}$	23-0 $\frac{3}{8}$	24-11	26-9 $\frac{3}{8}$	28-7 $\frac{3}{8}$	30-6 $\frac{3}{8}$	32-4 $\frac{3}{8}$																				
24	2-1 $\frac{3}{4}$	4-1 $\frac{3}{8}$	6-2 $\frac{3}{8}$	8-2 $\frac{3}{8}$	10-2 $\frac{3}{8}$	12-3 $\frac{3}{8}$				12-6 $\frac{3}{8}$	14-7 $\frac{3}{8}$	16-7 $\frac{3}{8}$	18-7 $\frac{3}{8}$	20-8 $\frac{3}{8}$	22-8 $\frac{3}{8}$	24-9	18-11 $\frac{3}{8}$	20-11 $\frac{3}{8}$	23-0 $\frac{3}{8}$	25-0 $\frac{3}{8}$	27-1	29-1 $\frac{3}{8}$	31-1 $\frac{3}{8}$																						
26	2-3 $\frac{3}{4}$	4-5 $\frac{3}{8}$	6-8 $\frac{3}{8}$	8-10 $\frac{3}{8}$	11-0 $\frac{3}{8}$	13-3 $\frac{3}{8}$				FOR TWO UNITS DEDUCT 2 $\frac{3}{8}$ " FROM WIDTH IF NO. 5 MULLION IS USED.												FOR THREE UNITS DEDUCT 5 $\frac{3}{8}$ " FROM WIDTH IF NO. 5 MULLION IS USED.												FOR FOUR UNITS DEDUCT 7 $\frac{3}{8}$ " FROM WIDTH IF NO. 5 MULLION IS USED.											

Mesker Solid Section Steel Counterbalanced and Counterweighted Windows.

Modern and superior to ordinary pivoted factory type. Architects and engineers are specifying windows of this character in designing hotels, schools, colleges, office and loft buildings.

Jams, heads and sills each of one-piece plate steel. Note the grooves in jams and heads into which the long flange of

sash slides—its draftproof and weathertight features. Pulleys are roller bearing and incased in head. Sash are suspended by galvanized steel chains. The double U reversed contact of meeting rails is an unique method. Heavy strong eccentric lock tightens the sash, prevents rattling and provides weatherproof contact. Sash joints are tenoned, riveted and welded. Jams are welded to heads and sills and flush finished. Mullions are expandable. Subsills filled with concrete by mason. Glass held in place by glazing clips and putty, or glazing angles. Openings up to 10 ft. high have 2 sash.



# NEWARK CORNICE AND SKYLIGHT WORKS

Manufacturers of Sheet Metal Work

9-15 Seventeenth Avenue

NEWARK, N. J.

TELEPHONE:

NEWARK, WAVERLY 3461

## Products.

High grade SHEET METAL WORK, including KALAMEIN DOORS, SASH, TRIM and MOULDINGS; HOLLOW METAL WINDOWS; UNDERWRITERS' FIRE DOORS; PUT-TYLESS SKYLIGHTS.

Also, Metal Covered Partitions, Metal Store Fronts, Ornamental Marquise, Cornices, Roofs, Ventilators, and other types of Architectural Sheet Metal Work.

## Quality and Underwriters' Indorsement.

In the construction of its products, this organization has adopted highest standards of construction, which are as a rule, and especially when so required, entirely in accordance with the requirements of the National Board of Fire Underwriters.

## Service and Facilities.

This organization is prepared to install any of its products in any part of the United States when size of contract warrants. The grade of work solicited demands the employment of only highly skilled workers and a shop equipment of latest and most efficient machinery and tools.

The service department invites consultation during and after the preparation of plans and will gladly send suggestive working drawings, detail sheets of mouldings, and any other information required.

## Kalamein Work.

The following suggested specifications will indicate the methods practised by this concern in the manufacture of its kalamein work. Contracts of any size or difficulty can be handled by its efficient force. Hardware will be applied or provision made for it. Fire doors—swinging, sliding, or hung—can be equipped with any type of control.

## Specifications for Kalamein Work.

**MATERIAL**—All woodwork used in the manufacture of door and window frames, jambs, doors, sash and trim to be of seasoned clear kiln dried white pine. Stiles more than 6 ins. wide must be built up of strips and glued together.

All metal to be of 16-oz. copper [or commercial bronze, low brass, No. 28 kalamein iron or galvanized iron].

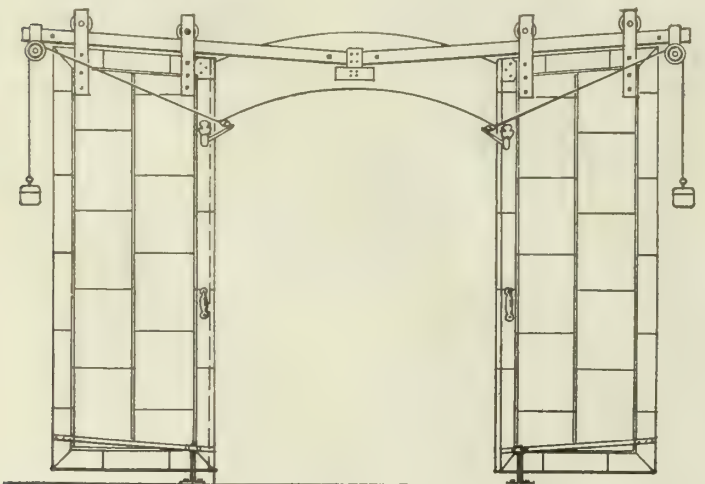
**COVERING**—All woodwork must be covered by machine, except on panels (whether of wood or asbestos) metal must be glued on. All metal must fit closely to wood cores, the surfaces to be straight and true without blisters, cracks or rough edges; edges to be straight and true; mouldings to be as per details, with sharp, square corners, showing true lines. Special care must be taken in assembling to avoid bench marks as much as possible and to get a true fit at the miters, cut ends at miters to be covered with same metal as used for mouldings.

**ASSEMBLING**—All members of doors, sash, etc., must be mortised and tenoned, and put together with hardwood wedges, or doweled with hardwood dowels and special gluing process.

All trim, where practical, shall be mitered and put together at shop, all joints and miters thoroughly brazed and each cleated with metal clips. Trims and mouldings, wherever possible, must be back screwed, thus avoiding defacing surface by nails or screws.

**EXTERIOR WORK**—On all work exposed to weather, joints of metal covering must be underlaid with a strip of metal, same as covering, and after assembling all joints must be properly brazed; and all joints where water, snow, or sleet has a chance to lodge or that are subjected to steam or moisture to any extent, must be completely filled with solder and brazed so that no moisture can gain entrance to cores.

**CLEANING**—After kalamein work is erected, all surfaces of copper, commercial bronze or low brass must be thoroughly cleaned of solder or other foreign matter and a coat of lacquer applied. Galvanized or kalamein iron surfaces must be painted with 1 heavy coat of Sherwin-Williams paint, known as galvanized iron primer, or other paint equally approved. Before painting is done, however, metal must be thoroughly cleaned with benzine and bran, of grease or other foreign matters to prepare surface for a good adhesion of paint to surface.



SLIDING FIRE DOORS ON INCLINED TRACKS

Used when there is not enough room to slide a single door in one direction

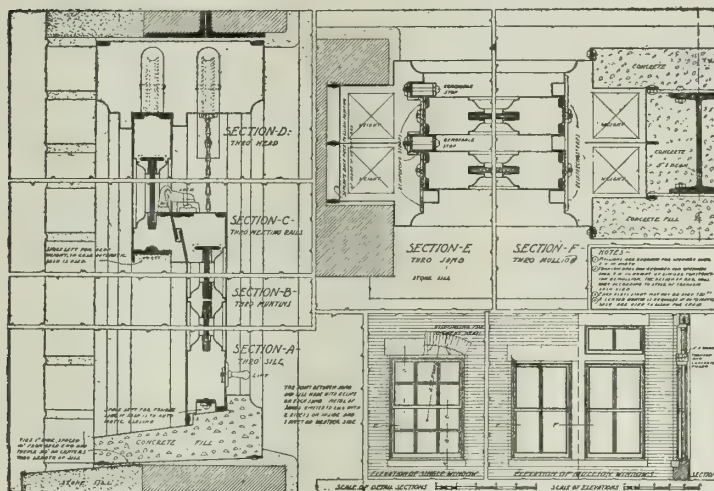


MAIN ENTRANCE, WEST SIDE TRUST CO. BUILDING, NEWARK, N. J.

Crow, Lewis & Wickenhoefer, Architects



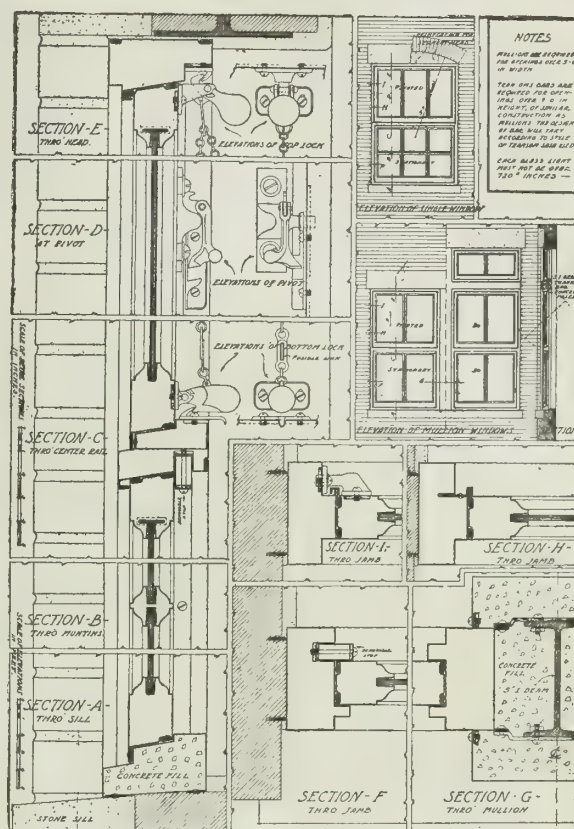
**APPLYING HARDWARE**—Special care must be taken to apply hardware; it must be done by men experienced in kalamein work. Metal work must be cut to allow a clinch around butts or any other hardware where it is necessary to let same into finished work, so that no wood may be exposed and no moisture have a chance to penetrate to wood core.



DETAILS OF HOLLOW METAL DOUBLE HUNG WINDOW  
Examined and labeled by Underwriters' Laboratories, Inc.

### Windows.

The accompanying cuts illustrate two types of windows made by this company. They have stood the test of severe service and have been found eminently successful. Pivoting sash are, when desired, supplied with fusing link control, so sash can close automatically in case of fire.



DETAILS OF HOLLOW METAL WINDOW; UPPER SASH  
PIVOTING, LOWER SASH STATIONARY  
Examined and labeled by Underwriters' Laboratories, Inc.

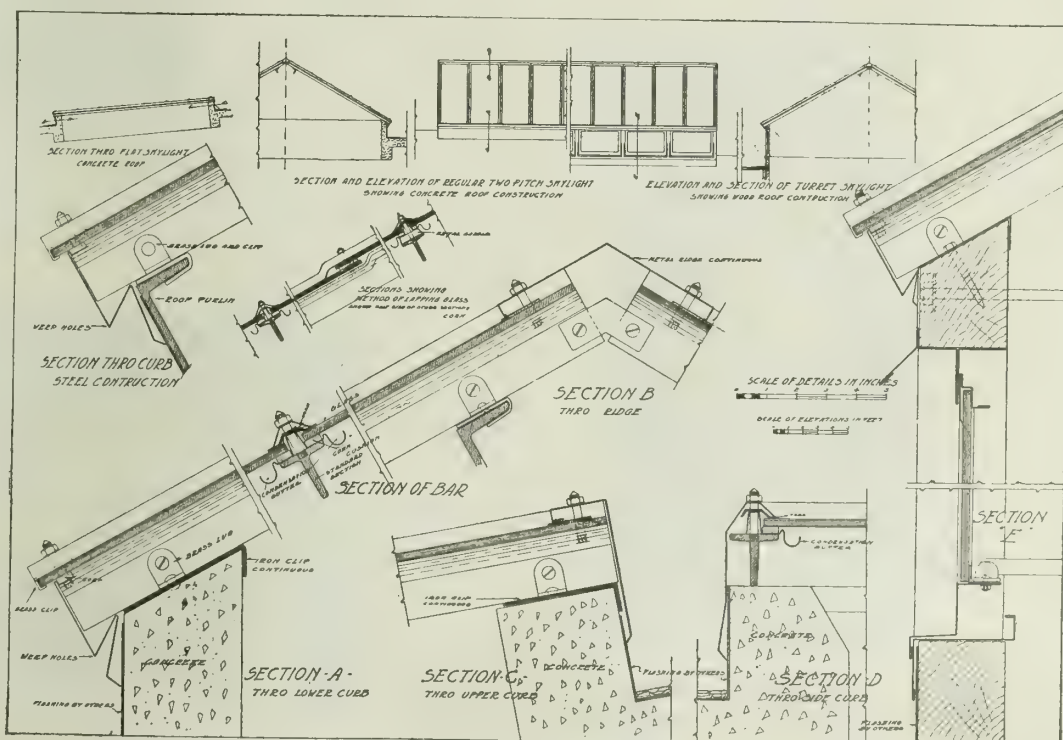
8-ft. spans. It requires practically no attention once it is installed.

For specially large openings, calculations for necessary intermediate supports will be made by this company, when desired.

### Puttyless Skylights.

The accompanying details of a puttyless skylight show the direct and scientific basis of the system. Briefly, it is a simple application of a spring bronze clip construction to structural steel spanning members. This clip construction, with its specially prepared cork cushions (see illustration), provides a firm yet flexible hold for the glass. It has sufficient give to allow for any vibration or expansion and contraction the construction may be subjected to, and thus reduces the danger of glass breakage to a minimum, and provides an economical construction which is permanently storm-proof and dustproof.

This system is adaptable to any form of skylight construction with no intermediate supports up to



DETAILS, SHOWING CONSTRUCTION AND APPLICATION OF PUTTYLESS SKYLIGHT

## S. H. POMEROY CO., INC.

### Hollow Metal Fire Retardant Windows and Partitions

282-296 East 134th Street

NEW YORK, N. Y.

SALES OFFICE, 30 East 42nd Street

#### Products.

POMEROY HOLLOW METAL FIRE RETARDANT WINDOWS; POMEROY HOLLOW METAL FIRE RETARDANT PARTITIONS.

#### Scope of Line.

The Pomeroy line includes more than 30 standardized window types—more than are offered by any other one window maker. This enables the company to meet practically all conditions with some standard construction of proved merit. Architects and owners, therefore, are not forced to accept some new or untried or experimental window, or to adopt some compromise type. There is a standard Pomeroy window for every class of window service.

The Pomeroy hollow metal partition for interior fire retardant subdivision is the logical outgrowth of Pomeroy experience and facilities.

#### Official Approval.

Following are some of the standard Pomeroy windows which have been approved by the National Board of Fire Underwriters' Laboratories, and bear their label:

Double hung counterbalanced (three types); double hung with pivoted transom; double hung with hinged transom; twin double hung; stationary, twin stationary; casement; top hinged upper and stationary lower; pivoted upper sash; pivoted lower sash; three pivoted sash; two upper sash pivoted with stationary lower; special mullion window; twin pivoted sash; tilting sash.

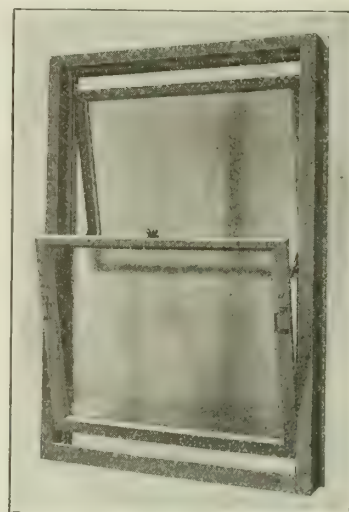
#### Facilities.

For more than twenty years fire retardant

windows, and later fire retardant partitions, have been the exclusive specialty of the Pomeroy Company, and its factory equipment and methods of production are the outgrowth of this long concentration on one particular line. The factory has the most up-to-date machinery—much of it specially made for Pomeroy service. The interchangeable or duplicate part system of production, by means of standard jigs and templates and dies, prevails throughout the factory, guaranteeing uniformity of dimensions and quality. Pomeroy windows and partitions are manufactured—not built. Hand labor is minimized, hand fitting eliminated, skilled specialists used on each operation of assembling. No other windows are made under such a system.

#### Cost.

The Pomeroy policy demands standards of quality which necessitate a strict adherence to a price which will



POMEROY AUSTRAL HOLLOW METAL FIRE RETARDANT WINDOW

Showing window partially opened for ventilation



POMEROY HOLLOW METAL DOUBLE HUNG SAFETY FIRE RETARDANT WINDOW

Similar to the standard double hung window in operation, but with upper and lower sash pivoted for cleaning both glass surfaces from the inside. Illustration shows method of cleaning upper sash; the lower sash already cleaned and elevated out of the way.



POMEROY HOLLOW METAL FIRE RETARDANT PARTITIONS

Installed in New York office building. Made in sectional construction and in a variety of styles and combinations



cover the most sound, substantial and efficient construction—this price itself being a guarantee of permanent satisfaction to architect, owner, agent and tenant of a Pomeroy equipped building. Pomeroy products are not made to meet a price but to set a standard of service—that standard being one which can be maintained only by specialization on one line of manufacture.

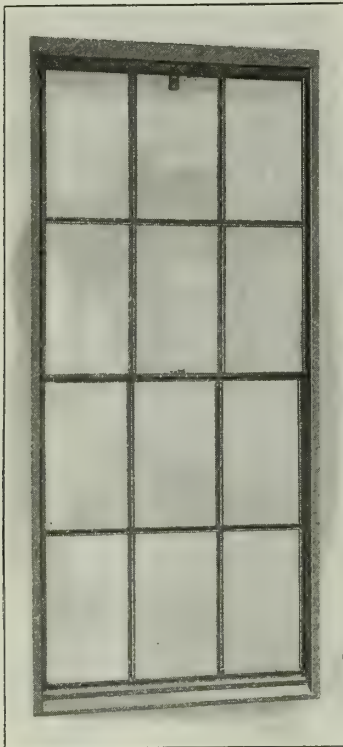
### Distinctive Features.

Standard material is the best grade of heavily galvanized steel, though copper and bronze are used in certain windows on order. Methods of handling which

maintain the zinc coating unbroken, preventing corrosion. All cutting and punching by costly special dies; interchangeable construction throughout. Specialized, intensified factory methods and processes; experienced factory organization of long standing. Improved hardware. Maximum fire resistant capacity; exceptional weathering qualities, excluding dust and wind. Easy operation maintained indefinitely by accurate workmanship and sustained adjustments. Prompt deliveries resulting from unequaled factory facilities and ample stocks of raw materials.

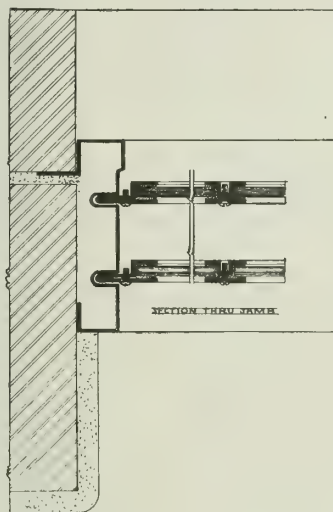
### Special Service.

Twenty years of specialization is the basis of Pomeroy service offered architects confronted with window problems. This service is free, and cheerfully offered. The company welcomes an opportunity to co-operate with architects in any way—either in adapting standard Pomeroy types to specific conditions, or in working out new types for any purpose.



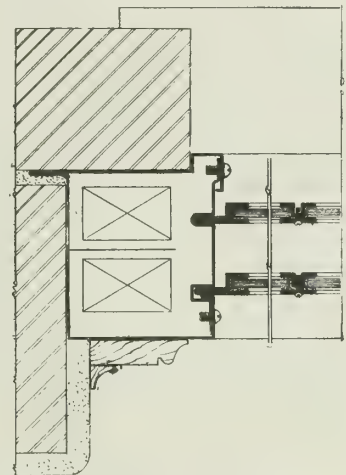
POMEROY NO. 14 COUNTERBALANCED HEAVY PRESSED GALVANIZED STEEL WINDOW

Made throughout of heavily galvanized steel pressed to shape; also furnished on order in ingot iron or Toncan metal. Illustration shows automatic closing device at top



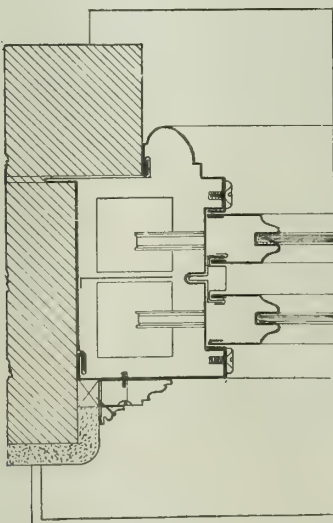
DETAIL OF POMEROY NO. 14 COUNTERBALANCED HEAVY PRESSED GALVANIZED STEEL WINDOW

An improved maximum-lighting window with narrow members, as shown at the left



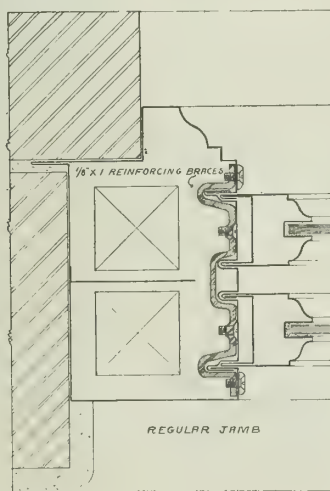
DETAIL OF POMEROY NO. 14 DOUBLE HUNG HEAVY PRESSED GALVANIZED STEEL WINDOW

Showing section through jamb and sash. The latest maximum-lighting window



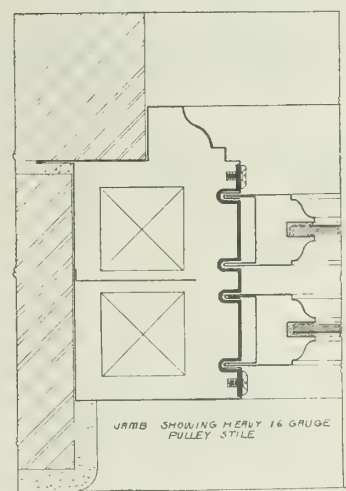
DETAIL OF POMEROY NO. 16 HEAVY GAGE DOUBLE HUNG HOLLOW METAL WINDOW FOR STREET FRONTS

Made in heavy gage galvanized steel, copper or bronze



DETAILS OF POMEROY NO. 60 HOLLOW METAL FIRE RETARDANT WINDOW

Section through jamb and sash, showing two standard types of jamb construction; double weathering feature illustrated



JAMB SHOWING HEAVY 16 GAUGE PULLEY STILE

# SAFETY DETACHABLE WINDOW CORPORATION

534-536 Security Building  
MINNEAPOLIS, MINN.

## Products.

SAFETY DETACHABLE WINDOWS; MONO-SASH STORM WINDOWS and SCREENS; MONO-SASH SAFETY COUNTERBALANCE WINDOWS.

## Adaptability and Advantages of our Windows and Screens.

Suitable for residences or any type of building, and simplify the putting up and taking down of storm sash and screens. All danger to life and limb incident to these tasks is eliminated. They do away with the hardest part of the work, saving annoyance and inconvenience.

## Safety Detachable Window.

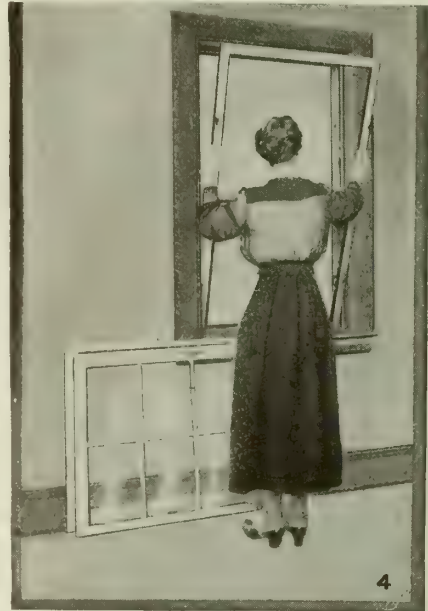
The necessity of removing stops to take out sash is eliminated by the installation of 4 sets of spring devices (see Figs. 2 and 4—parts shown in Fig. 13) which can be installed in the ordinary window frame made by any sash and door factory.

**REMOVING LOWER SASH**—To remove or insert lower sash, raise sash to position shown in elevation "A," and by slight pressure on side of sash, it is pushed to one side, letting it pass the stop and out of the frame. The rope is easily unhooked from hook plate in sash (see Fig. 3) and is hooked into a hook plate in frame (see Fig. 8). No. 2 of Fig. 14 shows hook which is clamped on sash cord.

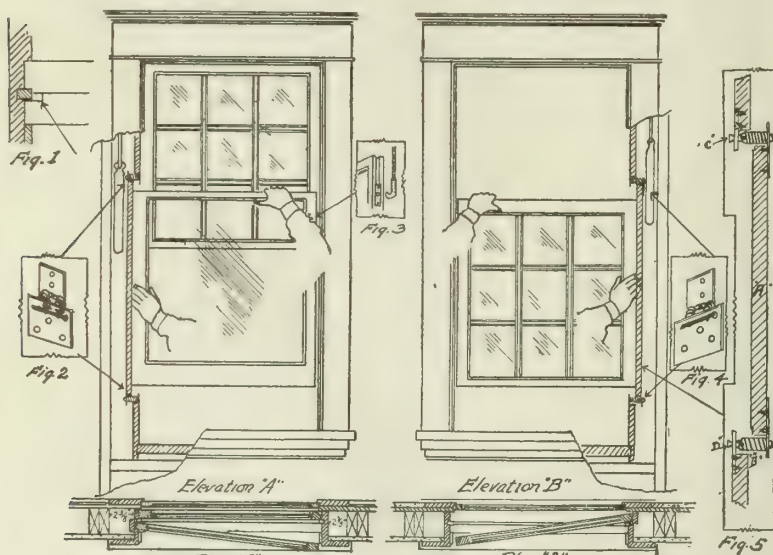
**REMOVING TOP SASH**—Elevation "B" shows the removing of top sash, which operation is the same as for the lower sash.

with 2 lights, each set in a steel sash and movable by sliding up or down on a steel guide.

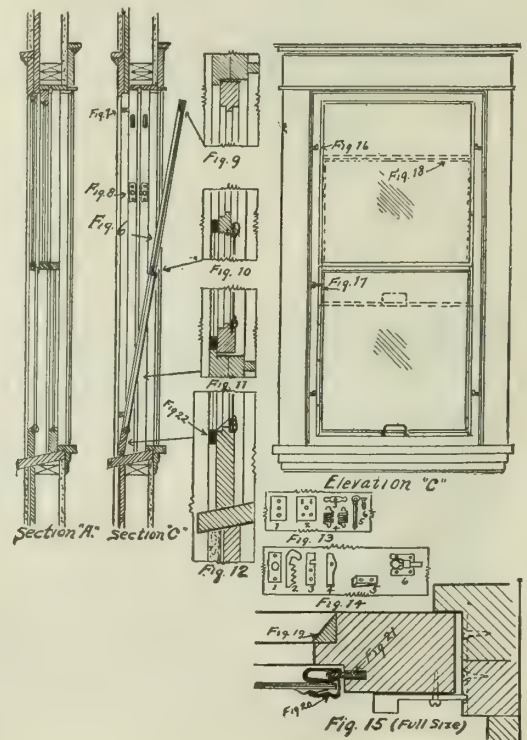
With this window in place (installed from the inside) a double window is obtained, and the trouble of removing and putting on storm sash twice a year is



MONO-SASH STORM WINDOW AND SCREEN



DETAILS OF SAFETY DETACHABLE WINDOW



DETAILS OF MONO-SASH STORM WINDOW

## Mono-sash Storm Window.

This window has revolutionized the use of storm sash. It is a wooden sash the size of the window frame

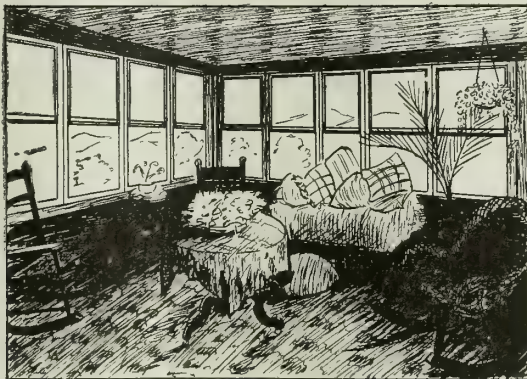


eliminated. The same amount of ventilation may be obtained as in the ordinary window. Screen cloth is put on the same sash, making it a "two-in one" window, or it may be equipped with a steel frame screen fitted on the same sash.

The Mono-sash window can be used as a window in sun porches, summer cottages or in mild climates, where it can be used as the only window, making a great saving in cost of construction. It is also made with only lower light movable, and top light set permanently in putty, as shown in details.

**DETAIL DESCRIPTION AND SPECIFICATION DATA—** After the top and bottom sash of the safety detachable window are removed, the Mono-sash storm window may be removed from the inside as shown in section "C" and Fig. 6. When the Mono-sash window is in position, it fits against outside casing, which is extended into frame opening and rabbetted (plans "A" and "B", section "A" and detail in Fig. 15) and held in place by 4 catches shown in elevation "C", Fig. 16, and details Nos. 3 and 4 of Fig. 14. Elevation "C" shows Mono-sash in place. Fig. 18 shows position of lower light when open.

The glass of the lower light of Mono-sash window is set in a steel sash which slides in a metal guide set in the sash (Figs. 20 and 21) and can be raised and lowered to any position desired for ventilation, or removed entirely. A catch shown in Fig. 17 (also see No. 6 of Fig. 14) holds sash in position desired. Metal guide shown at Fig. 21 is a flat iron rod  $\frac{1}{8}$  by  $\frac{1}{2}$  in., and set in a groove  $\frac{1}{8}$  by  $\frac{1}{4}$  in. Top light may also be set in a similar steel sash and made movable if desired. Metal guide should be oiled when new, in order to have sash work easily.



MONO-SASH IN PORCHES GIVES HIGHER PER CENT. OF LIGHT BY ELIMINATING FRAMES AND CASINGS

### Mono-sash Window Screens.

A metal screen frame (Fig. 22) of the size of the lower light can be fitted on Mono-sash. This frame can be removed for the winter if desired, but can be left in the whole year. Screen cloth may be nailed directly on Mono-sash window if desired.

In this way there is no need of disturbing the window at any time, as it is always equipped for winter or summer. For cleaning or any other purpose, any or all windows can be removed from the inside.

The Mono-sash window may be removed in the spring and replaced by a screen frame of the same size, all changing being done from the inside.

The sliding steel sash is so constructed that by removing one small screw the sash can be taken apart and re-glazed if necessary.

**DETAIL DESCRIPTION AND SPECIFICATION DATA—** No. 5 in Fig. 14 is a check rail block (wedge shape), to be screwed on check rail to fill opening of cut in opposite check rail, necessary for movement of sash past parting stop. Make cut in check rail of each sash on same side as springing pocket. See plans "A" and "B", also Fig. 1.

Fig. 19 is a beveled wooden strip to fill groove in lower half of Mono-sash to correspond with putty of upper half when top light is installed permanently.

Fig. 5 shows spring device in position in weight pocket. By removing screws "C" and "D" of Fig. 5, the pocket piece "A" can be removed same as usual for installing weights.

Cut pocket opening 3 ins. longer than sash and cut pocket piece "A"  $1\frac{3}{8}$  ins. short to allow for installing of springs.

### Mono-sash Counterbalance Window.

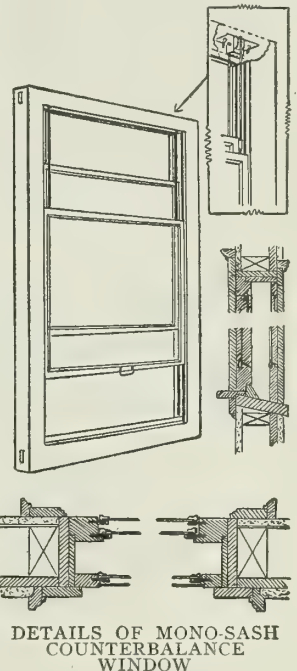
Both sash are made of steel and slide in steel guide set in one wooden sash. Swelling or shrinking is not possible, and sash cord is easily adjusted. Weights are eliminated. Less room is needed, which allows for installing 2 sets of windows in the same frame where double windows are required.

This window greatly reduces construction cost, and saves fuel by eliminating the pocket in the frame.

It can be installed with hinges, and used as a casement whenever desired. It is easily removed for cleaning or installing of screens from the inside.

Finished complete and shipped to any part of the country. The window frame may be made by any sash and door factory.

In tall buildings, such as hotels, where a storm sash can not be fitted on the outside, the use of the Mono-sash counterbalance window is recommended, which can be fitted on the inside of the permanent window against the window stop.



### Durability and Cost.

The hardware equipment of the safety detachable and Mono-sash windows is of very simple construction, and will not get out of order easily.

The cost is nominal, and is practically all saved in labor saving during construction.

### Installation and Co-operative Service.

Specify our windows according to detail, and any sash and door factory can make the frame and install our hardware. Detail drawing for sash and door factories forwarded on request.

The spring devices for the detachable window can be installed in any building already finished, provided the window frames have pocket.

In ordering, state thickness of window sash and size of glass.

# J. F. WAGNER'S SONS CO.

## Manufacturers of Fireproof Windows and Doors

Seventh and Oak Streets  
LOUISVILLE, KY.

### Products.

A complete line of STANDARD UNDERWRITERS' HOLLOW METAL WINDOWS, in Double Hung, Counter-balanced, Pivoted, Hinged, Casement and Stationary Types.

STANDARD UNDERWRITERS' METAL COVERED DOORS, Paneled and Tin Clad.

Various Types of THINBAR HOLLOW METAL SASH and METAL SKYLIGHTS; LUFTON VENTILATORS and ARCHITECTURAL SHEET METAL WORK.

Steel Door Frames and Bucks.

### Co-operative Service.

Estimates will be quoted on plans and specifications.

Any problems in metal window, sash or door construction will be worked out and full size details will be made, on request. The Engineering and Designing Departments are always at the service of architects, general contractors, owners and other interested persons. Correspondence solicited.

### Facilities.

The factories of this company are equipped with modern machinery and the process of manufacture is the result of many years' experience, enabling the manufacturers to produce superior sheet metal work along the above mentioned lines under the supervision of competent workmen. The artistic requirements as well as the intent of the drawings are faithfully carried out by well trained mechanics, permitting the execution without difficulty of most delicate, difficult, complicated details.

Prompt shipments guaranteed.

### Architectural Sheet Metal Work.

Estimates will be made from architects' drawings on every variety of sheet metal work required for buildings, large or small.

### Standard Underwriters' Windows.

The frames and sash are made of No. 24-gauge galvanized iron. Particular attention is directed to the excellent weathertight connections between sash and frame members.

The double hung windows are manufactured with roller or ball bearing pulleys, galvanized steel or bronze chain and standard locks and lifts.

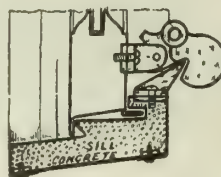
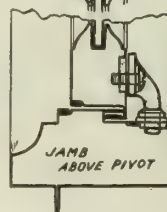
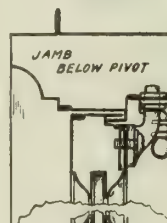
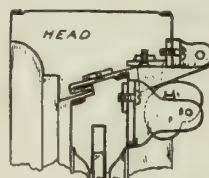
The pivoted windows are fitted with automatic closing arrangement; are provided with malleable iron pivots and gravity locks; also with heavy brass bushings in all bearings.

The adaptability of these different constructions is such as to permit their application to any design the architect may choose for installation of iron windows or frames.

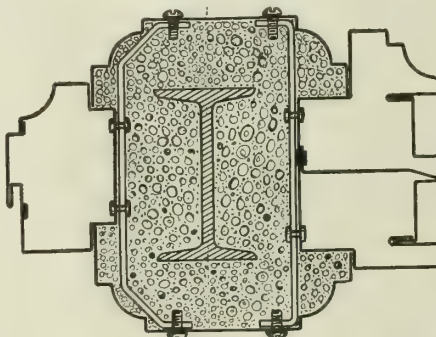
Mullions are provided when openings exceed 5 by 9 ft.

Concrete filling of sills and mullions should be done at the building.

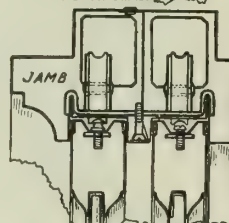
Wire glass should also be put in at the building.



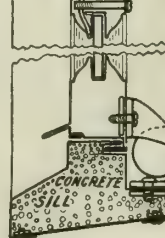
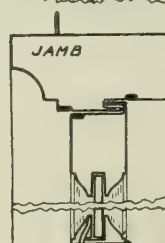
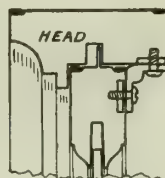
Type D Pivoted



Mullion



Type A Double Hung



Type K Top Hinged

STANDARD UNDERWRITERS' HOLLOW METAL WINDOWS

Illustrations are  $\frac{1}{8}$  actual size



### Standard Underwriters' Fire Doors.

**TIN CLAD FIRE DOORS**—Tin clad fire doors, manufactured by this company, are made with 2- or 3-ply cypress cores.

**Types**—Doors are built in several types to suit various conditions and requirements: horizontal, vertical, sliding and hinged types; the fire doors are also provided with standard hardware, for automatic closing.

**PANELED DOORS**—The panel styles of fire doors have wood cores, covered with special level, terne coated sheets, with pressed or drawn mouldings of any design. The panels are of solid construction or constructed of glass.

**FRAMES AND BUCKS**—The door frames are made of No. 18 special level steel; the bucks, of No. 14 gauge steel.

**FINISH**—The paneled types of Standard Underwriters' fire doors can be finished in baked enamel of any color; in imitation of various woods; or plain painted, as desired.

### Thinbar Sash.

**TYPES**—These sash are manufactured in different styles, such as counterbalanced, pivoted, hinged, etc.

**CONSTRUCTION**—Made of 16-oz. cold rolled copper or No. 24-gauge galvanized iron; hollow metal construction is generally adopted for fire protection purposes; galvanized metal is used for protection against corrosion; these and other advantageous features are worthy of consideration when selection of fireproof sash engages the attention of the architect or owner.

**SPECIAL INSTALLATIONS**—Copper thinbar sash are highly recommended by architects and contractors for installation in all places where chemical fumes and gases would be injurious to other surrounding material.

### Metal Skylights.

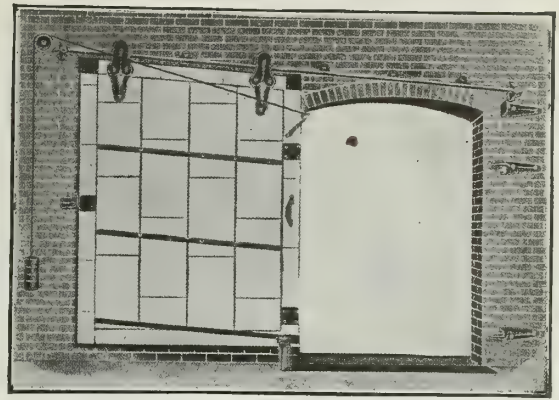
**ADAPTABILITY**—The Wagner system is adaptable to any form of skylight construction. For special large openings, the necessity for intermediate supports will be considered by the company, when desired.

**CONSTRUCTION**—All metal skylights made by this company are constructed of galvanized iron or copper. The design provides for condensation gutters and capping for glass. Wagner skylights require no attention after installation, can be made any size and are guaranteed not to leak. Every provision is made for an *economical* construction which will be permanently dust-proof and stormproof.

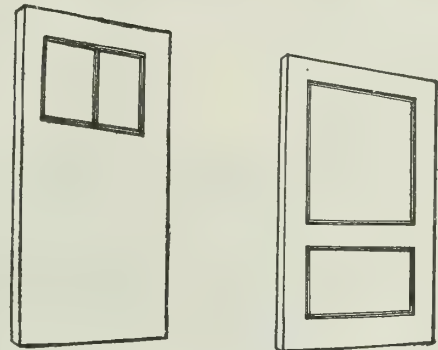
**EXPANSION AND CONTRACTION**—The capping construction provides a firm yet flexible hold for the glass, with sufficient give to allow for such vibration or expansion and contraction as the erection may be subjected to—thus reducing the danger of glass breakage to a minimum.

### Lufton Ventilators.

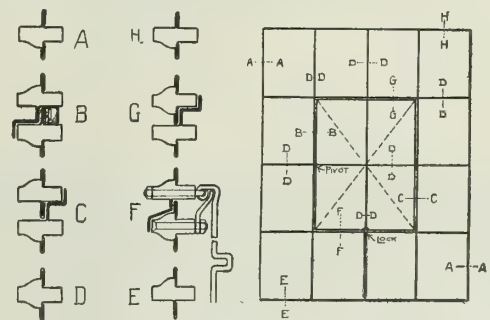
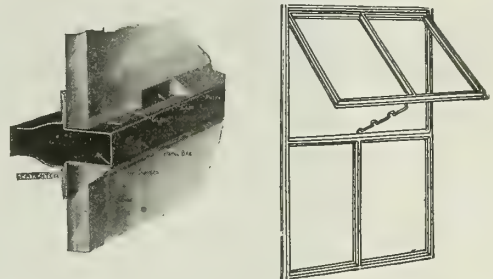
These ventilators are made of galvanized iron or copper in several types and sizes; and they give perfect ventilation in all kinds of weather. Further particulars will be mailed on application.



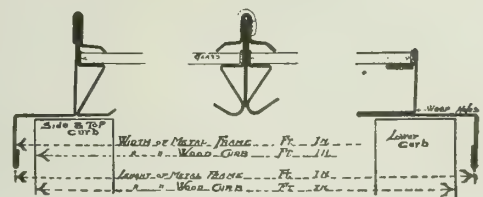
TIN-CLAD FIRE DOOR



PANELED FIRE DOORS



THINBAR SASH



SINGLE PITCH SKYLIGHT

# PENN METAL COMPANY

Manufacturers of Metal Windows, Doors, Shelving and Lockers

201 Devonshire Street

BOSTON, MASS.

NEW YORK OFFICE, 559 West 36th Street

## Products.

Penco Hollow Metal Windows and Doors; KALAMEIN Doors; TINCLAD Fire Doors; STEEL SHELVING, LOCKERS, etc.

For Metal Lath, etc., see page 216.



Trade Mark

of the National Board of Fire Underwriters, and this company *guarantees* that they are manufactured architecturally correct.

## Penco Hollow Metal Doors.

Formed of steel or genuine Hampton metal.

## Penco Hollow Metal Windows.

These windows are made pivoted, double hung or any standard or special type to fit any size opening. Formed of galvanized genuine Hampton metal or special coated steel.

INSTALLATION—When in place, no screws, bolts or fasteners are exposed to the weather. Installation or repair of any one part does not make necessary the removal of the entire window, or any part of it, each member being independent of the other.

DESIGN AND WORKMANSHIP—In design, mechanical perfection, workmanship and quality, Penco windows represent the best that 48 years of efficient service can suggest for reliable usage.

ECONOMY—The features of Penco hollow metal windows recommend them in all cases where eventual economy, coupled with permanence, is desired.



PENCO DOUBLE HUNG HOLLOW METAL WINDOW

Made of coated steel or Hampton metal; also made in pivoted or other type

Designed to serve under the most exacting conditions. Simplicity of construction is the foremost consideration, next to quality. Installation of a Penco door is simplified by the elimination of all unnecessary units.

## Penco Steel Shelving.

Fireproof; durable; verminproof; saves space; can be rearranged, added to or separated without damage to building where installed; can not chip, warp or crack; permanent and portable; displays and protects the stock; furnished in olive green or galvanized.

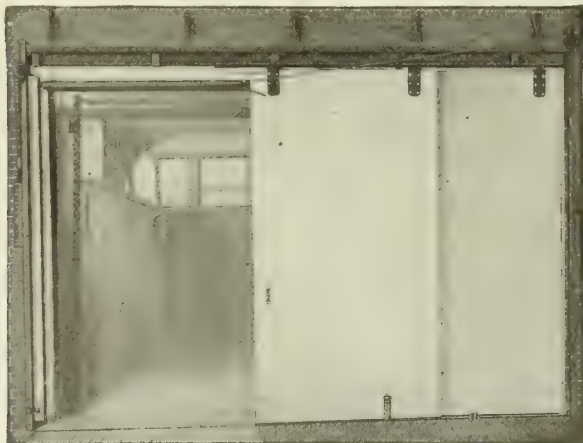
MATERIAL—Shelving is formed in all standard and special sizes from Nos. 14 to 20 gage special annealed sheets.

INSTALLATION—Shelving is carried in stock; special sizes, any type, size or quantity furnished without delay.

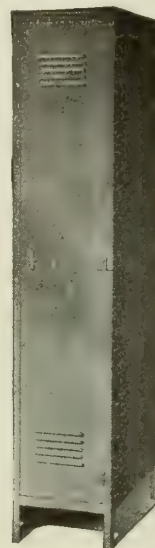


PENCO KALAMEIN DOOR

OFFICIAL APPROVAL AND GUARANTEE—The Penco hollow metal windows have received the official approval

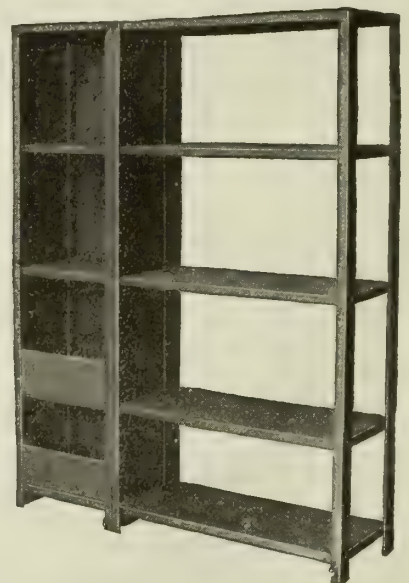


PENCO TINCLAD FIRE DOOR



METAL LOCKER

Made in galvanized, black or painted (olive green) steel



PENCO STEEL SHELVING



# WINSLOW BROS. COMPANY

## Window Department

TELEPHONE:  
445 AUSTIN

4600-4700 West Harrison Street  
CHICAGO, ILL.

NEW YORK OFFICE, 8 West 40th Street

PITTSBURGH OFFICE, Ferguson Building

AGENCIES IN ALL PRINCIPAL CITIES

### Products.

Designers and manufacturers of the WINSLOW WINDOW (Austral Balance), WINSLOW FIRE WINDOW, WINSLOW CASEMENT.

### Winslow Window.

**CONSTRUCTION**—All parts of window *solid rolled*, open hearth *steel*, specially designed, and welded connections throughout. Special hardware, shade fittings, cleaner bolts, etc., of solid bronze and drop forged steel, included with typical windows.

Simple and direct. No concealed counterweights or other mechanism. Finished with one coat of red lead and oil, other selected paint, or cold galvanized.

**AUSTRAL BALANCE AND ONE PLANE**—Upper and lower sash held in perfect balance and lie in *one plane* when closed, avoiding unsightly overhang at meeting rail.

**APPEARANCE**—The architectural value of Winslow window is definitely recognized, on account of its inconspicuous lines and lack of heavy or clumsy construction.

**EFFICIENCY**—Scientific ventilation; easily controlled; complete weather-tightness; ease of operation; additional daylight; approximating 15% to 20% more than ordinary double hung type.

**AWNINGS**—Shades on upper and lower sash make perfect, adjustable awnings, avoiding unsightly and expensive exterior awnings.

### Winslow Fire Window.

General construction same as Winslow window, adding dividing muntins, and bearing Underwriters' Laboratory labels.

### Winslow Casements.

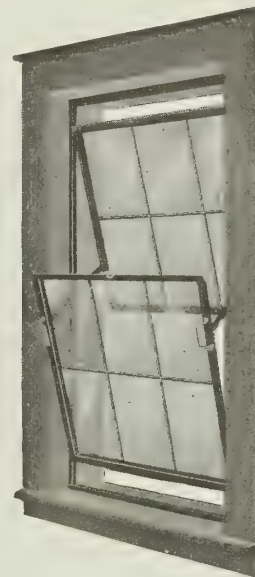
Similar construction to Winslow window, but with special hardware, comprising bronze stays, adjusters, hinges, handles, etc.

### Installations and Catalogue.

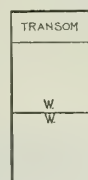
Upwards of 16,000 installations in important buildings in various cities. Complete illustrated catalogue will be mailed on request.



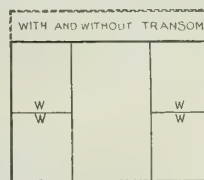
TYPICAL WINSLOW WINDOW



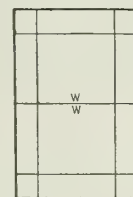
TYPICAL WINSLOW FIRE WINDOW



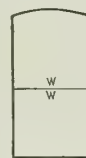
I



II



III



IV



V

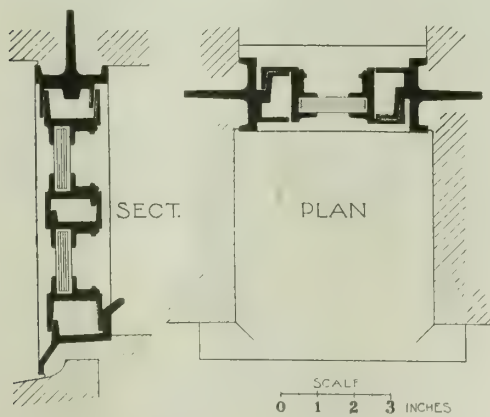


VI

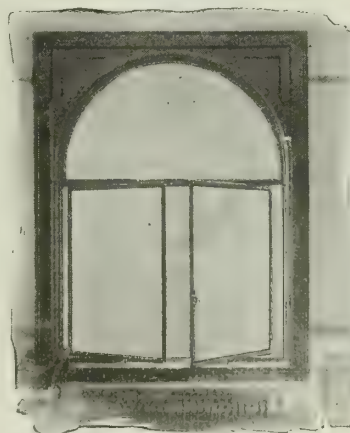


VII

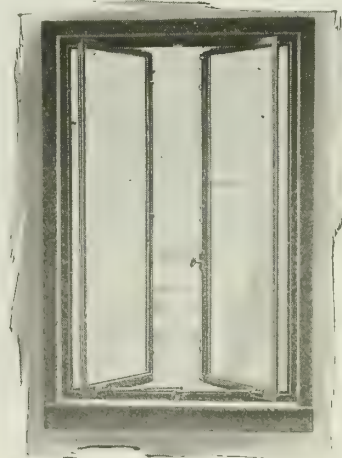
VARIOUS ADAPTATIONS AND DESIGNS FOR WINSLOW WINDOWS AND FIRE WINDOWS



DETAILS OF TYPICAL WINSLOW WINDOW



CASEMENT



DUPLIX PIVOTED CASEMENT

# AUSTRAL WINDOW CO.

Architects Building  
101 Park Avenue  
NEW YORK, N. Y.

## Products.

Manufacturers of AUSTRAL WINDOW HARDWARE, for Austral Balanced Windows.

Special Operating Devices and Curtain Pulleys used in connection with the Austral Window.

## Scope of Use.

Austral Hardware is applicable to Austral wood, kalamein, rolled steel and hollow metal windows for public buildings, offices, schools, hospitals, libraries, etc.

The one-plane solid steel window equipped with Austral Balance is designed for use in high grade buildings where special architectural effects are desired.

## Austral Hardware.

The types of Austral Hardware supplied by the AUSTRAL WINDOW Co. and applied to Austral wood or metal windows, are described as follows:

**APPLICATION TO AUSTRAL WOOD WINDOWS**—Type 2B and Type 2C Hardware (best grades): A set of type 2B Hardware consists of 2 balance arms, 4 sash guide pins, 2 parting strip bolts, with screws for applying; a set of Type 2C Hardware consists of 2 balance arms, 2 sash guide pins, 2 spring sash guide pins, 2 parting strip bolts, with screws for applying—electro-galvanized. Special prices on special finish.

Type 4 Hardware (second grade) galvanized finish: A set consists of 2 balance arms, 4 sash guide pins with screws for applying.

**APPLICATION TO AUSTRAL METAL COVERED AND HOLLOW METAL WINDOWS**—Type 2E and Type 2F Hardware: Each set consists of 2 balance arms, 4 sash guide rollers, 2 parting strip bolts, with screws for applying. Type 2F is approved by the National Board of Fire Underwriters.

## Advantages of Austral Windows.

(1) Permit free ventilation and circulation of air without draft. (2) Absolute control of light. (3) Reversible for cleaning and reglazing. (4) Exterior awnings eliminated. (5) Plank frames only are used, affording ad-

ditional light area. (6) Austral mullions are made about half the width required for double hung windows. (7) Windows adjusted by slight pull on lower sash. (8) Extreme simplicity in construction and operation.

## Austral Windows.

A simple balanced window construction through use of Austral Hardware, which eliminates sash weights, cords, pulleys, weight boxes and attendant disadvantages.

These windows (except the wood) are built by various licensed manufacturers under the supervision of this company. Weatherstripping integral with frame and sash. Wood frames and sash built by any mill according to furnished details.

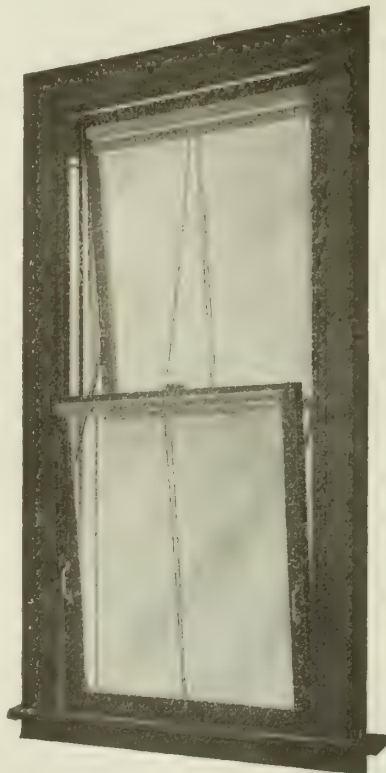
**OPERATION**—Austral sash are counterbalanced on pivot bars attached to the center of frames, with sash guide pins or hooks attached to lower corner of lower sash and upper corner of upper sash. Guide pins or hooks operate in vertical grooves or along parting strip, permitting free adjustment of sash. (See illustrations.)

**ORDERING**—Furnish width and height of masonry openings, thickness of sash, type of window.

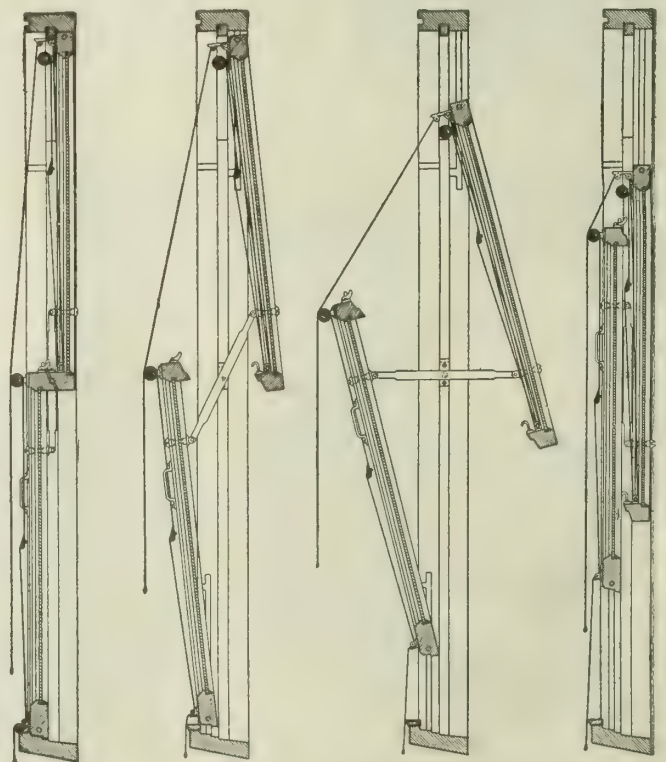
## Co-operative Services.

Full instructions for hanging windows accompany each set of hardware.

Specifications, details, prices, references and full information furnished on request.



AUSTRAL WINDOW EQUIPPED WITH AUSTRAL FIXTURES



VERTICAL SECTIONS THROUGH AUSTRAL WINDOWS, SHOWING SASH IN VARIOUS POSITIONS



# THE CASEMENT HARDWARE CO.

TELEPHONE:  
FRANKLIN 2790

9 South Clinton Street  
CHICAGO, ILL.

## Products.

CASEMENT ADJUSTERS, for outswinging casement windows, in all finishes.

Fasteners and Sash Reversing Devices for outswinging casement windows.

## Advantages of C-H Adjusters in General.

OPERATION WHOLLY FROM INSIDE THE SCREEN AND STORM SASH—Outswinging casements thus equipped are weathertight, convenient to operate, and permit of more artistic and practical treatment of shades and screen than do casements swinging in.

QUICK, POSITIVE ACTION COMBINED WITH POWERFUL LEVERAGE—By patented telescoping handle and direct acting bent lever. Release, swing, and relock sash with one continuous, quick motion. This rapid action, important in case of storms, etc., is impossible with more complicated adjusters.

COMPACTNESS—Handles telescope practically flush with edge of stool. Neat, without difficulties of removable handles. Adjusters shipped in strong separate boxes with complete installation data in each box.

Convertible "rights" and "lefts" except "Master."

## How to Detail.

"A"=distance from sash to screen.

"B"=distance from sash to face of apron.

For "Holdfast": "A"=2 to 4 ins., "B"=4¼ to 6 ins.

For "Bull-Dog": "A"=1⅞ to 2¾ ins., "B"—not fixed.

For "Master": "A"=2 to 5 ins., "B"—not fixed.

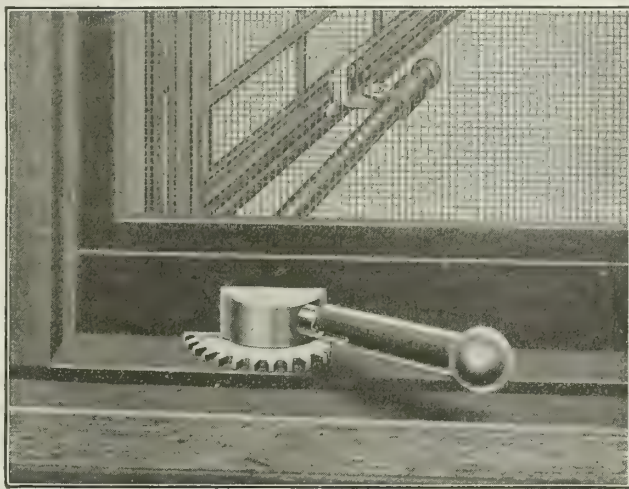
Standard sash width 18 to 32 ins. Lesser widths to order. No extra charge.

To avoid misfits always give "A" and "B" in ordering. 2 ins. only is recommended for "A" unless roller bearing is used.

Architects should get our free illustrated Casement Handbook for their draughtsmen.

SIMPLICITY AND LOW COST OF INSTALLATION—"Bull-Dog" design and construction represents the limit of simplicity, both as regards operation and installation.

Three sturdy, compact parts. Can be assembled and installed complete in less than fifteen minutes. Only 6 screws and fitting of rebated screen stop required.

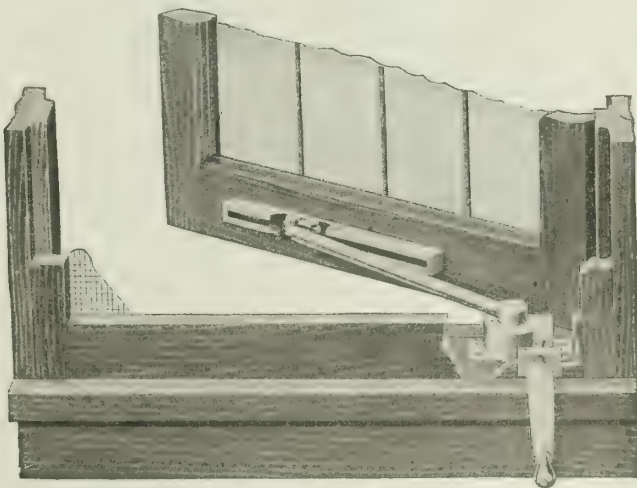


THE "BULL-DOG" CASEMENT ADJUSTER

Application to steel sash as with "Hold-Fast." Screen in place, window partly open (full opening 90°). Standard equipment is furnished for wood sash. Made in solid brass, also combined steel and brass.

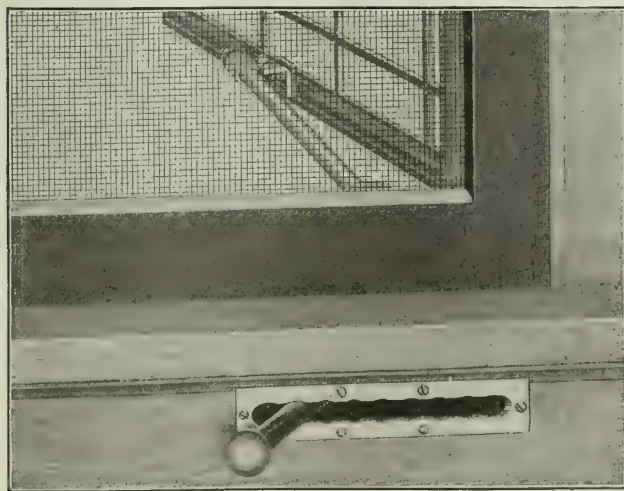
## Roller Bearings ("Bakelite").

Roller bearing steel traveler furnished with "Hold-Fast" or "Bull-Dog" at small extra expense.



"MASTER" CASEMENT ADJUSTER

A new, perfected C-H adjuster, with worm gear action. Completely covered gears. Frictionless roller-bearing sash connection. Handle of ample size, with easy grip, furnished in variety of pleasing designs. Sizes for almost every type of construction, wood or steel sash. All exposed parts brass, except traveler.



THE "HOLD-FAST" CASEMENT ADJUSTER

Application to steel casement by means of wrought steel lug. Screen in place, sash partly open (full opening 85° to 90°). Pivot between screen and sash. Standard equipment is for wood sash. All exposed parts are solid brass.

## Important "Bull-Dog" Features.

POWERFUL LEVERAGE—The "Bull-Dog" handles the heaviest sash quickly and easily in high winds.

## Warranty.

All C-H adjusters are warranted for five years against defects in workmanship or material.



H. I. SORENSEN, PRESIDENT

C. D. TABOR, VICE-PRESIDENT

# THE FRICTION PIVOT CO., INC.

TELEPHONE:  
BRYANT 7868105 West 40th Street  
NEW YORK, N. Y.FACTORY  
NEWARK, N. J.

## Products.

ELEVATING SASH PIVOTS, NON-ELEVATING SASH PIVOTS, FRICTION SASH CENTERS, ELEVATING CASEMENT HINGES, CASEMENT FRICTION HINGES, TELESCOPIC CASEMENT ADJUSTERS.

Special fixtures made to detail.

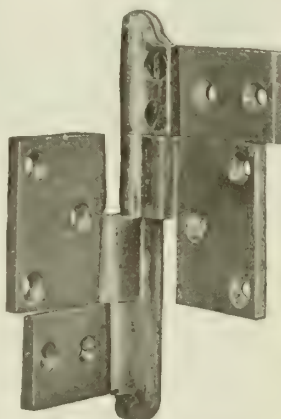
## C. D. T. Window Hardware Specialties.

This company is the manufacturer of C. D. T. window hardware specialties, designed by C. D. Tabor, mechanical expert, and vice-president of the company, for many years identified with the late Tabor Sash Fixture Co., Newark, N. J. Since severing connections with them in 1912 he has given his best thought and skill to perfecting the C. D. T. sash hardware. Every fixture embodies positively new and practical features in construction that justify our claim to superiority.

For our full line of various types, sizes and finishes, see catalogue.

## C. D. T. Combination Casement Hinge and Adjuster.

This two-in-one device is prominently featured by this company. The leaves are so divided that the upper section (sash leaf) and the lower section (jamb leaf) combine the safety feature supporting sash, regardless of accident to friction clamps. A strong steel pin extending the entire length of knuckles with all bearing parts bronze on steel. The center section leaves operating freely, and upper and lower leaf sections are provided with an adjustable tension, which can be set to hold light or heavy sash in desired position, hence eliminating the troublesome adjuster.

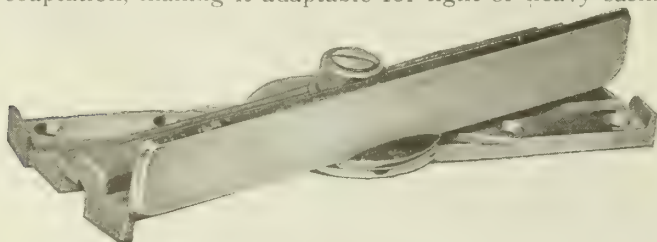


NO. 250 COMBINATION  
CASEMENT HINGE  
AND ADJUSTER

## No. 400 C. D. T. Non-elevating Vertical Sash Pivot.

Designed by C. D. Tabor to meet the demand for simpler mill construction, without sacrifice of efficiency. The liability of breakage, in rough handling, of large sash of the "raising and lowering" type of construction, is eliminated.

This fixture has a long, powerful grip with a friction bar of steel, extending its entire length. The tension is adjustable, and regulated by an ingenious arrangement of a hollow pivot-spring and set screw coaptation, making it adaptable for light or heavy sash.



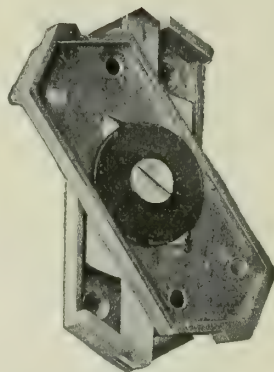
NO. 400 C. D. T. NON-ELEVATING VERTICAL SASH PIVOT



TRADE-MARK

## C. D. T. Continuous Friction Pivot.

Especially designed for the finest metal and wood construction. Its advanced feature is a continuous friction, operating steel-against-bronze, acquiring requisite tension by an unique idea and application, of a steel diaphragm regulated by a special pivot-screw and nut adjustment.



NO. 363 C. D. T. CONTINUOUS FRICTION PIVOT

## C. D. T. Elevating Hinge and Equipment for Casements.

One of C. D. Tabor's best productions, and approved for government work. It is extra heavy; has great operating power, and all bearing parts are protected by steel bushings. The top hinge has an automatic safety lock that prevents the sash from being lowered until fully closed. It unlocks top, sides and bottom automatically with the raising, and securely relocks by the lowering of the sash. Made in cast bronze or brass, finished as desired.



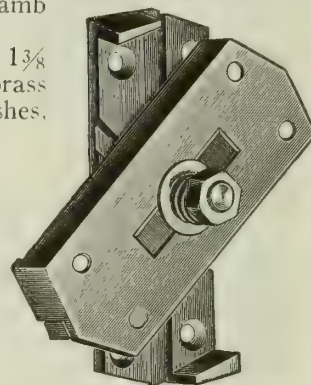
NO. 300  
C. D. T. ELEVATING CASEMENT HINGE

## C. D. T. Friction Sash Center.

Made for rabbeted or plain edge sash. To insure against shrinkage a compensating feature has been provided, eliminating strain on fixture woodwork and glazing.

A steel pivot with full length holding bar seated on a conical base, boxed in sash case and recessed in jamb plate, make it weatherproof.

Made in all sizes, from 1 3/4 ins. to 3 ins., in cast bronze, brass and iron and in various finishes, as may be required.



C. D. T. FRICTION SASH CENTER

## No. 600 C. D. T. Elevating Vertical Pivot.

A fixture for (1 3/4-in. and 2-in.) sash, pivoted at top and bottom. (Nos. 650 and 750 for 2 1/4- and 2 1/2-in. sash.) Strong and powerful, operating the largest and heaviest windows easily. A constant, increasing demand attests its merits.



NO. 600 C. D. T. ELEVATING VERTICAL PIVOT



# GRANT PULLEY AND HARDWARE COMPANY

SUCCESSORS TO TABOR SASH FIXTURE COMPANY

For the Manufacture and Sale of the Tabor Window Strips and Revolving Fixtures

Architects Building, 101 Park Avenue

TELEPHONE CONNECTION

NEW YORK, N. Y.

Agents in all the Principal Cities of United States and Canada, and our Name will be found listed in the Telephone Directories

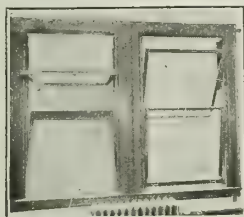
## Products.

TABOR WINDOW STRIPS and REVOLVING FIXTURES.

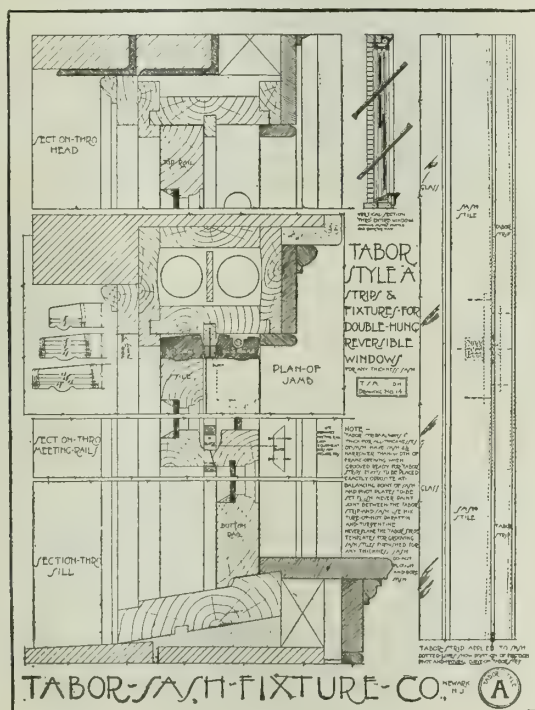
For Wood Rolling Partitions, see page 770; for Door Hangers and Bar Locks, see pages of Reliance-Grant Elevator Equipment Corp., 626-29; for Sash Pulleys, see pages 760-61.

## Tabor Style "A."

This is an equipment that makes it possible to pivot an ordinary double hung window. Its installation is quick and simple. All that is required is the regular standard box frame with the sash 2 ins. narrower than the frame opening, omitting plough and bore. Sash stiles are then grooved; Tabor strip and fixtures attached; and sash is ready to be hung the same as any weighted window sash. Each strip is slightly curved; and when drawn to the sash at the pivotal point, this curve forms a spring of the strip itself, making a tight and permanent contact between sash and strip. One edge of the strip fills the entire space between the jamb and the sash. Corrugations on the pivot plates hold the sash, when pivoted, at various positions for ventilation.



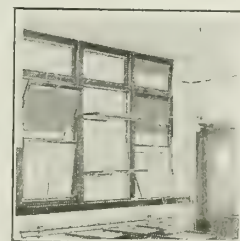
TABOR STYLE "A"



DETAIL OF TABOR STYLE "A"

## Tabor Style "D."

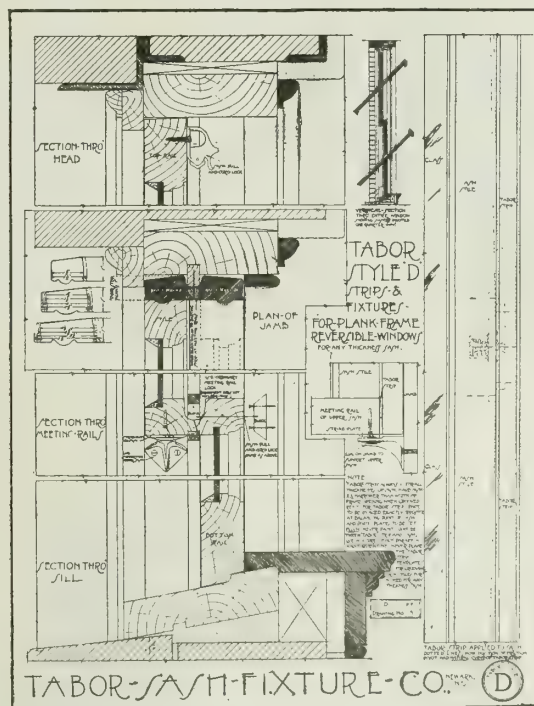
The Tabor Style "D" is the Tabor strip applied on plank or solid frame construction. Its ideal utility is for schoolhouses, and office building equipment, and for buildings where it is not necessary to screen windows. It eliminates the cost of box frames, weights and chains, thereby offering increased efficiency at a very low cost. The plank frame construction, equipped with the Style "D" fixture, allows a greater light area, particularly in mullion windows, and a more complete control of ventilation without draft than any other form of construction. Accessibility for cleaning and "safety first" precautions are the same considerations as in the selection of our Style "A" fixture. Since it is not necessary with Style "D" to slide the sash, same can be fitted very tightly, and assures a more weatherproof construction than the regular double hung. Window shades, being attached directly on the sash, provide a perfect substitute for awnings.



TABOR STYLE "D"

## Catalogue, etc.

Catalogue and full size details showing other styles of equipment furnished on request.



DETAIL OF TABOR STYLE "D"

# MICHIGAN ENGINE VALVE COMPANY

Sole Manufacturers of Howarth's Sash Centers

115-117 West Columbia Street  
DETROIT, MICH.

## Products.

HOWARTH'S FRICTION and ANTIFRICTION SASH CENTERS and EXTENSION HOOKS.

## Finishes.

All iron sash centers are finished in good serviceable imitation bower-barff finish. Brass goods finished natural.

Special finishes made to match any requirements or specifications.

## General Information.

This company manufactures 10 distinct styles of sash centers and makes them for any thickness of sash from 1 1/8 to 3 ins. A large stock of centers is always kept on hand and shipments are made promptly.

A complete catalogue is issued, giving full details, price lists, etc., and one will be mailed to any address upon application.

All hardware men are familiar with Howarth sash centers and are prepared to quote discounts.

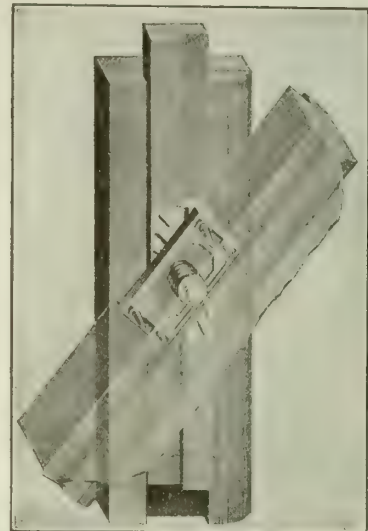
## Adaptability.

Where a friction center is desired to hold the sash at different angles without the use of adjusters the No. 300A to 0306 is recommended. These centers are ideal for pivoting sash in office buildings, schools, factories, foundries, etc., and can be used for swinging sash either horizontally or vertically.

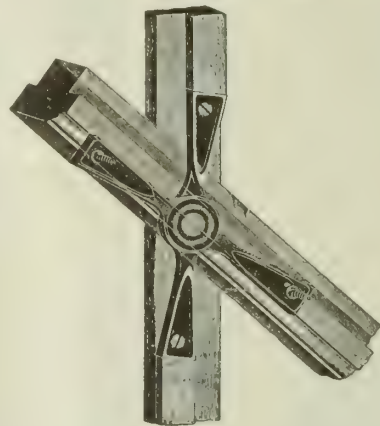
The hanging stile as shown in illustration should be fitted to the sash, and the centers applied to them at the sash factory; the rabbet should be 1/2 in.

For monitor windows, or where windows are operated in batteries or with cords and pulleys, and where a good, serviceable, watertight job is required, use Nos. 10 to 012 centers; with hanging stiles, rabbet should be 1/2 in.

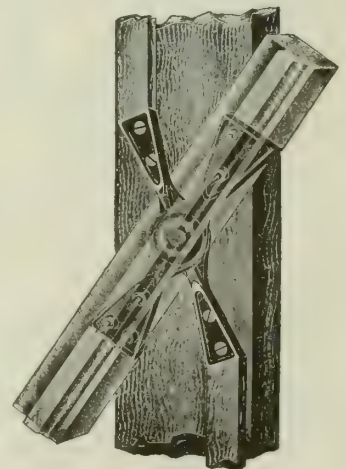
Where an inexpensive construction is wanted for foundries, factories, etc., use Nos. 20 to 022. No hanging stiles are necessary for these centers. The centers are fitted to the sash and to the jambs. Nail a stop to the jamb on the outside from the head of frame to center and on the inside from the center down to the sill; sash should be made the full width of the opening.



HOWARTH'S SASH CENTER, APPLICATION OF NOS. 300A TO 0306



HOWARTH'S SASH CENTER, NOS. 10 TO 012



HOWARTH'S SASH CENTER  
NOS. 20 TO 022

## SIZES AND PRICES OF HOWARTH'S SASH CENTERS FOR ONE SASH

IRON		BRASS	
No. 300A, for 1 1/8-in. sash.....	\$1.00	No. 0300A, for 1 1/8-in. sash.....	\$4.40
No. 300, for 1 3/8-in. sash.....	1.00	No. 0300, for 1 3/8-in. sash.....	4.40
No. 301, for 1 3/4-in. sash.....	1.15	No. 0301, for 1 3/4-in. sash.....	4.60
No. 302, for 2-in. sash.....	1.40	No. 0302, for 2-in. sash.....	4.85
No. 303, for 2 1/4-in. sash.....	1.70	No. 0303, for 2 1/4-in. sash.....	5.40
No. 304, for 2 1/2-in. sash.....	2.00	No. 0304, for 2 1/2-in. sash.....	6.00
No. 305, for 2 3/4-in. sash.....	2.30	No. 0305, for 2 3/4-in. sash.....	6.50
No. 306, for 3-in. sash.....	2.60	No. 0306, for 3-in. sash.....	7.00
No. 10, for 1 3/8- to 1 1/2-in. sash.....	.40	No. 010, for 1 3/8- to 1 1/2-in. sash.....	1.70
No. 11, for 1 3/4- to 2-in. sash.....	.50	No. 011, for 1 3/4- to 2-in. sash.....	2.60
No. 12, for 2 1/4- to 2 1/2-in. sash.....	.80	No. 012, for 2 1/4- to 2 1/2-in. sash.....	4.40
No. 20, for 1 3/8-in. sash.....	.50	No. 020, for 1 3/8-in. sash.....	2.30
No. 21, for 1 3/4-in. sash.....	.60	No. 021, for 1 3/4-in. sash.....	3.00
No. 22, for 2 1/4-in. sash.....	.90	No. 022, for 2 1/4-in. sash.....	4.75



# MALLORY MANUFACTURING CO.

Manufacturers of Shutter Workers

225 Main Street  
FLEMINGTON, N. J.

## Product.

MALLORY'S STANDARD SHUTTER WORKER.

## Description.

It operates shutters in any wind or storm, saves repair cost caused by damage from pulling in blinds by the slats, locks the blinds against opening from outside, avoids cold currents in winter by keeping windows shut, permits instant removal of blind for painting, automatically holds blind firmly in any position or against house, does away with rattling, and removes danger of leaning out of window to release catch.

It is easily installed in old or new houses, frame, brick, concrete, or stone, without tearing out walls.

Automatic two-fold blind attachment can be furnished to operate blinds where one blind is hinged to

## Construction.

They are made of durable metal, carefully hand fitted and finished in every part, insuring easy working qualities and long wear.

The principal working parts are of malleable iron and wrought steel forgings, accurately machine cut. They are tightly incased and can not be affected by any kind of weather. The incasing box is small and neat, and is inconspicuous both from inside and out. The handle is 2 ins. long and, with escutcheon plate, adds to the finish of the casing.

## Details.

Details showing all styles may be had on request.

## Installation.

Installing merely requires a  $\frac{1}{2}$ -in. hole bored through the casing, centered  $\frac{7}{8}$  in. from edge of casing, which does not interfere with the sash weights; the worker is attached to the shutter and the escutcheon plate is then screwed on. Each shutter operates independently.

Where subjamb is used, they should be placed, if possible,  $3\frac{1}{2}$  ins. to 4 ins. from edge of casing, to give room for handle to revolve, and the hanging style should also have a width of at least  $1\frac{3}{8}$  ins. to make room for the worker on the outside. Workers vary in throw of hinge and length of rod.

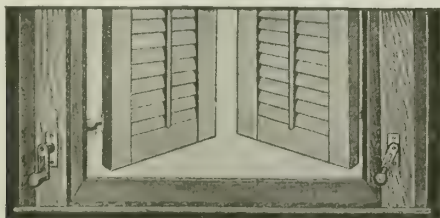
Frame workers throw the blinds around a reveal of  $2\frac{1}{2}$  ins., rods  $10\frac{1}{8}$  ins. long, less  $\frac{7}{8}$  in. for handle. Brick house workers throw around a  $3\frac{1}{2}$ -in. reveal; rods  $17\frac{1}{8}$  ins. long.



MALLORY'S AUTOMATIC TWO-FOLD BLIND ATTACHMENT

the other and folded back upon the other when open. These can be operated with our shutter workers so that such blinds can be opened or closed from the inside.

FOR CASEMENT WINDOWS—Mallory shutter workers are also used to operate casement windows, and the sash can be operated without interfering with inside screens.

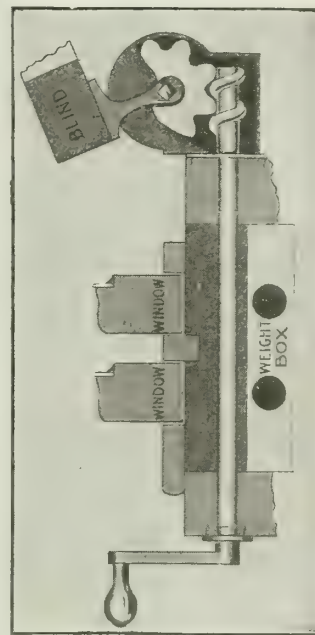


Interior View



Exterior View

MALLORY STANDARD SHUTTER WORKER



SECTIONAL VIEW OF SHUTTER WORKER, SHOWING SCREW AND WORM WHEEL

# THE WILLIAMS PIVOT SASH CO.

## Reversible Pivoted and Casement Window Fixtures

### CLEVELAND, OHIO

#### BRANCH OFFICES

CHICAGO, M. R. DUFFY, 708 Security Building  
 PHILADELPHIA, J. H. WINDELL, 707 South 56th Street  
 BOSTON, SKILLMAN & SUNDERLAND Co., 6 Beacon Street  
 CHARLOTTE, N. C., D. F. HOOVER, P. O. Box 1003

DETROIT, T. B. RAYL Co., Woodward and Grand River Avenues  
 PITTSBURGH, J. R. COLCLOUGH, 4070 Jenkins Arcade  
 CINCINNATI, GEO. C. RAMSEY, Builders & Traders Exchange

#### Products.

WILLIAMS REVERSIBLE WINDOW FIXTURES for Double Hung and Plank Frame Windows.

WILLIAMS STORMPROOF SUBSILL for Casement Windows.

WILLIAMS WINDOW FIXTURES for Vertically Pivoted Windows.

#### Adaptability of Reversible Window Fixtures.

**DOUBLE HUNG**—Williams fixtures for double hung windows are adaptable for use on windows in office buildings, hotels, hospitals, schoolhouses, and public buildings.

**PLANK FRAME**—Williams fixtures for plank frame windows are adaptable for use on windows in schoolhouses and factories.

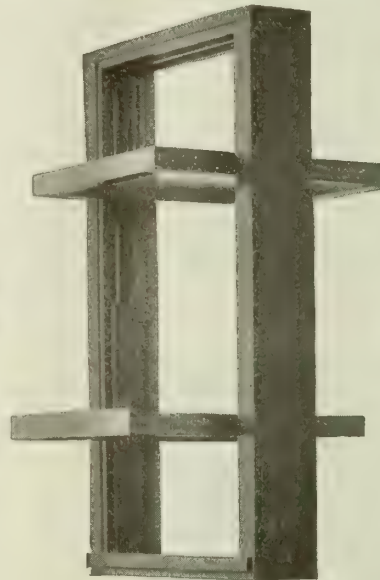
#### Advantages of Reversible Window Fixtures.

Windows equipped with Williams reversible fixtures afford overhead ventilation without draft. Roller springs prevent rattling and insure ease of operation.

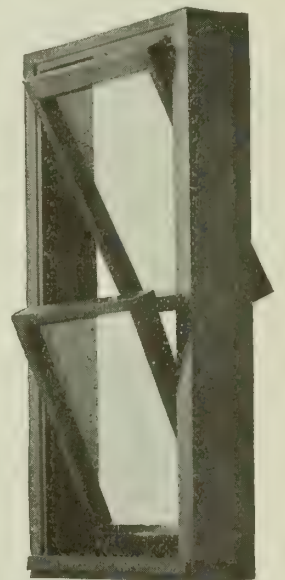
Outside of both sash can be cleaned from the floor with the opening closed in one-half the time ordinarily occupied, on account of both hands being available for cleaning. This insures rapid, safe and eco-



SECTION OF SASH AND FRAME  
Showing strip, roller spring and pivot



DOUBLE HUNG  
Showing 100% opening



PLANK FRAME  
Showing overhead ventilation

nomie cleaning. Many managers of hotels and office buildings recognize this device as a factor in the economic management of the building.

Weatherstrips may be used if desired.

Plank frame windows in schoolhouses especially have the added advantage of the elimination of weights, cords and pulleys. A plank frame is substituted for a box frame and it is possible to provide a more weather-tight window than can be obtained by an ordinary double hung window not provided with weatherstripping. On mullioned windows a greater light area is obtained.

#### Installation.

A staff of expert mechanics is maintained to install Williams fixtures.

This service includes fitting and hanging of sash as well as the application of fixtures. This fixes the responsibility for successful operation. Over fifteen years of experience stand back of these fixtures.

Small orders sold f.o.b. Cleveland, if desired.

#### Williams Double Hung Reversible Window Fixtures.

The Williams double hung reversible window fixtures require no special construction of frames or sash. The sash are merely to be made  $1\frac{3}{4}$  ins. narrower than inside width of frame.



The sash are operated the same as an ordinary double hung window with the additional advantage that each sash can be completely reversed or raised and lowered at will.

The Williams fixtures to be applied to double hung windows are the Williams Corrugated Side Strip with Truncated Cone Pivot and Spring Rollers.

**WILLIAMS CORRUGATED SIDE STRIP**—A wood strip of well seasoned hard maple,  $\frac{7}{8}$  in. thick, of width equal to thickness of sash, corrugated on the sash side. Furnished in length required for sash. Affixed to this strip are:

**Truncated Cone Pivot**—A reliable and effective sash pivot is assured by application of the truncated cone as a pivot. Weight of sash is automatically used to draw reversible strip and sash together tightly, thereby nesting corrugations in strip and sash firmly. The pivot holds sash in any position when open, without the aid of transom lift or chain. Made of cast iron with parts carefully fitted.

**Spring Roller**—A roller and spring device, the constant contact of which with the jambs allows free sliding movement, and keeps strip in snug contact with sash when in closed position.

**HARDWARE**—This company will furnish window hardware (locks, lifts, sockets and poles) if desired, but this is not essential, as the regular hardware may be used. However, a ring socket which will permit the top sash to be tilted without the window pole binding in the socket is recommended.

**SPECIFICATION**—All double hung windows shall be equipped with Williams Reversible Fixtures consisting of Williams Corrugated Side Strips with Truncated Cone Pivots and Spring Rollers. Fixtures shall be furnished and installed by THE WILLIAMS PIVOT SASH Co., Cleveland, Ohio. (This includes fitting and installing sash after weights are strung.)

**REFERENCES**—The following buildings are equipped with the double hung fixtures; the number of openings is also given.

Hotel Cleveland, Cleveland, Ohio—1,229  
Hotel Statler, St. Louis, Mo.—788  
Hotel Tuller Addition, Detroit, Mich.—467  
Hotel Ten Eyck Addition, Albany, N. Y.—529  
Carnegie Steel Co., Youngstown, Ohio—252  
Canadian Westinghouse Co., Hamilton, Ont.—361  
Hotel Statler Addition, Detroit, Mich.—271  
Hotel Winton, Cleveland, Ohio—587  
Hotel Olmsted, Cleveland, Ohio—220  
College of Agriculture, Syracuse, N. Y.—353  
Crosby Building, Buffalo, N. Y.—199

### Williams Plank Frame Reversible Window Fixtures.

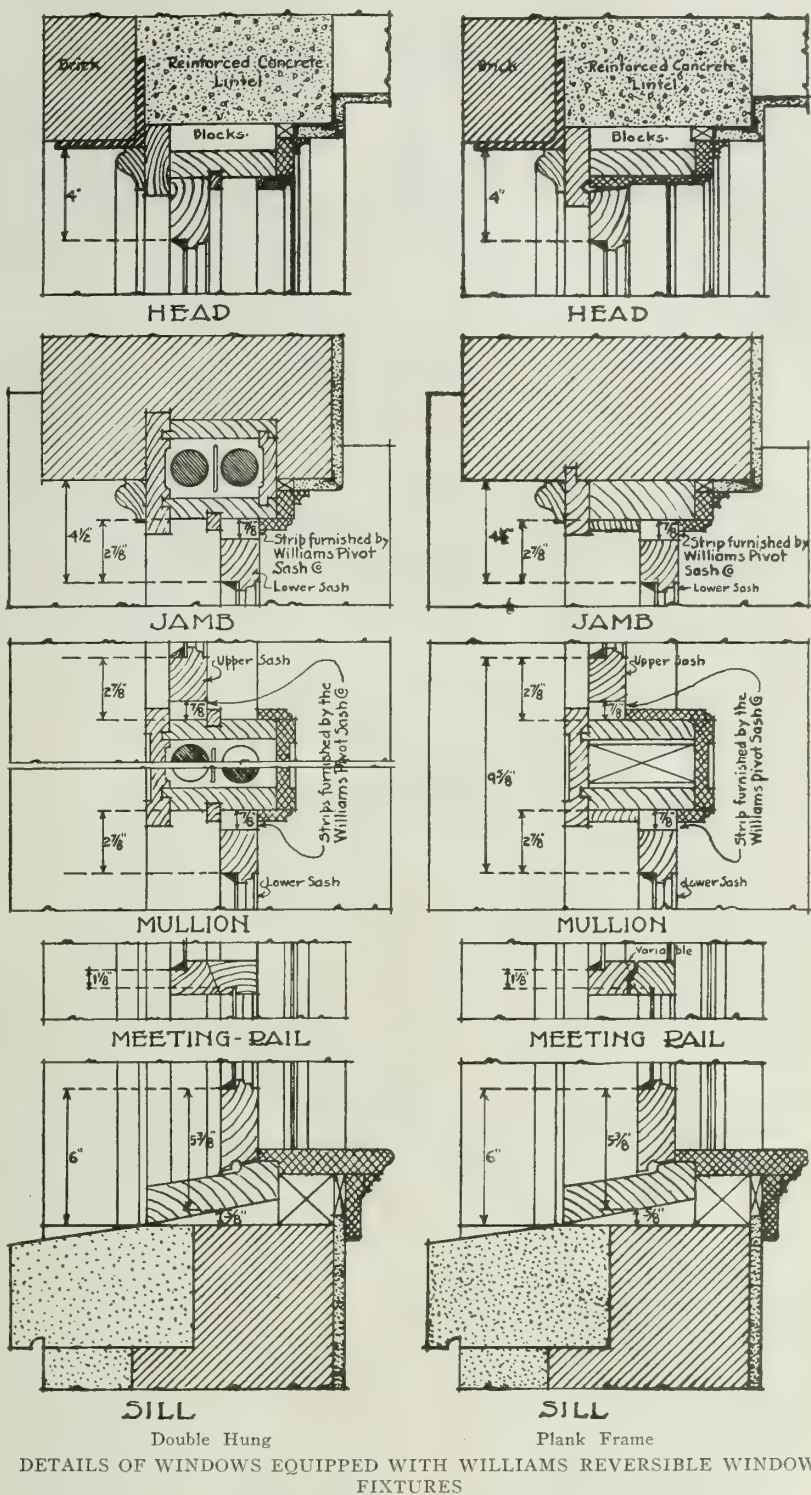
No special construction of frame required.

Sash to be made  $1\frac{1}{4}$  ins. narrower than jamb opening.

The Williams fixtures to be applied to this type of window are:

**WILLIAMS CORRUGATED SIDE STRIP**—Same as described under double hung windows.

**SPECIFICATION**—All plank frame windows shall be equipped with Williams Reversible Fixtures consisting of Williams Cor-



rugated Side Strips with Truncated Cone Pivots and Spring Rollers. Fixtures shall be furnished and installed by THE WILLIAMS PIVOT SASH Co., Cleveland, Ohio. (This includes fitting and installing the sash.)

**REFERENCES**—The following schools are equipped with the plank frame fixtures; the number of openings is also given.

High School, Canton, Ohio—523  
High School, Huntington, W. Va.—491  
High School, Turtle Creek, Pa.—249  
High School, Harrisburg, Pa.—488  
State Normal School, Potsdam, N. Y.—265  
Firestone School, Akron, Ohio—273  
Moorehead School, Durham, N. C.—174  
Jackson School, York, Pa.—64

**Williams Single and Double Casement Window Fixture.**

A perfect weatherproof casement window sill.

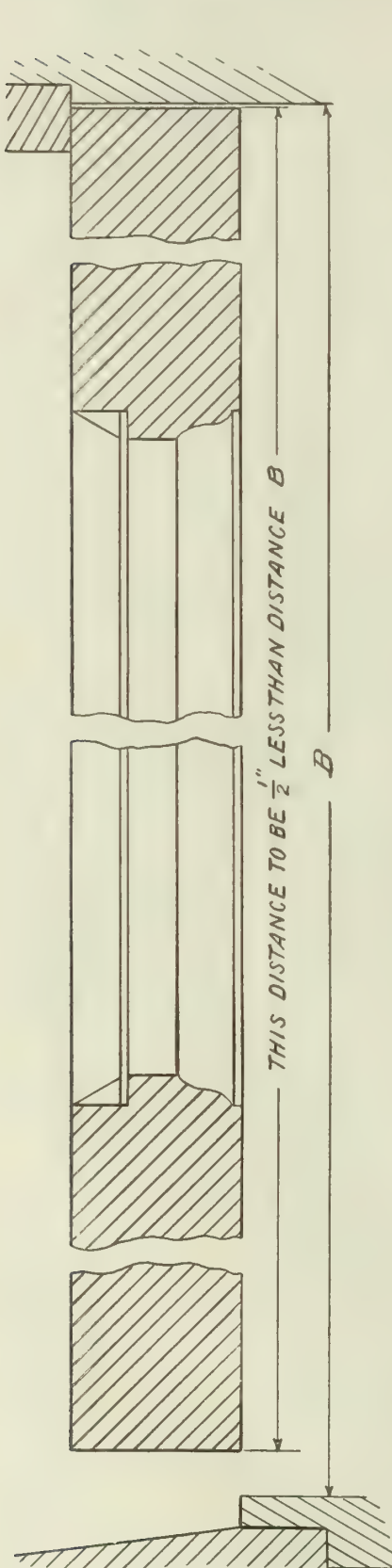
No special construction of header, sill or side jambs required.

Double casement fixture made with divided clos-

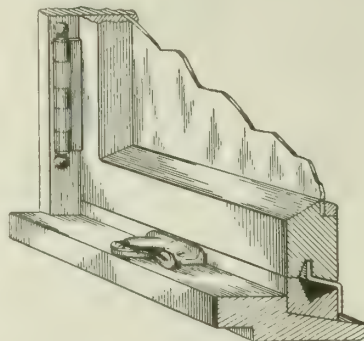
ure bar providing for independent operation of each sash.

Subsill and closure bar furnished with operating devices attached.

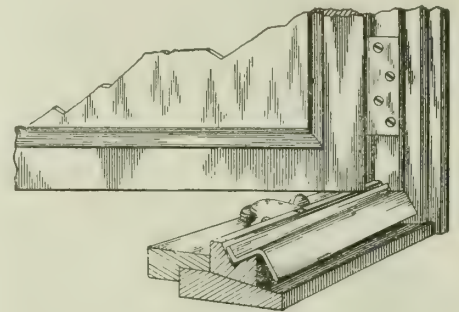
Use the ordinary butt hinge.



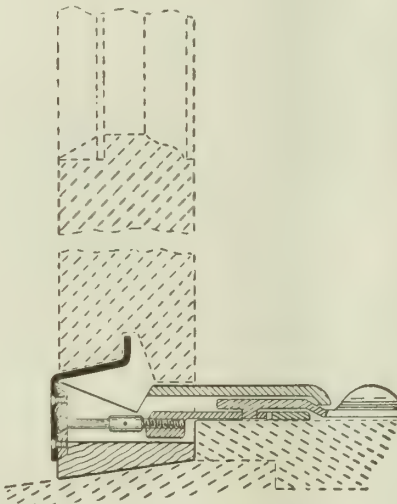
MILL DETAIL  
Showing sash construction



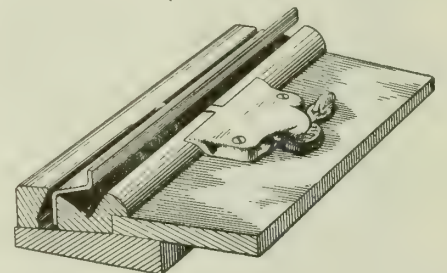
SECTION THROUGH BOTTOM RAIL,  
SUBSILL, STOOL AND SILL  
Sash and closure bar in closed position



SECTION THROUGH BOTTOM RAIL, SUB-  
SILL, STOOL AND SILL  
Sash and closure bar in open position



SECTION THROUGH BOTTOM RAIL  
AND OPERATING DEVICE  
Showing stool plate, eccentric lever,  
threaded adjusting rod, and closure bar en-  
gaged in groove in sash when closed.



SECTION THROUGH SUBSILL, FLOOR LINE  
AND SILL  
Closure bar raised, showing mould on inside  
and exterior protection for French or casement  
doors

**Specifications for Williams Stormproof Casement Fixtures.**

All casement or hinged sash to be equipped with The WILLIAMS PIVOT SASH Co.'s Stormproof Subsill and Closure Bar. Sash shall be made to conform to THE WILLIAMS PIVOT SASH Co.'s detail.

This company is to furnish the wood subsills, closure bars, stool plates and operating devices.

All finished hardware shall be equal to other hardware used in building in metal and style of finish.

Sash details and description may be seen at the office of the architects, or, by applying to THE WILLIAMS PIVOT SASH Co., Cleveland, Ohio.

**Specifications for Vertically Pivoted Sash.**

All vertically pivoted sash to be equipped with THE WILLIAMS PIVOT SASH Co.'s Vertical Sash Fixtures. Sash shall be made in width and height to conform to THE WILLIAMS PIVOT SASH Co.'s detail.

This company is to furnish the hardware, etc., necessary to equip all vertically pivoted windows specified, such as wood subsills, follower strips, closure bars, pivot plates, operating devices, spring rollers, guide screws and sash handles.

All finished hardware shall be equal to other hardware used in building in metal and style of finish.

Sash details and description may be seen at the office of the architect, or by applying to THE WILLIAMS PIVOT SASH Co., Cleveland, Ohio.





HEADER CONSTRUCTION, SHOWING TOP PIVOT, FOLLOWER STRIP, ROLLER SPRINGS AND GUIDE SCREWS

**Williams Vertically Pivoted Window.**

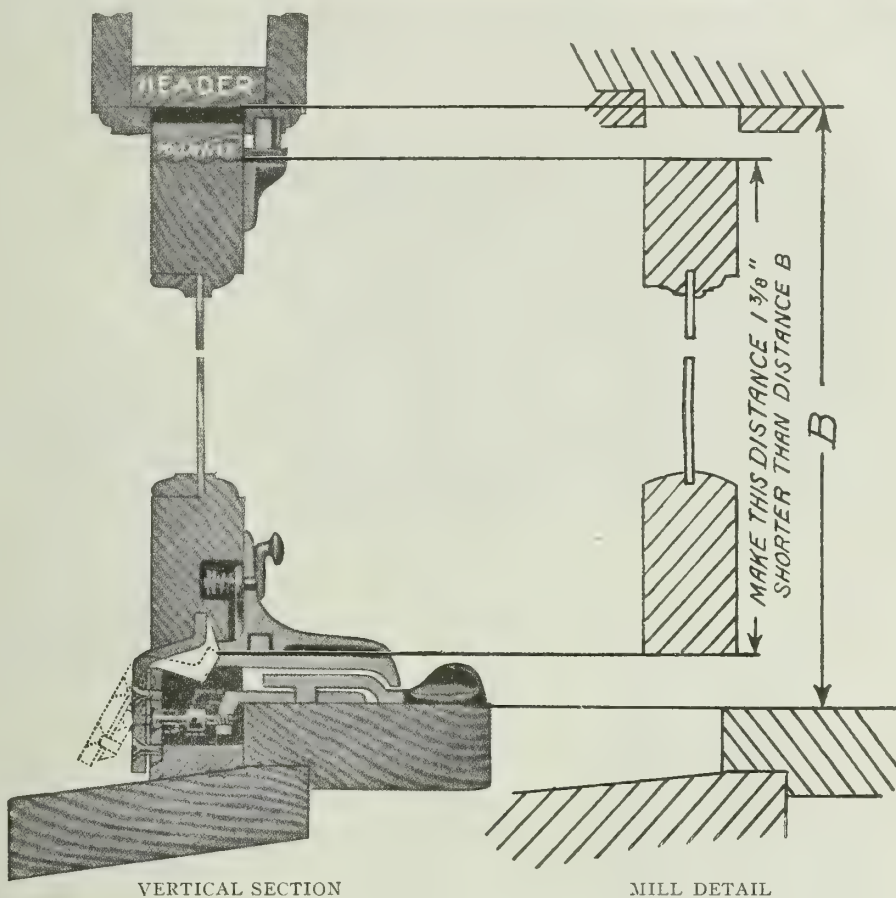
By raising and lowering the closure bar, sash is locked and unlocked; the necessity of lifting the sash to reverse for cleaning is eliminated.

With the closure bar and follower strip a perfectly tight sill and header is guaranteed.

An effective stop is provided to hold the sash at different angles.

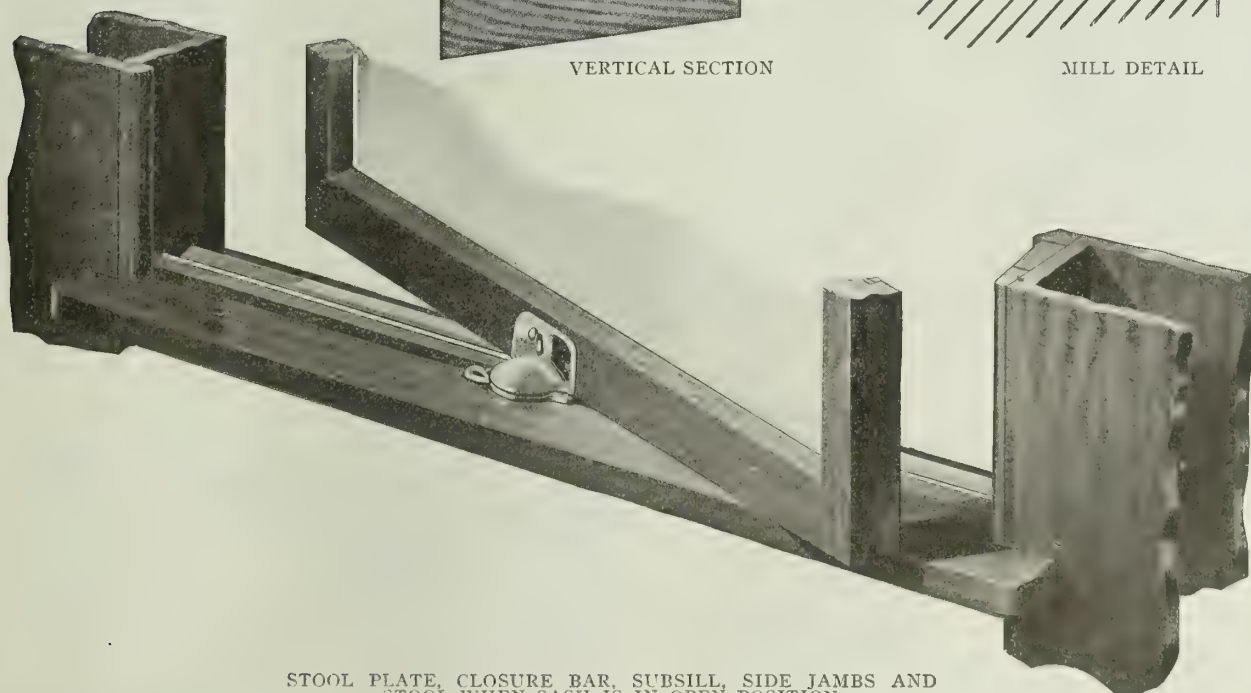
The follower and wood subsill are furnished with closure bar; all parts fitted and equipped with hardware in any material or finish desired.

Subsill and closure bar furnished to conform to thickness of sash.



VERTICAL SECTION

MILL DETAIL



STOOL PLATE, CLOSURE BAR, SUBSILL, SIDE JAMBS AND STOOL WHEN SASH IS IN OPEN POSITION

# GEORGE LESTER WILKINS

Manufacturer of Casement Adjusters

7067 North Clark Street  
CHICAGO, ILL.

## Products.

CASEMENT ADJUSTERS for outswinging casement windows.

## Service.

Instructions and information governing unusual conditions will be promptly forwarded if details of requirements are sent with request. Full size details showing how adjusters can be used, will be furnished on application.

## Advantages.

The simplicity of application avoids the necessity of any special modification of the sash or trim, and the inside operation makes the window insectproof when screen is properly fitted.

Convenient and positive control. Easy action; will close and automatically lock in any desired position and operate without removal of screen. Working parts are so arranged that they do not rub against exposed surfaces of other parts, which preserves the delicate finishes used.

Adjusters may be concealed if desired, and details showing method of concealment may be had on request.

## Wilkins Casement Adjusters.

Made of best French brass and statuary bronze, with locking device of best case hardened steel.

Adjuster block should be so placed, that the sash will swing out nearly to a right angle, but not past it.

Finished as desired, and to match other manufacturers' hardware.

**STYLE A, SIZE 1**—For general use on sash 12 to 28 ins. in width, where distance between screen and sash is not less than  $1\frac{3}{4}$  ins. nor more than 3 ins. The most satisfactory result is obtained when distance between screen and sash is 2 ins. and greatest width of sash does not exceed 28 ins. Placing butts so pin is as close to sash and jamb as possible, aids in making a satisfactory job.

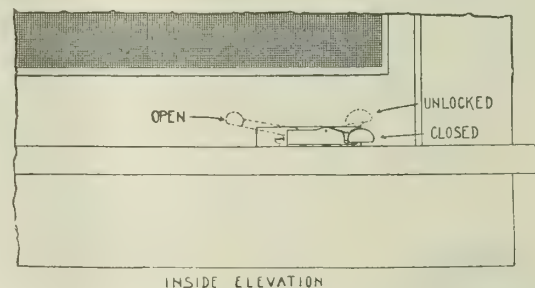
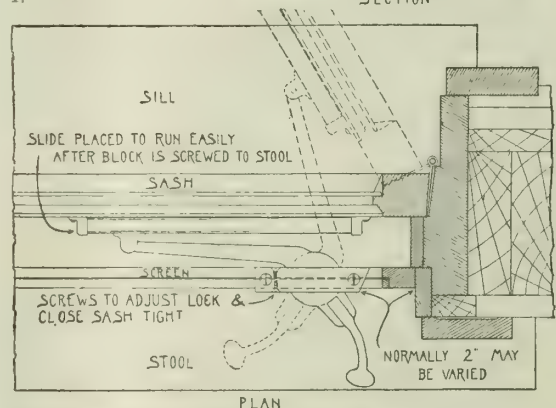
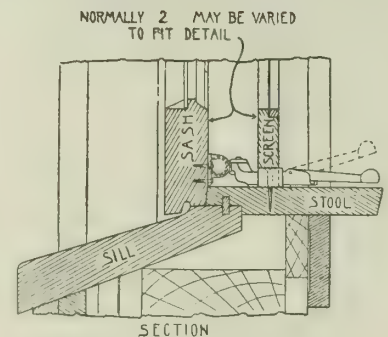
**STYLE A, SIZE 2**—For use on sash 18 to 36 ins. in width, where distance between screen and sash is not less than  $1\frac{7}{8}$  ins. nor more than 5 ins. Normal distance is about  $2\frac{1}{4}$  ins.

**STYLE B, SIZE 1**—Used on same size sash as Style A, Size 1, but minimum distance between screen and sash may be as narrow as  $\frac{7}{8}$  in. This distance between screen and sash is considered too close except for very special cases.

**STYLE B, SIZE 2**—Used on same size sash as Style A, Size 2, but minimum distance between screen and sash may be as narrow as  $1\frac{1}{8}$  ins.

**DETAILS OF APPLICATION, STYLE A—Size 1**—Indicated track on sash, 12 ins. Lever 8 ins. from center of hub to end. Handle 5 ins. from end to center of hub. Block  $4\frac{5}{8}$  ins. long over all, 1 in. wide and  $\frac{3}{4}$  in. high.

**Size 2**—Track on sash,  $15\frac{1}{2}$  ins. Lever 12 ins. from center of hub to end. Handle  $6\frac{1}{4}$  ins. from end to center of hub. Block same as Size 1.

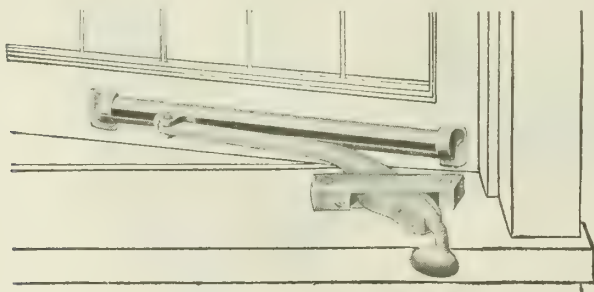


DETAILS OF APPLICATION, WILKINS ADJUSTER, STYLE A, SIZE 1

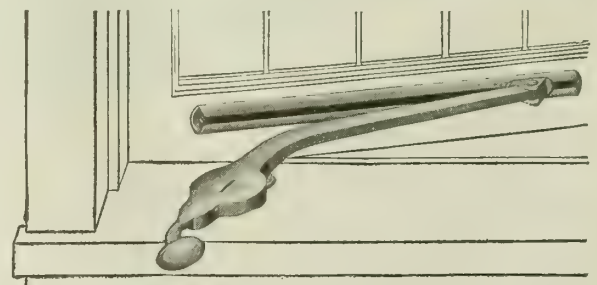
## Security Casement Adjusters.

Cost less than Wilkins adjusters. Malleable iron, with slide and guide tube of steel. One style for sash not less than 15 ins. wide, and where space between screen and sash is not less than  $1\frac{3}{4}$  ins. Adjuster block should be so placed that sash can not swing beyond a right angle; or opening in lower rail of screen should be cut, so that adjuster can not swing farther.

Finished as desired and to match other manufacturers' hardware.



WILKINS CASEMENT ADJUSTER, STYLE A, SCREEN REMOVED  
Should be ordered right or left, as required



SECURITY CASEMENT ADJUSTER, SCREEN REMOVED  
Should be ordered right or left, as required



## LORD & BURNHAM CO.

Manufacturers of Sash Operating Apparatus for Hinged and Pivoted Sash  
IRVINGTON-ON-HUDSON, N. Y.

### Products.

SASH OPERATING and VENTILATING APPARATUS in various styles and sizes for Operating Hinged and Pivoted Sash in factories, foundries, car barns, round-houses, powerhouses, machinshops, steamers, banks, churches, prisons, greenhouses, etc.; TRANSOM OPERATORS for heavy Transoms in such places as store fronts, hotels, public buildings, etc.

For Greenhouses and Equipment, see pages 1458-61; for Boilers, see pages 978-79.

### Rocker Shaft Apparatus.

Our standard apparatus (Fig. 1) consists of a worm and gear to turn a rocker shaft, to which are attached arms that in turn act directly on the sash through suitable rods. Arms are secured to shaft by combined bolting and set screw cap, or by set screw only if desired.

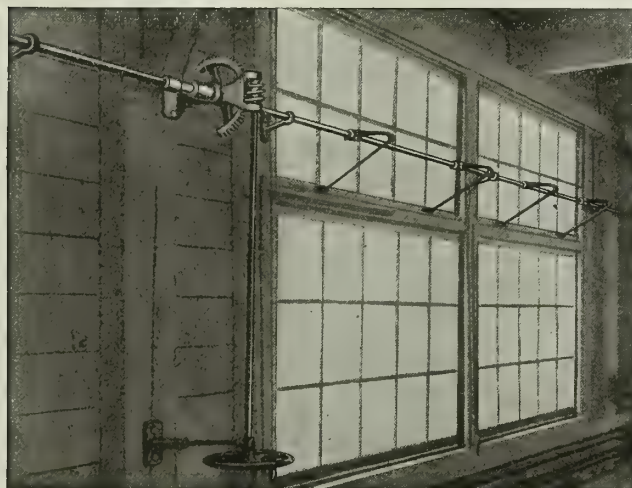


FIG. 1. ROCKER SHAFT APPARATUS

### Rack and Pinion Apparatus.

This type of apparatus (Fig. 2) is intended primarily for long runs of heavy hinged sash. On account of the small pitch radius of the pinion ( $1\frac{1}{2}$  ins.) the leverage on the shaft is so much reduced that the torsion of the shaft is reduced to a minimum.

By means of shoulders on the pinion and guides on the rack these parts are so made that it is an absolute impossibility for them to cramp together in any way. They have been so designed that they always run on their pitch line.

The simplicity of this apparatus is a strong point in its favor. The direct horizontal thrust given to the sash prevents all harmful strains.



FIG. 2. RACK AND PINION APPARATUS

### Tension Lever Apparatus for Long Runs.

We advocate the use of this tension lever system (Fig. 3) on runs of over 140 ft. in length. No bearings required for horizontally moving shafts; gear power has ball bearings; ball and socket joints on arms and rods; minimum friction and minimum back lash throughout; maximum freedom of motion. It is light, yet strong; free from complicated parts; easy to erect; enduring.

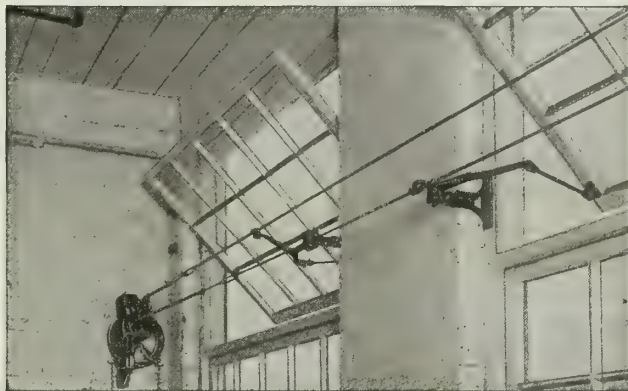


FIG. 3. TENSION LEVER APPARATUS

### Transom Operators.

Transom operators (Fig. 4) made in 2 sizes: No. 1 for heavy and No. 2 for extra heavy transoms. This apparatus consists of 2 enclosed miter gears, one of which is threaded; the threaded gear engages with a vertical rod which operates the transom by an intermediate rod. For extra heavy transoms the vertical rod operates a rocker shaft at bottom of transom, thus allowing it to be supported by an arm and rod at either end, relieving it of all injurious strains, and holding it rigidly in position against wind pressure.



FIG. 4. TRANSOM OPERATOR

### Erection.

Full directions for erecting are sent with apparatus, so that it can be easily installed by any mechanic.

### Estimates and Co-operative Service.

On receipt of data giving description of sash and that part of the building where it is intended to install the apparatus, we will gladly submit sketches, suggestions, and estimates for furnishing our stock apparatus, or one specially designed to meet unusual conditions; also, estimates for erecting the apparatus when desired.

### Catalogue.

Catalogue giving full and detailed description of each apparatus sent on request.

# METALLIC SASH-OPERATOR CO.

Geared Sash Operating Devices for Wood and Metal Sash

Twenty-third and Chestnut Streets

ST. LOUIS, MO.

CHICAGO REPRESENTATIVES: UNIVERSAL STEEL PRODUCTS Co., 939-40 Webster Building

## Products.

GEARED SASH OPERATING DEVICES, to control any style or arrangement of sash.

## Geared Sash Operators.

This company manufactures devices of especial strength and smooth operating characteristics—the result of long and thorough study. Several standard styles are illustrated, but in addition the company makes special styles, meeting every condition.

All styles embody worm and gear, thus automatically locking the sash in any position. Inquiries are invited for devices to meet special conditions not here provided for. Runs of extreme length and great weight have been easily handled by these devices—such installations giving continuous satisfaction.

A large safety factor and especially easily working under severe conditions are two outstanding features of the devices.

## Co-operative Service.

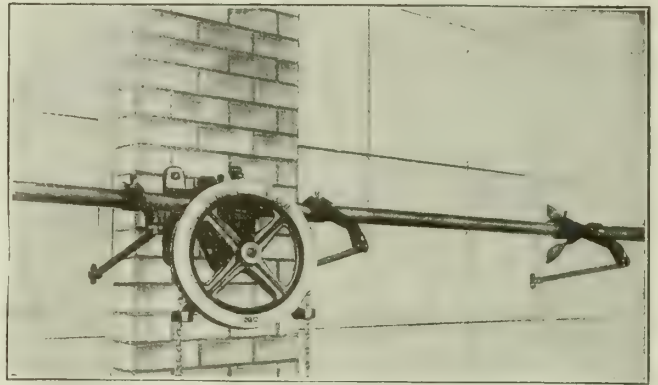
As practically every installation embodies some special conditions, the amount of engineering necessary becomes an important factor. The company's engineering organization is complete and fully experienced in sash operator design.

Economical and efficient arrangements will be suggested or laid out in detail by this co-operative service department and requests are invited for this assistance.

## Some Typical Installations.

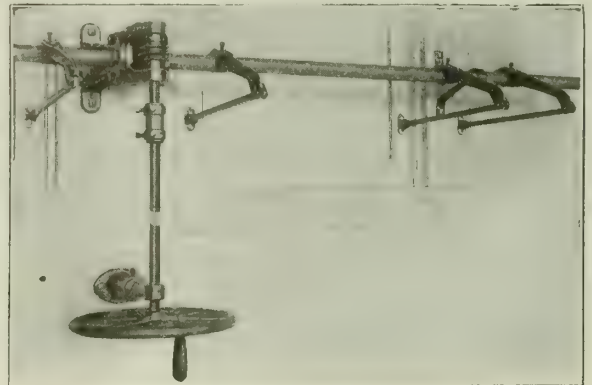
The installations listed are necessarily limited in number by the space. They will, however, give a fair idea of the character of work this company has been entrusted with.

White Automobile Co., Cleveland, Ohio  
 Aluminum Ore Co., East St. Louis, Ill.  
 American Steel & Wire Co., Cleveland, Ohio, and Donora, Pa.  
 Goodyear Tire & Rubber Co., Akron, Ohio  
 Hoyt Metal Co., Granite City, Ill.  
 Santa Fe Shops, Albuquerque, N. M.  
 Holt Mfg. Co., East Peoria, Ill.  
 Canedy-Otto Mfg. Co., Chicago Heights, Ill.  
 Missouri Pacific R. R. Roundhouses  
 Fairbanks, Morse & Co., Beloit, Wis.  
 Haughton Elevator Co., Toledo, Ohio  
 Springfield High School, Springfield, Ill.  
 Watervliet Paper Co., Watervliet, Mich.  
 Hooker Electro Chemical Co., Echote, N. Y.  
 Parish & Bingham Co., Cleveland, Ohio  
 Western Cartridge Co., East Alton, Ill.  
 Phillips Sheet & Tin Plate Co., Weirton, W. Va.  
 Berlin Machine Co., Beloit, Wis.  
 Monsanto Chemical Works, St. Louis, Mo.  
 National Malleable Iron Co., Chicago, Ill.  
 Hupp Motor Car Co., Detroit, Mich.  
 Otis Steel Co., Cleveland, Ohio  
 Merchants Central Heating Co., Spokane, Wash.  
 Great Western Smelting & Refining Co., Chicago, Ill.  
 Tallahassee Power Co., Baden, N. C.  
 Busch-Sulzer Bros. Diesel Engine Co., St. Louis, Mo.  
 Union Drawn Steel Co., Detroit, Mich.



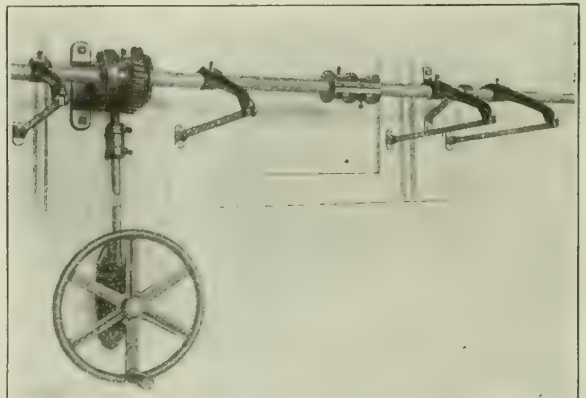
SASH OPERATOR, STYLE NO. 1

Controls side pivoted or top or bottom hinged sash of wood or metal. Controls 100 ft. or less, depending upon weight and condition of sash. A continuous chain transmits power from the hand to the gear; all parts are of substantial construction. Gears are furnished in 4 different sizes, connecting arms in 3 sizes, and wrought shaft brackets can be provided in almost any desired length. Very practical and simple; will give permanent satisfaction.



SASH OPERATOR, STYLE NO. 2

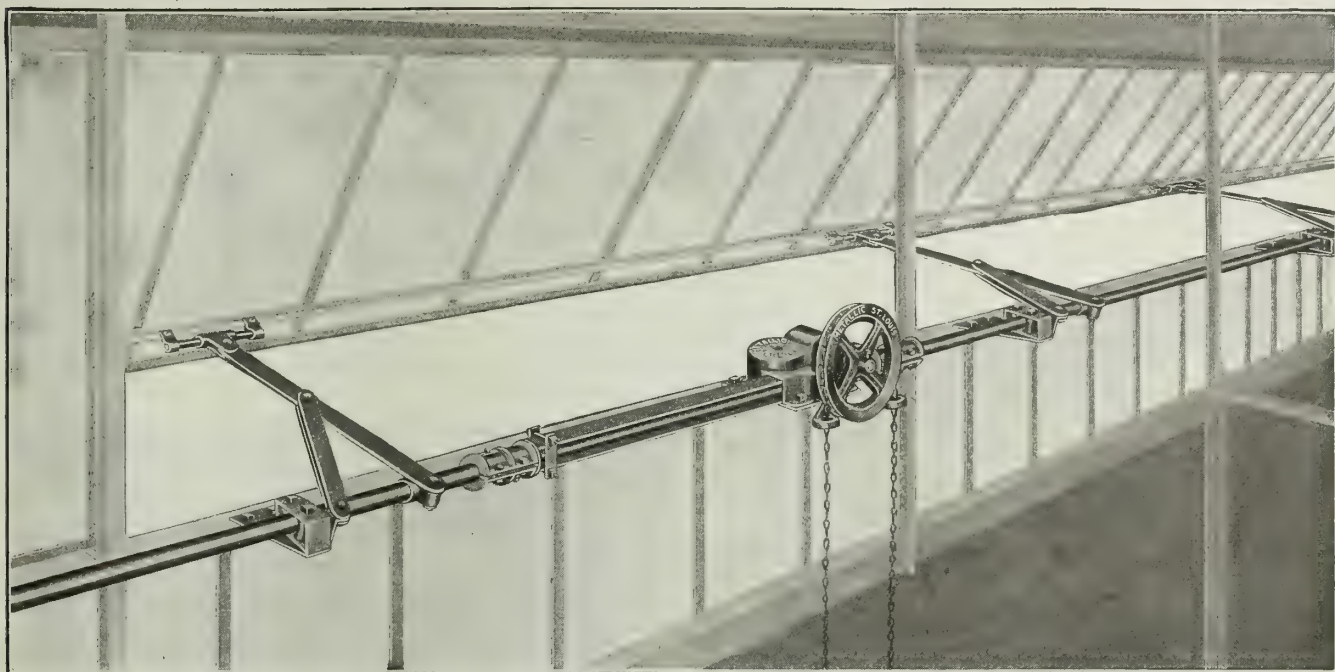
Same equipment as Style No. 1 excepting that power is transmitted by horizontal hand wheel through  $\frac{3}{4}$ -in. round steel rod



SASH OPERATOR, STYLE NO. 3

A bevel gear is here added to place the hand wheel in vertical position. Otherwise this style is identical with style No. 2





TENSION SASH OPERATOR, STYLE NO. 9  
(Patented July 18, 1916, and October 9, 1917)

#### Tension Sash Operator, Style No. 9.

This operator is designed to operate long runs of heavy, continuous top hung, or center pivoted sash. It can, also, be used to advantage on long runs of individual ventilators.

The power is delivered through a worm, worm gear, pinion, rack and thrust bearings connected to the shaft at either end of the rack. The shaft passes through the rack, thereby allowing free rotary movement of the shaft in conjunction with the opening of the sash.

The torsion developed by the thrust of the connecting arms on the sash is stopped at each individual arm, and is not delivered to the gear station in any way.

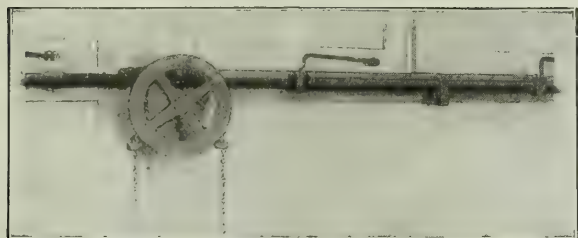
Thrust ball bearings insure easy operation.

All parts are made extra heavy and strong, to resist any possible strain.

This operator is ordinarily attached to the sill angle, but it can be readily fastened to any part of the building.

The operating gears are made in two sizes. The larger one has a connection which automatically stops the generation of power at the full open and closed positions of the sash, thereby preventing any breakage of the sash, or operator, at these positions.

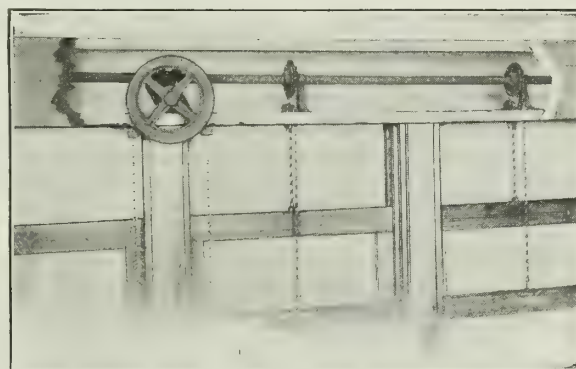
The connecting arms are made in sizes up to 48 in in length.



SASH OPERATOR, STYLE NO. 4

To meet conditions presented by runs of 100 ft. or less of side hinged, or top or bottom pivoted sash, in either wood or metal. Embodies a shaft supported by roller brackets, a gear station of heavy construction, and power transmission by endless chain.

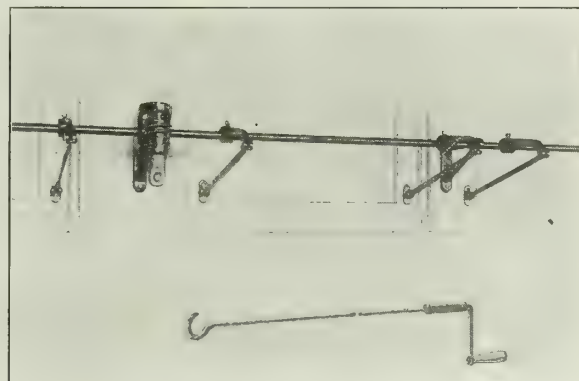
All wearing parts are designed to give maximum service and ease of operation.



SASH OPERATOR, STYLE NO. 5

Controls vertically sliding, counterbalanced sash. The shaft enclosed as shown, or suspended in front of sash. In some cases a chain is provided connecting the sash bottom, and passing beneath a pulley fastened to the sill—thus pulling the sash in both directions.

To overcome sliding friction, sash rollers are provided for the four corners of the sash. The amount of sash handled by one set is determined by conditions—no weights or other hardware are needed



SASH OPERATOR, STYLE NO. 6

To control the sash over display windows. Will handle a run of 20 ft. of small pivoted sash, or hinged sash of suitable weight and position. The operating shaft is of solid steel,  $\frac{3}{4}$  in. in diameter.

A detachable handle, furnished in lengths to suit conditions, transmits the power, or a dependent chain or rod with wheel or handle can be provided.

Another example of the special conditions which have been particularly studied, and exactly met.

Also furnished in heavier types

ESTABLISHED 1875

# THE PAYSON MANUFACTURING COMPANY

Manufacturers of Builders' Hardware, and of  
The Dearborn Hardware Manufacturing Co.'s Line of Sash Operating Devices

2920 Jackson Boulevard  
CHICAGO, ILL.

## REPRESENTATIVES

NEW YORK, N. Y., FREDERICK PFEIFER, 107 Reade Street  
SAN FRANCISCO, CAL., A. U. MORSE & Co., Rialto Building

BALTIMORE, MD., HENRY KEIDEL CO.

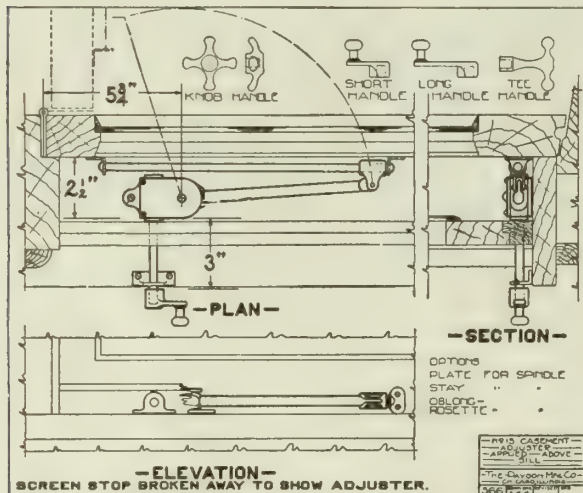
## Products.

GEARED SASH OPERATORS.  
CONCEALED TRANSOM LIFTERS.  
CASEMENT ADJUSTERS.

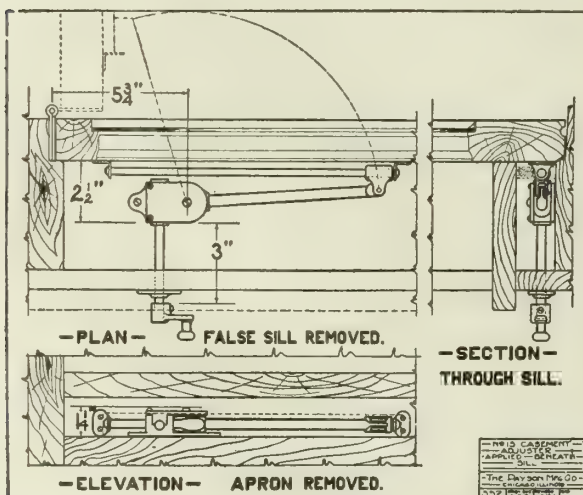
Signal Sash Locks; Underwriters' Sash Locks;  
Ventilating Sash Locks; "Simplex" Transom Lifters;  
Transom Hardware; Schoolhouse Coat and Hat Hooks.

### Harris No. 15 Casement Adjuster—Worm and Gear Type (Patent Applied for).

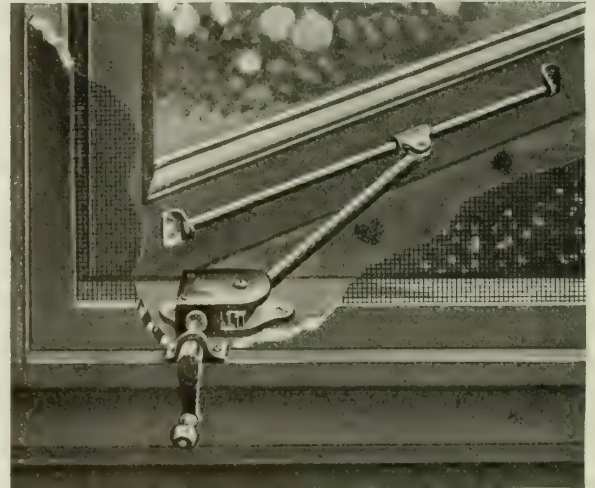
Always locked. Lock  $1\frac{5}{8}$  by  $2\frac{1}{4}$  ins., 4 screw holes for attaching.



DETAIL NO. 15 CASEMENT ADJUSTER PLACED ABOVE SILL



DETAIL NO. 15 CASEMENT ADJUSTER PLACED BELOW SILL



HARRIS NO. 15 CASEMENT ADJUSTER

Guide rod,  $\frac{3}{8}$  by  $13\frac{1}{8}$  ins. over all.

Operating rod,  $\frac{1}{2}$  by 8 ins. between centers.

Operating shank, 3 ins. between lock and handle.

Furnished with 2-in. crank handle and heavy stay plate.

A smaller crank, knob or key may be had.

A plate or oblong rose may be used instead of stay plate.

Made in iron, brass and bronze; with crank, tee, or knob handle.

Used either above or beneath the stool, to operate out-swinging casements without opening the screen.

**ADVANTAGES—Construction**—The simplest construction and operation—a plain worm and gear, cut to allow no play.

The direct control of the sash.

The strength of the material used,  $\frac{1}{2}$ -in. rod lever and equally strong slide.

The lock is attached to the sill by 4 screws, one of which passes entirely through the lock.

Reversible by removing top plate and turning worm and gear over.

**Operation**—Foolproof—locked at all points; crank control—understood by every one.

Holds without shake or rattle, and forces sash to a tight lock at closed and full open position.

When sash is wide open (where wind pressure is greatest) the lever and lock form a brace for the sash.

Relieves strain on the butts and sash, and gives better control because of the distance of the point of operation and sash attachment from the butts.

The method of attachment to the sash gives more strength and less wear to the adjuster.

Only 6 complete turns to open sash  $90^\circ$ .



For asylums, a detachable handle may be used; prevents tampering with lock and sash.

The regular minimum distance between sash and screen is  $2\frac{1}{2}$  ins. Mortising the screen over the lock makes the space  $1\frac{3}{4}$  ins.

Standard adjuster controls a casement with openings between jamb trim of  $15\frac{1}{2}$  to 30 ins. Specials made for other openings.

Lock should always be as close to sash as possible, which is  $\frac{3}{4}$  in.

The center of the gear in the lock should be placed  $5\frac{3}{4}$  ins. from the hinge line. If the lock is so placed the sash will open to  $90^\circ$  and the operating rod will always form a brace with the sash—even when the sash is at right angles. This forms the strongest adjuster made.

When there is very wide stool, the operating shank should be lengthened. The screen can be hung on side or top. Adjuster is reversible—making it right or left.

Casement sash out of reach may be operated with this adjuster by the use of corner gears.

#### Harris Concealed Transom Lifter (Patent Allowed).

This concealed lifter makes unnecessary the marring of trim by hardware.

In elegant homes and high-class buildings, where great attention is paid to the beauty of the wood trim, the ornamental knob can be made to match design of other trim, affording the chaste appearance so much desired.

Fig. 3 shows all that can be seen of the device even when transom is open.

The lifter can be electrically controlled if so desired.

Universal joints on main rod, special gear box, reversible transom plate and adjustable cross head make the Harris lifter adaptable to all types of transoms.

The transom is operated through its connection with the moving cross head, actuated by the screw. The slotted opening is protected from weather and dust by a shield which moves with the cross head.

The location of control near middle of transom eliminates the lost motion incident to other makes which prevents transom from being securely held. It affords ease of operation. The screw and cross head mechanism is so powerful that the lifter will operate a very heavy transom.

This lifter is guaranteed to be the strongest, simplest, most efficient and handsomest on the market. Operates any type of sash.

Requires smallest space for installation:  $1\frac{1}{4}$  ins. only between stud and jamb.

Automatically locks sash anywhere. No complicated mortising, and the two mortisings needed can be made at the mill. Installation easiest, the saving of time being a considerable item.

The hand may be changed when lifter is installed. Lifter may be used on any thickness of trim.

#### No. 20 Concealed Casement Adjuster (Patented June 22, 1915).

A perfectly concealed adjuster—only the knob and plate show.

*Permits the sash to open  $180^\circ$ .*

Holds sash in any position—severe strain upon the butts is avoided because the lock acts as a brake upon the rod and permits a slow movement under ex-

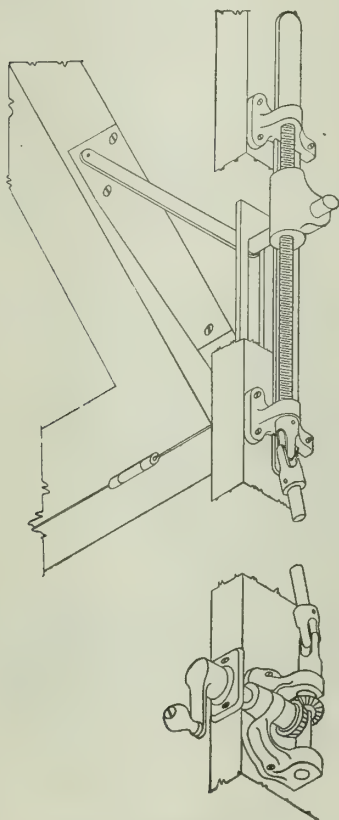


FIG. 1. Phantom View



FIG. 2. Details



FIG. 3. Transom Equipped

HARRIS CONCEALED TRANSOM LIFTER (PATENT ALLOWED)

cessive pressure. Operates sash swinging in or out, and is reversible.

Hole for the rod should be centered on the thickness of the sash at the hinge end in either the upper or lower rail of the sash.

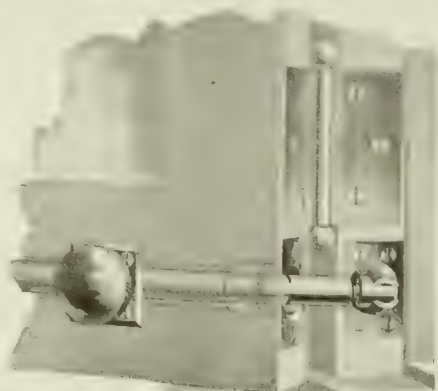
Regular adjuster controls sash hung on butts as large as 4 by 4 ins.

Intended only to hold the sash from swinging, and is not intended to act as a lock. A casement fast must be provided to hold the sash shut.

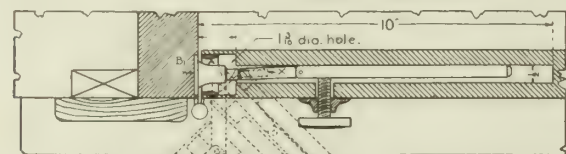
In case of undue pressure the friction of the rod sliding in the wood will allow the sash to give, thereby relieving the strain on the hinges.

Thumb screw may be on inside or outside of sash as desired. Regular size will fit butts up to 4 ins.

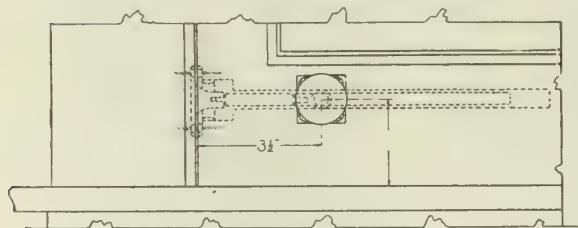
Minimum thickness of sash  $1\frac{1}{2}$  ins.



SECTIONAL VIEW CONCEALED CASEMENT ADJUSTER



Plan through one half of window frame and sash



Elevation at bottom rail of sash  
NO. 20 CONCEALED CASEMENT ADJUSTER  
Patented June 22, 1915

### Harris Geared Sash Operators.

This company's equipment is such that contracts of any size can be handled and on large contracts it is prepared to erect the machines. On all orders complete erection drawings are furnished, showing the placing of every screw. Machines may be operated with compressed air, or electricity, if so desired.

If architects will consult us at the time plans are in preparation, we can almost invariably suggest methods which will result in increased efficiency in ventilation at a decrease in cost.

### Ideal Sash Operator.

The Ideal sash operator is of the torsion type, operated with a chain wheel. The chain control is a very simple and inexpensive one, and is in many ways superior to the hand wheel method of operating torsion devices. The expense of installation is less than that of installing the torsion device of the rod and hand wheel type.

The sash are securely held in any position.

This device is recommended as the simplest and strongest of all torsion operators.



IDEAL SASH OPERATOR

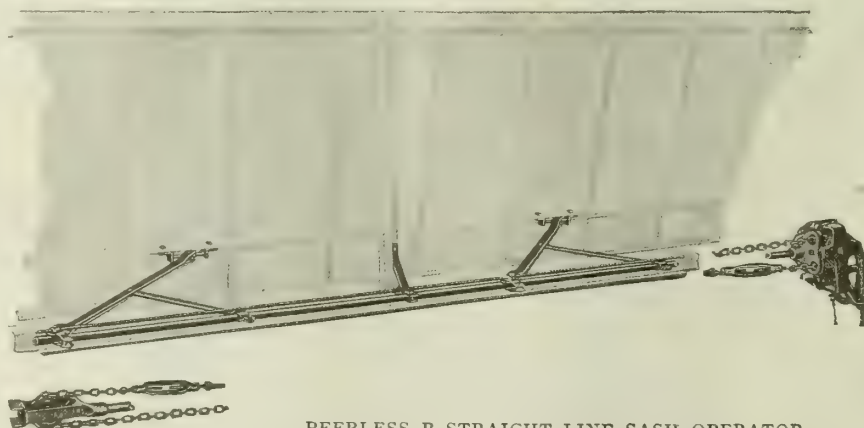
### Peerless B Straight Line Sash Operator (Patent Allowed and Pending).

OPERATOR—Worm and gear, tension type. Enclosed power, with worm and gear running in oil.

POWER TRANSMISSION—Endless cable or rod with power at one end and idler at other. Hand chain control.

SASH LEVERS—Same general type as Peerless A, but the levers are separate from brackets which support the shaft and can be attached to the sash at any point without reference to the brackets. Therefore the spacing of the vertical supports is not important. It is only necessary to provide a foundation for the shaft supporting brackets at intervals of 8 to 10 ft., depending on the height of the swinging sash.

The Peerless B is more efficient than tension operators of the sliding shaft type. With the power applied in two directions the levers can be operated from either



PEERLESS B STRAIGHT LINE SASH OPERATOR

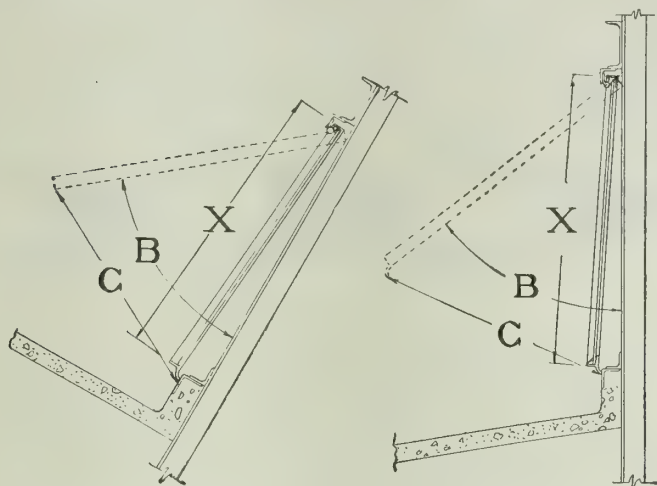
Patent applied for



of the two cables. Thus oppositely opposed, the levers eliminate all side strain on the sash. This feature is also of great value where it is necessary to space the lifting arms to clear obstructions, such as sway bracing or diagonal trusses.

For length of runs which can be handled and width of opening obtained, see table.

An angle or a tee bar, or some other means of attachment, must be provided by the contractor furnishing the sash for properly connecting the lifting arms or levers to the sash.



Top Hinged Continuous Sash, Inclined not Over 30° from Vertical

Top Hinged Continuous Sash, Sash Hanging Vertical

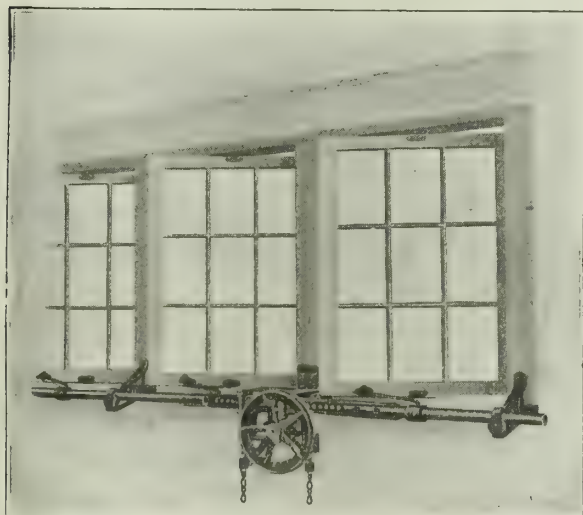
DUTY DETAILS, TENSION SASH OPERATORS

X	A	B	C	X	A	B	C
3' 0"	80'	40°	28"	3' 0"	100'	45°	28"
3' 6"	70'	40°	28"	3' 6"	90'	45°	32"
4' 0"	60'	35°	29"	4' 0"	80'	40°	32"
4' 6"	50'	35°	32"	4' 6"	70'	40°	37"
5' 0"	40'	30°	31"	5' 0"	60'	35°	36"
5' 6"	35'	30°	34"	5' 6"	55'	30°	34"
6' 0"	30'	30°	37"	6' 0"	50'	30°	37"

X—Height of sash. A—Maximum length of run. B—Standard opening in degrees. C—Standard opening in inches

### Victor Sash Operator.

The Victor operator is especially designed for operating top and bottom pivoted sash and side hinged sash. It is of the worm and gear type. The sash are



VICTOR ROLLER BEARING SASH OPERATOR

opened and closed by means of a sliding rod which travels on roller bearings.

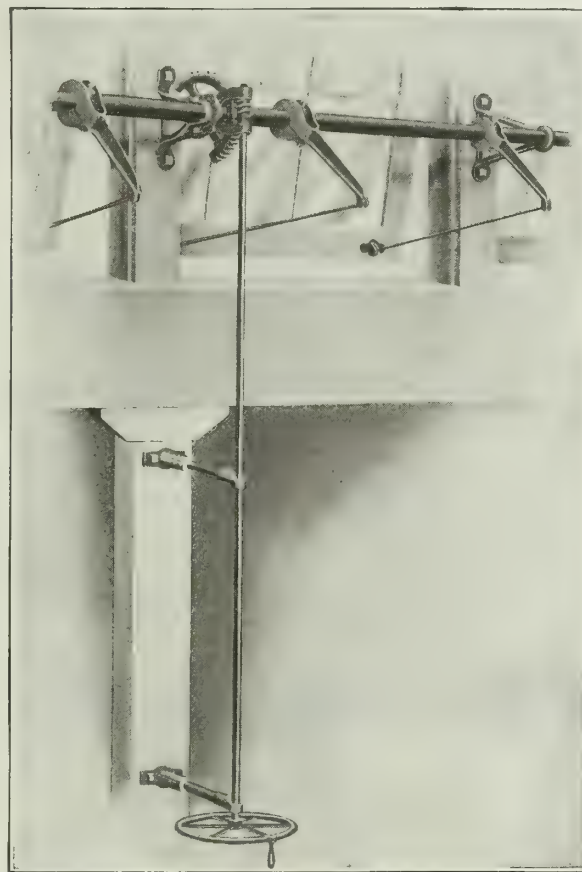
For small sash one attachment is all that is needed, but on sash that are large, or on sash that are extremely high, the rod should be carried across both the top and bottom of the sash. In this way, the sash is held absolutely rigid.

This device will control runs of top and bottom pivoted sash up to 300 ft. in length.

### Superior Sash Operator.

This operator, of the torsion type, is made in many sizes, and can be used for handling runs of side pivoted sash up to 125 ft. in length.

The worm and gear locking mechanism holds the sash securely in any position.



SUPERIOR SASH OPERATOR

### Estimates.

Send plans and specifications, and estimates will be made on the material required, and advice will be given concerning the proper operator to be used.

### References.

Western Electric Company  
Bridgeport Projectile Co.  
Standard Oil Co.  
Henry Ford & Son, Inc.  
Chicago & Northwestern R. R. Co.  
Grasselli Chemical Co.  
Bethlehem Steel Co.  
Armour & Co.  
American Car & Foundry Co.  
Prest-O-Lite Co.  
Aluminum Ore Co.  
American Locomotive Co.  
Savage Arms Co.

## AMERICAN CHAIN COMPANY. INC.

BRIDGEPORT, CONN.

CANADA: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ont.

LONDON OFFICE: 8 White Street, Moorfields, London, E. C.

BRIDGEPORT, CONN., (Weldless Chain Plant)  
BRADDOCK, PA.  
COLUMBUS, OHIO

## FACTORIES

CARLISLE, PA.  
MANSFIELD, OHIOYORK, PA., (Electric Welding Plant)  
MARION, IND.  
ST. MARYS, OHIO

## Products.

Manufacturers of every style of WELDED and WELDLESS CHAIN.

NIAGARA, EUREKA, TENSO and LOCK LINK STEEL WIRE CHAINS in more than 100 sizes.

APPROVED (GUARANTEED) STEEL, GALVANIZED and BRONZE SASH CHAINS; HERCULES SASH CHAIN.

Sole manufacturers of the CAMPBELL HAMMERLOCK SELF-SPREADING COTTER PINS.

The celebrated American Flat Steel Chains in 26 sizes; Safety, Furnace and Plumbers' Chains; Niagara Pipe Hanging Chains; S-hooks, 8-Hooks and Special Shapes of all kinds in Flat or Round Wire. "S. R. P." Finish Porch Swing and Hammock Chains.

## Scope.

Largest chain manufacturers in the world.

## Approved American Sash Chain and Fixtures, Guaranteed.

STEEL, HOT GALVANIZED—American guaranteed hot galvanized steel sash chain is manufactured from high grade steel, galvanized in our plant by our own special hot process, insuring a uniform, heavy, rustproof coating—with links perfectly free—running smoothly and noiselessly over the smallest pulleys, and is unquestionably the strongest sash chain made. Also furnished in any other finish desired.

AMERICAN GUARANTEED HOT GALVANIZED STEEL SASH CHAIN  
Number. . . . . 80      100      130      250  
For sash weighing. . . . . 80 lbs.      100 lbs.      130 lbs.      250 lbs

BRONZE—American guaranteed bronze sash chain is made from our own special rich, bronze composition, insuring the hardest and best wearing bronze chain possible to obtain.

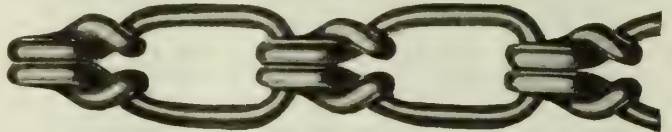
## Hercules.

Wherever a chain is required to harmonize with interior finish, guaranteed Hercules sash chain is earnestly recommended. It is made of high grade steel, hot galvanized, with a heavy electro-copper plate over the galvanizing, which makes a rich, red bronze color; and it is absolutely rustproof. The price is about two-thirds that of bronze chain. Being made of steel, it is stronger than any alloy chain, and in case of fire will maintain its load at a temperature 50% greater than bronze chain of any mixture.

## Chain for Fireproof Folding Doors, Rolling Doors and Shutters.

Lock Link sprocket chains, made in 17 sizes to fit any pitch sprocket. This chain is standard for hand

chain or fireproof folding doors and steel rolling doors and shutters. Furnished in hot galvanized, or any other finish desired.



LOCK LINK STEEL WIRE CHAIN

## American Galvanized Arc Light Chain.

This chain is especially designed for arc and incandescent lamp suspension. It is heavily galvanized and positively rustproof. Ice or sleet does not interfere in any degree with its operation, and it is superior to rope or cable in point of operation and wear. It has been on the market for nearly 20 years; millions of feet are in use. It has been adopted by a vast majority of all street lighting companies. Made in 3 sizes.

AMERICAN GALVANIZED ARC LIGHT CHAIN  
No. 31 and No. 33 for suspending arc lamps, and No. 35 for suspending incandescent lamps.

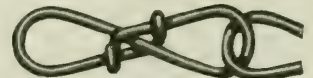
We supply arc lamp hooks to easily connect lamp and chain, also a strong ring which can be attached to pole end of chain with connecting hook.

## Other Types of Chains.

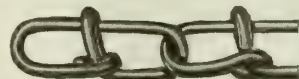
A few patterns of other types of chains manufactured by this company are shown below.



AMERICAN PATTERN



NIAGARA PATTERN



EUREKA PATTERN



TENSO PATTERN

## Cotter Pins.

Sole makers of Campbell hammerlock self-spreading cotter pin, patented March, 1912, and various automobile specialties.



CAMPBELL COTTER PIN

## Co-operation.

Submit chain problems to our Experimental Department. Experts in this department devote all their time to the solution of customers' difficulties.



# SAMSON CORDAGE WORKS

88 Broad Street  
BOSTON, MASS.

## Products.

Manufacturers of SOLID BRAIDED CORD in all sizes and colors and for all purposes, including SAMSON SPOT CORD, SAMSON WIRE CENTER CORD and other SASH CORDS.

Ventilator Cord, Curtain and Shade Cord, Awning Lines, Mason's Lines, Chalk Lines, Dumbwaiter Rope, Arc Lamp and Trolley Cord, Signal Cord, Clothes Lines, Transmission Rope, etc.

## Samson Cord.

All goods bearing the trade-mark of Samson and the Lion are made of extra quality stock; are carefully inspected, and warranted free from the rough braiding and finishing which destroy common cords so quickly.

We manufacture three grades of sash cord, but the lower grades are made for competing trade in cheap work and do not bear the Samson trade-mark. They



TRADE-MARK

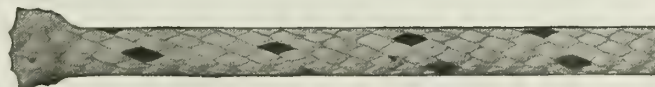
do not fill specifications for Samson cord, which is much more economical in the end.

## Special Cords.

Cords made to order for any purpose, in special braid, finish or color.

## Samson Spot Cord.

The spots on the cord serve as a means of identification after the label is removed. Spot Cord will wear many times longer than chain, or than the common cord so often found on the market, made of inferior yarn, roughly braided and poorly finished, causing early destruction by abrasion on the pulley.



SAMSON SPOT CORD

The spots on the cord and the words "Spot Cord" are trade-marks registered in the U. S. Patent Office. Beware of imitations with labels removed

**SPECIFICATIONS**—Architects' specifications should read,

"Windows to be hung with Samson Spot Cord; size of cord and size of pulleys to agree with manufacturer's list," as given in left hand column.

In figuring weights of windows, the weight of glass may be taken at  $3\frac{1}{2}$  lbs. per sq. ft., for plate glass;  $1\frac{1}{3}$  lbs. for double thickness glass; and 1 lb. for single thickness glass. For weight of wooden sash, add together height and width, in feet, of each sash, and multiply by 2.1 for  $2\frac{1}{4}$ -in. sash; by  $1\frac{1}{3}$  for  $1\frac{3}{4}$ -in. sash; and by  $1\frac{1}{3}$  for  $1\frac{1}{2}$ -in. sash. These figures are sufficiently accurate for determining size of sash cords and pulleys; but actual weights can only be determined by weighing each sash after it is glazed, as the weight of the glass often varies considerably.

**SAMPLE CARDS**—Sample cards, showing proper sizes for use with different weights and pulleys, will be gladly sent to architects and builders.

## Wire Center Cord.

A metal sash cord, protected by a braided cotton surface which acts as a noiseless cushion and harmonizes with the window finish. It wears longer than any chain, unprotected wire, or metal tape, and withstands fire more than twice as long as bronze metal sash chain.



SAMSON MAHOGANY WIRE CENTER SASH CORD

Carried in stock in mahogany color, and made to order for large buildings in other colors to match finish. Price of size No. 8,  $4\frac{1}{2}$ ¢ per ft.

## Territory.

Samson Spot Cord and our other goods are sold all over the world, and are carried by most of the builders' hardware dealers in the United States.

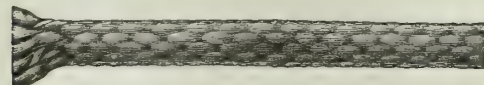
## Catalogues.

Send for catalogues and sample cards. Samples filed with Architects Samples Co., 101 Park Avenue, New York.



Size No. 6. Diam. 3-16 in.

About 18 lbs. per doz.; about 66 ft. per lb. Suitable for weights of less than 5 lbs. Minimum diam. of pulley allowable  $1\frac{1}{2}$  in.



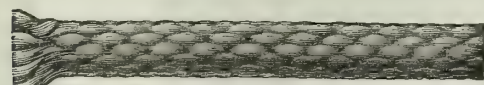
Size No. 7. Diam. 7-32 in.

About 22 lbs. per doz.; about 55 ft. per lb. Suitable for weights from 5 to 12 lbs. Minimum diam. of pulley allowable  $1\frac{3}{4}$  in.



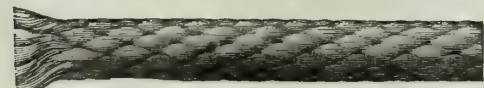
Size No. 8. Diam.  $\frac{1}{4}$  in.

About 27 lbs. per doz.; about 44 ft. per lb. Suitable for weights from 12 to 20 lbs. Minimum diam. of pulley allowable 2 in.



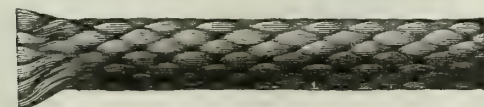
Size No. 9. Diam. 9-32 in.

About 33 lbs. per doz.; about 36 ft. per lb. Suitable for weights from 20 to 30 lbs. Minimum diam. of pulley allowable  $2\frac{1}{4}$  in.



Size No. 10. Diam. 5-16 in.

About 44 lbs. per doz.; about 27 ft. per lb. Suitable for weights from 30 to 40 lbs. Minimum diam. of pulley allowable  $2\frac{1}{2}$  in.



Size No. 12. Diam.  $\frac{3}{8}$  in.

About 60 lbs. per doz.; about 20 ft. per lb. Suitable for weights from 40 to 50 lbs. Minimum diam. of pulley allowable 3 in.

SAMSON SASH CORD

The number indicates the diameter in 32ds of an inch

# SILVER LAKE CO.

## Manufacturers of Sash, Bell and Signal Cord

HEAD OFFICE AND FACTORIES  
NEWTONVILLE, MASS.

### BRANCH OFFICES

NEW YORK, N. Y., 105 Worth Street  
CHICAGO, ILL., 120 West Illinois Street

PHILADELPHIA, PA., S. W. Cor. Market and Fifth Streets  
SAN FRANCISCO, CAL., 111 New Montgomery Street

### Products.

Manufacturers of "SILVER LAKE" SOLID BRAIDED WINDOW SASH, RAILROAD BELL, TROLLEY, SIGNAL, CURTAIN and SHADE CORD; ARC LAMP, DUMBWAITER and TRANSMISSION ROPE; MASONS' LINES and CLOTHES LINES, and all kinds of SOLID BRAIDED CORDAGE.

### Description of Solid Braided Cordage.

We are the pioneer manufacturers of solid braided cordage. "Silver Lake" cords have been used for the best work since 1868 and have become known as the standard. "Silver Lake" solid braided sash cord is made of the best quality of selected cotton yarn; twice doubled and twisted, and then braided on solid braiding machines of our own design.

ADVANTAGES—"Silver Lake" cord costs less per pound than linen and other fine fibers, and its weight is so much less that it costs less per foot than cords that are cheaper per pound. Cotton is the only fiber that will stand constant bending over a pulley; consequently a cotton cord is more durable than one made of linen or hemp. It varies in diameter by thirty-seconds of an inch, and is adapted to all styles and sizes of weights and pulleys. Our process of finishing takes up all the stretch, so that "Silver Lake" cords do not lengthen, as they wear, but maintain the weight at its original height.

Ordinary twisted cords kink badly in unwinding from the hank, and a great deal of time is required to straighten them out. "Silver Lake" braided cord comes out smoothly, and makes it possible to hang more sash in a given time than when ordinary cords are used. "Silver Lake" cord is smooth in finish, and can not work in between pulley and sheaf, a fact that

precludes all possibility of broken sash cords. Our shade cords are extremely handsome in appearance, and do not fray and break.

**GUARANTEE**—Furthermore, we issue a certificate of guarantee protecting every architect who specifies "Silver Lake A" sash cord against the breakage of same for a period of 20 years after installation.

**TESTS**—Tests as made by the United States Government, Bureau of Standards, show that "Silver Lake" outwears many times chains and cheap cords. The hard braid and smooth finish also make it more fire resisting than chains.

### Special Cords.

All colors of wire center cord and a great variety of other braided cords for special purposes manufactured to order. Estimates promptly furnished on any sample sent to us. Anything in the way of a solid braided cord, in any color or design, may be had.

### Sizes, Weights, etc.

The table gives the sizes and weights of cords, and the weight which each size will safely carry.

### Territory.

Our cords are in use the world over, and are carried by dealers throughout the United States.

Orders of any size promptly filled.

### Trade-marks.

All hanks of genuine "Silver Lake" cord are bound with our label, bearing our trade-mark. As an additional protection and means of identification, every foot of cord is stamped with our name. Cord not so marked is not genuine "Silver Lake."



REPRODUCTION OF "SILVER LAKE" CORD WITH TRADE-MARK AND NAME  
Registered in U. S. Patent Office

SIZES, WEIGHTS, LENGTHS, ETC., OF "SILVER LAKE" CORD

Size	Diameter	Weight per dozen hanks	Feet per pound	Minimum diameter of pulley allowable	Suitable for weights
No. 6	$\frac{1}{8}$ in.	18 lbs.	about 66	$1\frac{1}{2}$ ins.	up to 10 lbs.
No. 7	$\frac{7}{16}$ in.	23 lbs.	about 52	$1\frac{3}{4}$ ins.	10 to 15 lbs.
No. 8	$\frac{1}{4}$ in.	27 lbs.	about 44	2 ins.	15 to 25 lbs.
No. 9	$\frac{9}{16}$ in.	33 lbs.	about 36	$2\frac{1}{4}$ ins.	25 to 35 lbs.
No. 10	$\frac{5}{8}$ in.	44 lbs.	about 27	$2\frac{1}{2}$ ins.	35 to 45 lbs.
No. 12	$\frac{3}{4}$ in.	60 lbs.	about 20	3 ins.	45 lbs. and up

### PRICES

The best cord, "Silver Lake A," comes as follows:

White cotton.....75c per lb.  
Drab cotton.....90c per lb.  
Prices of "Silver Lake," a thoroughly reliable cord:  
White cotton.....70c per lb.

Italian hemp.....\$1.00 per lb.  
Linen.....1.50 per lb.  
Drab cotton......85 per lb.



# THE AMERICAN PULLEY COMPANY

Manufacturers of Pressed Metal Sash Pulleys

4200 Wissahickon Avenue

PHILADELPHIA, PA.

## STORES

NEW YORK, N. Y., 33-35 Greene Street  
BOSTON, MASS., 165 Pearl Street

CHICAGO, ILL., 114-116 South Clinton Street  
SEATTLE, WASH., 536 First Avenue, South  
SAN FRANCISCO, CAL., 14 Natoma Street

## Products.

PRESSED METAL SASH PULLEYS: "American" Sash Pulleys for the highest grade installations; "Merit" or "Eagle" Sash Pulleys for installations requiring a durable but inexpensive sash pulley.

## Features of Pressed Metal Sash Pulleys.

"American," "Merit" and "Eagle" sash pulleys are made throughout of pressed metal. They are much lighter and far more durable than the best cast iron sash pulley.

They can not be broken in putting them into a frame or in handling when in transit. They are practically indestructible, and are cheaper, lighter and better finished than cast iron pulleys.

They are coated with a compound which prevents rust.

In plain axle bearing pulleys, the steel bushings are made of extra heavy metal and are locked to the sides of the wheels. In roller bearing pulleys, the rollers run between a hardened thimble and the axle. In ball bearing pulleys, the cones and races are of hardened steel, and only high grade finished steel balls are used.

Axle pins are made of cold drawn steel, and shouldered.

## Wheels.

"American," "Merit" and "Eagle" sash pulleys can be furnished with either brass, bronze or steel wheels. All steel wheels are electrically welded together.

"American" sash pulleys are made with wheels 2, 2¼, 2½ and 3 ins. in diameter.

"Merit" sash pulleys are made with wheels 2¼ and 2½ ins. in diameter.

"Eagle" sash pulleys are made with wheels 1¾, 2 and 2¼ ins. in diameter.

## Bearings.

"American" sash pulleys can be furnished with either plain axle, ball or roller bearings.

"Merit" and "Eagle" sash pulleys can be furnished with plain axles or ball bearings.

## Finish of Face Plates.

The face plates of these sash pulleys may be natural steel, plated steel or solid brass or bronze, as specified. They may be furnished plated to match the surrounding hardware.

## Special Pulleys.

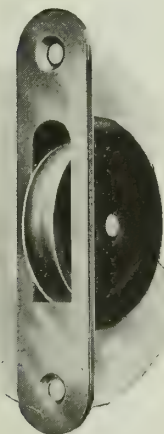
This company manufactures special sash pulleys for any make of fireproof windows.

## Government Installations.

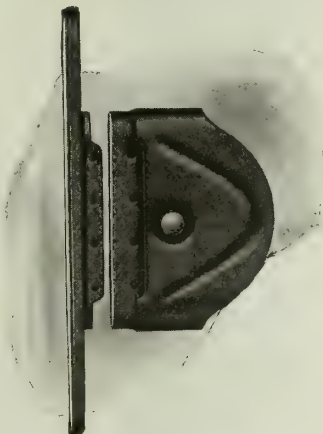
The company has equipped a large number of government buildings with sash pulleys to meet with the United States Government specifications.

## References.

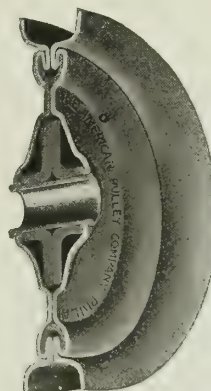
"American" sash pulleys are installed in the United States Post Office, Washington, D. C., and in many other post offices throughout the country; also in the Metropolitan Life Building, Hudson Terminal Building, City Investing Building, Trinity Building and Hotel McAlpin in New York, N. Y., and many equally prominent installations in other cities in this country and abroad.



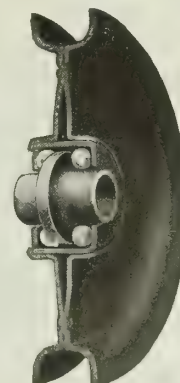
End View



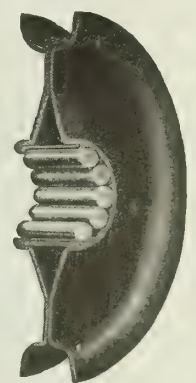
Side View, Showing Method of Electrically Welding Case to Face Plate



Section of Plain Axle Bearing Steel Wheel, Locking Ring Construction



Section of Ball Bearing Steel Wheel, Electrically Welded



Section of Roller Bearing Steel Wheel, Electrically Welded

CONSTRUCTION DETAILS OF AMERICAN SASH PULLEYS

# CALDWELL MANUFACTURING CO.

## Sash Balances and Door Holders

MAIN OFFICE AND FACTORY

8-10 Jones Street  
ROCHESTER, N. Y.

BRANCH OFFICES

CHICAGO, 202 North Wabash Avenue

PHILADELPHIA, 521 Commerce Street

### Products.

Manufacturers of CALDWELL SASH BALANCES; VERTICAL, JUNIOR and EMPIRE DOOR HOLDERS.

Caldwell French Window Holder, and other Hardware Specialties.

### Caldwell Sash Balances.

This company has made these sash balances during the past 28 years. They are made of the best material, by workmen thoroughly experienced in the art of producing sash balances with uniform tension, insuring

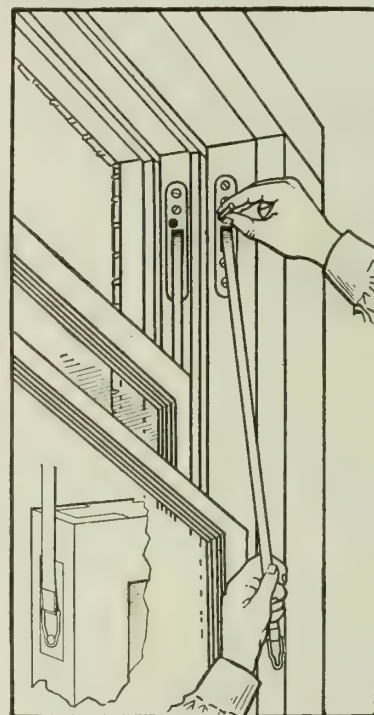
a perfect counterbalance at all points of the sash.

Illustration No. 1 shows an important improvement, which enables the carpenter to apply Caldwell balances in half the time required for the ordinary balance. There is also no danger of injury to the suspending band.

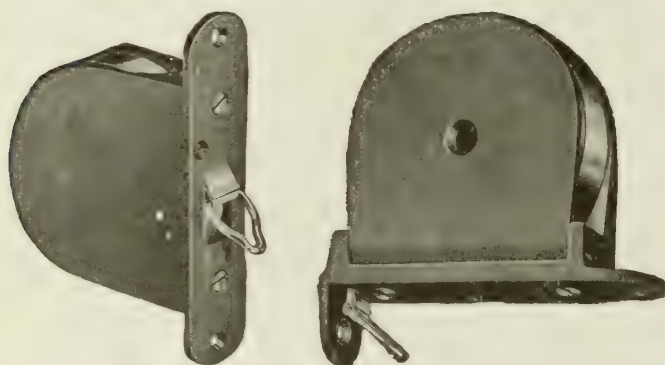
**TOP BALANCE**  
—The top balance enables the architect to make the narrowest possible mullion, in order to get the maximum light in a desired space.

**GUARANTEE**—Caldwell sash balances are guaranteed for 15 years.

**LITERATURE**—Send for catalogue, "Suggestions for the Present Day Architect."



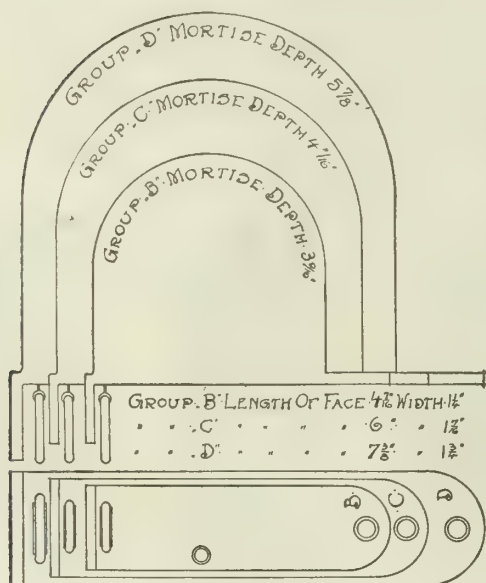
NO. 1. METHOD OF INSTALLING  
A CALDWELL SASH BALANCE  
(Patent pending)



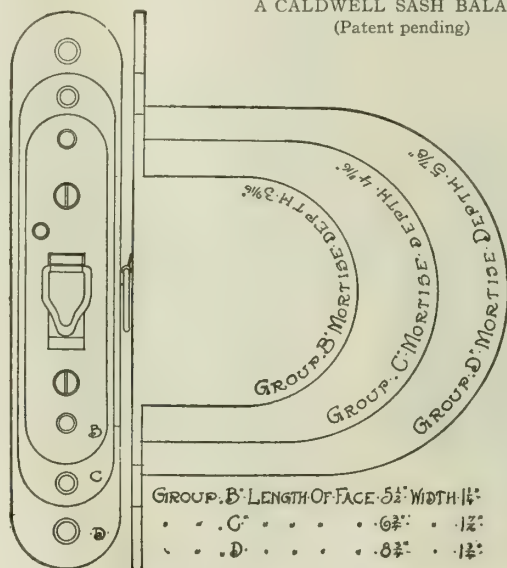
Side

Angle Top

CALDWELL SASH BALANCE



Top Balance for Mullion Windows



Side Balance

### SIZES OF CALDWELL SASH BALANCES

Measurements on outline cuts are full size. Uniform mortises cut at the mill simplify the application



REFERENCES—The leading architects call for the Caldwell sash balances in their specifications, in order to be sure of getting the best.

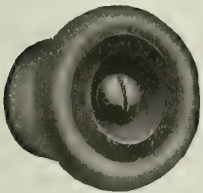
Recommended and carried in stock by all first class hardware dealers.

Our marine balances are standard for the United States Navy Department, and are used by many of the foreign Governments in all classes of vessels.

#### Caldwell Vertical Door Holders.

Of strongest construction; made in all finishes; have no screw ears.

A bracket affixes the holder immovably to the door, and gives strength at the base of holder where it is most required. Our special large vertical door holder is recommended for use on heavy outside doors, particularly upon vestibule doors, which open over incline floors, such as theaters, moving picture entrances, etc. Made in cast brass and bronze metal only.



RUBBER FOR CALDWELL VERTICAL DOOR HOLDERS  
(Full-Size)



1 1/4-in. Drop



(Special Size)  
4 1/4-in. Drop

CALDWELL VERTICAL DOOR HOLDERS

Pressers are made of cold rolled rods, 5/8 in. in diameter. The rubbers are the *original cup shape*, reinforced with hard leather gaskets, which prevent the rubbers from being cut and torn.

#### Caldwell Junior Door Holder.

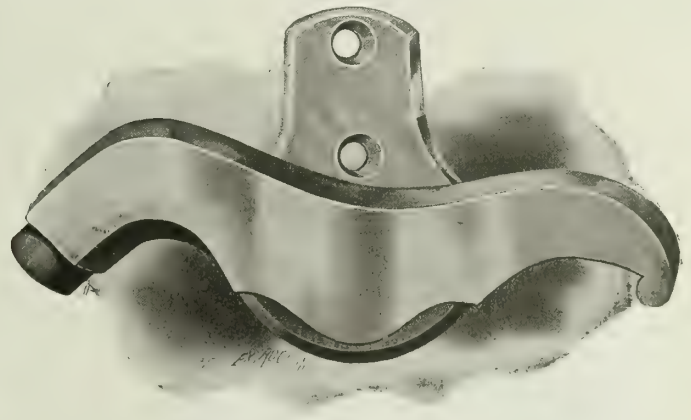
This holder is adapted for use upon interior doors only. They are applicable also to light double acting, pantry and office doors. Always release presser before attempting to close door. Otherwise, the floor is liable to be marred, and the rubber presser is sure to be damaged.



CALDWELL JUNIOR DOOR HOLDER  
1-in. drop

#### Empire Door Holder.

This holder is made in 3 sizes, to hold light, medium and heavy doors. They are made for use upon right and left hand doors. The large size is suitable for heavy office, church and vestibule doors. Made of malleable iron and bronze metal in all finishes. Operated by the toe.



EMPIRE DOOR HOLDER  
(Improved)  
Drop 1 1/2 ins., on all three sizes

# GRANT PULLEY AND HARDWARE COMPANY

## Sash Pulleys and Casement Window Hardware

Architects Building, 101 Park Avenue

NEW YORK, N. Y.

TELEPHONE CONNECTION

Agents in all the principal cities of the United States and Canada and our Name will be found listed in the Telephone Directories

### Products.

Manufacturers of SASH PULLEYS and CASEMENT HARDWARE:

"Grant," "Queen" and "Lee" Sash Pulleys.

"Grant" and "Queen" Overhead and "Lee" Cast Iron Side Sash Pulleys for wood and metal frames; made in all sizes, finishes and bearings.

"Grant" Casement Hardware.

"Grant" Antifriction Vertical Pivot Lifts.

"Turner" (Patent) Antifriction Drawer Slides and Supports.

"Grant" Ball Bearing Door Sheaves and Flush Track; "Grant" Sash Chain and Fixtures; "Grant" Friction Sash Centers; "Queen" Friction Casement Adjusters.

For "Grant" Wood Rolling Partitions, see page

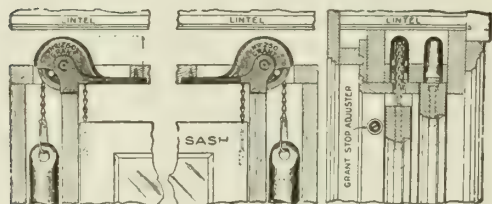
770; for Door Hangers and Bar Locks, see pages of Reliance-Grant Elevator Equipment Corp., 626-29; for Revolving Window Devices, see page 739.

### Selling Agents for:

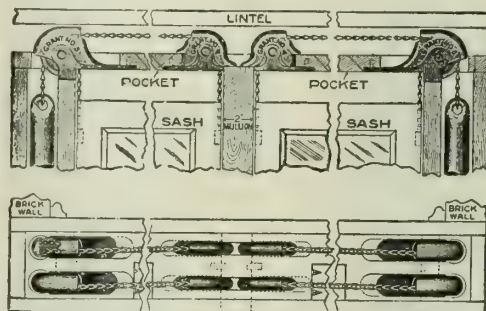
"American" steel sash pulleys; "Von Duprin" safety exit devices; "Howarth" reversible sash centers; "Diamond" tubular ball bearing door hangers.

### "Grant" Overhead Pulleys.

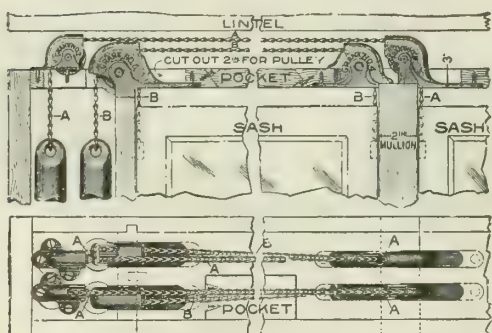
On account of the additional pocket room gained by the use of "Grant" pulleys, iron instead of lead weights can be used for the heaviest plate glass windows, thus materially reducing the cost. The frames are cut for "Grant" pulleys by the regular pulley machine.



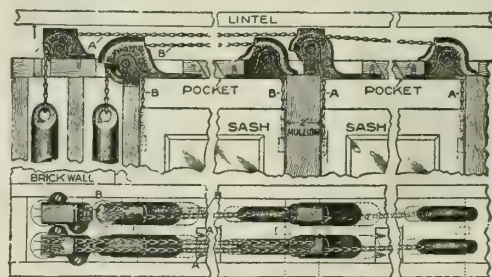
SINGLE FRAME WINDOW AND SECTION OF FRAME



"GRANT" PULLEYS FOR TWIN WINDOWS



"GRANT" PULLEYS FOR TRIPLET WINDOWS

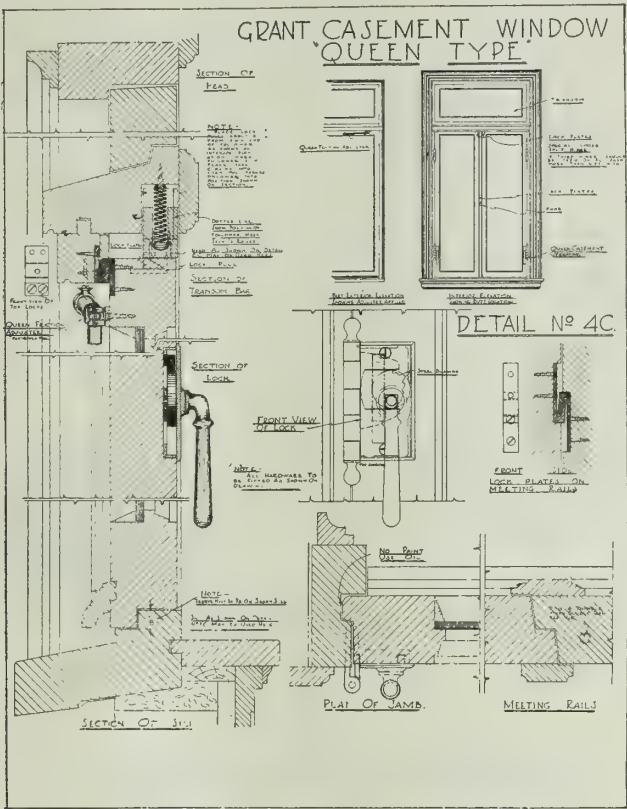


"GRANT" PULLEYS FOR QUADRUPLE WINDOWS



“Grant” Casement Hardware.

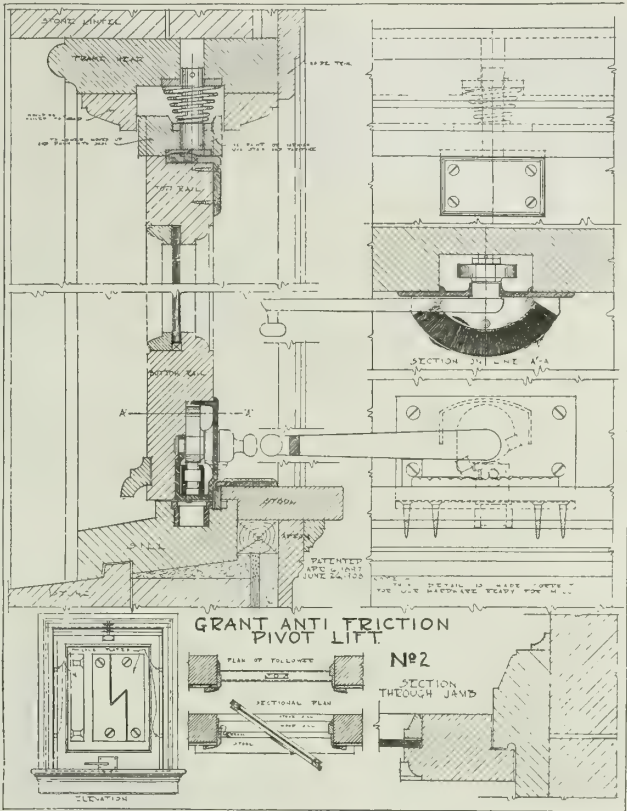
A casement window, opening into room fitted with this hardware, gives, without changing the natural appearance, an inexpensive and weatherproof casement window.



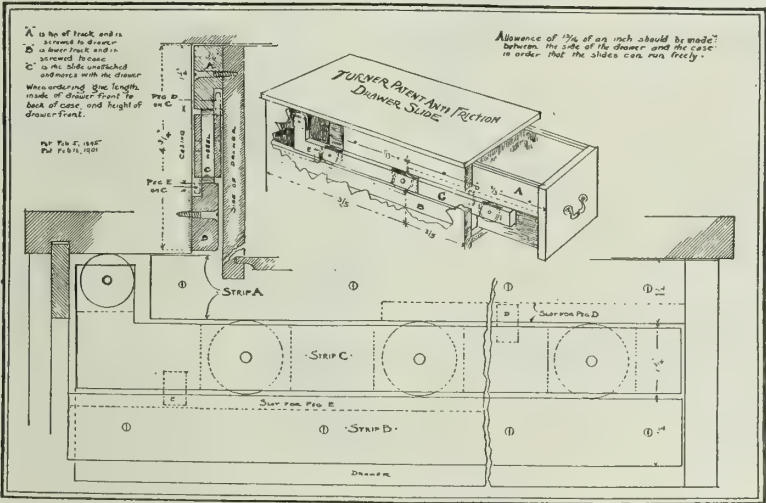
DETAILS, “GRANT” CASEMENT WINDOW  
Showing application of hardware

“Grant” Antifriction Vertical Pivot Lifts.

The “Grant” antifriction pivot lift, when applied to sash pivoted top and bottom, can be quickly and easily opened for ventilation.



DETAILS, PIVOT WINDOWS  
Equipped with “Grant” Antifriction lifts



DETAILS “TURNER” (PATENT) ANTIFRICTION DRAWER SLIDES

“Turner” (Patent) Antifriction Drawer Slide.

The “Turner” antifriction drawer slide and support are noiseless. When fitted with the “Turner” attachment a drawer can not fall from the case when pulled out suddenly; nor can it sag, if heavily loaded, when opened to its limit.

References.

This company will furnish as references, on request, the names and locations of buildings in all large cities in the United States and Canada where its products are in use. These products are giving such satisfaction that the company can refer to all the users.

# THE COLUMBIAN HARDWARE COMPANY

Manufacturers of Side and Overhead Sash Pulleys

CLEVELAND, OHIO

## BRANCH OFFICES

BALTIMORE, MD., EDWIN CUGLE, 315 North Charles Street  
BUFFALO, N. Y., E. B. LAWSON, 78 Builders' Exchange  
CHICAGO, ILL., COLUMBIAN HARDWARE Co., 15 North Jefferson  
Street

LOS ANGELES, CAL., W. H. STEELE, 224 Central Building  
MINNEAPOLIS, MINN., A. N. STARK, 223 Plymouth Building  
NEW ORLEANS, LA., J. C. BRILL, Queen and Crescent  
Building

NEW YORK, N. Y., COLUMBIAN HARDWARE Co., 16 Warren Street  
PHILADELPHIA, PA., COLUMBIAN HARDWARE Co., 305 North  
15th Street

RICHMOND, VA., W. P. THURSTON, 36 Merchants National  
Bank Building

SAN FRANCISCO, CAL., RUST-GODFREY SALES Co., 268 Market  
Street

SEATTLE, WASH., T. D. McLEAN, L. C. Smith Building

## Products.

"COLUMBIAN," (formerly the "GARDNER") SASH PULLEYS, for Side and Overhead Hung Window Sash.

## The Case.

The case is gray iron, inspected castings, carefully machined.

## Faces.

Plain, polished, polished and lacquered, electroplated, or bronze metal faces are available in standard pulleys. The bronze metal faces are heavy gage carefully fitted and fixed permanently into position.

## Wheels.

Wheels are deeply grooved, carefully polished or turned, and accurately centered. Two standard grooves are available, combination for rope and chain, and double groove for chain only. Each has its special advantages. The combination is of value in being more adaptable for either rope or chain. The double groove for chain is of special value where chain is used, as it offers for the chain three points of support.

## Bearings.

Two alternate bearings are offered in standard pulleys, plain axle and roller bearing. The plain axle is  $\frac{5}{16}$ -in. special cold rolled steel. The roller bearing is a  $\frac{5}{16}$ -in. axle, with six  $\frac{1}{8}$ -in. rolls. All axles are cold riveted in position.

## Overhead Pulleys and Mullion Overhead Pulleys.

OVERHEAD PULLEYS FOR SINGLE WINDOWS—Use of these pulleys reduces width of the weight box, and allows an increased window space. Owing to increased height of weight box, iron weights can be used where lead weights would be required if side sash pulleys were used.

MULLION OVERHEAD PULLEYS FOR TWIN AND TRIPLE WINDOWS—Used in mullion windows where insufficient space is provided between windows to take care of the weights. Also, where large area of glass is desired and reduced



TRADE-MARK

width of mullion. Weights are carried at sides of windows and no weights or weight box required in the center, one weight carrying each sash. Works smoother than sashes hung on two weights.

## Orders.

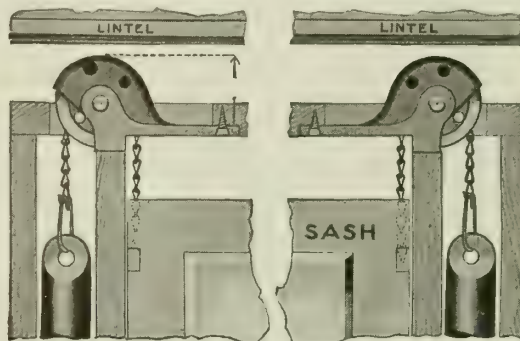
The "Columbian" line of pulleys has been standardized, with the result that better pulleys are produced and better service given. With our facilities prompt care of all pulley orders is guaranteed.



Style B  
"COLUMBIAN" OVERHEAD PULLEY  
For single windows



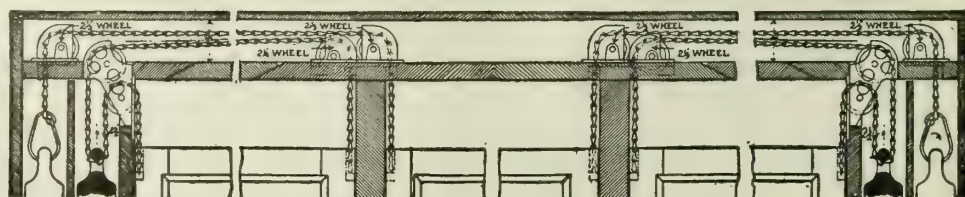
STANDARD SIDE  
SASH PULLEY



"COLUMBIAN" OVERHEAD PULLEY FOR SINGLE WINDOWS



"COLUMBIAN" MULLION OVERHEAD PULLEYS  
Two windows and one mullion



"COLUMBIAN" MULLION OVERHEAD PULLEYS  
Three windows and two mullions



# L. P. T. SPECIALTY COMPANY

E. K. FLEISCHER, EXCLUSIVE SELLING AGENT

## Overhead Pulleys and Adjusters for Counterbalanced Windows

ST. PAUL, MINN.

### Products.

Manufacturers of L. P. T. OVERHEAD PULLEYS and ADJUSTERS for COUNTERBALANCED WINDOWS.

### Advantages of L. P. T. Pulley and Adjuster for School Buildings.

**FOR VENTILATION**—Counterbalanced feature lowers top sash as lower sash is raised, allowing stagnant heated air to pass out of the room as fresh air comes in at the bottom of lower sash. This system is being used in most schools, and school boards are agitating this method of ventilation.

**MORE GLASS AREA**—L. P. T. overhead pulleys permit of narrow mullions between sash, thus reducing the shadow incident to wide mullions in double hung windows. There is also more light and a saving on mullions which can be reduced in size to 3 ins.

**TROUBLE REDUCING**—The L. P. T. overhead pulleys and adjusters are the most simple of adjustment and easiest operated of any window opening device. Nothing to get out of order, no weights to stick, no cheap cords to fray and wear out, no sash pockets to open up, everything exposed and easily reached—a turn of the screw for adjustment.

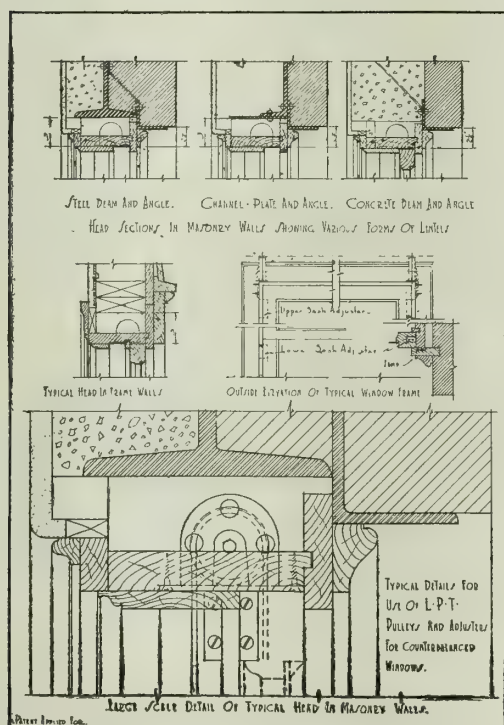
**COST**—L. P. T. overhead pulleys and adjusters cost less to install than other patented devices, doing away with box frame and sash weights and the four side pulleys that are

used in the operation of the old style window. Another advantage is the using of a plain jamb frame, which reduces the cost over a box frame, makes a much tighter job, and also eliminates the upper sash socket, all window poles, and requires only the use of 1 sash lift.

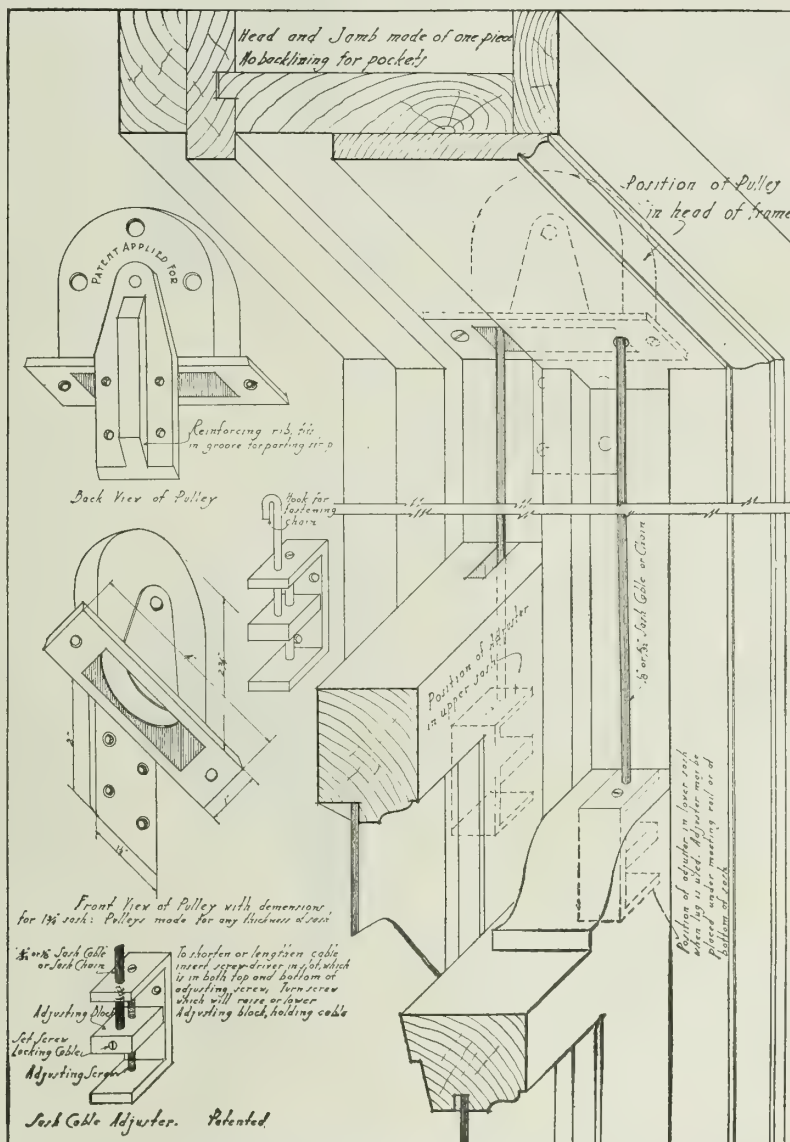
**SATISFACTION**—These overhead pulleys and adjusters have given universal satisfaction. School architects who have specified and used them are unanimous in their recommendations and they continue to specify them.

### Co-operative Service.

Full information about the L. P. T. school specialties will be sent to any architect. Sample and further particulars furnished on request.



TYPICAL DETAILS FOR USE OF L. P. T. PULLEYS AND ADJUSTERS WITH COUNTERBALANCED WINDOWS



ISOMETRIC VIEWS SHOWING APPLICATION OF L. P. T. ADJUSTERS AND OVERHEAD PULLEYS

# PULLMAN MFG. COMPANY

Manufacturers of Unit Sash Balances

ROCHESTER, N. Y.

## Products.

PULLMAN UNIT SASH BALANCES, taking the place of Cords, or Chains and Weights in modern buildings.

Special Sash Balances—X-Raise, for extra long run of tape; Tandem, for extra heavy windows; Corner, requiring no mortises; All Brass, for marine work, and Sash Balances for every purpose.

## Why Pullman Unit Sash Balances Are Better.

Pullman Unit Sash Balances are made of pressed steel throughout. All moving parts are incased, are practically indestructible, and, being so incased, the forcing of the balance into a tight mortise can not interfere with the smooth running of the balance—an exclusive Pullman feature.

The Pullman Unit Balance has a tape of rustproof steel, wound on a revolving drum and operated by a clock spring of the finest steel. All parts are made by punch and die; therefore fit accurately, run smoothly, and are practically noiseless.

## Advantages and Special Features.

The balances are made in three sizes of units ("K," "L" and "M"), easily determined from the architect's plans which size unit is suitable for the window; the mortises may then be cut in the frame at the mill as easily and cheaply as the mortise for the ordinary pulley.

The box frame is eliminated; only a plain frame is necessary for Pullman Balances—this means a positive saving of lumber.

The economy and durability of the Pullman Unit Sash Balance are recognized features, the first cost is less than cords, weights and pulleys, and with hard usage they last indefinitely, being guaranteed for ten years.

Pullman Unit Sash Balances, after severe tests, have been approved by the National Board of Fire Underwriters' Laboratories, and may therefore be used in fireproof buildings—this is the only sash balance that has been so approved.

## Unit Top Pattern Balance.

The top pattern balance is for use where there is



not sufficient space for the side pattern. The mechanism of the top pattern is the same, the difference being that the top pattern is mortised into the head of the frame instead of the side. It is particularly useful in group windows with narrow mullions; in fact, the width of the mullion is limited only by the thickness that is required to give the necessary strength to the building.



THE TOP PATTERN BALANCE, FITTED IN THE HEAD OF FRAME



UNIT SASH BALANCE, SIDE PATTERN

## Easy to Install.

The unit feature makes the installation of the Pullman Unit Sash Balance very simple; and because the face plates are all the same size in a given unit, mortises for them may be cut at the mill as for ordinary sash pulleys.

Not only are the face plates standardized, but they are designed for the utmost convenience in the cutting of mortises. The mortises for unit "K," for illustration, are made complete by boring six 1-in. holes tangent. Four of these holes are bored through the stile, making the mortise for the body of the balance; the two end holes are centerbored to the proper depth to let the face plate in flush.

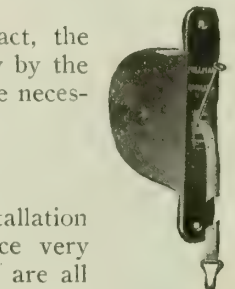
The mortises may also be cut with pulley mortising machine and router bit, the same as for ordinary pulleys.

Any carpenter with a screwdriver can install at least twice as many windows with sash balances per day as can be fitted with cords and weights.

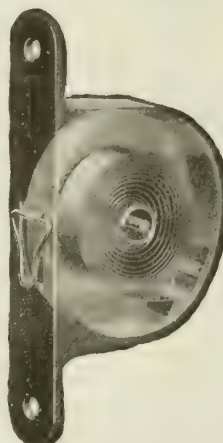
## Steel Housing.

For concrete buildings we have provided a convenient and economical way of making the recess for the balances by means of a steel housing.

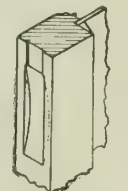
When the frame is set into the wall the concrete flows around the housing, embedding it in the mixture. Thus set, the housing not only provides a metal recess for the sash balance, but helps to hold the window frame in place.



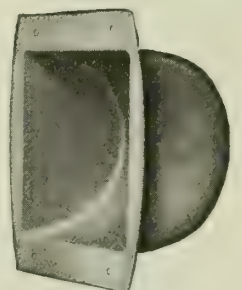
AN ORDINARY NAIL INSERTED IN BALANCE HOLDS SPRING WHILE TAPE IS BEING ATTACHED TO SASH



UNIT SASH BALANCE, SHOWING INTERIOR CONSTRUCTION



SHOWING GROOVE IN SIDE OF SASH TO RECEIVE LOOP AT END OF TAPE

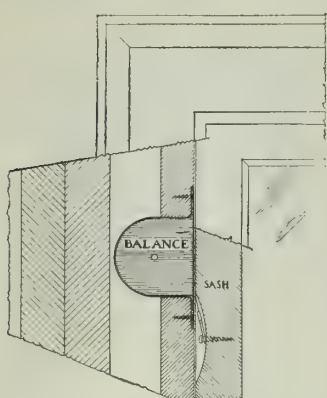


STEEL HOUSING

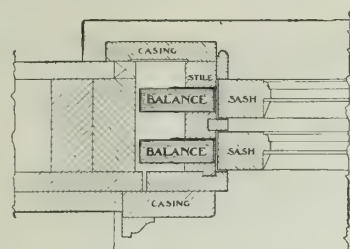
## Illustrated Catalogue.

This catalogue, giving further information, together with blue print, will be sent on application.

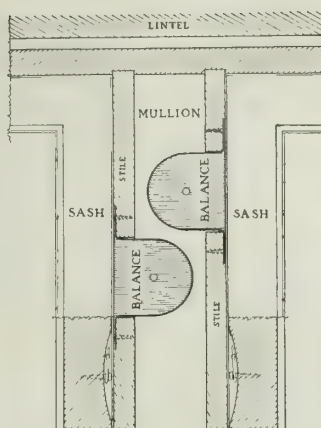




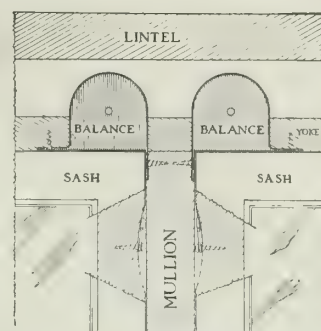
SECTIONAL VIEW OF SIDE PATTERN INSTALLATION



HORIZONTAL SECTION SHOWING TWO SIDE PATTERN BALANCES ATTACHED TO THE TWO SASH



ONE METHOD OF INSTALLING SIDE PATTERN BALANCES IN NARROW MULLIONS, BY PLACING THE BALANCES TANDEM



INSTALLATION SHOWING TOP PATTERN BALANCES IN VERY NARROW MULLIONS

## PRICES, ETC., OF PULLMAN UNIT SASH BALANCES

Side and Top Pattern Balances are the same price. Side Pattern is always sent unless Top Pattern is Specified.

UNIT "K," FOR 4-LB. TO 32-LB. SASH

UNIT "L," FOR 10-LB. TO 48-LB. SASH

Balance No.	Weight of each sash, lbs.	Length of tape, ins.	Code word	Per set of 4 balances for 2 sash	Balance No.	Weight of each sash, lbs.	Length of tape, ins.	Code word	Per set of 4 balances for 2 sash
0-K	4 to 5	30	Kale	\$1.75	3-L	10 to 11	46	Label	\$3.50
1-K	6 to 7	30	Kalif		4-L	12 to 13	46	Labor	
2-K	8 to 9	30	Kaolin		5-L	14 to 15	46	Lace	
3-K	10 to 11	46	Keck		6-L	16 to 17	46	Lack	
4-K	12 to 13	46	Kedge		7-L	18 to 19	46	Lactic	
5-K	14 to 15	46	Keel		8-L	20 to 21	46	Lacona	
6-K	16 to 17	46	Keg		9-L	22 to 23	46	Lacteal	
7-K	18 to 19	46	Keep		10-L	24 to 26	54	Laddie	
8-K	20 to 21	46	Kern		11-L	27 to 29	54	Lade	
9-K	22 to 23	46	Ketch		12-L	30 to 32	54	Lading	
10-K Special	24 to 26	46	Key	2.50	13-L	33 to 35	54	Ladle	
11-K Special	27 to 29	46	Kick		14-L	36 to 38	54	Lady	
12-K Special	30 to 32	46	Kidnap		15-L	39 to 41	54	Lag	
					16-L	42 to 44	54	Laggard	
					17-L	45 to 48	54	Lagging	

Depth of unit "K" balance  $3\frac{1}{2}$  ins.Depth of unit "L" balance  $4\frac{1}{2}$  ins.**Finish.**

The face plates of unit balances are regularly finished in dull black lacquer.

When required, unit balances are furnished with solid bronze or brass plates in unit "K" at \$1.00; unit "L" at \$1.50 net per set in addition to regular price, and in unit "M" at \$1.95 net per set extra.

Electroplated face plates—brass, bronze, nickel or copper—45¢ net per set extra in unit "K," 55¢ extra in unit "L," and 75¢ net per set extra in unit "M."

**How to Order.**

Give weight of each sash.

Unit "K" takes uniform mortise for 4-lb. to 32-lb. sash.

Unit "L" takes uniform mortise for 10-lb. to 48-lb. sash.

Unit "M" takes uniform mortise for 24-lb. to 105-lb. sash.

Weight is usually marked on sash at the mill. Generally the upper and lower sash weigh the same. If not, give weight of each and half sets of proper size will be sent.

CAUTION—Do not estimate the weight of sash, but weigh each one on scales. There is much variation in the weight of sash of the same dimensions. Be sure that sufficient space is left for the balances. See blue print. Where there is not room for the side pattern balances, use the top pattern, shown in blue print furnished as applied to narrow mullions.

## UNIT "M," FOR 24-LB. TO 105-LB. SASH

Balance No.	Weight of each sash, lbs.	Length of tape, ins.	Code word	Per set of 4 balances for 2 sash
10-M	24 to 26	54	Mace	\$5.00
11-M	27 to 29	54	Machine	
12-M	30 to 32	54	Mackerel	
13-M	33 to 35	54	Madam	
14-M	36 to 38	54	Madly	
15-M	39 to 41	54	Madonna	
16-M	42 to 44	54	Magic	
17-M	45 to 48	54	Magnate	7.50
19-M	49 to 52	60	Magnet	
21-M	53 to 56	60	Magnify	
23-M	57 to 60	60	Magnolia	
25-M	61 to 64	60	Magpie	
27-M	65 to 68	60	Mahogany	8.75
29-M	69 to 72	60	Maiden	
31-M	73 to 76	60	Mail	
33-M	77 to 80	60	Maintain	
35-M	81 to 84	60	Majestic	
37-M	85 to 88	60	Major	10.00
39-M	89 to 92	60	Maker	
41-M	93 to 96	60	Malady	
43-M	97 to 100	60	Malice	
45-M	101 to 105	60	Malign	

Depth of unit "M" balance  $5\frac{1}{4}$  ins.

# ROYAL SAFETY ANCHOR CO.

## Window Cleaners' Safety Devices

62-64 West Washington Street  
CHICAGO, ILL.

### Products.

ROYAL IMPROVED SAFETY DEVICES for window cleaners, consisting of BELTS and ANCHORS.

### Royal Improved Bronze Anchors.

Made of hard bronze throughout. They are doubly secure, as they overcome the weakness of ordinary anchors which provide for a 4-in. bond in the wall, by securing a bond of twice this length, making them permanent fixtures during the life of the building. These anchors can be attached to any style or pattern of window frame, whether of stone, brick, concrete, steel or wood.

### Underwriters' Test.

Following letter refers to Royal bronze anchor for wood frames or mullions, shown on opposite page:

CHICAGO, ILL., Aug. 24, 1917.

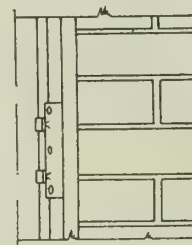
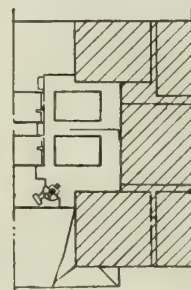
GENTLEMEN:

As promised your Mr. Clark, we have tested the cast bronze through-bolt anchor for use in wood window frames in connection with your safety belts. The ultimate breaking load

was 2106 pounds and failure took place at the root of the thread in the shank. The area of the fracture was approximately 0.066 square inch, making the strength of the metal  $2106 \div 0.066$ , or 31,900 pounds per square inch.

In our opinion this anchor is amply strong for the purpose intended and we shall gladly issue a supplementary report on this item.

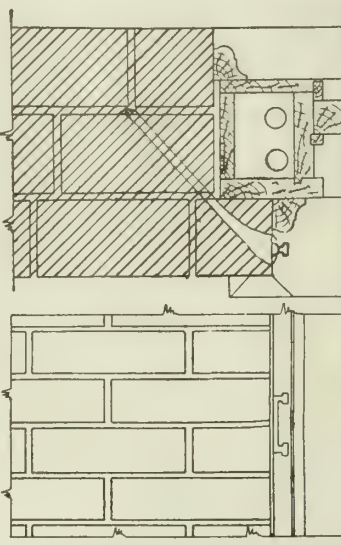
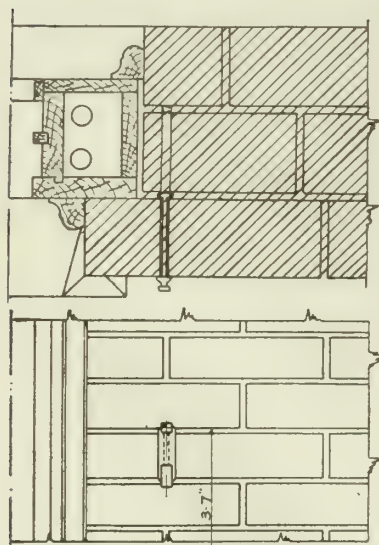
Very truly yours,  
UNDERWRITERS' LABORATORIES, INC.  
(Signed) S. V. JAMES,  
Mech. Engr., Casualty Dept.



ROYAL BRONZE DRILL PLATE NO. 1

For attaching to hollow metal window frames.

Sheet metal contractor shall fasten to inner side of metal window frames, reinforcing plates, drilled and tapped to receive drill plates. Place drill plates 42 to 45 ins. above sill, one on each side of frame. These drill plates can be attached to cast iron or steel frames or mullions.



ROYAL BRONZE ANCHOR NO. 1

For installation in brick or stone buildings during construction.

Showing manner of placing in wall. Secures a bond of 8 ins. into masonry. Placed 42 to 45 ins. above sill, one on each side of window frame, as shown

ROYAL BRONZE ANCHOR NO. 2

For installation in brick or stone buildings during construction.

Showing manner of placing in reveal of wall. Secures a bond of 10½ ins. into masonry, and can be used in face as well as reveal of wall.

Placed 42 to 45 ins. above sill, one on each side of window frame, in any width reveal, as shown



ROYAL BRONZE DRILL PLATE NO. 2

For attaching to concave jamb sections of steel window sash of Fenestra or other construction. Allows terminals of safety belt to slide over heads, clearing both glass and masonry.

Placed from 42 to 45 ins. above sill. Drill and tap three ¼-in. holes after template furnished by manufacturer



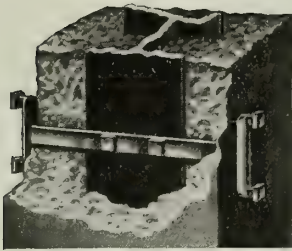
ROYAL BRONZE MULLION BOLT

For solid metal window frames or steel mullions.

When attaching to solid cast frames, place 42 to 45 ins. above sill. Drill and tap two 5/16-in. holes, 2¼-in. centers. Install 2 bolts on each side of window frame.

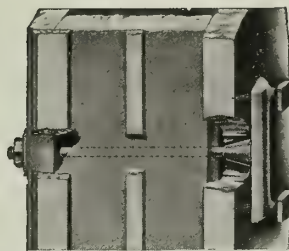
When attaching to T-iron mullions, or other construction of ½ to 1½ in. thickness, drill two 3/8-in. holes, 2¼-in. centers, 42 to 45 ins. above sill. Turn on brass nut as furnished with bolt, and head in end of bolt to keep nut from working loose





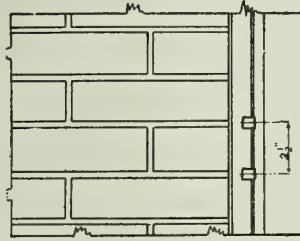
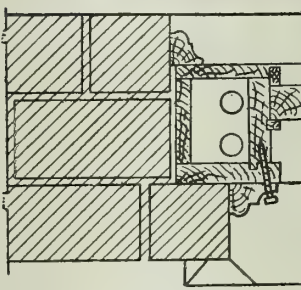
**ROYAL BRONZE UNDERWRITERS' MULLION ANCHOR**

For attaching to I-beam before pouring concrete. Bolt anchor to I-beam with two  $\frac{3}{8}$ -in. bolts, 42 to 45 ins. above sill. Contractor must drill 2 holes,  $1\frac{1}{2}$ -in. centers,  $\frac{3}{4}$  in. from edge of beam. Anchors to be set before concrete forms are placed



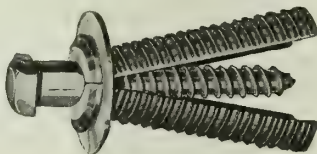
**ROYAL BRONZE ANCHOR FOR WOOD FRAMES OR MULLIONS**

Set 42 to 45 ins. above sill. Drill  $\frac{3}{8}$ -in. hole through pulley stile. Let heads incline toward window opening; 2 anchors to be placed in each mullion



**ROYAL SPECIAL HEAD GALVANIZED GIMLET POINTED SAFETY BOLTS**

For jambs of wood window frames. Install 2 bolts on each side of window casing, 42 to 45 ins. above sill,  $2\frac{1}{2}$ -in. centers, as shown



**ROYAL PATENTED BRONZE EXPANSION SHIELD WITH GALVANIZED BOLTS**

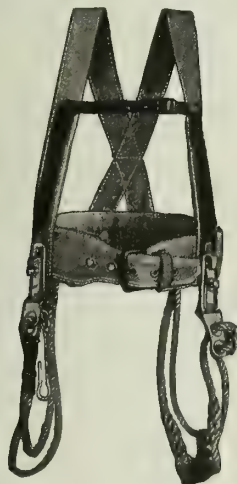
For installing in masonry of existing buildings. Install 2 bolts on each side of every window frame, 42 to 45 ins. above sill,  $2\frac{1}{2}$ -in. centers

### Royal Improved Safety Belts.

Made of best material throughout. Adjusted to fit any size window. Due to the patented "half hitch" fastening on left side of belt, length of rope can be easily adjusted with one hand. Patented terminal clamps on both ends of rope insure maximum safety, and are instantly attached to or detached from the safety bolts or anchors.



**ROYAL IMPROVED BRONZE TERMINAL AND "HALF HITCH" ATTACHED**



**ROYAL IMPROVED SAFETY BELT**

When ordering safety belts, specify one measurement, the width of the widest sash.

### Specifications for Royal Improved Safety Devices.

Contractor shall furnish and install, at all windows above first story, Royal window cleaning safety devices as follows:

In all masonry jambs, install Royal improved bronze anchors, one on each side of window frame. (If desired on face of wall, specify Royal bronze anchor No. 1; if in reveal, specify Royal bronze anchor No. 2.) Where wood mullions occur, furnish and install in each mullion 2 Royal bronze mullion anchors.

Wherever cast iron or steel mullions occur, each mullion shall be drilled and tapped for 4 Royal bronze mullion bolts.

Wherever underwriters' concrete or steel mullions occur, furnish and attach Royal bronze underwriters' mullion anchors.

Contractor shall furnish and deliver to the owner or his authorized representative [number required] Royal improved safety belts, and take receipt for same.

All anchors, bolts, belts, etc., are to be manufactured by the Royal Safety Anchor Co., of Chicago, Ill., and shall be installed in accordance with the printed directions published by them.

Contractor shall also guarantee that all material, and the installation thereof, shall meet with the requirements of the local building department.

NOTE—In hollow metal window frames, where the use of bronze anchors is objected to, contractor shall furnish and attach Royal bronze drill plates with reinforcing plates, one on each side. If bronze anchors are objected to where there are wood frames, contractor shall furnish and install 4 Royal special head galvanized safety bolts in every window frame, two on each side, with  $2\frac{1}{2}$ -in. centers.

### Where Royal Safety Devices Can be Seen.

Royal improved safety devices are on exhibition at the display rooms of the following Safety Commissions and Insurance Companies:

United States Fidelity Co., Baltimore, Md.  
United States Casualty Co., 80 Maiden Lane, New York, N. Y.  
Maryland Casualty Co., Baltimore, Md.  
Industrial Accident Commission of the State of California, 525 Market St., San Francisco, Cal.  
Industrial Commission of Ohio, Columbus, Ohio  
Hamlin & Co., Employees' Safety Department, 45 William Street, New York, N. Y.  
American Museum of Safety, 14 West 24th Street, New York, N. Y.

### References.

Royal safety devices meet the requirements of all building departments and insurance companies.

Letters of indorsement by Wm. Burgess, Executive Secretary of the Public Safety Commission, and Coroner Peter M. Hoffman, of Chicago and Cook County, Ill., are on file at our office.

Royal devices are indorsed by the Chicago Window Washers Union.

Further references sent on request.

### Prominent Installations.

A few of the buildings and institutions in which "Royal Four-bolt System" has been installed:

Public Schools, Chicago, Ill.; Milwaukee, Wis.; Rockford, Ill.; Joliet, Ill.; Elgin, Ill.  
University of Michigan, Ann Arbor, Mich  
Commercial Tribune Building, Cincinnati, Ohio  
Times-Star Building, Cincinnati, Ohio  
Duttenhofer Building, Cincinnati, Ohio  
Lackman Hotel, Cincinnati, Ohio  
Hotel St. Clair, Detroit, Mich.  
Great Northern Hotel, Chicago, Ill.  
Y. M. C. A. Building, Chicago, Ill.  
Chicago Lying-in Hospital, Chicago, Ill.  
Crerar Library Buildings, Chicago, Ill.  
Corn Products Co. Building, Chicago, Ill.  
Delaware Syndicate Building, Chicago, Ill.  
Tribune Building, Chicago, Ill.  
Western Electric Building, Chicago, Ill.  
Willys-Overland Building, Toledo, Ohio  
Polk Building, Des Moines, Iowa

# H. B. DODGE & CO.

ESTABLISHED 1885

Wilson's Rolling Partitions and Blinds

INCORPORATED 1905

332 South Michigan Avenue  
CHICAGO, ILL.

## Products.

WILSON'S ROLLING or COILING PARTITIONS, in two types: Horizontal or Overhead Coiling, and Vertical or Side Coiling, which roll around a metal shaft into box or case at top or side of opening.

Sanitary Wardrobes for Schools; Venetian Blinds and Awnings.

## Uses.

Coiling partitions are extensively used to separate and subdivide rooms.

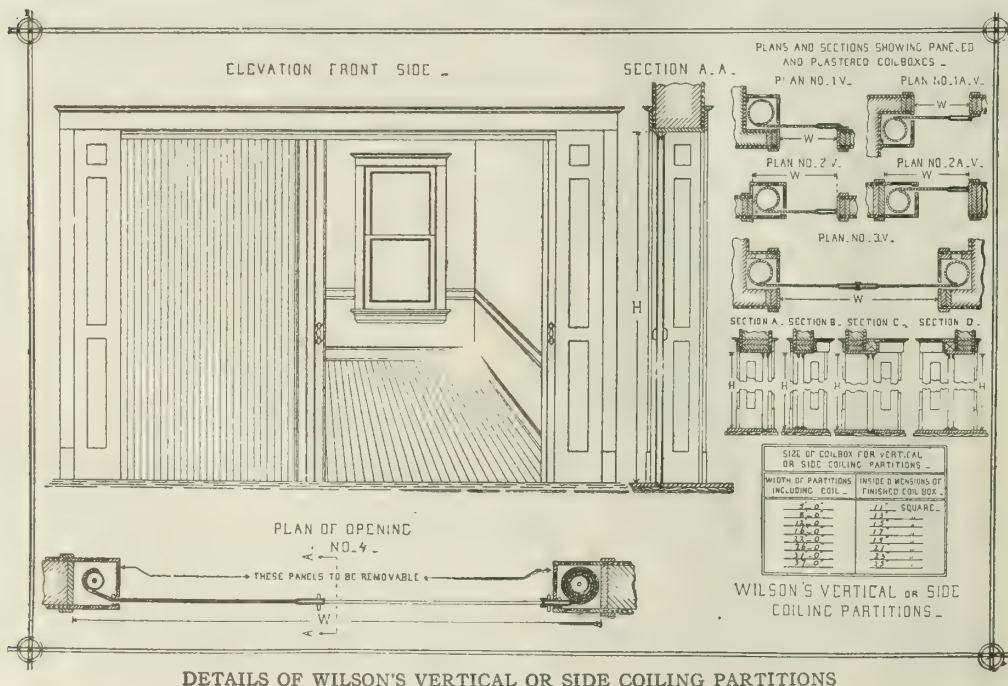
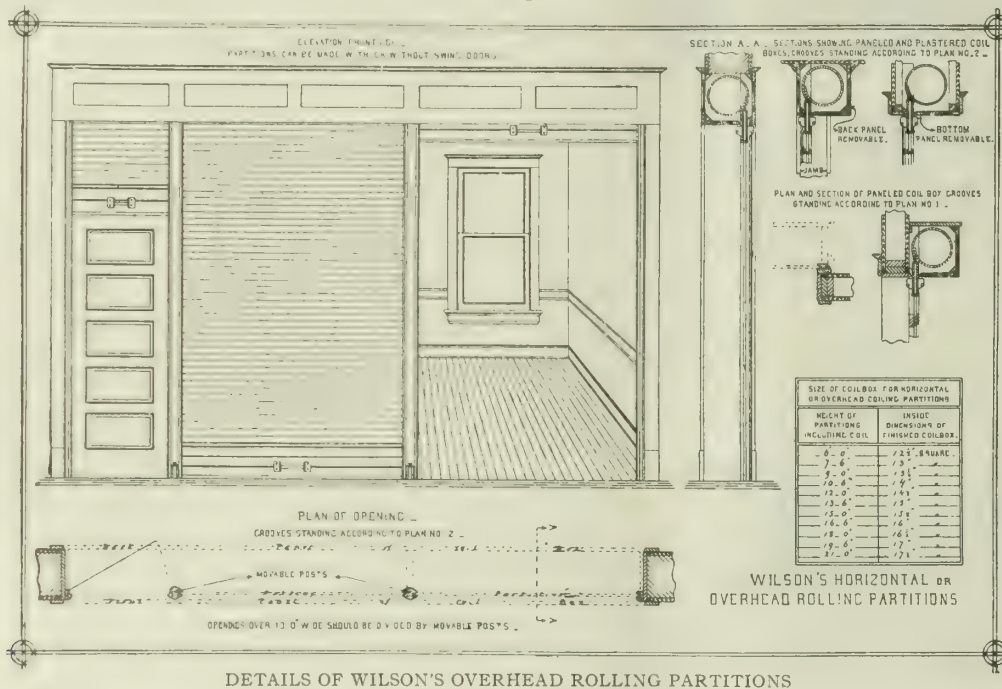
## Service.

It is recommended, wherever possible, that customer purchase the doors installed by the manufacturer. This company has skilled and experienced men that do the installing, and will guarantee perfect working doors.

Their 30 years' experience is at your command.

## Details.

Below are shown a few of the most common applications. Write us for further details.





# FOLDING PARTITION COMPANY

TELEPHONE:

CORTLANDT 4147

200 Broadway  
NEW YORK, N. Y.

## Products.

Sole owners and manufacturers of the IMPROVED SECTIONFOLD PARTITIONS.

SECTIONFOLD SASH; SECTIONFOLD WARDROBES.

## Scope of Use.

Improved Sectionfold partitions can be used in churches, schools, Y. M. C. A.'s, auditoriums, assembly halls, indoor playgrounds, ballrooms, gymnasiums, bungalows, and office buildings, or wherever subdivision of floor space is desired.

Sectionfold sash can be used for sleeping porches, sun parlors and wherever casement sash is required.

Sectionfold wardrobes are used in schoolrooms, offices, hotels, apartments and public buildings.

## Partitions.

**DESCRIPTION**—The partitions are composed of doors hinged together in pairs.

The partition, being supported on adjustable roller bearing actions, located at the outer corners of each pair of doors and which are pivotal, works in conjunction with a swivel guide piece at the head that slides in a narrow groove used for guiding purposes only. The adjustable actions, being located at the bottom, allow of adjustment at any time, thus providing for the sagging of floor or settling of building.

**TO FOLD**—Each 2-door section is rolled along on the track to the end of the line, where the ceiling guide on one side permits the 2 doors of the section to fold together at that side of the track and stand next to the other folded sections.

**TO UNFOLD**—Each section is opened in turn and rolled to its proper place. The sections may be arranged to run to either end of the track, or both, and may be subdivided as desired.

**CONSTRUCTION**—Improved Sectionfold partitions are made in steel or in all kinds of woods and finishes. They can be made of slow burning material, and sound-proof. The panels may be of glass, wood or slate. An unobstructed flush surface the whole length of both sides of the partition can be provided if desired. Communicating or shuttle doors can be put in any section, thus giving a passageway through, without the need of folding any part of partition.

Long partitions are as easily moved as short ones, being simply a number of 2-door sections. Cross partitions may be used without the necessity of posts at the intersections, as the partitions butt against each other at these points.

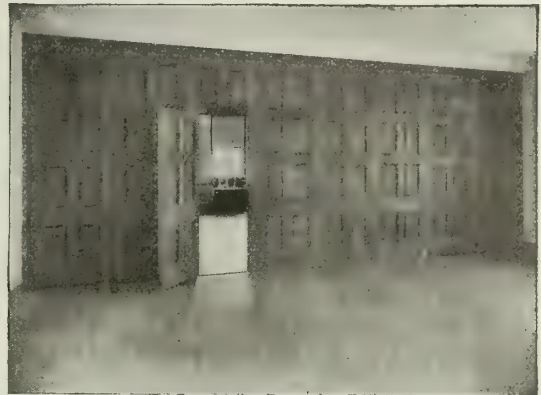
Hinges may be visible or invisible as desired. The tracks are flush with the floor, with a  $\frac{1}{4}$ -in. slot in the center for a guide attached to the rollers.

## Designs, Exhibit, etc.

Erected per standard details; modified to meet existing conditions; or after architect's designs and details. The required measurements are the actual size of the space to be filled, floor to ceiling or beam; width; wall to wall.

Improved Sectionfold partitions require no special wall, ceiling, or floor construction.

We manufacture the partitions complete, and furnish heads, wall stiles and tracks with each, and entirely fill the opening. All hardware will be applied to partitions, ready for erecting.



PARTITION UNFOLDED



PARTITION FOLDED

We guarantee all partitions erected by us.

The Improved Sectionfold partitions now have many added improvements, thus giving an absolutely perfect folding partition, it being next to impossible for them to get out of order at any time.

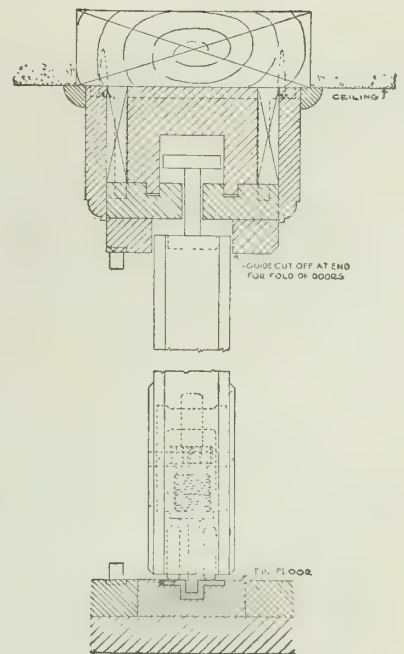
So simple in construction that any boy or girl can operate the largest partitions with perfect ease.

Full size exhibit in the rooms of the Architects Samples Company, Architects Building, 101 Park Avenue, New York, N. Y.

Send for particulars regarding our new sectionfold wardrobes and sash.

## Specifications.

— to be improved Sectionfold partitions as manufactured by the FOLDING PARTITION COMPANY, 200 Broadway, New York, N. Y."



SECTION DETAIL, SHOWING GUIDE AT HEAD AND ACTION AT FLOOR

# GRANT PULLEY AND HARDWARE COMPANY

## Vertical Coiling Doors and Horizontal Rolling Partitions.

Architects Building, 101 Park Avenue

TELEPHONE CONNECTION

NEW YORK, N. Y.

Agents in all the principal cities of the United States and Canada and our Name will be found listed in the Telephone Directories

### Products.

Manufacturers of "GRANT" VERTICAL COILING DOORS and HORIZONTAL ROLLING PARTITIONS for churches, schools, public buildings and residences.

Ventilating School Wardrobes with front rolling either vertically or horizontally, accommodating any number of pupils.

For Sash Pulleys, see pages 760-61; for Door Hangers and Bar Locks, see pages of Reliance-Grant Elevator Equipment Corp., 626-29; for Revolving Window Devices, see page 739.

### Construction.

"Grant" doors and partitions are made of  $\frac{3}{4}$ -in. and  $\frac{1}{2}$ -in. thick mouldings, respectively, of any kind of wood. The wood is varnished, finished, stained or painted to harmonize with the interior of a building,

and all doors and partitions are supplied with appropriate hardware. Material and workmanship are the best obtainable.

### Rolling Partitions.

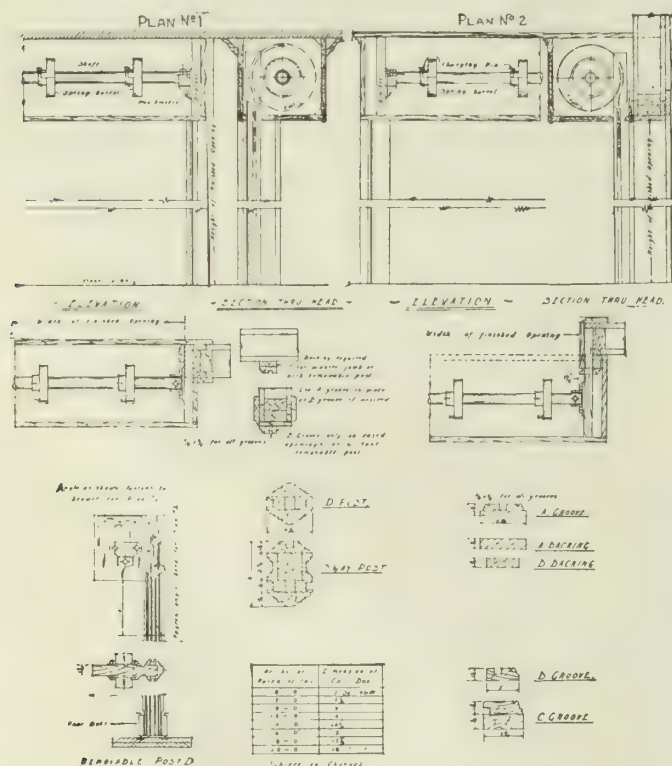
Openings of any width can be closed with one or more horizontal partitions. By use of movable posts, a clear floor is secured when partitions are rolled up.

### Guarantee.

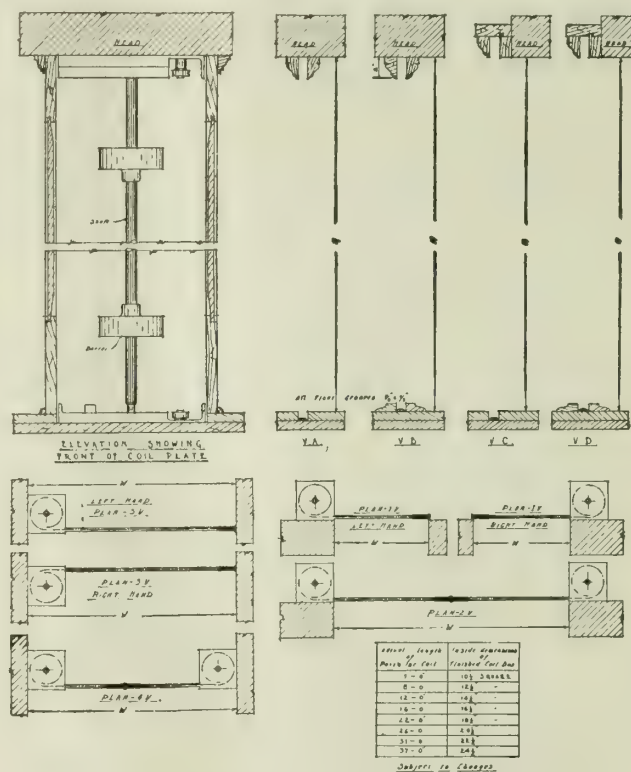
All "Grant" doors and partitions are guaranteed to work satisfactorily if installed in accordance with "Grant" instructions.

### Illustrations.

The illustrations below show methods of installation and measurements.



"GRANT" HORIZONTAL ROLLING PARTITIONS



"GRANT" VERTICAL COILING DOORS



# IMPROVED OFFICE PARTITION CO.

Sole Manufacturers of the Telescoping Portable Sectional Partition

TELEPHONE:  
SPRING 3822, 3823

536-538 Broome Street  
NEW YORK, N. Y.

## Product.

TELESCOPING, PORTABLE, INTER-CHANGEABLE OFFICE PARTITION.

## Description of Telesco Partition.

A sectional partition, carried in stock 7 ft. high, and to ceiling, in plain oak, quartered oak, birch and mahogany. Also furnished in hollow steel. Posts are 7 ft. long, built up hollow, and contain a 7-ft. telescoping extension member to fit ceilings up to 13 ft. 6 in. For higher ceilings, longer members are supplied. Section units are made of different widths to fit all layouts. Screws only are used for erection, and



the partition is constructed to be movable over and over again, without damage.

## How Shipped.

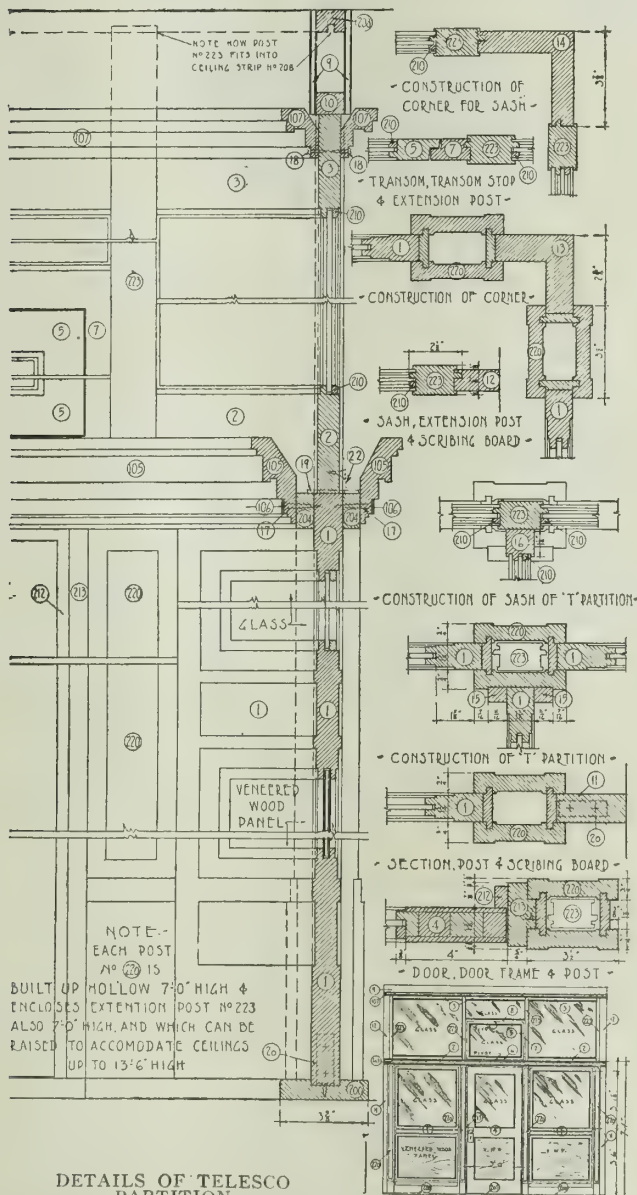
Telesco partition is shipped knocked down in the white or finished, without glass, including stock hardware, Russell & Erwin make, crated. Quotations also given for complete erection.

## Advantages.

The sectional and telescoping features of this product make it possible to re-arrange the partition whenever necessary, without loss of its original value. The first cost of Telesco partition does not exceed that of non-portable partition. Telesco partition represents a permanent investment, like furniture.

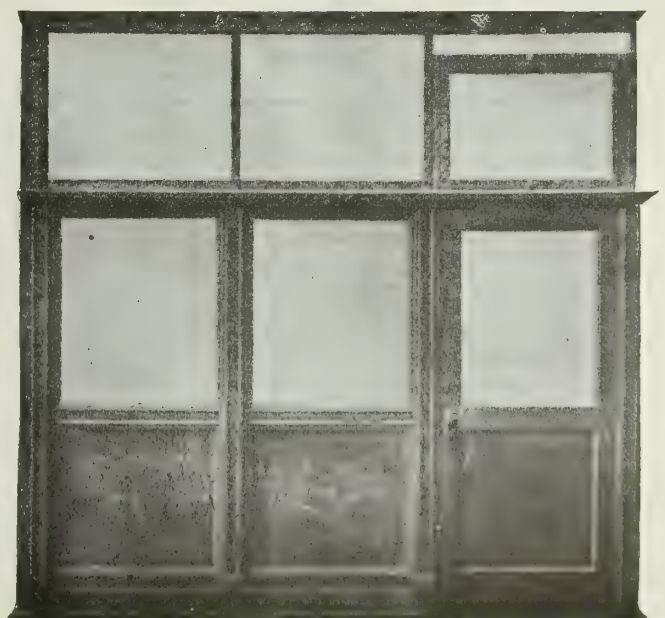
## References.

Building, location and name of architect follows:  
Equitable Building, New York, Graham, Burnham & Co.  
Architects' Building, New York, LaFarge & Morris and Ewing & Chappell.  
Astor Trust Building, New York, Montague Flag  
Bush Terminal International Exhibit Building, New York, Helmle & Corbett  
Columbia Trust Building, New York, McKim, Mead & White  
Fire Corporation Building, New York, Graham, Burnham & Co.  
42nd Street Building, New York, Buchman & Fox  
Heckscher Building, New York, Jardine, Hill & Murdock  
Book Building, Detroit, Louis Kamper  
Kahn Building, Indianapolis, Vonnegut & Bohn  
Lexington Street Building, Baltimore, Parker, Thomas & Rice  
Merchants Bank Building, Indianapolis  
Munsey Annex, Washington, McKim, Mead & White  
Park Building, Worcester, Cross & Cross  
Real Estate Exchange Building, Detroit, Louis Kamper  
Rice Building, Boston, Parker, Thomas & Rice  
Scranton Life Building, Scranton, Edward Langley  
Union Central Building, Cincinnati, Graham, Burnham & Co.  
Vinton Building, Detroit, Albert Kahn and Ernest Wilby



Units are standardized and numbered. Any mechanic can erect and move Telesco partitions

NOTE--SECTION #1, GLASS BARS #12 & #13 ARE MADE IN THE FOLLOWING WIDTHS AND DESIGNATED THUS, 15"-A, 24"-B, 30"-C, 36"-D, 42"-E, 48"-F, 54"-G, & 60"-H



TELESKO PARTITION

# MONROE SCREEN, BLIND & PARTITION CO.

Manufacturers of Rolling Partitions

LIMA, OHIO

## Products.

MONROE'S ROLLING OR COILING PARTITIONS for churches, schools, residences and fronts of bookcases; SLIDING and VENETIAN BLINDS and WINDOW SHADES. All products made in any kind of wood, steel and textile.

## Blinds.

Monroe sliding and venetian blinds (Fig. 1) are made with same precision and care as are the partitions.

## Rolling or Coiling Partitions.

They are practical, durable, easily operated, look well and the prices are right. They contain ball bearings instead of frictional bearings, and adjustable springs instead of weights suspended by cords and cables. Friction is reduced to a minimum because weight is carried on  $\frac{3}{8}$ -in. steel balls (Fig. 2). Also note the 8 different points for attaching curtains, making a complete and perfect adjustment.

Openings of any width can be closed with one or more partitions. By the use of removable posts, a clear opening is secured when partitions are rolled up.

Single partitions should not be over 12 ft. wide.

Illustrations show construction of rolling or coiling partitions; also, how measurements should be taken.

## Material Guarantee.

Only the best materials enter into the construction of Monroe products, which are guaranteed to give perfect satisfaction if installed in accordance with instructions accompanying every shipment.

## Co-operative Service.

Will furnish estimates, details and full information on request. Send plans at our expense.



FIG. 1. MONROE SLIDING AND VENETIAN BLINDS

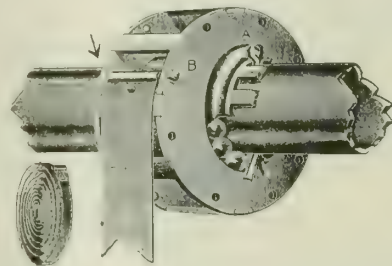


FIG. 2. "NE PLUS ULTRA" BALL BEARING FIXTURE

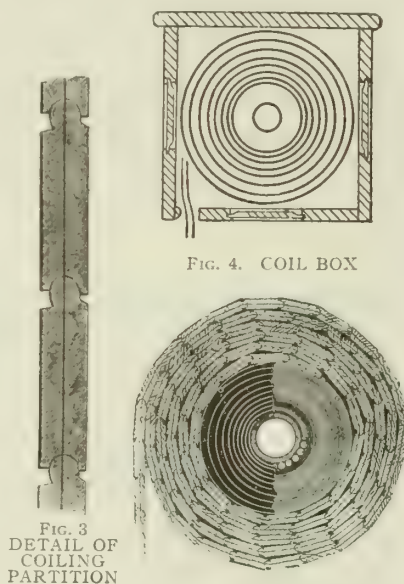


FIG. 4. COIL BOX

FIG. 5. PARTITION COILED ON BALL BEARING ANTIFRICTION ROLLER

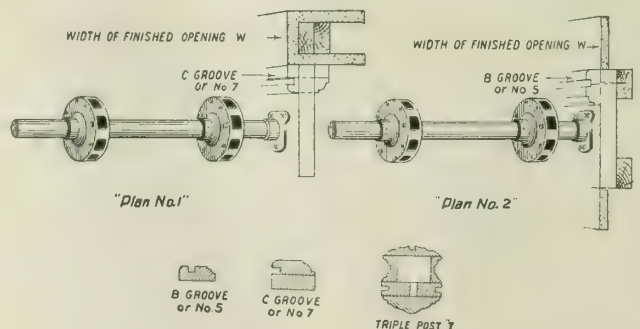
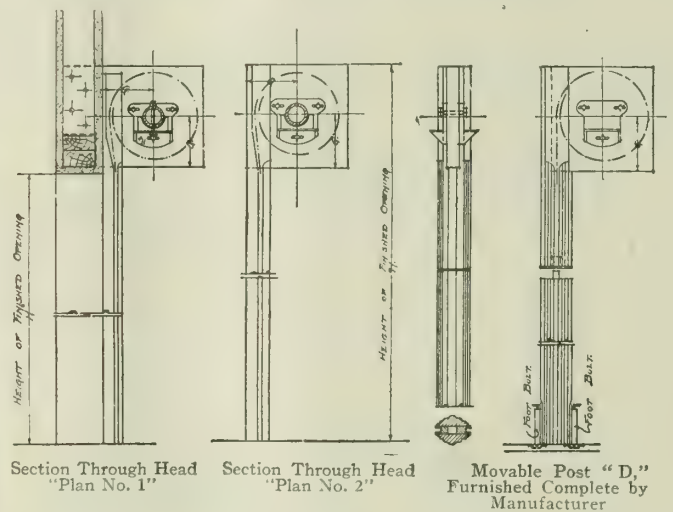


FIG. 6. VERTICAL AND HORIZONTAL SECTIONS, SHOWING "PLAN 1" AND "PLAN 2" ARRANGEMENTS OF COILING PARTITIONS; ALSO, MOVABLE POST "D," AND TRIPLE POST "T"

## DIMENSIONS, COILING PARTITIONS

Height of partition, including coil	Dimensions of coil box inside
6'-0"	12" square
8'-0"	12 1/2" square
10'-0"	13" square
12'-0"	14" square
14'-0"	14 1/2" square
16'-0"	15" square
18'-0"	15 1/2" square
20'-0"	16" square



SWEDISH VENETIAN BLIND COMPANY

Manufacturers of Rolling Shutters, Partitions and Blinds

TELEPHONE:  
GREELEY 188

1328 Broadway  
NEW YORK, N. Y.  
AGENCIES IN ALL PRINCIPAL CITIES

CABLE ADDRESS:  
"VENETBLIND"

Products.

ROLLING SHUTTERS, PARTITIONS and BLINDS of every description. Established 1856.  
For Imported Swedish Venetian Blinds for all purposes, see page 806.

Description.

Shutters, partitions, and blinds, as shown here, are radically different from all others, excelling in material and improved construction. Fig. 1 shows blind open, extended out like an awning, giving perfect ventilation. Fig. 2 shows it closed down and folded in. Can be locked and used as a burglarproof shutter when the house is closed. Operated from inside by strap, spring roller or gear wheel.

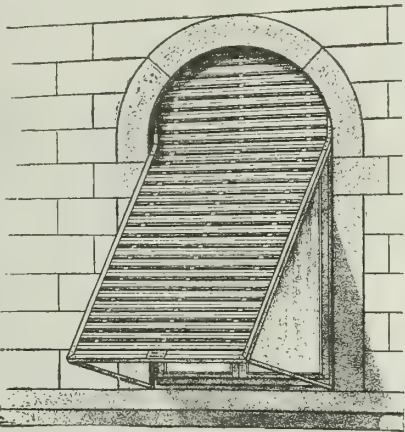


Fig. 1. BLIND OPEN AND EXTENDED OUT LIKE AN AWNING

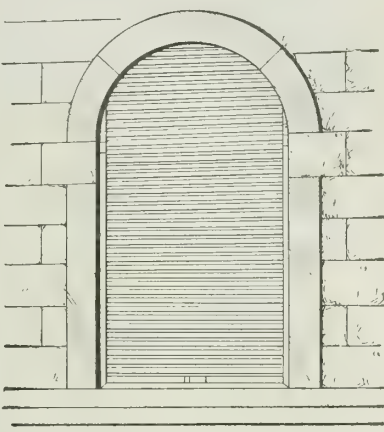


Fig. 2. BLIND CLOSED DOWN AND FOLDED IN

Partitions.

Made for all purposes where division of rooms is necessary, such as in schools, churches, club rooms, etc., and operated with great ease by the best mechanism, according to the size of the partition.

Steel Shutters.

Made of the best English corrugated steel sheets, and used for all kinds of openings, windows, doors, driveways, etc. Over 50 years' experience in this line guarantees a perfect article.

Prices.

Although these goods are of superior quality, the prices are not higher than those for goods of inferior grade.

DIAMETER IN INCHES OF SPACE REQUIRED FOR ROLLER BLINDS OR SHUTTERS WHEN ROLLED UP

Height of shutter . . . . .	4'7"	5'3"	5'11"	6'7"	7'3"	7'11"	8'7"	9'3"	9'11"	11'7"	13'3"	16'7"
Prof. I. . . . .	10 1/4	10 3/4	10 3/4	10 3/4	11	11 1/2	11 3/4	12 1/4	12 1/2	13 1/2	13 3/4	13 3/4
Prof. II. . . . .	11	11 1/2	11 3/4	12 3/4	12 3/4	13	13 1/2	13 3/4	14 1/2	15	15 3/4	15 3/4
Prof. IIa. . . . .	11 3/4	12 1/4	12 1/2	13	13 1/4	13 3/4	14 1/4	15	15 1/2	16 1/2	17 1/4	17 3/4
Prof. 3a, about 1/8" . . . . .	9	9 1/2	10	10 1/4	10 1/2	11	11 1/2	12 1/4	12 1/2	13	13 3/4	13 3/4
Prof. 3b, about 1/8" . . . . .	7 1/2	7 3/4	8 1/4	8 3/4	9	9 1/2	10	10 1/4	10 1/2	11	11 1/4	11 1/4
Prof. 4, about 1/8" . . . . .	6	6	6 1/4	6 3/4	7	7 1/2	7 3/4	8 1/4	8 3/4	9	9 1/4	9 1/4
Prof. 5b, about 1/8" . . . . .	5	5 3/4	6	6 1/4	6 3/4	7	7 1/2	7 3/4	8 1/4	8 3/4	9	9 1/4
Prof. 6a and 7a, about 1/8" . . . . .	7 3/4	8 1/4	9	9 1/2	10	10 1/4	10 1/2	11	11 1/2	12 1/4	12 1/2	12 1/2
Prof. 6b and 7b, about 1/8" . . . . .	7	7 1/2	7 3/4	8 1/4	8 3/4	9	9 1/2	10	10 1/4	10 1/2	11	11
Prof. 6c and 7c, about 1/8" . . . . .	6 3/4	7	7 1/2	7 3/4	8 1/4	8 3/4	9	9 1/2	10	10 1/4	10 1/2	10 1/2
Prof. 8, about 1/8" . . . . .	8 3/4	9	9 1/2	10	10 1/4	10 1/2	11	11 1/2	11 3/4	12 1/2	13 1/2	13 1/2

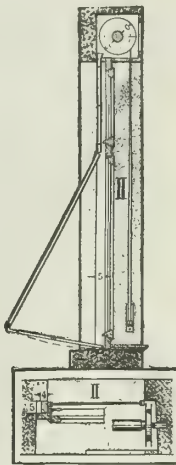
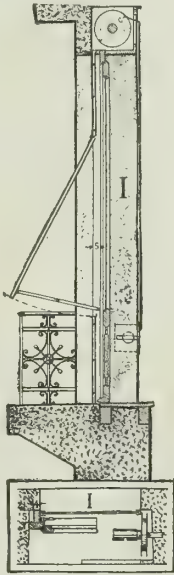
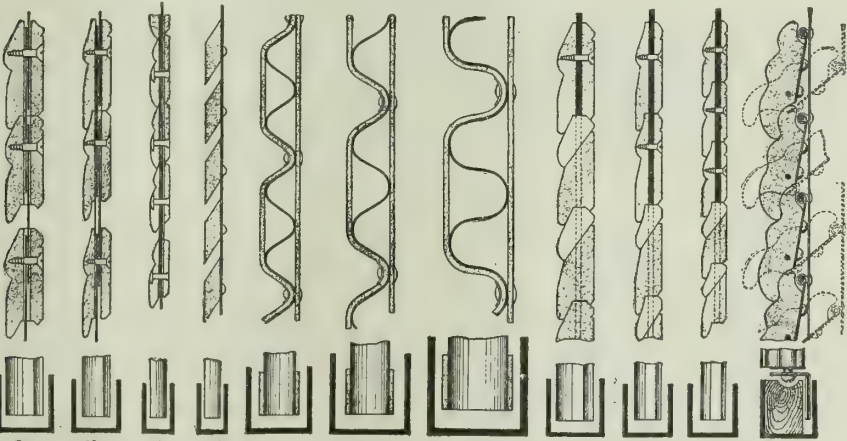


Fig. 3. DETAILS OF ROLLER BLINDS AND SHUTTERS



PROFILES OF ROLLER BLINDS AND SHUTTERS OF WOOD AND STEEL

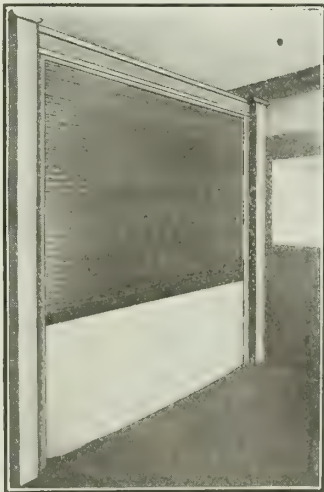


Fig. 4. ROLLING PARTITION

# THE J. G. WILSON CORPORATION

## Wood Partitions, Wardrobes, and Block Flooring

TELEPHONE, VANDERBILT 1875-76  
CABLE, "LYDIAN, NEW YORK"

8 West Fortieth Street  
NEW YORK, N. Y.

FACTORY ADDRESS  
MAIL AND TELEGRAPH: NORFOLK, VA.

BRANCH OFFICE: CHICAGO, ILL., 332 South Michigan Avenue  
Other Agencies on page 692

### Products.

Manufacturers of WOOD ROLLING PARTITIONS; WOOD FOLDING PARTITIONS; HYGIENIC WARDROBES, and WOOD BLOCK FLOORING.

For Rolling Doors and Shutters, in steel and wood, see pages 692-93; for Venetian Blinds and Awnings, and Diffuselite Blinds, see pages 804-05.

### General Quality.

Wilson rolling partitions and school wardrobes were first introduced and manufactured by James G. Wilson in 1876. Since that time many improvements have been made in a never-ceasing effort to perfect these goods. The test of time, nearly 40 years, in every State of the United States and in almost every country in the world, has demonstrated the wonderful quality of the Wilson partition, its construction being of such a character as automatically to adjust itself to every condition of climate.

Nearly 30,000 churches and schools are fitted with Wilson rolling partitions and wardrobes, and many hundreds of letters commending them have been sent this company.

Some of the Wilson equipped buildings will be found listed at the end of these pages.

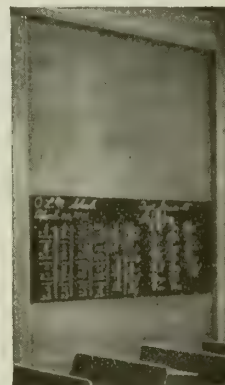
### Wilson Horizontal Rolling Partitions.

Wilson improved patent rolling partitions are composed of wood slats  $1\frac{1}{2}$  to 2 ins. wide and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. thick, fitted with rule joints, edge to edge, and threaded on tempered steel bands running from top to bottom about 16 ins. apart. These bands are riveted to the top bar of the partition, and each band is attached separately to a spiral spring anchor concealed in the bottom rail, and fitted with simple means of adjustment for regulating the tension.

This tension on steel bands holds all slats in close contact, so that, when partition is rolled down, joints are absolutely airtight and form a soundproof screen.



HORIZONTAL ROLLING PARTITIONS,  
PARK M. E. CHURCH, BLOOMFIELD,  
N. J.



HORIZONTAL ROLLING  
PARTITION WITH  
BLACKBOARD

**WIDTH**—Horizontal partitions should not be over 12 ft. in width. This will insure great ease in operation; yet with movable posts, which are very light and easily handled, any size room can be advantageously divided with these partitions.

NOTE—See next page for information on Blackboards.

### Brief Erecting Instructions, Horizontal Partitions (See Details Below).

**BRACKETS**—These (except when otherwise specified) shall be furnished by contractor, and shall consist of 2-in. wood blocks securely spiked or screwed to wood framing of opening. These brackets must be carefully placed, giving about  $\frac{1}{2}$ -in. clearance at end of coil.

**SOCKETS**—These cast iron fixtures anchor the ends of shaft and are adjustable. They must be fastened to the wood blocks with lag screws, and must be on exactly the same level.

**SHAFT**—Put in place so that shoulder on cast iron barrels will face toward opening. Be sure that both bolts at end of shafts are tightened up before inserting curtain.

**GROOVES**—Must be plumb and fastened securely to plastered wall, or to face of casing. Distance between backs of grooves should be  $\frac{1}{4}$  in. more than width of curtain. Tops of all grooves must be rounded off, or bell mouthed, so that curtain will enter easily and without any damage to slats.

**CURTAIN**—Should be placed on scaffold near top of opening. Bottom bar passed over top of shaft down into grooves. When bottom bar reaches floor, top bar should be about opposite shoulders of barrels and be fastened to them with stove bolts. After charging pins are taken out, curtain will be ready to be tried.

A-GROOVE

A-BACKING

B-BACKING

B-GROOVE

C-GROOVE

D-POST

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Wilson Vertical Rolling Partitions.

This organization has perfected many substantial improvements in the actuating mechanism of partitions coiling sidewise, and finds no difficulty in closing openings of 50 ft. in width without the aid of intermediate posts.

The operating device is very simple, and can not get out of order if properly installed and given ordinary attention.

In the illustration below showing section of slats for vertical rolling partition note how little of the wood, and consequent strength, is taken away.

One face or a part of one face of partition is made smooth and even when blackboard or decorative surface is desired.

Brief Erecting Instructions, Vertical Partitions.

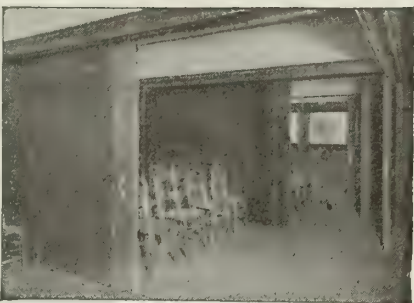
- THE OPENING—Must have even, level and clean floor.
- BOTTOM PLATE—"L. B." or "R. B." (cast iron) to be screwed in position first; must rest on solid floorings, and flange must be flush with inside of groove.
- TRACK—To be screwed to bottom of groove, flush with coil plate and perfectly level.
- TOP GROOVE—Shall be formed from 2 mouldings, be nailed to head of opening and be absolutely plumb above track at ends and in middle. A 1½-in. clearance to be provided in groove above top line of partition.
- CURTAIN—Cords shall not be untied until coil is standing on bottom plate, with casters down and with heavy bar opposite end of grooves.
- SHAFT—Fitted with a steel pin to fit in socket bearing of bottom plate. Top end is now to be secured by top plate.
- TOP PLATE—Must be absolutely plumb above bottom coil plate. Clearance is to be left above coil, and shaft must be held firmly, yet free to turn. Sides must line up with grooves.
- LUBRICATION—Lubricate bottom plates with thin machine oil; also put a few drops on track, and at both ends of shaft.
- CASING OR BOXING—(Usually of a plain paneled design) shall be fitted together with round head screws, so that at least one section may be removed. Allow ample clearance between edges of the slot to prevent slats being damaged even after the building settles.

Blackboard or Decorative Surfaces.

In either horizontal or vertical type partition, when a portion or the whole of one side of a partition is pre-

pared with a flat, smooth surface, as for blackboard use or decorative purposes, the joints are so close that the lines are discernible only at a very short distance, and when the surface is coated with black silicate it is in every respect equal to a regular blackboard.

This surface can be used for decorative purposes where it is desired that the partition should harmonize in color with the walls.

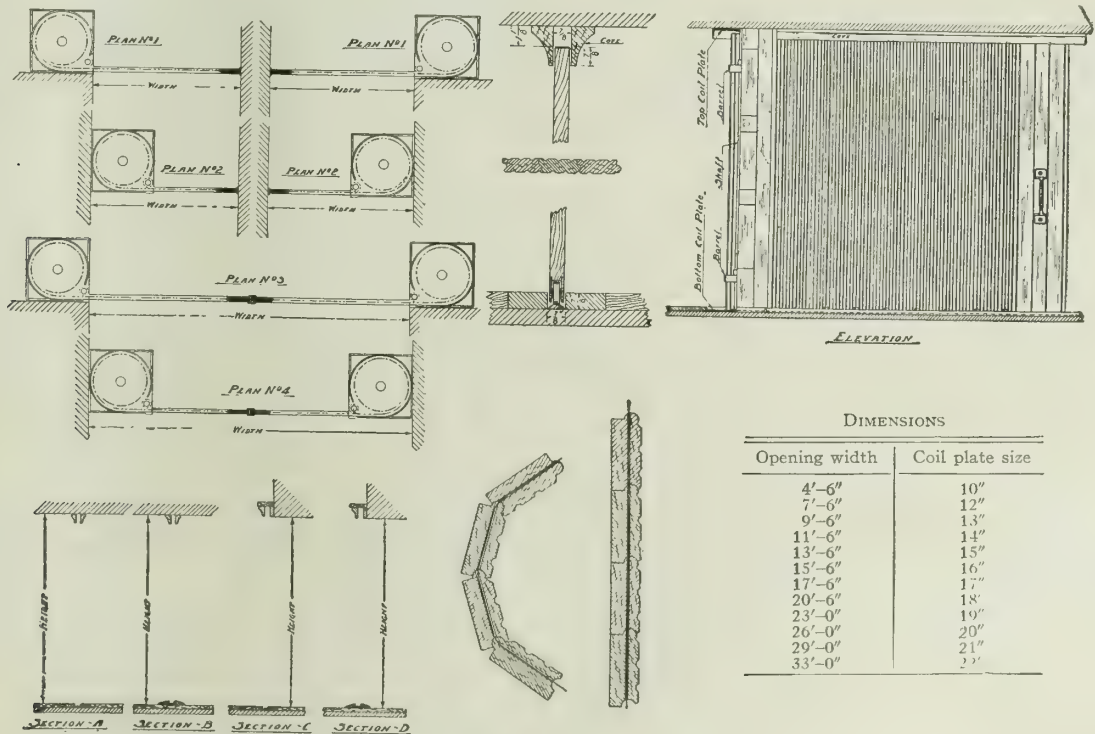


VERTICAL ROLLING PARTITION, FIRST CHRISTIAN CHURCH, IRVINGTON, N. J.

To Specify Horizontal and Vertical Partitions.

To enable architects and owners, adopting the Wilson modern methods of converting large floor space into enclosable units, and to secure the results obviously desired, THE J. G. WILSON CORPORATION have in these pages shown detail drawings and given erecting instructions which will afford standards that may be followed for specifying and installing. Therefore, when the qualities evolved by this corporation, including ease and quietness of operation, are desired, specifications may be drawn as follows:

The partitions, or openings, shown on plans (describe them by notes or otherwise) are to be furnished and completely equipped with rolling wood partitions of the vertical [or horizontal] type, constructed in accordance with the detail drawings shown in SWEET'S ARCHITECTURAL CATALOGUE, 1918 Edition, and of woods to match the finish of the various rooms enclosed. These are to be delivered at the building by the manufacturer, with all hardware, parts and fittings required, and are to be erected by the general contractor [or carpenter] in full accord with the "erecting instructions" supplied by the manufacturer, and are to be left in complete and easily operating working order.



DETAILS SHOWING CONSTRUCTION OF WILSON VERTICAL ROLLING PARTITIONS

DIMENSIONS	
Opening width	Coil plate size
4'-6"	10"
7'-6"	12"
9'-6"	13"
11'-6"	14"
13'-6"	15"
15'-6"	16"
17'-6"	17"
20'-6"	18"
23'-0"	19"
26'-0"	20"
29'-0"	21"
33'-0"	22"

### The Wilson Folding Partition.

A partition (not accordion doors) of ingeniously devised units for temporarily and effectively dividing a large room or hall into a number of smaller rooms, and that can be folded up in a comparatively small, out of the way space at will.

A partition that is practical in its construction; that lends itself to individuality in design and decoration; that operates positively and easily and is controlled with the slightest effort.

**DESCRIPTION**—The Wilson folding partition is composed of two or more units of two sections each and may be of height or width to suit the requirements.

The two sections of each unit are hinged together with tight pin butts, the leaves of which are concealed where desired with "invisible hinges" that are entirely out of view when the partition is unfolded.

The units do not hang from overhead but rest and operate on pivoted, double ball bearing castors, on a track set in the floor and flush with it. They are held in their correct position by shovel shaped guides between the castors that serve the double purpose of holding the unit securely in place at the base, and keeping the groove of the track free from dirt in the operation of folding or unfolding the partition. The units are held in their correct position at the head by roller bearing wheels operating in an overhead pocket, in which there is sufficient vertical space to allow for any play required by uneven or "out of level" floors.

The track sets flush with the floor. The base of the partition is adjusted to fit the floor whether it is level or winding and may be easily re-adjusted to overcome reasonable settlement of floors after the installation, without inconvenience or the necessity and incidental expense of calling special mechanics. A situation that can not be met by overhead hanging in tracks that must of necessity be level.

The guides in the track and the wheels in the overhead pocket are always in a locked position cross-sectionally, regardless of shrinkage or swelling of the units longitudinally. This overcomes the annoying feature of bottom bolts being out of alignment with the floor plates when shrinkage takes place, the necessity of changing the location of the strike plate to accommodate the changed position of the bolt, and of repeating the operation indefinitely as each climatic condition causes swelling and shrinkage of the partition.

The construction of the sections and the units is such that they form a perfect interlocking vertical joint where they come together.

In folding the partition the units slide individually and easily, and do not and can not fold until they are in the correct position to fold and set snugly against the preceding folded unit. Minimum space occupied by the projection from the wall of these partitions, completely folded, averages about 4 ins. to every 6 or 7 ft. of opening.

In unfolding the partition each unit unfolds immediately and automatically, and aligns with the track at once. It can not jamb, nor can the overhead catches become fouled because it can not be moved laterally until it is in line with the track, when it rolls easily to the desired position.

The units roll in either direction, and partitions can be arranged to fold against either side wall or against both. Self-adjusting jambs have been contrived to bring the jamb tightly against the edge of the partition when shrinkage has taken place in the partition, and to avoid the necessity of dressing down the edges of the units when swelling has resulted from excessive dampness.

**USES AND TYPES**—The sections of Wilson folding partitions are constructed to fulfil the many requirements of their great variety of uses for church and Sunday school convenience, for parochial schools, parish houses, Y. M. C. A. buildings, clubs, hotels, residence or office building efficiency and design. They are arranged with slate inserts for blackboards with automatically folding chalk troughs; raised or flush panels to conform to wainscotings; glazed for the transmission of light; screened for ventilating requirements or finished flush to conform with wall surroundings and sanitation. They are made for convenience and economy in a variety of well designed standards or will be made to conform to the architect's requirements.

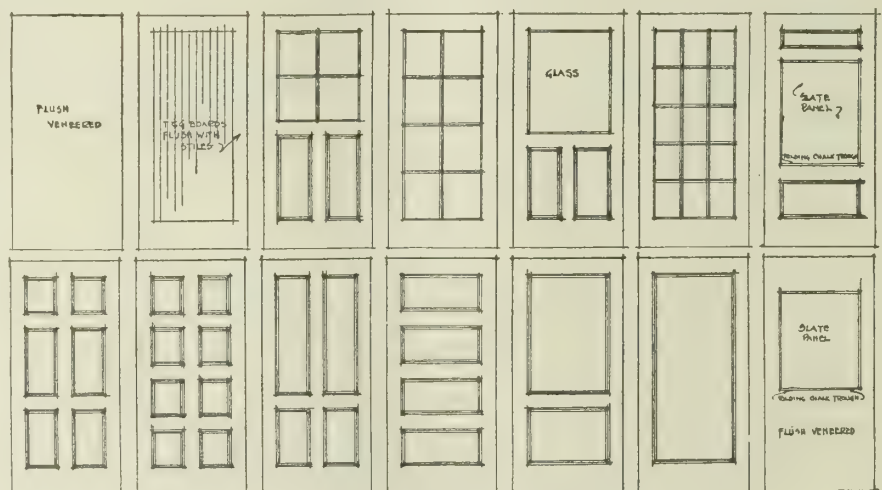
There is practically no limit to the height, length, weight, arrangement or design of these partitions, and communicating doors can be placed in desirable positions.

Arrangements can be made to conceal the folded units when desired.

**INSTALLATION**—THE J. G. WILSON CORPORATION contracts for the complete material and installation including all trim and hardware that is incidental, but will omit such items as casings or decoration that conflict with the proper construction or operation of the partitions.

**DETAILS AND ESTIMATES**—Typical details of construction are shown herewith and types are suggested for convenience in obtaining quick estimates or ordering standard designs.

In asking for estimate, give width and height of opening; kind of material; type of door; finish of hardware; whether panels are to be wood, glass (or slate for blackboards), and whether folding chalk troughs are desired. Also state whether partition is to fold at one or both ends and whether any shuttle or communicating door is required.



STANDARD TYPES OF DOORS  
Bead and cove moulded unless otherwise specified



**Wilson Hygienic Wardrobes.**

The Wilson hygienic wardrobes have been used as standard by a great many architects, who, after careful investigation and tests, have found them added features to school hygiene. They economize space to such an extent that they more than pay for themselves in total reduction of the size or cost of building.

The wardrobe is generally made up of units about 4 ft. wide; these are often advantageously connected with the ventilating system. Hot water or steam pipes, when placed in wardrobes, effectively dry clothing.

These wardrobes are manufactured in 4 styles. Types A, B, and C are similar in construction, the difference being that Type A has a false floor, giving space for heating purposes; and Type C has a wire instead of a solid panel back. In Type D, doors roll vertically. Type B seems to have given the very best satisfaction.



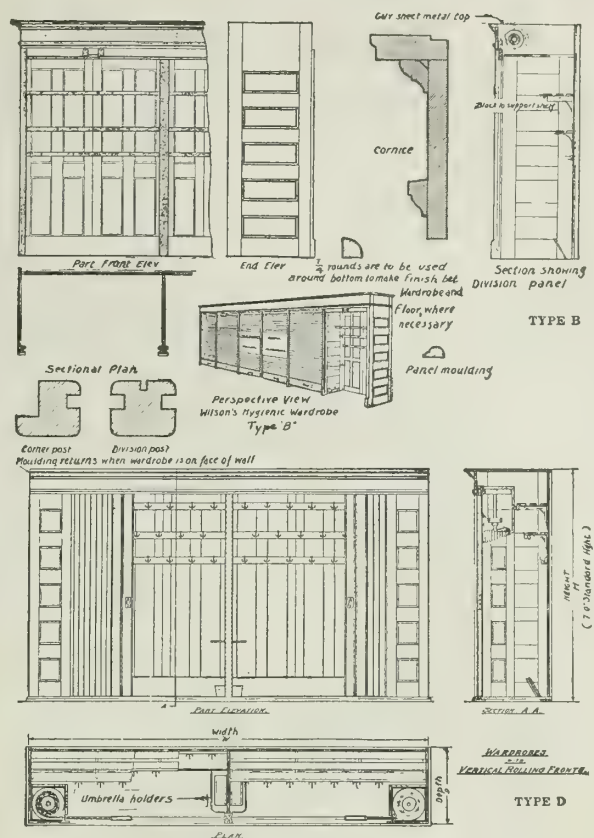
HYGIENIC WARDROBE, TYPE B,  
PUBLIC SCHOOL, HEMPSTEAD, L. I.



HYGIENIC WARDROBE, TYPE C, HIGH  
SCHOOL, UNIONTOWN, PA.

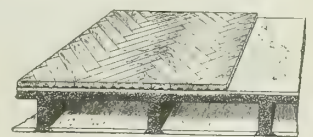


HYGIENIC WARDROBE, TYPE D,  
PUBLIC SCHOOL NO. 32, BUFFALO, N. Y.

**Wood Block English System Flooring.**

This system of securing a solid wood surface without nailing can be applied to any construction of floor beams. Every block is firmly and completely anchored to the concrete foundation by a bituminous compound which not only serves as a dampproof and verminproof course, but forms also a key, binding the wood flooring and the concrete foundation into one solid structure.

Indestructible, perfectly solid, noiseless and fire-proof. Possesses complete sanitary advantages of imperviousness to dry rot, vermin, dirt, disease germs, damp and draughts, etc. Admirably adapted for use in public and private buildings.



WOOD BLOCK ENGLISH  
FLOORING

**A Few Wilson Installations.****ROLLING PARTITIONS**

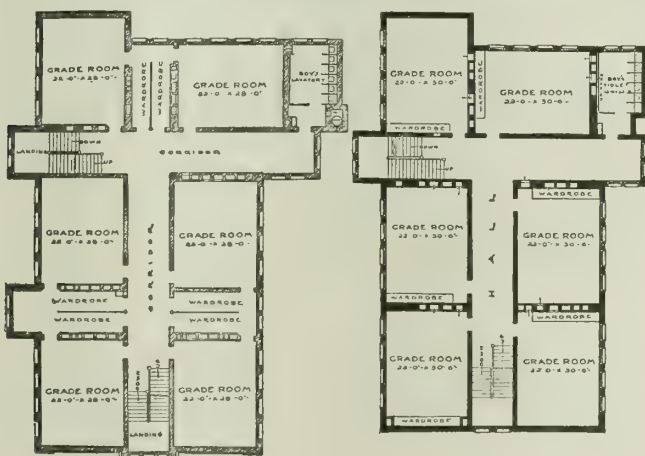
Church of the Intercession  
Young Men's Christian Association  
St. Mary's Catholic School  
Young Men's Christian Association  
Emanuel College  
Carnegie Library  
Young Men's Christian Association  
Greenwood Heights Reformed Church  
Temple Beth Shalom  
Euclid Avenue United Brethren Church  
Knox Presbyterian Church  
School, District No. 29

**WARDROBES**

High School  
High School  
Normal Training School  
Hodge School  
High School  
Fairmount School  
High School  
Public Schools  
St. John's Parochial School

New York, N. Y.  
Birmingham, Ala.  
Mobile, Ala.  
Oakland, Cal.  
Saskatoon, Can.  
Denver, Colo.  
Boston, Mass.  
Brooklyn, N. Y.  
Brooklyn, N. Y.  
Dayton, Ohio.  
Cincinnati, Ohio  
Mayer, Ore.

Adrian, Mich.  
Monroe, Mich.  
Detroit, Mich.  
Cleveland, Ohio  
Crafton, Pa.  
West Orange, N. J.  
Schenectady, N. Y.  
Buffalo, N. Y.  
Uniontown, Pa.



ALTERNATIVE PLANS SHOWING ADVANTAGES OF WILSON  
WARDROBES

Plan No. 2 was designed as an alternative to No. 1, with a view to reducing cost. Area of entire floor space is 330 sq. ft. less than No. 1, and yet all rooms are 2 ft. 6 ins. wider. This building (3 stories) contains 50,400 cu. ft. less than building as per plan No. 1, and cost, after purchasing hygienic wardrobes, \$3500 less.

# UNION BLIND & LADDER CO., INC.

## Horizontal Rolling Partitions and Vertical Coiling Doors

3545 Peralta Street  
OAKLAND, CAL.

AMERICAN SASH & DOOR CO., 16th and Bellefontaine Streets, KANSAS CITY, MO.  
(For States east of and including Minnesota, Nebraska, Oklahoma, Iowa, Kansas, Louisiana)

### Products.

ACME HORIZONTAL ROLLING WOOD PARTITIONS and VERTICAL COILING DOORS, for churches, schools, residences, warehouses, garages, etc.

Coiling Wardrobe Fronts, Rolling Store Ladders, and other patented Building Specialties.

### Description of Horizontal Rolling Partitions.

Regularly made of white cedar; but pine, fir, oak or other woods furnished as desired. Finish may be stain and wax, shellac and varnish, special oil, or unfinished (natural wood). For school purposes a black-board surface can be furnished on one side of the partition.

Standard horizontal partitions or doors (coiling overhead) are composed of wood slats,  $1\frac{1}{2}$  ins. wide and  $\frac{1}{2}$  in. thick, or thicker as required, accurately machined and threaded on galvanized steel cables. Provision is made for automatic adjustment of slats and equalization of variance due to climatic conditions.

Horizontal partitions should not be over 14 ft. wide, but any width opening can be closed with two or more partitions with removable mullions.

Equipment consists of coiling apparatus adjusted ready to place in position, socket hangers to support shaft, standard handles and, where necessary, pull to operate curtain above reach; also, removable mullions when required.

### Advantages of Acme Rolling Partitions.

By their use convenient and economical floor arrangements can be obtained. Dispenses with folding and accordion doors which take up valuable floor space.

Improved double annular ball bearing coiling device insures ease of operation and noiselessness. A 10-by 20-ft. partition is easily operated with one hand.

Durability of Acme partitions is shown by those in continuous operation for twenty years in the Ferry Building, San Francisco.

### Vertical Coiling Doors.

Designed to close openings 6 to 60 ft. wide, 7 to 14 ft. high, without use of removable mullions. Woods and finishes as above. Steel floor track and special hardware included in quotations. Furnished with automatically adjustable and positively efficient tension device. Special details furnished for all orders. Installing very simple, as doors are tested and adjusted at factory; shipped in mill dressed coil boxes, ready to be set up.

### Garage Doors.

Acme horizontal wood coiling doors roll up above opening, giving clear space; do not take up valuable room; operate easily with one hand. Same insurance rate as steel doors, except in extremely hazardous exposure.

### Guarantee.

Acme partitions and doors are guaranteed to be just as represented in material, workmanship and finish, and to work satisfactorily when installed in accordance with instructions; sizes will conform to dimensions received, and broken parts will be replaced without charge unless broken by accident or intentionally.

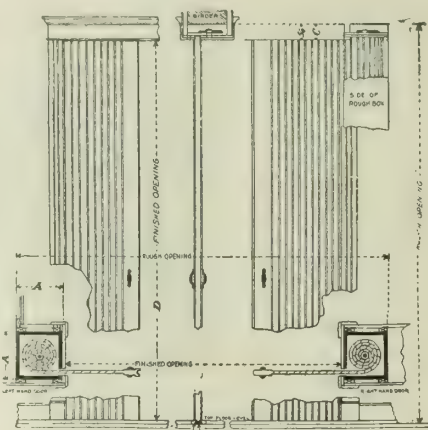


VERTICAL COILING DOOR IN FOREGROUND. HORIZONTAL ROLLING PARTITION IN BACKGROUND

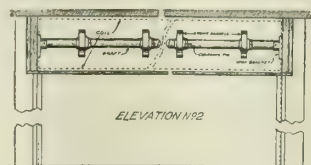
BOX SPACE REQUIRED FOR ACME VERTICAL PARTITIONS

Width opening, ft.	For pair doors, ins.	
	Lines A	Lines A
8	12	14 $\frac{1}{2}$
10	13	15 $\frac{1}{2}$
12	13	16 $\frac{1}{2}$
14	14	17 $\frac{1}{2}$
16	15	18 $\frac{1}{2}$
18	15	19 $\frac{1}{2}$
20	16	20
22	16	20 $\frac{1}{2}$
24	17	21
26	17	21 $\frac{1}{2}$
28	17 $\frac{1}{2}$	22 $\frac{1}{2}$
30	18	23 $\frac{1}{2}$

Allow 1 in. more than table calls for to accommodate coil box.



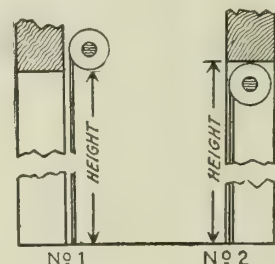
ELEVATION AND SECTIONAL DETAILS ACME VERTICAL COILING PARTITIONS



LONGITUDINAL SECTION COILING DEVICE OF HORIZONTAL ROLLING PARTITIONS

DIMENSIONS OVERHEAD HORIZONTAL ROLLING PARTITIONS

Height ins. coil, ft.	Coil space ins., square	Height ins. coil, ft.	Coil space ins., square
4	10 $\frac{1}{2}$	14	14 $\frac{1}{2}$
5	11	15	15
6	11 $\frac{1}{2}$	16	15
7	12	17	15
8	12 $\frac{1}{2}$	18	15 $\frac{1}{2}$
9	13	19	15 $\frac{1}{2}$
10	13 $\frac{1}{2}$	20	16
11	14	21	16
12	14	22	16
13	14 $\frac{1}{2}$		



FLOOR PLANS AND TRANSVERSE SECTIONS OVERHEAD ROLLING PARTITIONS



# AMERICAN METAL WEATHER STRIP CO.

HOME OFFICE AND FACTORY  
GRAND RAPIDS, MICH.

Branch Offices from Coast to Coast with All Sales and Installations Made Under Our Direct Supervision

## Product.

Manufacturers of "WINDUSTITE" AMERICAN METAL WEATHERSTRIPS for windows and doors of all types.

## "Windustite" American Metal Weatherstrip.

All exterior openings of a building, and inside closet doors of residences, should be equipped with the American "Windustite" line, which renders the greatest protection to the occupants, draperies and decorations against the weather elements.

## Mechanical Construction.

The "Windustite" patented equipment is so constructed as to eliminate wear or bowing of the sash. It forms a perfect airtight joint on the sides and also at the corners where the side strips intersect with the crosspieces, and always affords easy operation.

## Quality.

Nothing but the very best metals obtainable are used in the construction of our equipment, and every screw and nail used in its application is rustproof, which means long life and perfect operation.

## Efficiency.

Every architect has his own particular ideas or details of windows and doors, therefore, each job and



REGISTERED TRADE-MARK

opening is treated according to its own peculiar conditions; the type of equipment most suitable is furnished and installed in such a manner as to render the highest efficiency possible.

## Workmanship and Co-operative Services.

Our branch office managers and salesmen are of the type of men who will look after customers' interests in every respect. None but the best skilled mechanics are employed and they are capable of constructing the most difficult work without injury to the woodwork, walls or decorations.

## Blue Prints.

Our line of equipment being too extensive to show here, we will, on request, mail our complete detailed blue print, showing various types of equipment as installed on the different kinds of openings.

# ATHEY COMPANY

NEW YORK BRANCH:  
1015-17 Marbridge Building  
34th Street at Broadway

Cloth Lined Metal Weatherstrips  
Twenty-fourth and La Salle Streets  
CHICAGO, ILL.

BRANCHES AND AGENCIES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA  
See Classified Telephone Directories

## Products.

Manufacturers of "ATHEY"  
CLOTH LINED METAL WEATHER-  
STRIPS.



## "Athey" Weatherstrips.

USES—For any window or door of either wood, metal or kalamein, or any sort of structural work where it is desired to make the openings weatherproof and dustproof—a strip to fit every condition that can be imagined.

Used successfully on the coaches of many railroads.

ADVANTAGES—The only device which excludes *all* dirt. The cloth lined channel acts as cushion guide for sash. Windows operate smoothly and can not rattle.

Makes tight casements. Reduces heating cost.

Dirtproof; saves labor in cleaning decorations and furniture; eliminates danger of filth and disease entering with draughts.

Noiseless, and practically without friction when applied to hollow metal windows.

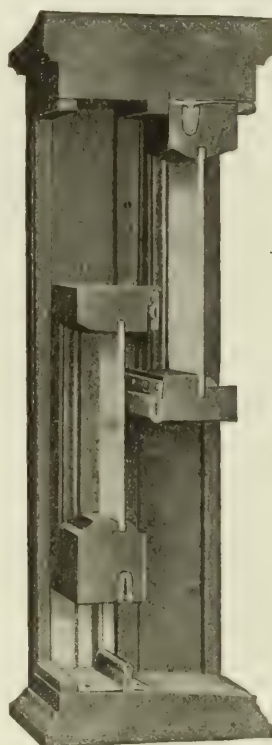
Cloth is 3-ply Windsor or billiard cloth with center ply of cotton web which will not stretch. It is chemically treated and impervious to moisture; will not rot, and the metal will not rust. Heavy cloth inserts back of material prevent back leakage.

Materials used when applied to metal sash prevent electrolytic action.

The results are positive at every point.

Does away with storm sash in winter and allows outside air when desired.

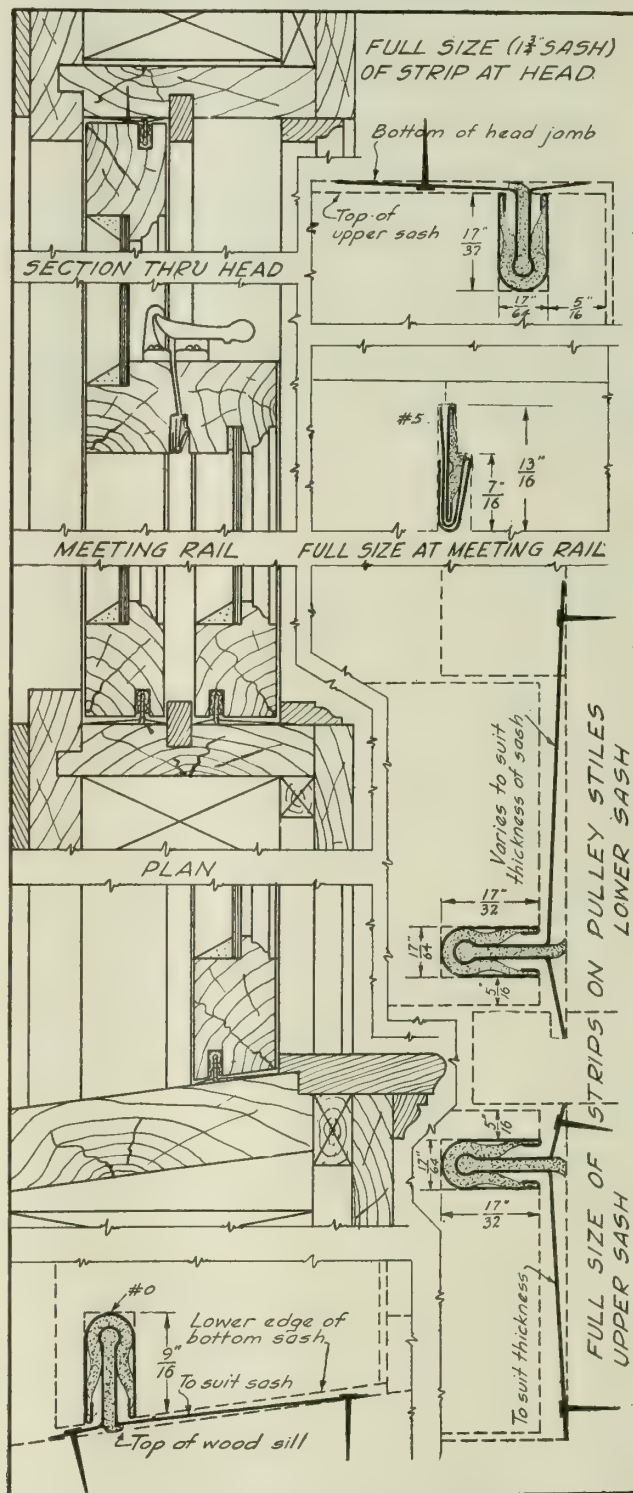
GUARANTEE—The Athey cloth lining is chemically treated, making possible our guarantee against rot or mildew.



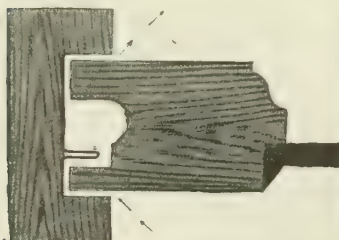
SECTION OF COMPLETE WINDOW MODEL FITTED THROUGHOUT WITH CLOTH LINED EQUIPMENT

## Co-operative Service.

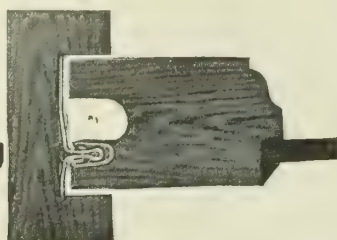
Samples, drawings and prices supplied on request.



3-INCH SCALE AND FULL SIZE DETAILS SHOWING STANDARD EQUIPMENT FOR DOUBLE HUNG SASH  
Athey cloth lined metal weatherstrip, 1 3/4-in. sash



ORDINARY WEATHERSTRIP  
Showing leakage without channel at sash cord groove



CLOTH LINED CHANNEL  
No leakage possible even at sash cord groove



## CHAMBERLIN METAL WEATHER STRIP CO.

### GENERAL OFFICES

107-109 Third Avenue  
DETROIT, MICH.

### OFFICES AND SHOWROOMS

BALTIMORE, MD., 123 East Fayette Street  
BOSTON, MASS., 17 Pearl Street  
BUFFALO, N. Y., 411 Curtiss Building  
CHICAGO, ILL., 626 South Dearborn Street  
CINCINNATI, OHIO, 2437 Gilbert Avenue  
CLEVELAND, OHIO, 2010 East 46th Street  
DES MOINES, IOWA, 803 Hubbell Building  
HARRISBURG, PA., 405 Telegraph Building  
INDIANAPOLIS, IND., 32 When Building  
KANSAS CITY, MO., 3301 Gillham Road  
MANCHESTER, N. H., 913 Elm Street  
MINNEAPOLIS, MINN., 553 Plymouth Building  
NEW HAVEN, CONN., 87 East Orange Street

NEW YORK, N. Y., Marbridge Building, Broadway at 34th Street  
OKLAHOMA CITY, OKLA., 713 Majestic Building  
OMAHA, NEBR., 318 South 19th Street  
PHILADELPHIA, PA., 708 Real Estate Trust Building  
PITTSBURGH, PA., 1204 Hartje Building  
RICHMOND, VA., 313 Travellers Building  
ST. LOUIS, MO., 4230 Olive Street  
SPOKANE, WASH., 606-7 Peyton Building  
TOLEDO, OHIO, 436 Ohio Building  
WASHINGTON, D. C., 918 New York Avenue  
WILKES-BARRE, PA., Miners' Bank Building

FACTORIES: DETROIT, MICH., and PERU, ILL.

### Product and Services.

"CHAMBERLIN" METAL WEATHERSTRIP for windows and doors.

This company installs "Chamberlin" metal equipment to stop leakage, to eliminate draughts, to keep out dust and noise, to perfect the operation of the sash, to insure even heating of the building throughout, to assist heating and ventilating plants so as to secure maximum efficiency.

The equipment is all metal, either solid zinc, copper or bronze.

It can be installed in either old or new buildings of any kind and for any size or shape of window or door.

### Co-operative Service.

Architects and engineers will be furnished, on request, full sized details and illustrations of "Chamberlin" as applied to double hung windows, casements opening in or out, transoms, doors, hollow metal sash, kalamein or metal covered doors or windows, pivoted windows (top or bottom wood, metal or metal covered), showcases, garage doors, etc.

# THE HIGGIN MANUFACTURING CO.

## Metal Weatherstrips

NEWPORT, KY.

SALES AGENCIES IN FIFTY OF THE LARGER CITIES THROUGHOUT THE COUNTRY

Look up Our Local Office in Telephone Directory, or write to Newport, Ky., for Information

### Products.

Manufacturers of HIGGIN ALL-METAL WEATHER-STRIPS.

For Higgin All-metal Window Screens, Wood Frame Window and Door Screens, see pages 794-95.

### Higgin All-metal Weatherstrips.

**COMPLETE EQUIPMENT**—The complete equipment for sliding windows (see illustration) consists of two strips, one of which is attached to the window frame and is made with a  $\frac{3}{8}$ -in. tongue or raised portion that forms a track on which the sash slides. This track is usually made of zinc, but bronze may also be used.

The other strip, called the insert, is made of very light spring bronze, and is inserted in a groove made in the sash and slides on the track strip. The spring flanges of the insert lightly contact with the tongue of the track and effectually seal the aperture. As the insert is higher than the tongue of the track there is no chance for it to cut the insert.

At the meeting rail a zinc strip is attached to the lower rail of the upper sash and a spring bronze strip to the upper rail of the lower sash in such manner that as the sashes are closed the strips interlock, sealing up the opening completely.

**PLAIN EQUIPMENT**—The plain equipment, consisting of the track strip only, can be furnished at less cost, if desired, but it is not so effective as when the insert strip also is used.

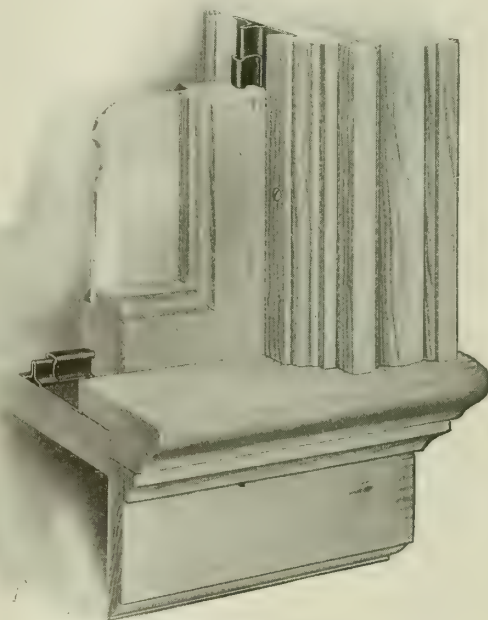
### Casement Strip.

This company manufactures a number of strips specially designed to conform to the different conditions to be met on casement windows. Because of the difficulty encountered in the past in making casement windows watertight, particularly those opening in, some architects have not used them as often as they desired.

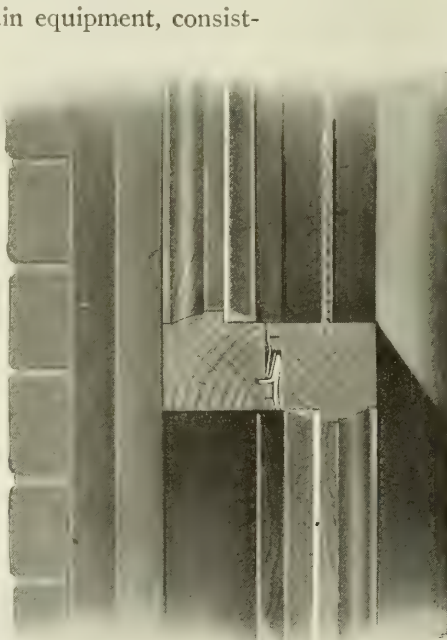
There no longer exists any reason for not using this very popular style of window.

### Other Strips.

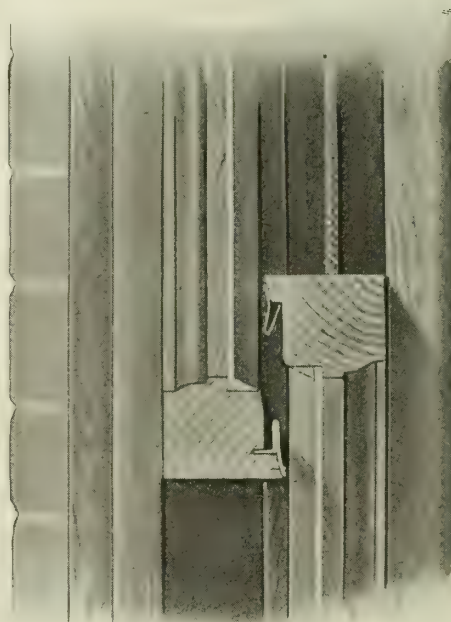
Strips of various kinds have been designed for circle top and all other styles and kinds of windows, making our line complete in every particular and equal to every need.



TRACK AND INSERT STRIPS  
Patented September 21, 1909



MEETING RAIL STRIP LOCKED, SASH  
CLOSED



MEETING RAIL STRIP, SASH PARTLY OPEN



### Specifications.

In order to insure the best possible results, specifications should call for "Higgin Complete Equipment." In no other way can the same results be obtained.

### Durability and Efficiency.

Nothing can wear out or get out of order, because the method of construction is such that the two parts do not cut or damage each other. Note their difference in height (Fig. 1). The head of the raised portion of the track *can not* cut into the insert strip. The sides of the insert strip only come in contact with the upright portion of the track and effectually close up the space.

When the sash is loose and is drawn away from the side, the contact is as in Fig. 2. The space is closed tight and there is no chance for dust or air to get through.

When the sash is tight against the side, the contact is as in Fig. 3. Note that the ends of the insert rest on the slightly raised portion of the track, so there is no friction between the sash and the track. This insures an *easy sliding window*.

Figs. 4 and 5 graphically illustrate the advantage of the use of the insert strip, where the sash is cut out to accommodate the sash cord. When the track strip alone is used, there is absolutely nothing to prevent the air coming in. The use of the insert strip seals the space completely. The insert strip is essential to a perfectly tight job.

### Fuel Saving.

The saving in fuel effected by the plain track equipment is from 10% to 30%, depending upon the condition of the openings. The complete equipment effects a considerably larger saving.

### Estimates.

Estimates of cost for either complete or plain equipment will be furnished from any of our branches

or sales offices, located in all the principal cities of the country, or from the home office.

Canadian inquiries may be referred to the factory in Toronto, Ontario.

### Door Strips.

In addition to the door bottom strips shown below we use several other styles. At the sides and top a spring bronze strip is used that comes in contact with the edge of the door in closing. This prevents slamming and effectually closes up the space between door and frame.



FIG. 1  
First Position

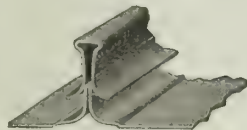


FIG. 2  
Second Position

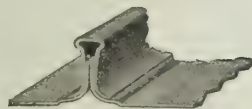


FIG. 3  
Third Position  
TRACK AND INSERT STRIPS

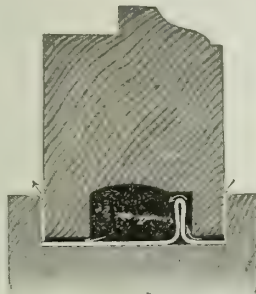


FIG. 4  
TRACK STRIP ONLY  
Where sash is cut out for sash cord

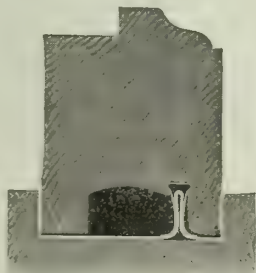
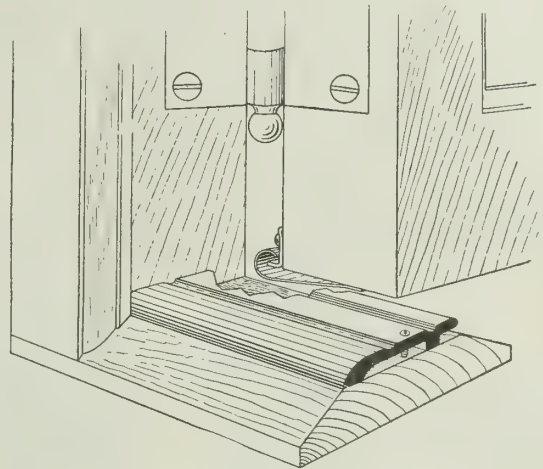
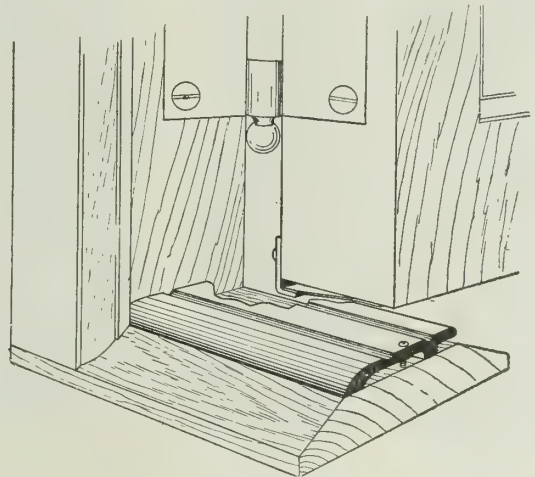


FIG. 5  
TRACK AND INSERT STRIPS  
Where sash is cut out for sash cord



Special Spring Bronze Strip attached to bottom of Door contacting with the Bronze Threshold as the Door closes



Hook Strip on inside of Door Bottom, Spring Bronze Strip on bottom of Door contacting with Bronze Threshold as Door closes

DOOR BOTTOM STRIPS

### Installation.

The work of installation is done by trained mechanics in the employ of this company, scattered all over this country and Canada. They are prepared to meet in a satisfactory way all the difficulties to be encountered on either new or old work.

### Catalogue.

Our booklet, "The Reasons for the Higgin Metal Insert Strip," shows in figures and charts the relative efficiency of the strips. Sent on request.

CLARE SMITH, PRESIDENT

ORRIN THACKER, SEC.-TREAS.

C. J. PARSONS, GEN'L MGR.

# THE DIAMOND METAL WEATHER STRIP COMPANY

## COLUMBUS, OHIO

AGENCIES LOCATED IN ALL THE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

### Products.

"DIAMOND FLEXIBLE" METAL WEATHERSTRIP EQUIPMENTS for Windows and Doors.

Special Weatherstrip Equipments for Metal Sash and Frame.

### Equipments.

The company makes 6 different equipments for double hung or sliding windows, 3 for doors and 4 for casement windows.

### Advantages.

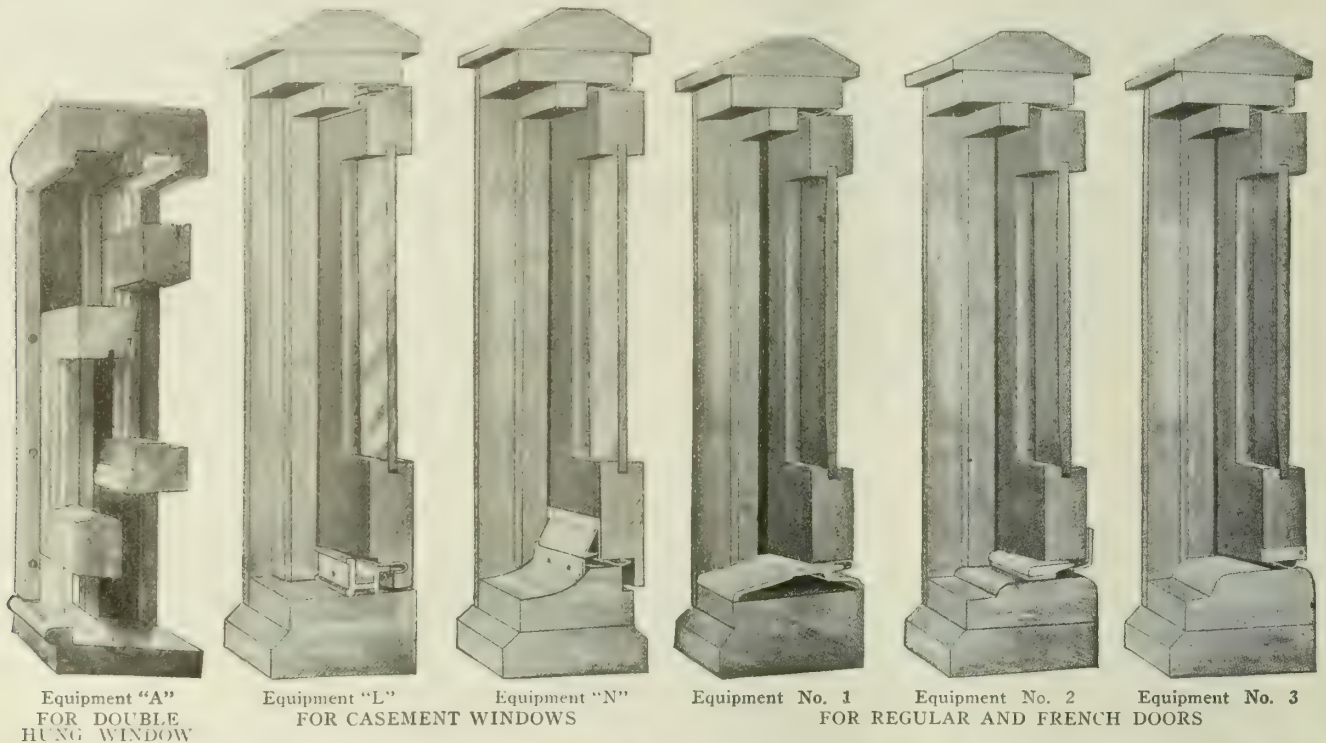
Flexibility and removability of double hung window equipments. Superiority of spring bronze as to



This is a most important feature to consider when figuring on the installation of weatherstrips. No other weatherstrip possesses it, and this fact should cause architects to decide in favor of the "Diamond Flexible." It would repay them, even at twice the cost.

Breaking of sash cord, for instance, is a common occurrence, and repair of this kind necessitates the removal of sash, which is an expensive operation, if fitted with other than the "Diamond Flexible."

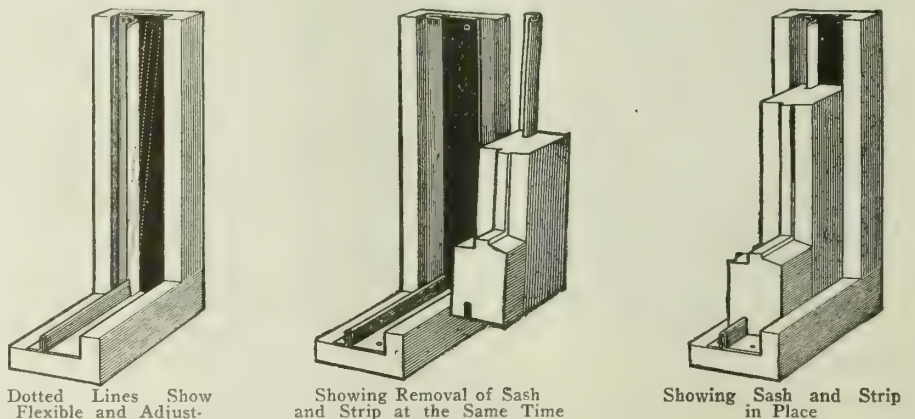
The advantages herein mentioned do not come with other makes of weatherstrip, and surely are worth careful consideration, especially when the price is about the same as others not nearly so good.



shape and nailing margin, and perfect interlock for bottom of doors. Efficiency in interlocking devices for casement windows opening in or out.

### Superiority.

The section of strip entering side of sash, being independent of the runway section, assures flexibility the instant the window is raised above the rigid bottom strip, thus avoiding the binding and sticking of sash so commonly complained of.



DETAILS "DIAMOND FLEXIBLE" METAL WEATHERSTRIP



# THE NATIONAL METAL WEATHER STRIP COMPANY

117-119 Erie Street, North Side  
PITTSBURGH, PA.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

## Product.

METAL WEATHERSTRIPS.

## Description.

**NATIONAL No. 2**—Constructed to the highest point of efficiency in its manufacture. Is the heaviest metal weatherstrip manufactured that can successfully be used for the purpose intended. With its double walls and double interfitting members it affords a protection that is most complete. In its manufacture the metal used is cut the crossway of the grain, thereby adding greatly to its strength. This strip shows very noted difference in the frame member from that of the National No. 1; instead of having the sides of the plow in the frame member doubled, they are single and of much greater thickness. The base of the frame member being doubled upon itself allows the use of countersunk screws. To the company's knowledge this is the only strip secured in this manner which allows the removing of the strip at any time without inconvenience.

**NATIONAL No. 1**—Carries the same principle as that of the National No. 2, but is manufactured of a lighter metal and covers the entire run of the window frame; the one edge entering the parting bead, the other or inner edge of the frame member extending under the inside bead of the frame and fastened with small nails which are entirely concealed by this bead, holding in place the frame member without the necessity of marring or disfiguring the window frame. At the same time it is the means of preventing any dust from collecting back of the strip.

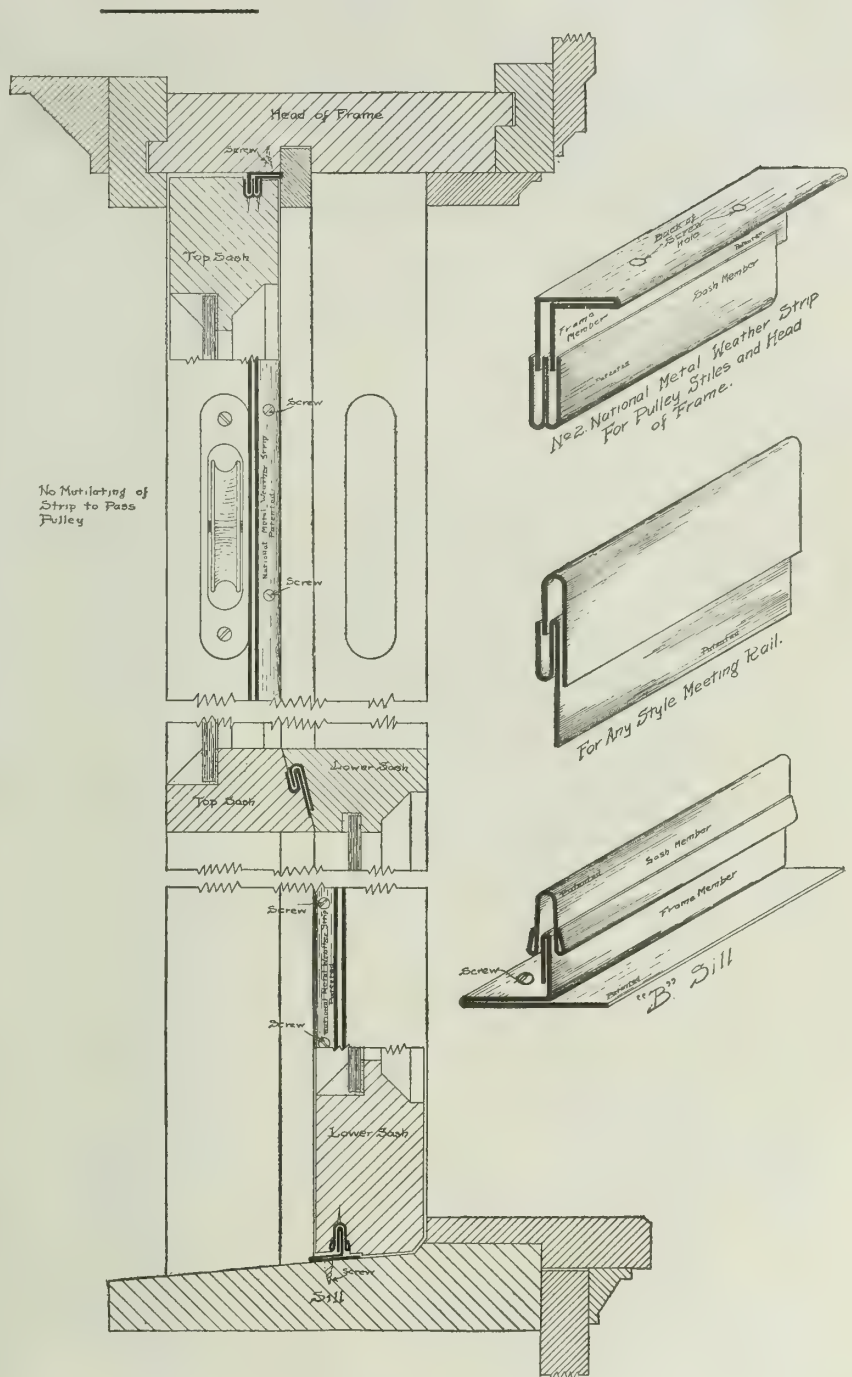
**COLUMBIA No. 1**—Is a strip more simple in construction than the National strips described.

It consists of a frame member with flat bases and a raised rib designed to enter the bare groove in the sash.

Being so simple in itself, the cost of manufacturing is considerably lessened, hence it is a strip that is somewhat lower in cost than the National strip.

## Special Features of the National Weatherstrip.

Installation complete on old, as well as new



DETAILS, NATIONAL METAL WEATHERSTRIP NO. 2

windows. Prevents dust entering through windows. Enables the window to slide with ease. Does not disfigure the sash, or mar the window. Quiets all rattling. Will never wear out. Access to strips at all times. Advantage of unobstructed light. More comfortable than storm windows. First and only cost is moderate.

# MONARCH METAL WEATHER STRIP CO.

4121-4123 Forest Park Boulevard  
ST. LOUIS, MO.

EXCLUSIVE LICENSEES IN ALL SECTIONS OF UNITED STATES AND CANADA

## Products and Services.

Manufacturers and contractors for the installation of "MONARCH" METAL WEATHERSTRIPS, as applied to doors and windows of every type, shape and condition, including a Special Form Strip for new and old buildings.

Manufacturers of the "MONARCH" CASEMENT WINDOW STAY for all types of Casement and Pivoted Windows.

## "Monarch" Metal Weatherstrips.

**DESCRIPTION**—The essential feature of weatherstrips, as applied to any door or window, is to provide an absolute seal that will remain constant during any subsequent changes in the alignment of the doors or windows.

"Monarch" metal weatherstrips are the result of close and practical study of cause and effect. They are shaped and applied to meet conditions as they exist in all types and manner of openings requiring a leakproof seal.

Made of zinc, bronze and copper, ingeniously shaped, they are impervious to climatic conditions and wear.

**INSTALLATION**—They are applied by this company's skilled mechanics under the supervision of Licensees, stationed in all the large centers, within easy reach of most any purchaser.

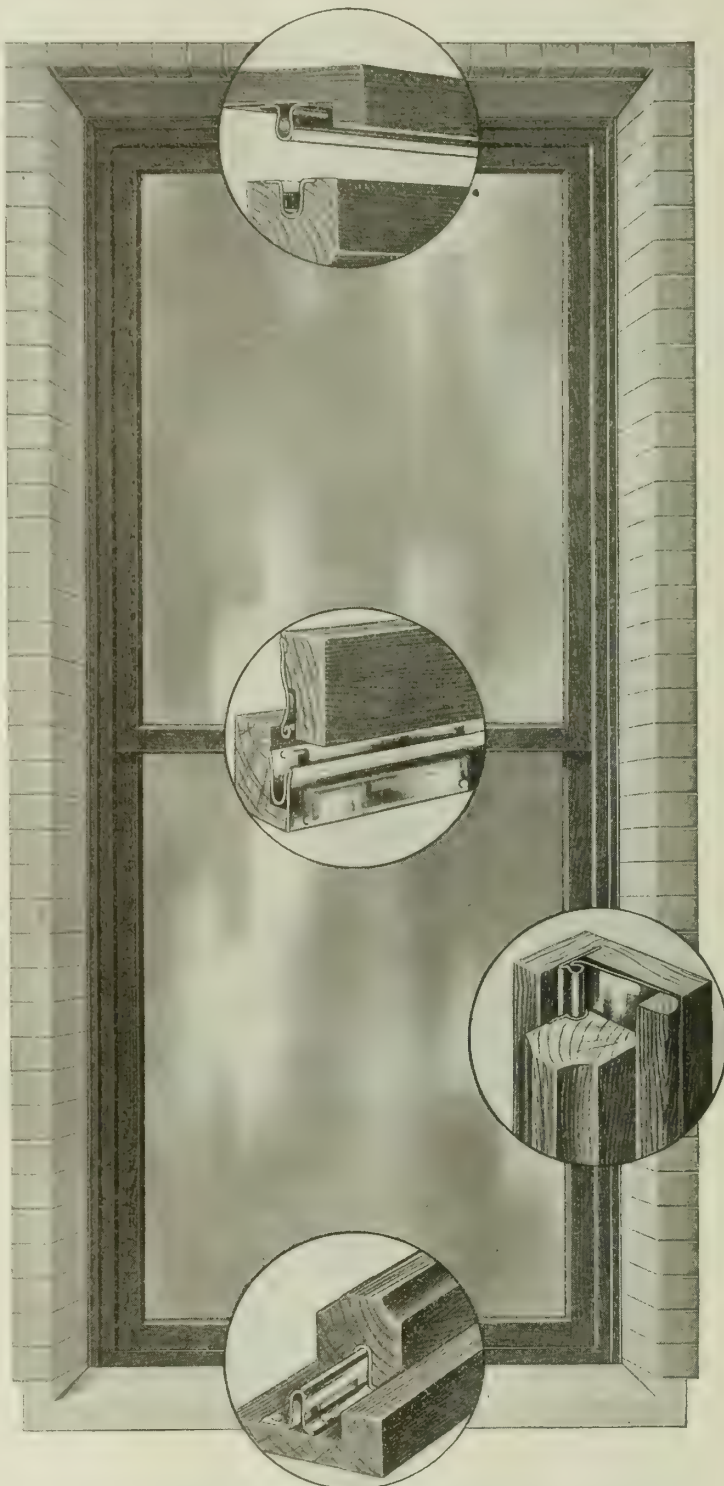
Write for Architects' and Engineers' Detail Book, illustrating the shapes and application to all kinds of doors and windows.

**HEAD OF SASH AND FRAME**—Two zinc strips, one on the frame projecting into and engaging the one in the sash. This makes a snug, tight metal to metal joint, which prevents rot and wear.

**MEETING RAIL**—Two ingeniously shaped members, one of copper and one of spring bronze, form a tongue and groove joint, providing a positive and flexible seal against all the elements.

**SIDE OF SASH AND FRAME**—The necessary clearance, about  $\frac{1}{4}$  in., is sealed by the sliding zinc tubes. One, with the lap seam, is placed on the frame; the other is placed in the corner of the sash. This forms a leakproof adjustable joint that will give with any movement of the frame and window, without losing its efficiency. It is the only metal to metal weatherstrip that will automatically adjust itself to meet any changes in the slope of the window.

**SILL**—The sill is provided with the same type and shape of weatherstrip as the head of frame and sash. Only the position of the strip is reversed to meet the conditions. All zinc strips are made to withstand wear and tear and provide reinforcement for the sash.



"MONARCH" METAL WEATHERSTRIPS  
Showing application to double or box frame window

**APPLICATION**—"Monarch" metal weatherstrips can be applied to any type of casement window, pivoted, or railroad car window, French doors, transoms, etc.



# **"Monarch" Casement Window Stay.**

CONSTRUCTION—Made on the telescopic principle; all brass tubes, sliding in and out as the window is opened or closed.

The inner tube is provided with two friction shoes fitted to, and pressed against, the walls of the outer tube by the action of the expanding member. This creates a friction surface that is positively firm in action, holding the window securely at any angle, at the same time acting as a shock absorber.

Eliminates all vibration and noise, so evident in most casement stays.

It is made in two sizes:

No. 1 Collapsed ..... 8¼ ins. long  
Extended ..... 14 ins. long

No. 2 Collapsed ..... 10 ins. long  
Extended ..... 17½ ins. long

No. 1 to be used concealed or exposed (see detail) on double casements.

No. 2 to be used exposed.

Prices on Nos. 1 and 2 are the same.

APPLICATION—For use on any casement, pivoted or transom window, opening in or out.

Can be applied to French doors also.

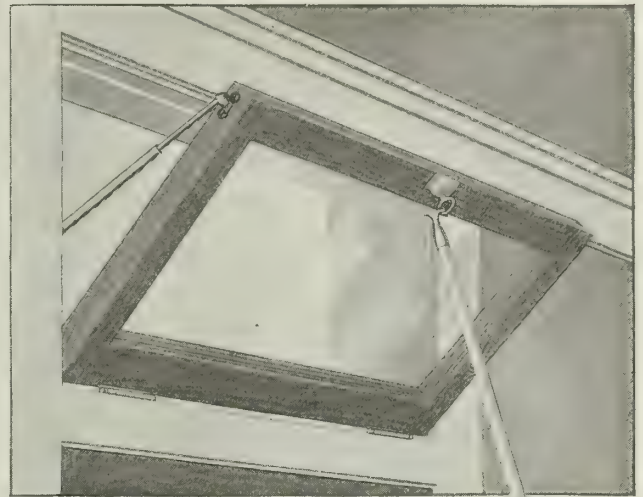
Can be attached, concealed or exposed, top or bottom, right or left, and is interchangeable.

Its position and location precludes any possibility of interference with screens, shades, curtains or any other fixture.

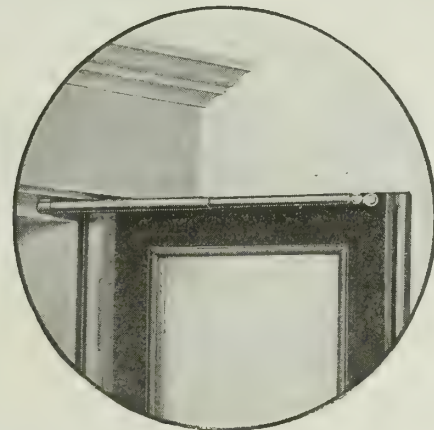
TRANSOMS—For the transom, the "Monarch" casement stay eliminates the rods and catches which bind and stick so readily.

Attached to the transom, it allows it to be opened to any degree without the use of chains, cords, or pulleys.

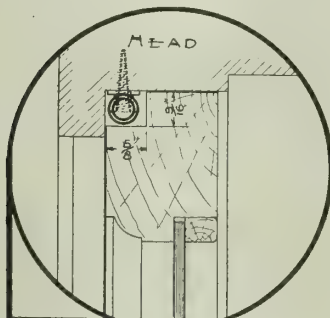
A transom pole can be used to open and close the sash.



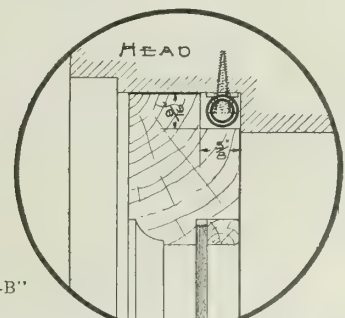
"MONARCH" CASEMENT WINDOW STAY  
A pull opens. A push closes



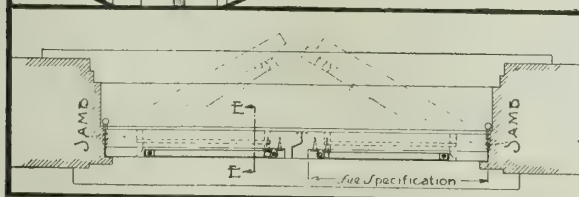
"MONARCH" CASEMENT WINDOW STAY  
Showing application to window. Entirely self-adjusting and requires no attention. Special finishes to harmonize with fixtures



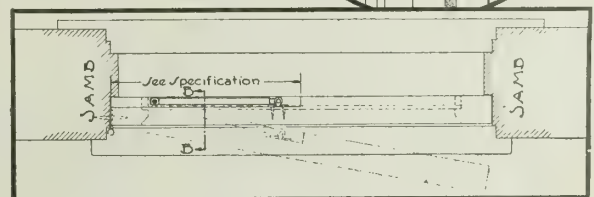
Section "E-E"



Section "B-B"



Double Casement—Open Out Plan. Head Removed



Single Casement—Open Plan. Head Removed

DETAILS OF "MONARCH" CASEMENT WINDOW STAY

# NIAGARA METAL WEATHER STRIP CO.

GENERAL OFFICES AND FACTORY

33 West Tupper Street  
BUFFALO, N. Y.

## Products.

Manufacturers of "PEACE" METAL WEATHER-STRIPS, for windows and doors; "PEACE" THRESHOLDS.

### "Peace" Metal Weatherstrip.

The "Peace" metal weatherstrip is simple in construction and perfect in operation. It is made from No. 26 U. S. standard gage zinc; the only metal weatherstrip reinforced by wood, the strongest and most practical strip on the market. The wood reinforcement is considerably compressed in manufacture and is, therefore, not subject to further shrinkage or seasoning after installation.

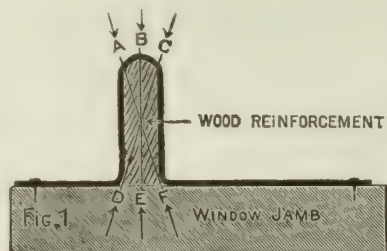


FIG. 1. "PEACE" METAL WEATHER-STRIP



FIG. 2. THE ORDINARY WEATHER-STRIP

**ADAPTABILITY**—"Peace" weatherstrips can be applied to all styles of windows, old or new, loose or tight, round or square, swinging or bowed, arched or curved, and to all varieties of casement windows, etc.

**ADVANTAGES**—From Fig. 1 it will be seen that a pressure exerted at (a) in the direction of the diagonal line is met by the resistance of the wood with pressure at (f). In the same way pressure at (b) and (c) is met by counter pressure at (d) and (e) respectively. Unless the wood yields, the strip can not dent or collapse.

Fig. 2 shows what happens to the ordinary weatherstrip. If strip were reinforced with wood, as in Fig. 1, the sides could not be drawn together to thus weaken the base.

In the manufacture of weatherstrip the depth of the tongue must ordinarily be limited, owing to the loss in strength as the depth increases. This tongue being reinforced in the "Peace" equipment, it is obvious that a rib of greater depth and strength is manufactured, insuring greater protection.

**"PEACE" SPRING BRONZE STRIP**—Used with doors and casement windows; made of the heaviest gage; the straightest ribbon bronze manufactured.

**"PEACE" THRESHOLD PROTECTION STRIP**—Consists of brass bar and "L." A strip of rubberoid is placed under the brass bar to adjust any unevenness in the floor. It also assures a tight and waterproof joint. The bar is beveled on the inside edge, extending the width of the door sill, and is screwed to the floor. An "L." lined with felt, is screwed to the inside of the

door. The lower end of this "L" engages with the bevel when door is closed.

**"PEACE" NON-COLLAPSIBLE MEETING RAIL STRIP**—For the center or meeting rails of double hung windows. This strip consists of a piece of metal folded back on itself (Fig. 3) to give maximum strength, and nailed securely along both top and bottom edges to prevent tearing off or collapsing. Should any strain or pressure be brought to bear at (b) it would be met by either a pulling or pushing force at (a). Owing to the extra strength of this construction this company is able to have the deepest hook insuring the greatest protection.

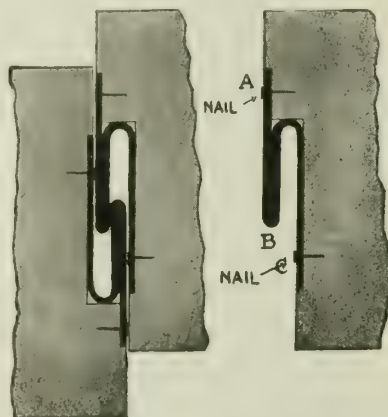


FIG. 3. "PEACE" NON-COLLAPSIBLE MEETING RAIL STRIP

**"PEACE" BRASS OR ALUMINUM CHANNEL STRIP**—For the sill of casement windows. The outer wall is of sufficient height to engage with edge of sash—making a water shed. Should water be forced past the shed, it would drop into the channel. Holes are bored in the outer wall to allow the water to escape. The inner part of the channel engages the hook on the sash.

**DURABILITY**—The "Peace" metal weatherstrips will last the lifetime of any ordinary building. They need no adjustment or repairing. The initial cost is the only cost.

**GUARANTEE**—Every inch of "Peace" metal weatherstrip is absolutely backed by an old reliable company, and they guarantee all work undertaken.

**SPECIFICATION**—To insure its installation architects should specify: "Install the 'Peace' metal weatherstrip manufactured by the NIAGARA METAL WEATHER STRIP Co., of Buffalo, N. Y."

### "Peace" Saddle or Threshold.

Made extra wide. The saddle or threshold is set in cement and supplants the ordinary wood, marble or stone threshold. It is  $4\frac{1}{4}$  ins. wide and  $\frac{3}{4}$  in. high. The lip engages with brass "L" placed on lower inside edge of door. Being of shapely design and highly polished, it is an attractive door sill.

### Estimates.

Estimates cheerfully given, and any other information will be promptly furnished on request.



ESTABLISHED 1887

# SCHOULER CEMENT CONSTRUCTION CO.

## Weatherstrips for Sliding Doors

TELEPHONE:  
WAVERLY 10

154-156 Frelinghuysen Avenue  
NEWARK, N. J.

LEHIGH VALLEY R. R. SIDING

### Products and Services.

SCHOULER PATENT DOOR GUIDE and WEATHERSTRIP for sliding doors.

SCHOULER PATENT SANITARY STALL FLOOR.

Concrete and Cement Sidewalks and Floors for stables, barns, factories, garages, etc.; Concrete Roads; Reinforced Concrete Construction; Stable Fixtures, including Duplex Gutter Trap; Buildings with Hollow Concrete Walls, at less than the price of brick walls; Designers and builders of Chemical Plants.

This company contracts for the installation of its products where desired.

### Schouler Patent Door Guide and Weatherstrip.

**ADAPTABILITY**—This device is adapted for use on sliding doors in garages, barns, stables, factories, freight stations, etc. Adapted to any size door, and in connection with flooring of concrete, asphalt, brick or wood, it is the only successful appliance for the purpose.

Furnished for either single or double doors, and is invaluable when the opening of garage or stable is so arranged that it is necessary to slide doors past each other, permitting the entire front to be used for entrance (Fig. 2). Over 100,000 in use.

**DESCRIPTION**—This device consists of a heavy steel groove embedded in the floor, flush with the surface, in which slides a steel plate attached to bottom of door. The groove acts as a guide, and the door, sliding smoothly, is kept in place on the overhead track. The door may be hung clear of the sill to avoid possible obstruction.

**DISTINCTIVE FEATURES**—It is the only weatherstrip on the market for sliding doors. It is made of metal; will last indefinitely; will fit any door, and can be applied after the door is hung, in connection with any kind of flooring. It will prevent the door from leaving the overhead hanger and permits doors to be hung 1 in. above the sill and run smoothly without friction.

It prevents the penetration of rain, snow, dust and wind, as the steel plate acts as a weatherstrip and effectually closes the space (Figs. 1 and 2). The harder the wind blows, the tighter will be the weatherstrip.

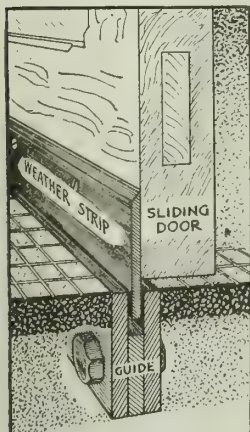


FIG. 1. Single  
SCHOULER PATENT SLIDING DOOR GUIDE AND  
WEATHERSTRIP

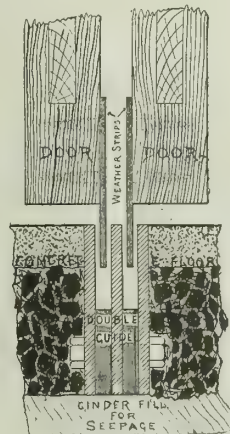


FIG. 2. Double

It will plow through any ice that may accumulate. The opening in the guide runs entirely through to the seepage bed below, thus all water is carried away.

### Sanitary Stall Floor.

This system is designed for use in connection with concrete or artificial stone floors. Consists of a series of wooden slats held in position by a patent slat holder. Spaces between slats are wholly unobstructed by bolts or otherwise, thus giving a free passage for liquids. Slat holders can be easily lifted out at any time, thus sanitary conditions are more completely assured by this system than by any other. Its economy is unchallenged, both in first cost and in maintenance. Slat holders being interchangeable, they may be so altered in position as to avoid undue wear on the center ones.

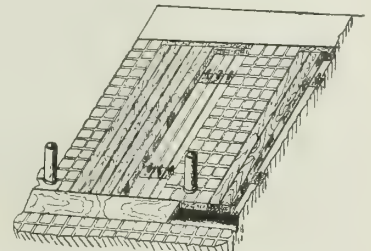


FIG. 3. SCHOULER PATENT SANITARY STALL FLOOR

Standard sizes, 7 ft. 4 ins. by 3 ft., kept in stock. Sets may be ordered direct or through local contractors. Maple used in regular sets; oak, yellow pine or spruce to order

### References.

The following persons (and many others) are using Schouler's patent devices. In these installations the cement floor work was done by the company; also the general contract in several instances, where the buildings are of concrete hollow wall construction.

#### OWNER

#### ARCHITECT

F. W. Vanderbilt, Hyde Park, N. Y.  
R. Van Cortlandt, Mt. Kisco, N. Y.  
R. C. Lounsbury, Bedford, N. Y.  
Jas. E. Speyer, Ossining, N. Y.  
J. C. Colgate, Bennington, Vt.  
H. McK. Twombly, Madison, N. J.  
Percy R. Pyne, Bernardsville, N. J.  
U. S. Naval Academy, Annapolis, Md.  
W. D. Guthrie, Locust Valley, N. J.

Burnet & Hopkins, New York

Acker, Merrill & Condit (200 stalls),  
536 West 46th Street, N. Y.  
Paul D. Cravath, Locust Valley, L. I.,  
N. Y.  
John F. Dryden, Bernardsville, N. J.  
Chas. Head, Manchester-by-the-Sea,  
Mass.  
Meadow Brook Stable (125 stalls),  
Newark, N. J.  
W. V. S. Thorne, Morristown, N. J.

C. P. H. Gilbert, New York  
Buchman & Fox, New York  
Babb, Cook & Willard, New York  
George D. Post, New York  
H. D. Hale, Boston

J. B. Duke, Somerville, N. J.  
Sheffield Farms-Slawson-Decker Co.  
(200 stalls), New York, N. Y.  
J. Griswold Webb, Clinton Corners,  
N. Y.  
Hamilton F. Kean, Elizabeth, N. J.  
Miss E. de H. Kean, Elizabeth, N. J.  
E. R. Squibbs & Sons, New Brunswick,  
N. J.  
H. M. Tilford, Monroe, N. Y.

T. C. Hughes, Newark, N. J.  
Delano & Aldrich, New York

Senator Frelinghuysen, Raritan, N. J.  
Wilson D. Lyon, Glen Ridge, N. J.

F. A. Rooke, New York  
E. Burnett, New York  
D. B. Provost, Elizabeth, N. J.  
Alfred Hopkins, New York  
E. F. Washburn, New York

# THE E. T. BURROWES CO.

Manufacturers of Rustless Screens for Windows, Doors and Porches

GENERAL OFFICES AND FACTORIES  
PORTLAND, ME.

BRANCH OFFICES AND SALESROOMS

ALBANY, N. Y.  
ATLANTA, GA.  
BIRMINGHAM, ALA.  
BOSTON, MASS.  
CASPER, WYO.  
CHARLOTTE, N. C.  
CHICAGO, ILL.  
CLARKSBURG, W. VA.  
CLEVELAND, OHIO  
COLORADO SPRINGS,  
COLO.  
DAVENPORT, IOWA

DAYTON, OHIO  
DES MOINES, IOWA  
DETROIT, MICH.  
EL PASO, TEX.  
GALVESTON, TEX.  
HALIFAX, N. S.  
INDIANAPOLIS, IND.  
JACKSONVILLE, FLA.  
KANSAS CITY, MO.  
LOS ANGELES, CAL.  
MEMPHIS, TENN.  
MINNEAPOLIS, MINN.

MOBILE, ALA.  
MONTREAL, CAN.  
NEW ORLEANS, LA.  
NEW YORK, N. Y.  
OKLAHOMA CITY, OKLA.  
OMAHA, NEBR.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.  
PORTLAND, ME.  
PORTLAND, ORE.  
ROCHESTER, N. Y.  
SALT LAKE CITY, UTAH

SAN ANTONIO, TEX.  
SAN FRANCISCO, CAL.  
SAVANNAH, GA.  
SIOUX CITY, IOWA  
SPOKANE, WASH.  
ST. LOUIS, MO.  
TOPEKA, KANS.  
TORONTO, CAN.  
WASHINGTON, D. C.  
WATERTOWN, N. Y.  
WICHITA, KANS.

## Products.

INSECT SCREENS with WOOD or METAL REWIREABLE FRAMES, for windows, doors, ventilators and other openings, including porches, outdoor sleeping rooms, loggias, etc.

Screen Netting; Grilles and Guards, for screen doors; Wire Safety Guards, for basement windows.

## Co-operative Service.

Maintained direct with architects through local salesmen equipped to extend expert screen service in harmony with architect's plans. Drawings, samples, illustrations and estimates furnished promptly on receipt of particulars. Every proposal is regarded as a new screen problem to be worked out in a way to supplement and complete the architect's conception. THE E. T. BURROWES Co. especially solicit unusual and difficult work, either in wood or metal, requiring long experience, a trained organization and modern equipment.

Permanent offices and telephone connections in above cities.

## Screen Installations.

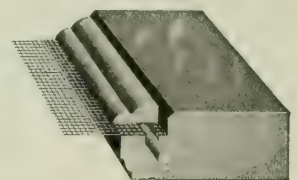
Screens made to measure only and guaranteed to fit *corresponding numbered openings*. All materials thoroughly tested for efficiency and durability—qualified to stand hard usage for many seasons—the standard screen for 45 years.

Sash runs are numbered when measured and screens are built and numbered at factory, to correspond. Window screen stock is finest selected kiln dried pine or white cedar, unless otherwise specified. Doors

and interior screens may be selected hardwood, finished to match surroundings. All screens finished to specifications.

Porches, outdoor sleeping rooms and loggias specially treated for best appearance inside and out; made in sections for easy installation, and separated by astragals to close joints.

All wood frame screens, for windows, doors or porches, are wired with spline and groove, drawing the netting even and taut. See illustration.



SECTION OF WINDOW  
SCREEN STOCK  
Reduced size

## Burrowes Nettings.

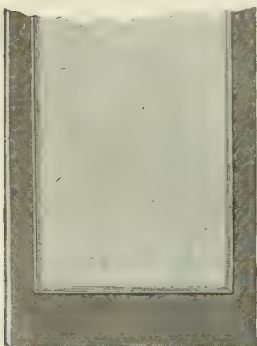
Unless otherwise specified, 14-mesh. Finer meshes if ordered. Extra heavy netting for doors.

Burrowes "Copbronze" netting is 93% pure copper, practically indestructible. Requires dusting only.

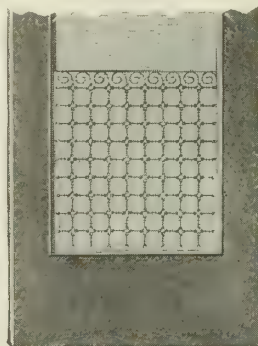
Burrowes "Enameled Galvanite" netting is high grade, far superior to the average; wire is galvanized before weaving, heavily enameled and japanned.

## Burrowes Hardware.

Excellent quality hardware included with all orders. Special designs in standard finishes to order. Hardware attached to ordinary sliding window screens at factory. Hardware for doors and special screens carefully packed with full directions.



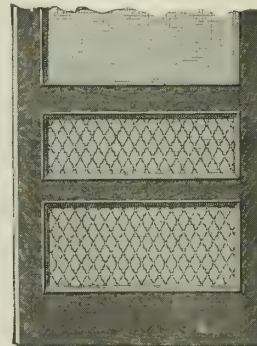
Design No. 24



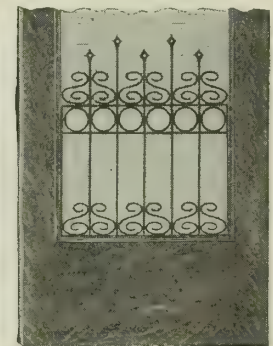
Design No. 24-C 5



Design No. 26-D



Design No. 39-D. G



Design No. 24-C Special

A FEW SUGGESTIONS FOR SCREEN DOOR TREATMENT. NOTE PANELS AND GRILLES



**Burrowes Screen Doors.**

Always made to order from Burrowes' own or architect's designs; finished to harmonize with house door.

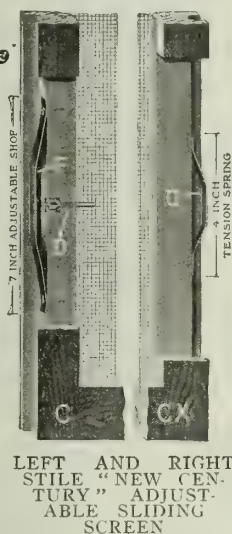
Burrowes doors are very strong; made with greatest care from best selected kiln dried lumber, either straight grained pine for painting, or hardwood finished to match submitted samples. The netting is much heavier than window screen netting. Note lock-strip method of wiring; every strand held taut and even.

Beautiful, substantial hardware, in standard finishes, adds to the distinctive character of Burrowes doors. Lower panels may be reinforced with heavy 3-mesh guard, 1¼-in. diamond mesh guards or plain or ornamental grilles of bronze or iron.

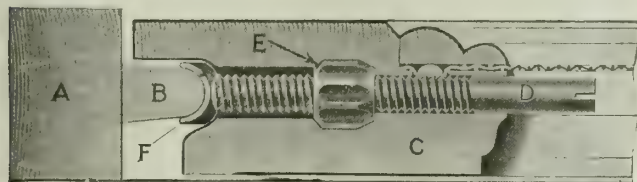
NOTE—Burrowes screen doors are unusually thick and strong. They adjust themselves readily to architect's plan if the rabbet on outside of door frame is at least 1¼ ins. wide, with proper allowance between doors to clear house door hardware.

**"New Century" Spring Sliding Screens.**

Recommended for double hung windows. Made with well constructed wood frames with grooved stiles for sliding screen on full length moulded runs. Left-hand groove is fitted with two adjustable shoes or bearings and right-hand groove with two arched steel balance springs, to hold screen in any desired position, for top or bottom ventilation. These bearings and springs, as shown in lettered diagrams, form the only points of contact between screen and screen runs. They assure ease of operation with minimum of friction, and overcome inequalities in window frames. Once adjusted in position, "New Century" screens require no attention whatever. No interference with window sash, draperies or blinds. Installed either inside or outside of sash. Frames finished to match surrounding trim.

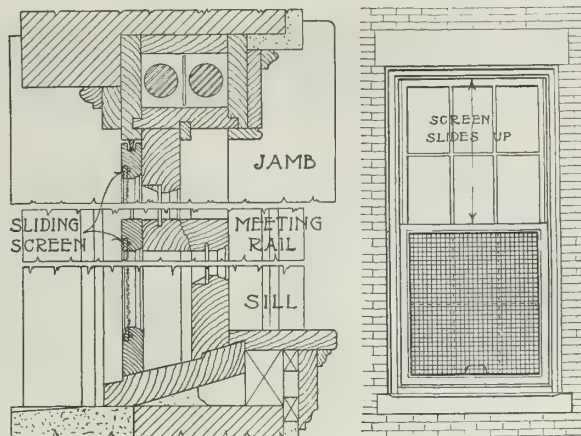
**Patent Spring Sliding Screens.**

Identical with "New Century" without the adjustment feature. Springs in groove hold screen in any desired position.

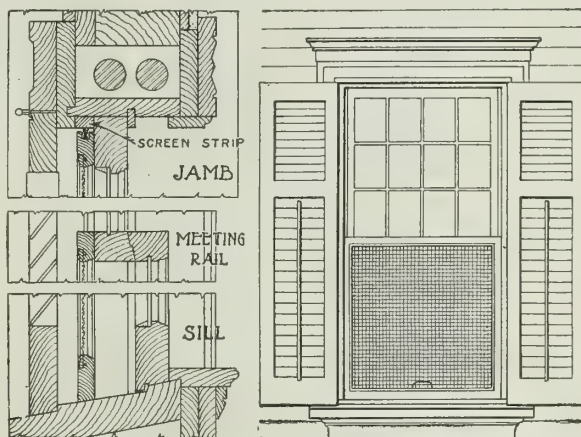


FULL SIZE SECTION "NEW CENTURY" ADJUSTABLE WOOD FRAME WINDOW SCREEN

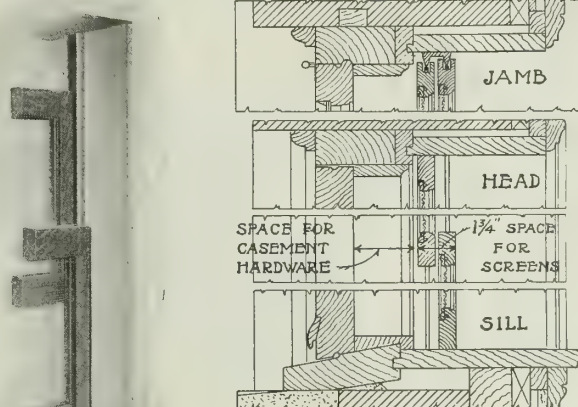
(A) Blind stop. (B) Slide moulding. (C) Left-hand screen stile. (CX) Right-hand screen stile. (D) Bronze screw bolt through (E) Stationary nut operating (F) Adjustable shoe or bearing. (G) Elliptical tension spring for perfect balance



Detail of Window Frame Construction for Applying Burrowes Wood Frame Window Screen to Blind Stop, on Building without Blinds. Screen stock, unless otherwise ordered, finished to 13/16 in. thick

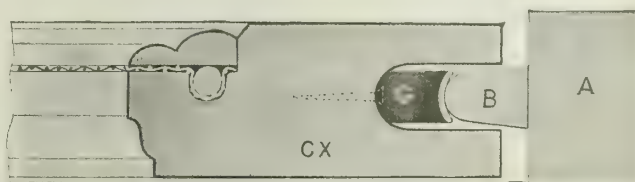


Detail of Window Frame Construction Showing How Extra Space May Be Provided for Screens and Blinds or Shutters, by Inserting a Screen Strip (width determined by conditions) Inside of Blind Stop

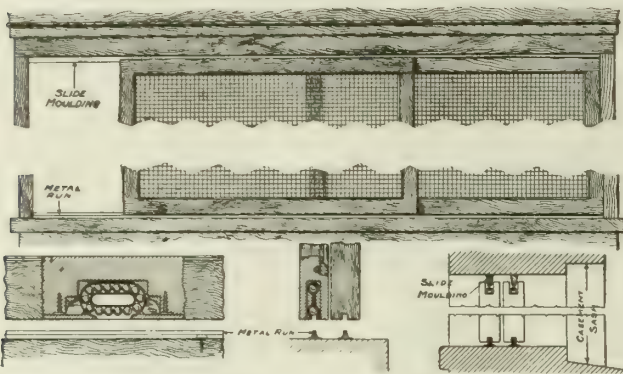


Detail of Casement Window Construction, with Burrowes Wood Frame Twin Sliding Screens (at the left) Applied Inside of Sash

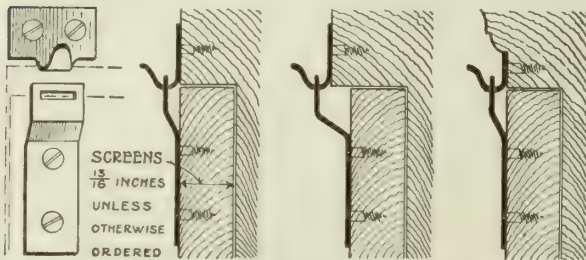
DETAILS SHOWING APPLICATION OF BURROWES SCREENS





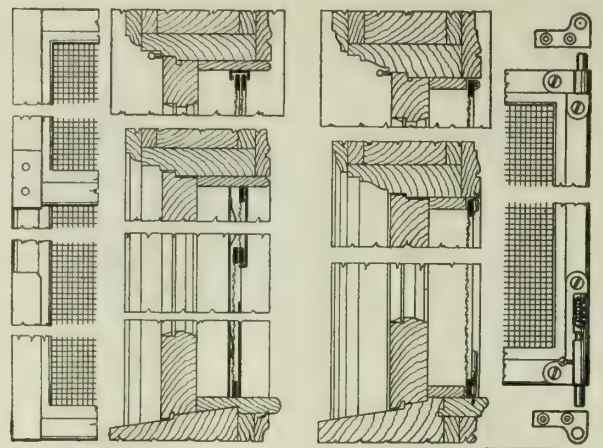


Ball Bearing Horizontal Sliding Screens for Wide Casements or Porch Openings above the Rail  
Allow  $1\frac{3}{4}$  ins. total width on stool



Burrowes Top Hung Full Length Screen Applied to Casements and Other Windows  
Note offset on hangers for various depths of rabbet

DETAILS SHOWING ADDITIONAL APPLICATIONS OF BURROWES SCREENS



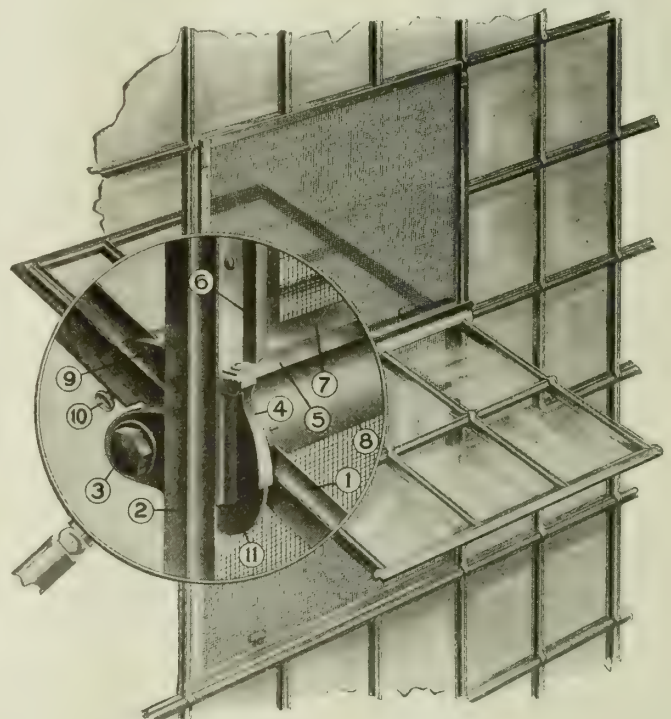
DETAILS SHOWING APPLICATION OF BURROWES SCREENS TO CASEMENT WINDOWS

Left-hand diagram shows Burrowes twin sliding metal frame screen applied to casement inside the sash. Similar construction, with U-guides reversed, is applied outside on blind stop.

Right-hand diagram shows Burrowes full length side-pivoted metal frame screen applied to casement. Metal keepers for pivot at top and spring-actuated pivot at bottom for easy insertion or removal.

### Screens for Steel Sash Ventilators.

The Burrowes patents applied to all types of steel sash ventilators guarantee insectproof screening without cages. Note numbered parts (from outside looking in) showing one style of ventilator screened with "Burrowes."



SCREEN FOR STEEL SASH VENTILATORS  
Note magnified parts

Ventilator (1) is pivoted at (3) in sash (2). Bronze casting (4) supports bottom guide (5) and side guides (6). These guides support and hold upper screen (7) in contact with sash. Sheet metal roll (8) screwed to ventilator through casting (9) centered on pivot (3) and rotates in contact with lower edge of guide (5). Roll (8) fitted around muntins and butts against glass, completely closing opening below upper screen.

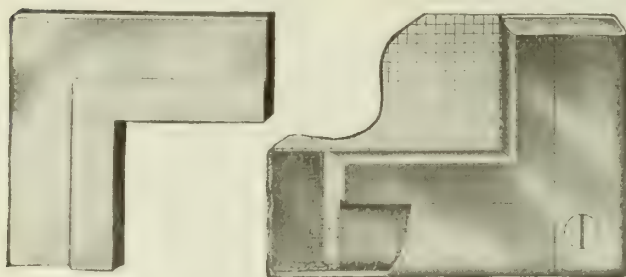
Opening over lower screen is closed by "T" shaped cap (not visible) held by thumbscrews (10) to rotate with ventilator in closing contact with upper edge of lower screen. Pivot cover (11) fast to ventilator is drawn up through hollow casting (4) to close small opening over pivot—every opening absolutely insectproof.

Upper screen is narrower than ventilator opening, and removed from inside by raising to clear guide (5). Lower screen (on inside) removed by detaching cap held by thumbscrews (10).

Other types of ventilators similarly screened by Burrowes patented devices.

### "Regis" Metal Screen.

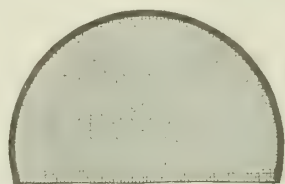
Strong, rigid inner frame, electro-welded at corners, over which netting is drawn taut and held by outer casing secured by bronze screws and housings; easily re-wired. All steel parts thoroughly sherardized (best known process of protecting steel from rust) and enameled any color. Made of solid bronze if desired. Neat U-guides of metal, equipped with springs for sliding screens.



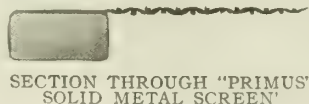
CORNER SECTION OF "REGIS" SCREEN ASSEMBLED  
Full size

### "Primus" Metal Screen.

Has a one-piece continuous solid metal frame with electro-welded corners, sherardized, painted and enameled. Made of solid bronze if desired. The netting is firmly and smoothly soldered to face of frame. Adapted for every shape of window, including circles, ovals, gothic arches and irregular openings.



"PRIMUS" METAL SCREEN FOR CIRCULAR OPENINGS



SECTION THROUGH "PRIMUS" SOLID METAL SCREEN



# KANE MANUFACTURING CO.

SUCCESSOR TO KANE BLIND & SCREEN CO.

Manufacturers of Rustless Door and Window Screens

KANE, PA.

REPRESENTED IN ALL PRINCIPAL CITIES

## Products.

Manufacturers of RUSTLESS DOOR, WINDOW and PORCH SCREENS (Rewireable).

## Kane Sliding Window Screens.

Made to order only. Kane window screens are made from any wood desired, thoroughly seasoned and kiln-dried; they do not warp nor twist; take and hold paint indefinitely; and are finished to match the surrounding woodwork.

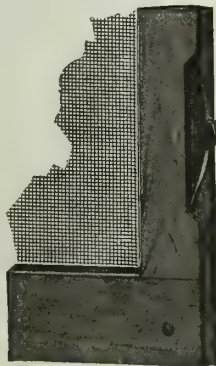
CONSTRUCTION—Screen has a shallow groove on one edge and a deep groove on the opposite edge. These grooves engage with sliding strips or mouldings attached to each side of the window frame. The spring in side groove is made from clock spring steel, and is covered with a tough coat of enamel to prevent corrosion.

Kane quality screens are used more than any other because of special corner construction. They combine lightness with greatest strength and rigidity, and are easily rewired.

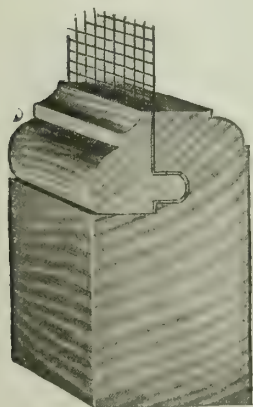
All corners have full mortise and tenon joints. It is well known that these are usually the weakest points in all window screens. The joints loosen and become broken. This company has overcome this defect by reinforcing the corners of all exterior screens with a special clamp rivet, a feature which effectively guards against frames being broken from continued use or exposure from the weather.

ADJUSTABILITY—Screens may be instantly removed by a slight pressure sidewise against the springs. By sliding up and down on the slide strips, the screen may be used in either the upper or lower half of window.

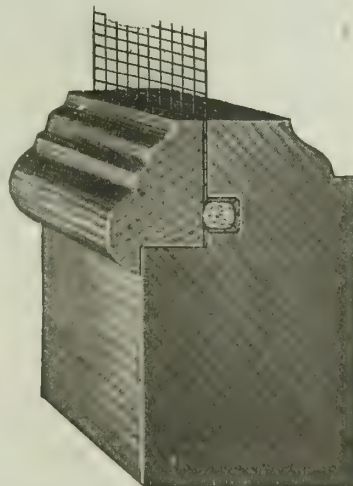
SPECIAL SHAPES—Screens made circular, elliptical segmental, box or any shape desired.



CORNER OF SLIDING SCREEN  
Showing flanged friction spring, rivet, and meeting of grooved stile with bottom rail



KANE METHOD OF FASTENING WINDOW NETTING



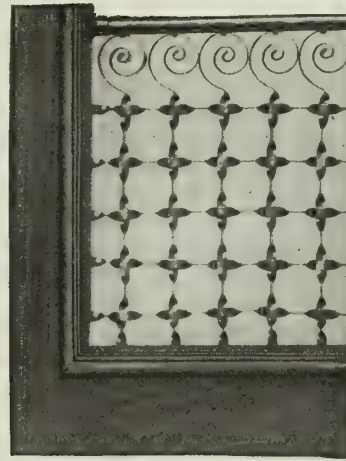
KANE METHOD OF FASTENING DOOR NETTING

## Stationary Screens.

Materials and construction are the same as in the sliding pattern, except the location of the grooves and springs. These are hung by special hinges at either top or sides of window; suitable locks are provided, permitting instant removal.

## Door Screens.

Made in any design, with or without grilles or guards, from any kind of wood, as desired; color or finish will harmonize with the surroundings; full mortise and tenon joints, glued and wedged; screen can not sag or warp.



CORNER OF DOOR

## Wire.

The best grades obtainable—bronze, galvanized or enameled—are the only types of wire used in all screens; and of any mesh desired.

## Hardware.

A full line of solid and plated fixtures for both doors and windows is carried in stock.

## Facilities.

The KANE MANUFACTURING Co. has been making screens for 18 years.

Its plant is modern in every particular and manned by skilled workmen; with excellent shipping facilities, enabling it to make prompt deliveries to points East of the Mississippi River.

## Prices.

Quoted on application.

## Installations.

Some of the company's recent installations:

Cresson Sanatorium, Cresson, Pa.  
Hotel Dieu, New Orleans, La.  
State Hospital for Insane, Trenton, N. J.  
U. S. Marine Barracks, Norfolk, Va.  
Tuberculosis Sanatorium, Meriden, Conn.  
U. S. Army Barracks, Fort Huachuca, Ariz.  
U. S. Post Office and Courthouse, Muskogee, Okla.  
National Geographical Society Building, Washington, D. C.  
U. S. Government Building, Boise City, Idaho  
Cape May Hotel, Cape May, N. J.  
Soldiers and Sailors Home, Erie, Pa.  
J. N. Adam Memorial Hospital, Perrysburg, N. Y.

# THE HIGGIN MANUFACTURING CO.

## Window and Door Screens

NEWPORT, KY.

SALES AGENCIES IN FIFTY OF THE LARGER CITIES THROUGHOUT THE COUNTRY

Look up Our Local Office in Telephone Directory, or write to Newport, Ky., for Information

### Products.

Manufacturers of HIGGIN ALL-METAL WINDOW SCREENS, WOOD FRAME WINDOW and DOOR SCREENS, all of which are made to order.

For Higgin All-metal Weatherstrips, see pages 782-83.

### Facilities.

Our extensive plant is centrally located, and prompt deliveries can therefore be made to all parts of the United States. Facilities are constantly being increased to meet the growing demand for our products.

### Higgin All-metal Window Screens.

The Higgin metal frame window screen is made entirely of metal and is adapted for use on either wood or metal window casings. It is especially suited to fire-proof buildings. It is set just outside the upper sash and requires only 9/16-in. space, which includes the guide strips or channels in which the screen slides.

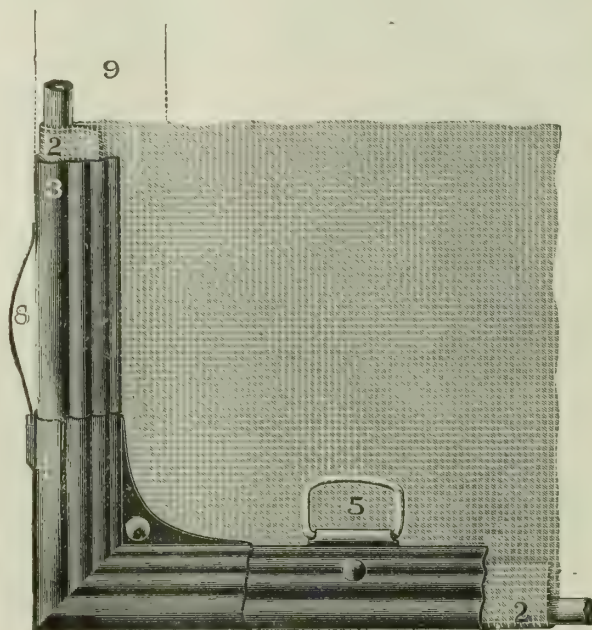
**CONSTRUCTION**—The screen (see illustration) is made with an inside frame of 1/4-in. galvanized steel or copper clad rod. Around this rod the wire netting is drawn, stretched perfectly tight, and held securely there by the outside mouldings. The netting can not pull out or get loose, and there are no sharp edges bearing against it with a tendency to cut it, as it expands or contracts with changes in the atmosphere.

In the "Higgin" screen only round surfaces bear against the netting. The mouldings are made from open hearth basic steel thoroughly galvanized and finished in baked enamel, which may be black or in color; or from copper or bronze in various finishes.

It is designed for use on sliding, bow, casement, oval, round and pivoted windows. Each style has its own special fittings looking to security and convenience in use. The sliding screens have side springs so as to be easily removed from the window and replaced. The guide strips are made of copper or galvanized steel. The bottom mouldings are perforated to allow for perfect drainage.

Each screen is numbered to identify it with the opening for which it has been made.

No screen of greater durability than this has ever been produced.



SECTION OF SCREEN, SHOWING CONSTRUCTION  
One-half actual size

### Wood Frame Screens.

We manufacture high grade wood frame screens of standard construction, to measurements only.

### Screen Doors.

We make, to order, a full line of high grade screen doors of pine, quartered oak, cherry, mahogany, etc. Doors are fitted, as required, with guard wire protection, or with copper grille, which we make in a variety of styles.

### Wire Netting.

The netting used in both screens and doors is made of solid bronze wire and is usually 14-, 16- or 18-mesh.

For special work, such as office or bank windows, laundry dry rooms, varnish rooms, etc., we are prepared to furnish 20, 24, 40, or even finer, mesh netting, if desired.

### Invisible Roll Screen.

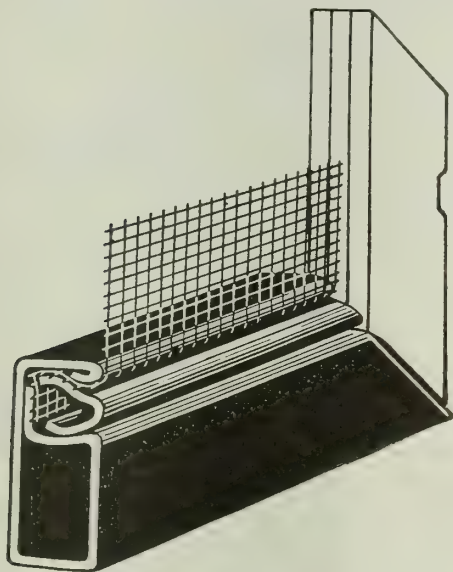
We have the exclusive sales agency for the Invisible roll screen for the United States and Canada. It is ideal for use on casement windows opening out and for all windows where it is desired to have the screen out of the way when not in use.



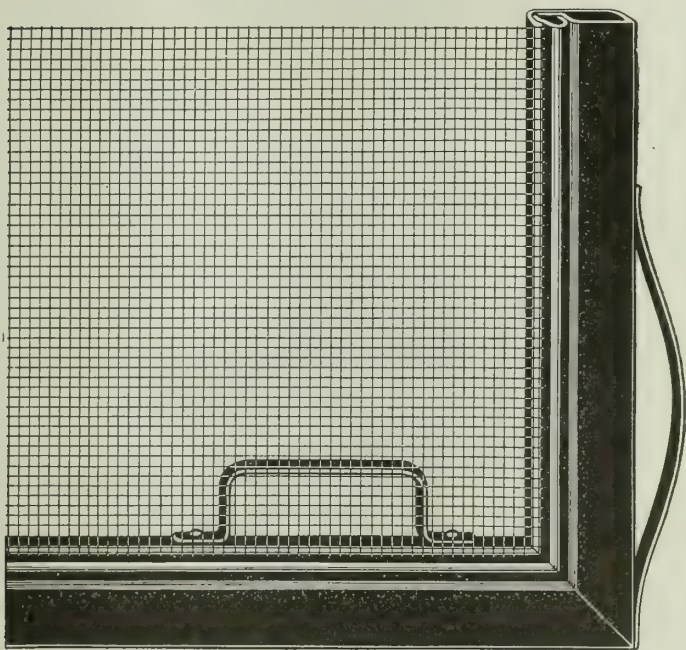
**The Higgin Re-wireable All-metal Screen.**

This screen is manufactured under patents issued February 15, 1916, with additional patents applied for.

**THE FRAME**—The frame is of hollow construction, so made that no solder is used, thus making it possible to thoroughly enamel the inside as well as the outside of the steel frame and bake it at the high temperature necessary. The surfaces are plain and smooth. The corners are reinforced with triple steel angles, locked



SECTIONAL VIEW RE-WIREABLE SCREEN, SHOWING CONSTRUCTION



CORNER SECTION RE-WIREABLE SCREEN, SHOWING LIFT AND SIDE SPRING

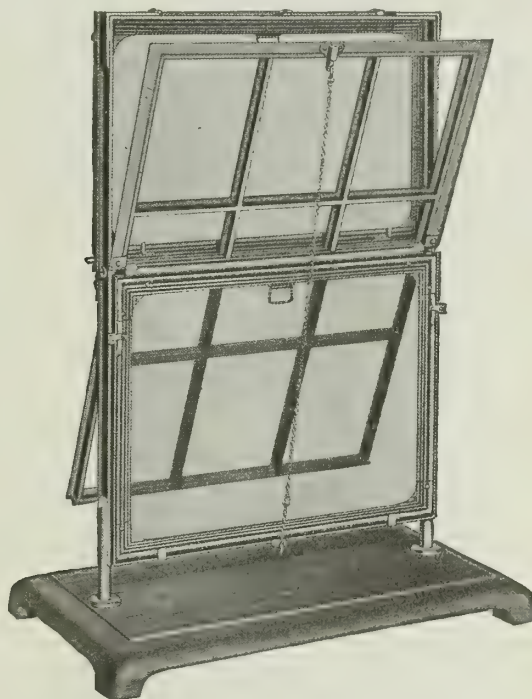
mechanically, no soldering or brazing being used, the outside moulding or frame being neatly mitered.

**RE-WIRING**—The netting is held in the groove by means of a stiff, non-resilient spline so formed as to roll into place and lock. This spline can be removed for the purpose of re-wiring the screen without danger of damaging it, making it unnecessary to order new splines from the factory.

**SHAPES**—It can be made any necessary shape to fit bow, circle top or round windows.

**Higgin Equipment for Ventilating Steel Sash.**

This equipment, consisting of angle plates and metal rolls permanently attached to the window frame, together with two straight Higgin screens, the upper on the outside and the lower on the inside, and which are removable, thoroughly screens the opening with the sash at any angle. It does away with the use of unsightly basket screens at less cost. It is adapted to all the standard makes of steel sash.



EQUIPMENT FOR PIVOTED STEEL SASH  
Inside view

**Estimates.**

Estimates will be cheerfully furnished by any of our sales agents, who will also superintend the erection of the work.

# REESE MANUFACTURING COMPANY

## Metal Frame Screens

325 Fillmore Street  
MINNEAPOLIS, MINN.

AGENTS IN ALL PRINCIPAL CITIES OF THE UNITED STATES

### Products.

PERMEX TWO-PIECE METAL FRAME SCREENS (Patented Feb. 20, 1917). R. M. C. PIVOTED STEEL SASH SCREENING. (Patent applied for.)

Screen Doors from Standard Designs or Special Designs; Utility Wood Frame Screens.

### Adaptability.

Permex construction is applicable to the screening of any kind of windows or screenable openings, such as casement, bow, convex, arch, circle, and the various kinds of special and patented windows.

Half-sliding screens for outside use, and twin sliding screens for inside use are the most popular types.

### Steel Sash Installation.

Our Engineering Department has worked out standard installations for pivoted steel sash and will be glad to supply blue prints and detailed information regarding these or any special installations on request.

### Construction of Permex Screens.

Fig. 2 shows the perfectly smooth welded corner by which means the entire frame is made of only two pieces. The corners of Permex screens are electrically welded and unbreakable. The handles and bearings are spot-welded to the frame and are thereby made integral parts of it.

Fig. 3 shows clearly the embroidery hoop principle of Permex construction, which makes re-wiring very easy. Brass screws and nuts hold the frames together.

Fig. 4 is an interior view of a half size sliding Permex screen in place, with parts of the frame cut away to show how the simple construction extends through every part of the complete screen.



TRADE-MARK

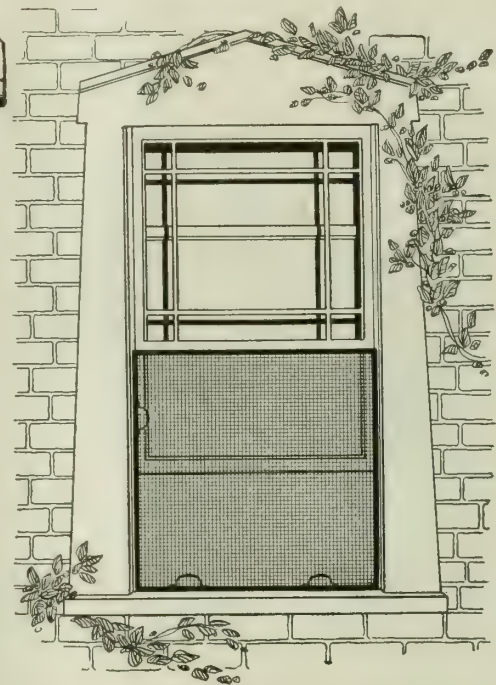


FIG. 1. HALF-SIZE SLIDING PERMEX SCREEN FOR USE ON DOUBLE HUNG WINDOW

Will cover either upper or lower sash, as guides extend full height of window. Raised or lowered by bottom handles, or removed by drawing in on side handle until side channel of frame is free of guide

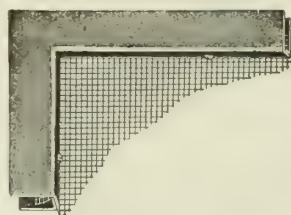


FIG. 2. Corner Construction

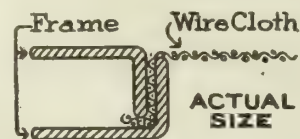
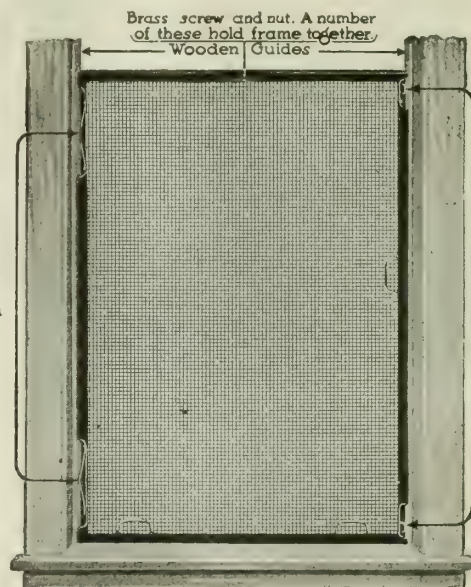


FIG. 3. Cross Section Showing Method of Applying Wire Cloth

Springs attached to frame hold screen firmly in position and allow easy removing and replacing of screen



Stationary bearings attached to frame and running on guide.

FIG. 4. Interior View of Half Size Sliding Screen in Place with Parts of Frame Cut Away to Show Simple Construction

CONSTRUCTION DETAILS OF PERMEX TWO-PIECE METAL FRAME SCREEN  
Figs. 2 and 3 show simple two-piece construction of No. 1 frame. Nos. 2 and 3 are same thickness but  $\frac{1}{8}$ -in. and  $\frac{1}{4}$ -in. wider, respectively.



**Durability of Permex Screens.**

The durability of Permex screens is one of their most important features. They are built so that, with reasonable care, they will outlast a modern substantial building. After all abrasive and burning operations are

completed, the parts of the frame are each heavily electro-galvanized and finished in three coats of baked-on enamel. There are no weak spots in Permex rust-proofing.

**Cost of Permex Screens.**

Judged by cost per year of service, Permex screens are the cheapest screens made. By reason of their simple construction they contain the utmost of quality, and cost very little more than first class wood frame screens.

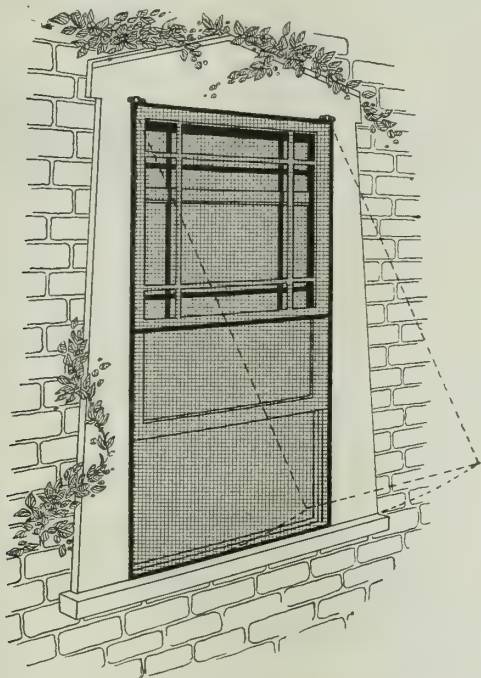


FIG. 5. FULL SIZE PERMEX SCREEN

Top hung on two-piece hangers which are interchangeable with Stanley's No. 1717 storm sash hanger. Thus but one permanent fixture need be attached to window frame for both screen and storm window. Small brass hooks fasten screens at bottom

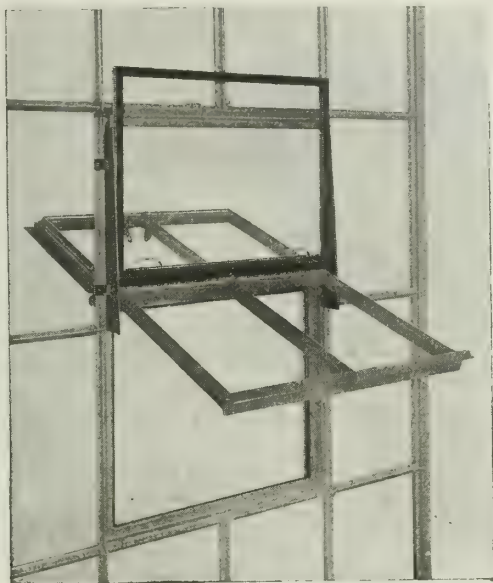


FIG. 7. EXTERIOR VIEW OF PERMEX SCREEN  
INSTALLED ON FENESTRA STEEL SASH  
Note simplicity and neatness of attachments

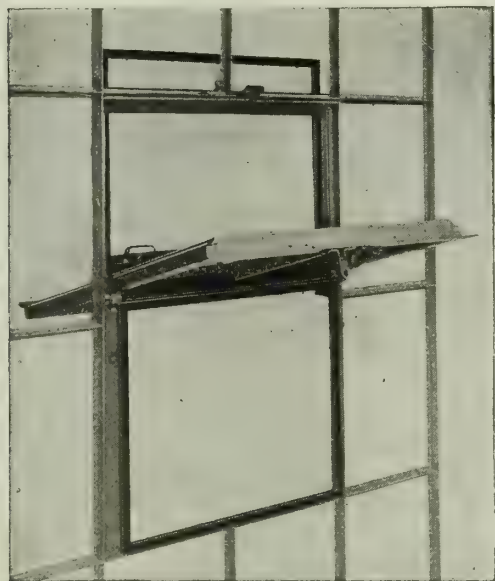


FIG. 6. Interior View  
Note that ventilator can be opened to full horizontal position

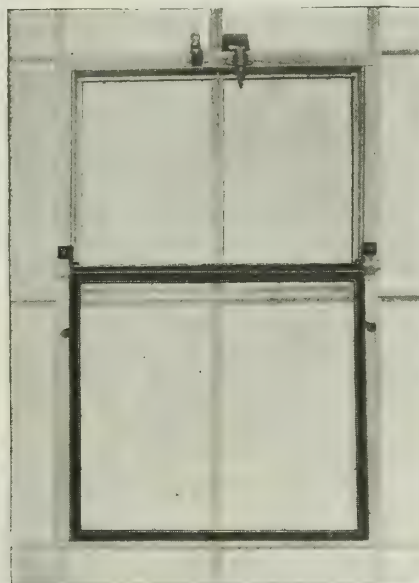


FIG. 8. Interior View with Ventilator Closed  
Note small obstruction of light

**INSTALLATION OF PERMEX TWO-PIECE METAL FRAME SCREEN ON STANDARD FENESTRA STEEL SASH**

The sash are pivoted 2 ins. above center. The light obstruction by this installation is only  $1\frac{5}{8}$  ins. with the ventilator closed, and only  $1\frac{1}{16}$  in. more with the vent in any other position

# WATSON MANUFACTURING COMPANY, INC.

## Window, Door and Porch Screens

JAMESTOWN, N. Y.

NEW YORK OFFICE, Architects Building, 101 Park Avenue  
REPRESENTED IN ALL PRINCIPAL CITIES

### Products.

MADE-TO-ORDER INSECT SCREENS.  
For Steel Furniture, see page 1429.

### Twentieth Century Rewirable Window and Door Screens.

Watson Twentieth Century Screens are made for all kinds of windows and doors. The frames being made of bronze, galvanized steel, or seasoned and kiln dried wood.

**METAL FRAME CONSTRUCTION**—The construction combines light weight with unusual strength and rigidity.

The lightness of the Watson metal frame is attained by our patented one-piece tubular form of construction. Designed to provide maximum strength with minimum weight, making a screen that is practically indestructible.

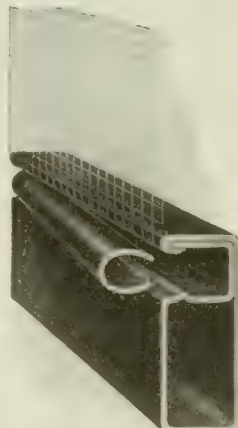
**Bronze Frames**—Made from the highest grade of commercial bronze (90% copper), contains no steel and will not rust under any conditions. A variety of brass, bronze and copper finishes is offered.

**Steel Frames**—The highest grade of alloy-coated steel is used, galvanized after being assembled, providing ample protection for corners, edges, surfaces, etc., against rust.

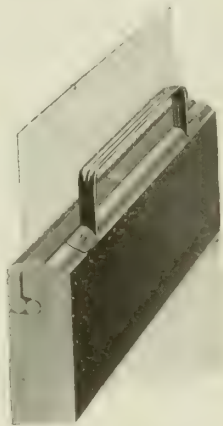
The finish is baked-on enamel and may be had in either plain colors or grained to harmonize with interior woodwork.

**WOOD FRAMES**—Furnished for every type of window regardless of whether it is of ordinary shape and dimensions, or of special design.

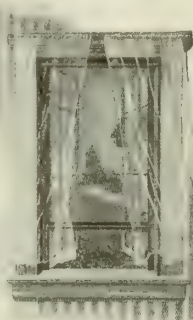
**ROLL SCREENS**—While roll screens are not intended to supplant the usual frame screen, they are particularly adaptable and can be advantageously used in connection with casement windows opening out. The roll screen being inside is easily raised and lowered, giving accessibility to the sash for the purpose of opening and closing. There is no interference with the window draperies.



SECTION THROUGH METAL FRAME  
Shows patented tubular construction and method of rewiring screen



SECTION THROUGH WOOD FRAME  
Shows patented method of attaching wire cloth.

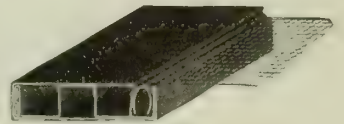


ROLL SCREEN  
(Patented)  
Used with casement window opening out, the most advantageous application of roll screens

### LIGHT METAL FRAME

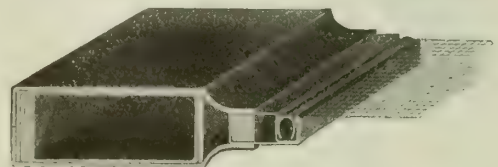
**SCREEN DOORS**—This type of door is intended for use in connection with French window openings or other small entrance openings to terraces, porches, breakfast rooms, etc. The neat, narrow and inconspicuous framework harmonizes closely with the lines of the house doors; is built in either brass, bronze or steel frame construction, and especially designed hardware made by ourselves is used.

**HEAVY METAL FRAME SCREEN DOORS**—Designed for use where entrance doors are of metal, as in banks,



SECTION THROUGH STILE OF LIGHT METAL DOOR

Shows method of attaching wire cloth, the reinforcement, and particularly the small, neat and inconspicuous design.

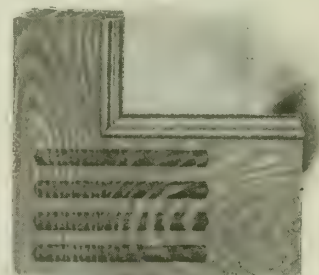


SECTION THROUGH STILE OF HEAVY METAL DOOR  
Shows construction, method of attaching wire cloth and interior reinforcing  
Note that both light and heavy metal frame screen doors are as easily rewired as the regular metal frame screens

libraries, hospitals and public buildings, and are particularly adaptable for main entrances and other large openings where the service is severe, and where the lighter construction would not be suitable.

Strictly high grade in every way, these doors combine beauty with great strength. In both line and finish they are built to harmonize with the house door.

They are made in all the plain and grained finishes, or of brass or bronze in a variety of natural and plated finishes.



CORNER OF WOOD DOOR  
Hardwood dowel construction used in corners of all wood doors and wood screen

**SCREENS FOR SPECIAL SASH**—By construction, our screens are particularly well adapted to the satisfactory screening of the various new or special types of sash, or sash operating on, or by, special hardware.

### Watson Service.

The same type of window may be screened in many different ways, according to conditions. Such points as material, construction, weight, strength, design, finish, fitting, utility, should be gone into carefully before reaching a decision.

Our representative will call and advise as to the best methods of treating the various types of windows, doors and porches, so that the lines of the screen will harmonize with the general architecture of the home. Will also furnish estimates of cost of the different types of screens and offer suggestions.



# F. D. KEES MFG. CO.

## Window Screen and Storm Sash Hangers and Fasteners BEATRICE, NEBR.

### Products.

"KEES" (GOSSETT) HINGES (or HANGERS) and FASTENERS for full length Window Screens and Storm Sash; "KEES" HANGERS for Half Screens.

For Metal Building Corners, etc., see page 240.

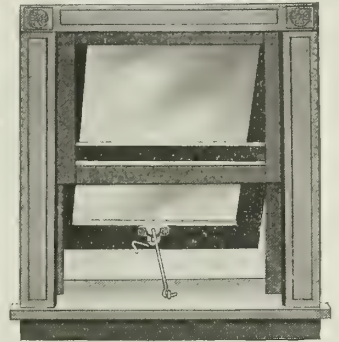


### "Kees" Fasteners.

No. 1 fasteners secure the screen on the inside at the bottom.

No. 2 fasteners lock storm sash when closed, and also when opened for ventilation.

They require less space, and are stronger and more convenient than hooks and screweyes.



NO. 2 FASTENER APPLIED  
Storm window open for ventilation (actual length 8 ins.). Made rights and lefts, can be used on sides of sash as well as at bottom.

### "Kees" (Gossett) Hinges.

"Kees" (Gossett) hinges are separable so that the screen or storm sash can be hung in place or removed easily and quickly without the use of tools or ladder.

ADVANTAGES — Screens or storm sash can be hung or removed without the use of ladder or tools, even on upper story windows.

Being hung from the top they will not sag out of true. Can be opened to drive out flies or to wash windows. Storm sash swing open for ventilation.

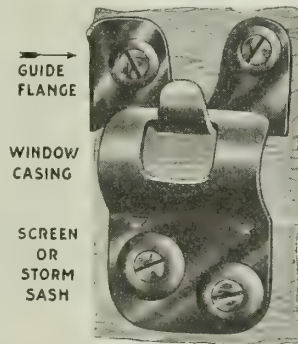
None but full length screens keep all the flies out and still allow the windows to be opened from the top. "Kees" (Gossett) hinges afford the most convenient way to attach them.

COST—The hinges cost no more than common hinges, and can be applied to any screen or storm sash.

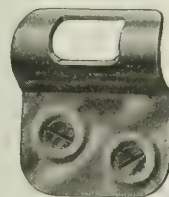
WHERE USED—"Kees" (Gossett) hinges have been used for the past 17 years; their sale is still increasing in the Central West, where they were first introduced.

They will be found on many residences, business and public buildings.

Some few larger installations are: Office Building of General Conference of Seventh-Day Adventists, Takoma Park, Washington, D. C., United States Army Barracks at Fort Slocum, New Rochelle, N. Y., Fort Leavenworth, Kans., Fort Leary, N. Y., Fort Oglethorpe, Chattanooga, Tenn., and Vancouver, Wash.



"KEES" (GOSSETT) HINGE  
Actual size 2 1/4 x 1 1/8 ins.



LOWER SECTION  
OF "KEES"  
(GOSSETT)  
HINGES

A pair or set consists of two pieces (like cut) needed to hang either a screen or storm sash after the window has already been fitted to the part of the hinge attached to the building answers for both

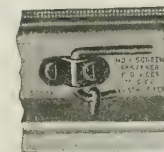


HANGING STORM  
SASH OR SCREEN  
FROM WITHIN  
BUILDING

No ladder or tools  
required even on upper  
stories



WASHING WIN-  
DOWS WITHOUT  
REMOVING SASH  
OR SCREEN



NO. 1 FASTENER  
One-third size

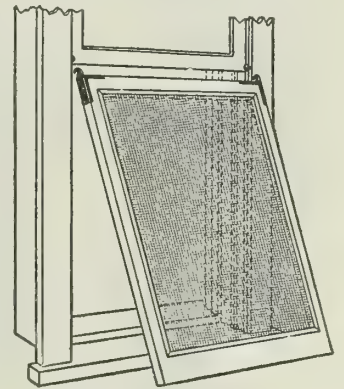
### "Kees" Half Screen Hanger.

Acts as a corner brace for the screen frame.

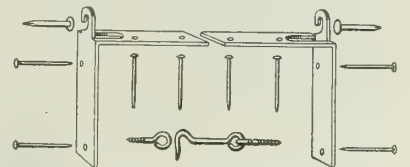
Easily attached. The screws on which the screen are hung are put in place after the screen is fitted and the hangers are attached. They can be located accurately so that the screen fits tight against the jamb of the window frame.

Screen can not fall off when swung out even if it should shrink.

Screen can be hung between or outside of the blind stops, and can be swung out or removed to wash windows or drive out flies, etc.



"KEES" HALF SCREEN  
HANGER APPLIED



"KEES" HALF SCREEN HANGER  
One-fourth full size

### Material and Finishes (All Products).

Made of pressed steel, japanned or galvanized. Furnished to order in solid brass and solid bronze.

### Distribution.

Sold by dealers in hardware and building material or may be ordered direct from the manufacturer.

### Samples and Prices.

Samples furnished free and prices quoted on request.

# PHENIX MANUFACTURING CO.

Screens and Awnings, Storm Sash, Screen Hardware

022 to 044 Center Street  
MILWAUKEE, WIS.

## Products.

PHENIX WINDOW and DOOR SCREENS, and SCREEN ENCLOSURES; PHENIX COMBINED WINDOW SCREENS and AWNINGS; PHENIX STORM SASH and ENCLOSURES; PHENIX HANGERS and FASTENERS (Patented) for screens, storm windows and doors.

## Phenix Window, Door Screens and Enclosures.

Made to order to fit any opening.

MATERIAL—Window and door screens and storm sash made from thoroughly seasoned white pine, wired with either rustproof or copper bronze wire cloth. Hardware finishes in steel, galvanized finish and solid brass.

FULL LENGTH TOP HUNG SCREEN—Fastening and locking device No. 102 for cleaning of windows and for ventilation.

TOP HUNG, SWINGING HALF SCREEN—Fits in between outside casings, with shut-off stop at meeting rail, and provided with inside locking device No. 30.

SIDE HUNG, HALF or FULL LENGTH SCREEN—Swings out like a door; hung by "Phenix" loose joint.

self-locking hinges No. 130, permitting hanging or removal from inside.

CORNER JOINTS—Joined by special dovetail hardwood dowel set in glue—superior to any mortise and tenon in carrying strength. Dowel pins form perfect wedge lock.

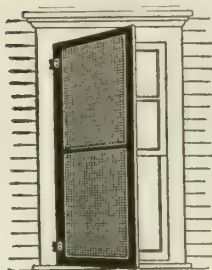
METHOD OF WIRING—No tacks used. Note wedge-grip manner of wiring; every strand of wire held perfectly taut and secure.

SCREEN DOORS—Furnished complete with all necessary hardware, ornamental grilles and guards for special wire protection.

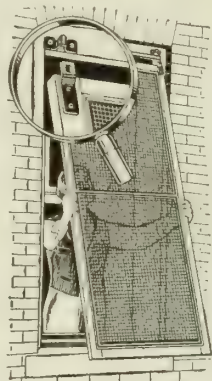
VERANDA ENCLOSURES—Made in convenient sized sections and held together with Phenix Nos. 60, 70 and 75 flush and corner locking devices (see illustrations on opposite page).

## Phenix Combined Screens and Awnings.

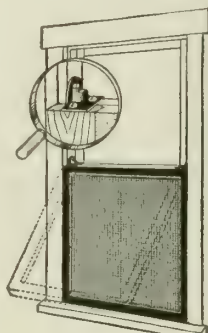
A two-in-one combination. Screen covers entire window with awning attached to same, awning being raised and lowered from inside without disturbing screen.



SIDE HUNG, FULL LENGTH SCREEN



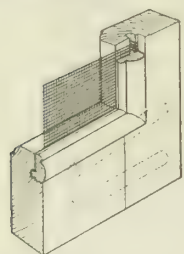
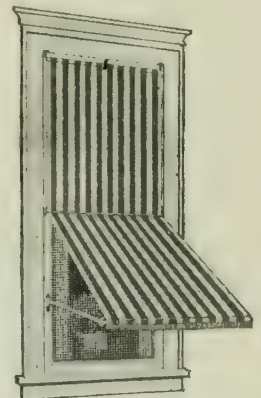
PHENIX FULL LENGTH TOP HUNG SCREEN



TOP HUNG, HALF LENGTH SCREEN

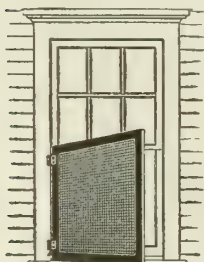


PHENIX COMBINED SCREEN AND AWNING  
Awning raised and lowered without opening screens. Full length screen makes ventilation possible



PHENIX WEDGE-GRIP AND CORNER JOINT

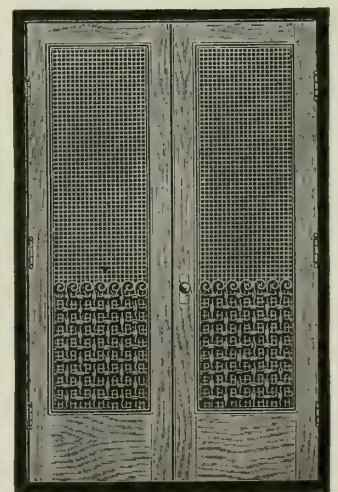
Showing method of wiring without tacks. Holds every wire taut.



SIDE HUNG, HALF LENGTH SCREEN



PHENIX VERANDA SCREEN ENCLOSURE



PHENIX SCREEN DOOR

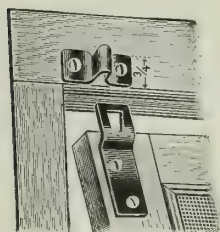


## Hangers and Fasteners.

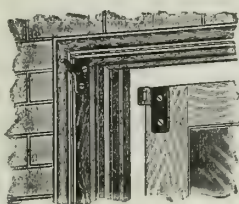
Complete line of hangers, hinges and fasteners adaptable for all requirements to hang and fasten storm sash, full and half length window screens. So designed as to be easily hung or removed from inside, and fastened at bottom with lock that draws sash firmly to

building. Screens or storm sash may, for cleaning of window or ventilation, be extended outward. Made of wrought steel, galvanized finish or wrought brass.

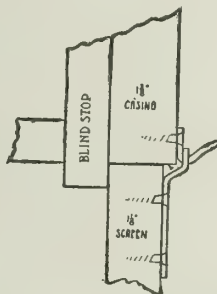
See illustrations of various styles of hangers and fasteners and their applications.



No. 114  
Designed for Flush Casings  
Strong, simple, unbreakable;  
retain form for years



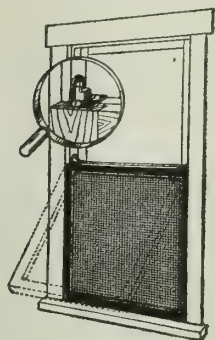
No. 20  
For Brick Frame Construction  
Part AA screwed on edge of casing, part BB on face of sash. Part AA can be sunk in, or its equivalent taken off edge of sash



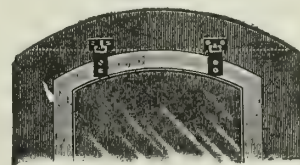
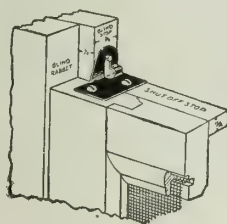
No. 3  
Shows sash  $1\frac{3}{8}$ -in., casing  $1\frac{3}{8}$ -in., difference in thickness  $\frac{1}{4}$  in. B part required in this case offset  $\frac{1}{4}$  in.



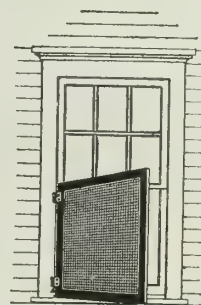
TRADE-MARK



Phenix Top Swinging Half Length Screen Hanger No. 112  
Adjustable to any thickness of sash or stop. So constructed that half screen can not be raised, blown or pushed from its pivots

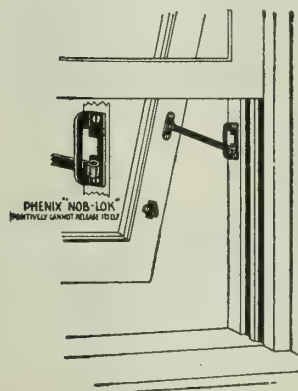


Method of Hanging Segment Head Screens

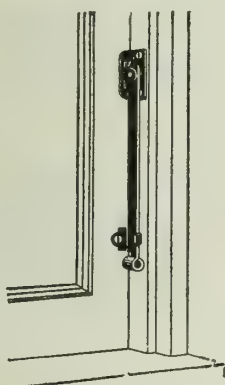


No. 130  
Phenix Side Swinging Loose Joint Self-Locking Hinge for Half Length Screens

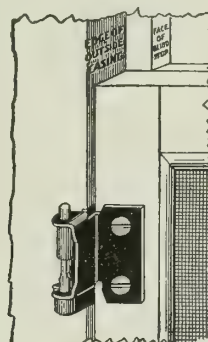
APPLICATIONS OF PHENIX SCREEN AND STORM SASH HANGERS TO ALL CONSTRUCTIONS OF WINDOW FRAME



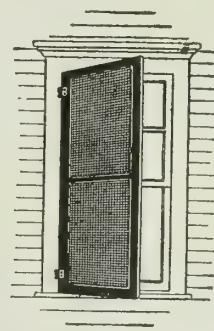
Extended for Ventilation or Cleaning of Window



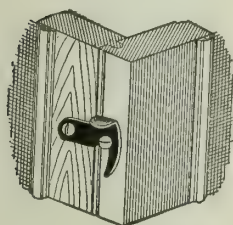
Window Closed



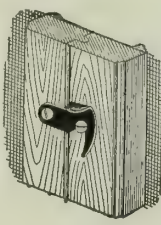
No. 130 Phenix Side Swinging Loose Joint Self-Locking Hinge for Full Length Screens



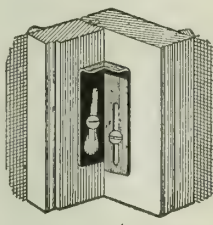
Phenix "Nob-Lok" Fastener No. 102  
Draws sash up tight and secure to building at all points. When sash is extended for ventilation, automatically locks and can not accidentally become unfastened



No. 60 Outside Corner Joint Fastener

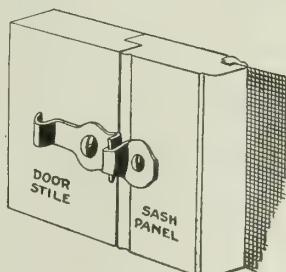


No. 60 Inside Flush Joint Fastener

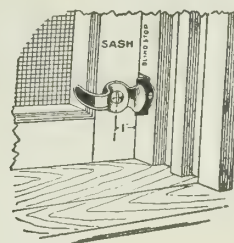


No. 70 Inside Corner Joint Fastener

For clamping veranda screen and storm enclosure sections (either flush or corners) into solid joints. Joints are rigid, sections are easily separated



No. 75 Rabbet Joint Fastener



No. 30 Fastener  
For all full and half length screens, storm, sash, basement screens and storm sash, porch enclosures

PHENIX FASTENERS AND LOCKS FOR STORM SASH, WINDOW SCREENS AND PORCH ENCLOSURE JOINTS

# BURLINGTON VENETIAN BLIND COMPANY

MAIN OFFICE AND FACTORY  
BURLINGTON, VT.

BRANCHES IN THE PRINCIPAL CITIES

## Products.

VENETIAN BLINDS, SLIDING BLINDS, WINDOW SCREENS, SCREEN DOORS.

## Services.

"Burlington" goods are made to order and are the output of a large, well equipped factory, and of skilled workmen trained to this kind of work. Details to suit any of the varying conditions that arise, catalogues, prices and special information will be forwarded on request. Will be pleased to send order blanks showing information desired.

## Venetian Blinds.

**USES**—For keeping out the glare of the sun, controlling the quantity and quality of outside light admitted through window and other openings where desired, and for regulating the entrance and direction of outside air through such openings.

**ADAPTABILITY**—For general use in moderate cost cottages or largest and most costly residences, hospitals, club houses, hotels and offices. Particularly adaptable for verandas, summerhouses and sleeping porches.

**INSTALLATION**—The installation is simple and anyone who can hang a window shade can hang or remove these blinds without difficulty. They can be hung on stop beads or subjambes having a flat surface of  $\frac{3}{4}$  in. or more.

**TYPES**—"Burlington," generally used for openings not exceeding 35 or 40 sq. ft.; "Rolling" and "Junior Rolling," which may be used for openings exceeding 35 or 40 sq. ft.

**OPERATION**—The *tilting* of slats in all types (slats are "*raised*" flat under each other) is accomplished by operating a cord at the left of the blind. They will remain in a fixed position until changed. In the "Burlington" and "Junior Rolling" types the slats are *raised* and lowered by a cord on the right of the blind and held at any desired elevation by one turn around the cord fastener placed on the right-hand casing. In the "Rolling" type the blind is held at desired elevation automatically by a ratchet in the device, operated by a hand tape.

**SLATS**—Slats about  $\frac{1}{8}$  in. thick,  $2\frac{3}{8}$  ins. wide are generally used; 2 ins. wide, in the smaller windows; the wider the slat, the lower the price; fewer slats being required.

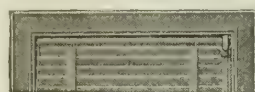
**Space Occupied**—With 2-in. slats, a "Burlington" blind 5 ft. high will occupy about 10 ins. at top of window when it is gathered; and 1 in. more for each additional foot in height—thus, a 6-in. blind would be

11 ins.; a 7-ft., 12 ins., etc. On  $2\frac{3}{8}$ -in. slats, same height blind would take about 2 ins. less. The "roller" styles require about 2 ins. more in space at top for same height blind than the regular style.

**Tenoned Slats**—Furnished with the "rolling" blinds when ordered; tenons engage with grooved guides at sides of windows, preventing the swaying of blind.

**MATERIALS AND FINISHES**—All types are made of any kind of wood desired, *from linden to mahogany*, and finished in any style as ordered—varnished, machine or hand rubbed, plain enamel, rubbed between coats, etc.—using the best material only for staining, painting and varnishing.

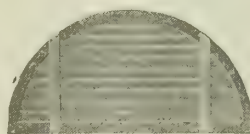
**PRICES**—List prices per sq. ft. of blind depend on the width of slats, finishes, and kind of wood used. Estimates and prices will be sent on receipt of window or porch sizes and other necessary particulars.



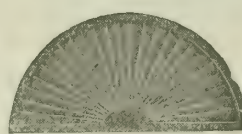
Section of "Rolling" Type  
with "Rolling" Device



"Burlington" Type



Horizontal Slats



Radial Slats

Showing treatment of semicircular tops



Section of "Junior Rolling" Type  
with Tenoned Slats and Guides



Spring on Top Rail Holding Slats  
in desired position

"BURLINGTON" VENETIAN BLINDS



**"Burlington" Inside Sliding Blinds.**

**ADAPTABILITY**—When properly made and fitted, the "Burlington" inside sliding blinds add to the comfort and convenience of all classes of buildings.

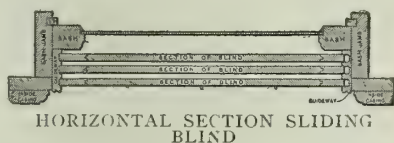
**ADVANTAGES**—(1) Sunlight can be excluded, when desirable to do so; (2) inside blinds freely admit air for required ventilation; (3) are noiseless in operation; (4) will not sag; (5) cost less than folding blinds.

**DESCRIPTION**—Usually made in 3 sections vertically, the 2 upper sections having stationary slats and lower one equipped with rolling slats; or, in other numbers of vertical sections, as ordered; or, with rolling slats in more than one section, as desired. Sections may be at various elevations in window, and are with 2 or more horizontal divisions of slats in each section, according to width of openings. Constructed of any wood, with any finish, and attachable to any window. The sections run in grooved guideways,  $2\frac{3}{4}$  ins. wide, more or less, to accommodate all of them. No hinges, therefore, sections can not sag; no rattle, because sections are held in their vertical slots by strong springs; no interference with window draperies, blinds being set between facing jambs next to inside sash.

**OPERATION**—Sections slide past each other, upward and downward; by pressing sections against springs, one way horizontally, they are removable from guideways for cleaning purposes.

**INSTALLATION**

—The accompanying sketch illustrates an installation of an inside blind of 3 sections.



HORIZONTAL SECTION SLIDING BLIND

Note 3 sections of blind, sash, casings, jambs, etc.

**SIZES**—Generally  $\frac{1}{2}$  in. thick and strong; other dimensions, as ordered.

**WHEN ORDERING**—State, for regular square windows, the following exact measurements: (1) Width of window between jambs; (2) height from window sill to top jamb; (3) distance from lower sash to face casings; (4) if blinds are to run to floor, give length that slides must be; (5) if windows have segment or circular heads or swells, send full particulars with pattern or radius measurements; (6) for circular blinds, state whether jambs are set parallel to each other or on radius lines.

**PRICES**—According to wood used, finish and size.

**"Burlington" Window Screens.**

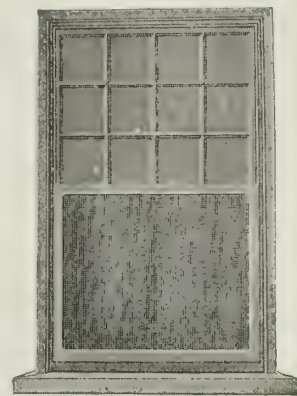
**INSIDE SLIDING**—When used with "Burlington" sliding blinds, the grooved guideways for blinds are provided with an extra groove next to the sash to be used for the screens. When not used with blinds,

grooved guideways with but one groove for the screen are provided, these guideways being the entire height of window so the screen may be used either at bottom or top of window.

It is the work of but a moment to take them entirely from the windows by pressing slightly to one side.

**OUTSIDE SLIDING**—The frames are usually of pine  $\frac{7}{8}$  in. thick and painted as desired; but they can be made of other dimensions, woods, and finishes, if preferred, though painted frames only are recommended for outside screens.

The splines on which the screens run are attached to the edges of casings closest to the upper sash, in proper position. The springs placed in deep groove of screen will hold the screen in place and at any desired elevation. These screens travel entirely upon the splines.



OUTSIDE SLIDING SCREEN

**OUTSIDE FULL SIZE**—These screens may be used between the blind stops and fastened in with buttons, or attached at top, so as to easily open outward, as shown, thus affording a convenient way for washing the glass without removing the screen.

The frames may be  $\frac{7}{8}$  in. or  $1\frac{1}{8}$  ins. thick, as is advisable, and painted such color as suits purchaser. The use of painted frames for outside screens is recommended.

Screens for enclosing porches are also furnished.

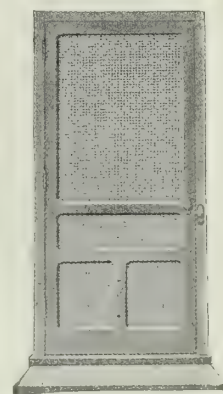


FULL SIZE OUTSIDE SCREEN

**Screen Doors.**

Made of best material; the frames  $1\frac{1}{8}$  ins. thick, containing panels as desired, are manufactured and finished in harmony with frames of wood door with which the screen door is to be used. Lower panels can be made of wood or wire, or regular wire covered with grille.

**PRICES**—According to square feet in screens and number of panels in doors; fewer the panels, lower the price. Further particulars on request.



SCREEN DOOR

**Wire Cloth for Windows and Doors.**

14-mesh regular black rustproof (gray finish) special black, and dark or bright bronze. Higher meshes, on order.

# THE J. G. WILSON CORPORATION

Manufacturers of Blinds and Awnings

TELEPHONE, VANDERBILT 1875-76  
CABLE, "LYDIAN, NEW YORK"

8 West Fortieth Street  
NEW YORK, N. Y.

FACTORY ADDRESS  
MAIL AND TELEGRAPH: NORFOLK, VA.

## BRANCH OFFICES

CHICAGO, ILL., H. B. DODGE & Co., McCormick Building  
PHILADELPHIA, PA., L. H. MYRICK, Heed Building

PITTSBURGH, PA., H. H. CHARLES, Bessemer Building  
ATLANTA, GA., J. M. VAN HARLINGEN, Candler Building

## AGENCIES

BUFFALO, N. Y.  
CINCINNATI, OHIO  
DENVER, COLO.  
EL PASO, TEX.  
FORT WORTH, TEX.

HOUSTON, TEX.  
LOS ANGELES, CAL.  
MINNEAPOLIS, MINN.  
NEW ORLEANS, LA.  
OKLAHOMA CITY, OKLA.  
ROCHESTER, N. Y.

ST. LOUIS, MO.  
SALT LAKE CITY, UTAH  
SAN FRANCISCO, CAL.  
SEATTLE, WASH.  
SPOKANE, WASH.  
WASHINGTON, D. C.

CALGARY, CAN.  
MONTREAL, CAN.  
VICTORIA, CAN.  
LONDON, ENG.  
WELLINGTON, N. Z.

## Products.

SLIDING VENETIAN BLINDS, for inside and outside use; VENETIAN AWNING-BLINDS; VENETIAN PORCH BLINDS; DIFFUSELITE BLINDS.

Rolling Blinds, Diffuselite Paints.

For Wood Rolling Partitions, Folding Partitions, Wardrobes, and Wood Block Flooring see pages 774-77; for Rolling Doors and Shutters, in steel and wood, see pages 692-93.

## Wilson Awnings.

**TYPE 1**—This type (Fig. 1) is a combination outside blind and awning. It can be raised or lowered vertically to any position; it can be extended to form an awning, and the slats can be deflected to modify lighting and ventilation, whether the outfit is used as a blind or as an awning. Perfect control of light is thus obtainable and the temperature of the room can be regulated to a degree unattainable by any other similar device. The raising or lowering of the blind, and the deflection of the slats, can be effected from the inside of the room without opening the sash.

Blinds of this type are constructed at the factory in wooden frames that fit into the openings prepared for them, and can be placed in position very readily. Slats are operated on collapsible phosphor bronze ladder or imported linen ladder, as specified.

**TYPE 3**—This type is a moderate priced awning-blind (Fig. 2), without the side protection afforded by Type 1. Perfect protection from the sun and wind, and yet ample ventilation, is obtained at low cost.



FIG. 1. WILSON AWNINGS, TYPE 1, IN THREE POSITIONS  
Note slats can be deflected for perfect control of light and air



FIG. 2. WILSON AWNING, TYPE 3, APPLIED TO PAGODA  
Note neat, airy, yet substantial effect of this awning

This type of awning is especially adapted to pagodas, main porches, sleeping porches and other locations where side protection is not required. It is much more attractive and far superior to usual type of porch awning.

## Wilson Inside Modern Venetian Blinds.

The Venetian blind has well passed the century mark in design, and by that token has proved its fundamentally good qualities.

A cord on the right of the blind operates the raising or lowering device, and one turn around the cord holder keeps the blind in any position. On the left hand a similar cord operates the slats at any angle, increasing or decreasing the light as desired; the slats are held at any angle by one turn around the cord holder.

In this type, as in most of the Wilson Venetian blinds, a device termed the "traverse roller" is generally used. This is a device which accomplishes the important feature of keeping the slates of the blind

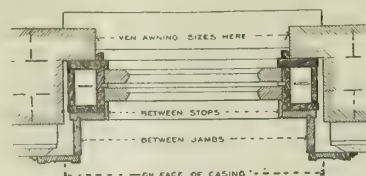


FIG. 3. DETAIL SHOWING WIDTH DIMENSIONS REQUIRED IN ORDERING AWNINGS OR BLINDS, ACCORDING TO POSITION



FIG. 4. OUTSIDE AWNING SLIDING IN FIXED VERTICAL GROOVE

always horizontal and, therefore, the entire blind symmetrical.

The blind can be made of any wood and finish to match the woodwork of the room.

## General Cost of Venetian Blinds and Awnings.

Price lists for general use are so unsatisfactory that it is deemed best to not include them herewith. As a guide, would say, however, that an inside Venetian blind for windows 3 ft. wide by 6 ft. high can be supplied at \$14.00 per window, and upwards; or a No. 1 Wilson awning for a similar window for \$30.00 and upwards.



### Heights of Pockets for Awnings and Blinds.

The following sizes are based on the assumption that bottoms of pockets are at top of window openings and that the blinds are to be wholly concealed within the pockets when drawn up. It is seldom considered necessary, however, to provide such pockets or to conceal any portion of inside Venetian blind. They are more frequently hung between window jambs, stop beads, or upon the head casings, without any pockets whatever, and when so hung present a very good appearance. For space occupied when slats are entirely up, add to the pockets heights given below.

HEIGHTS OF POCKETS FOR AWNINGS AND BLINDS

Height of opening	Inside slats 2 3/8 ins. wide, metal tapes	Inside slats 2 3/8 ins. wide, linen tapes	Inside slats 2 ins. wide, linen tapes	Inside slats 1 1/2 ins. wide, linen tapes	Awning slats 2 3/8 ins. wide, metal tapes
4 ft.	13 ins.	12 ins.	13 1/2 ins.	16 ins.	14 ins.
5 "	14 1/4 "	13 1/4 "	15 "	18 "	15 1/2 "
6 "	15 3/4 "	14 1/2 "	16 1/2 "	19 3/4 "	17 "
7 "	17 "	15 1/2 "	17 3/4 "	21 1/2 "	18 1/2 "
8 "	18 1/4 "	16 3/4 "	19 "	23 1/2 "	20 "
9 "	19 3/4 "	18 "	20 1/2 "	25 3/4 "	21 1/2 "
10 "	21 "	19 "	22 "	27 3/4 "	23 "
11 "	22 1/4 "	20 1/4 "	23 1/4 "	29 "	24 1/2 "
12 "	23 3/4 "	21 1/2 "	24 1/2 "	31 "	26 "

NOTES—If fronts of pockets are not removable add 1 in. to the above. For blinds over 6 ft. wide and up to 8 ft. high, add 2 ins. If over 6 ft. wide and 8 ft. high, add 3 1/2 ins.

Inside width of pockets should not be less than 4 1/2 ins. for linen tapes, or 5 3/4 ins. for metal tapes. The width must be more when the blinds are not to slide in grooves, in order to allow for swaying.

### Wilson Diffuselite Blinds.

The practical application of proved facts in conserving daylight.

**ADVANTAGES**—Diffuselite blinds reclaim all light at window openings and diffuse it evenly and properly throughout the room.

The light so diffused is maximum in quantity and high in quality.

All glare and strong contrasts are eliminated, and the direct rays of the sun are cut off with an increase of visual acuity.

Injurious sun rays, which cause eye trouble and nervous disorders, are dissipated or absorbed.

Without interfering with light control, they create definite currents of air which make possible perfect ventilation.

Diffuselite blinds are mechanically perfect. They will not get readily out of order under hard usage, vibrate or rattle in the wind, and can be adjusted to all window conditions.

They permit privacy in office or home without interfering with light or ventilation; are sanitary, and easily cleaned.

In addition to this, they perform all the functions of fabric shades, fabric awnings, and ventilators; making the installation of such equipment unnecessary.

**ECONOMY**—Diffuselite blinds last indefinitely, their upkeep is nominal, showing a saving in this respect over fabric shades, fabric awnings and ventilators, according to the number of openings. They do not have to be taken down and erected yearly, with ensuing labor, storage and repair cost, as do fabric awnings.

**INDORSEMENT**—Diffuselite blinds are indorsed by the medical profession, scientists, building and hotel managers, school boards, and all interested in lowering maintenance cost, the retention of patronage and individual welfare.

**INQUIRIES**—In writing for information state the character of building for which installation is contemplated and the type of window which will probably be used. This is important.



Fabric Shade



Diffuselite Blind

FIGS. 5 AND 6. ILLUSTRATIONS OF A PRACTICAL TEST

Two rooms of exactly similar dimensions and conformation, same exposure. One room equipped with fabric shade, the other with a Diffuselite blind. Photometer readings showed that the Diffuselite blind passed five times more light of very high quality and evenly diffused it throughout the room. All strong contrasts and glares were eliminated, and the atmosphere was cheerful and restful.

# SWEDISH VENETIAN BLIND COMPANY

Importers and Sole Distributors on this Continent of Swedish Venetian Blinds

TELEPHONE:  
GREELEY 188

1328 Broadway  
NEW YORK, N. Y.

CABLE ADDRESS:  
"VENETBLIND"

AGENCIES IN ALL PRINCIPAL CITIES

## Products.

SWEDISH VENETIAN BLINDS: SLIDING VENETIAN, for inside and outside use; VENETIAN AWNING BLINDS; VENETIAN PORCH BLINDS; manufactured in Sweden. Established 1850.

For Rolling Shutters and Partitions of Steel or Wood, see page 773.

## Swedish Venetian Blinds.

These are the only imported blinds on the market, and are radically different from all others, excelling in material, improved construction, ease of operation, durability, and harmony of color.

The slats are made of Norway pine, straight grain, very thin, and by our secret treatment guaranteed not to warp; and are very flexible, tough and strong as steel slats.

They stay automatically at any height when pulling ceases, and are adjusted automatically to any desired angle by a patent regulating device, and need no tying or fastening as with the ordinary style.

They can be put up and taken down as easily as a roller shade. No tools required.

## Space.

When pulled up, they occupy 1/3 less space than is required by domestic makes. Our blinds close tightly, giving a neat appearance, and darken the room entirely. They are installed in the finest residences throughout the country.

## Sliding Venetian Blinds.

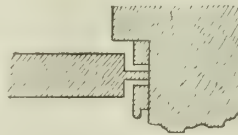
Our blinds are constructed for outside as well as inside purposes; with or without grooves, as desired. They are also made with extensions, taking the place of awnings. They answer the purpose of a shutter to a certain degree when let down.

## Venetian Porch Blinds.

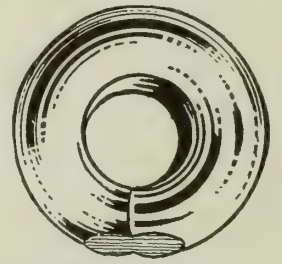
Sleeping porches and outside lounging rooms can not adequately serve their purpose without our Venetian blinds, which insure absolute privacy, at the same time allowing free ventilation, a feature that is so much sought nowadays.

## Swedish Venetian Quality.

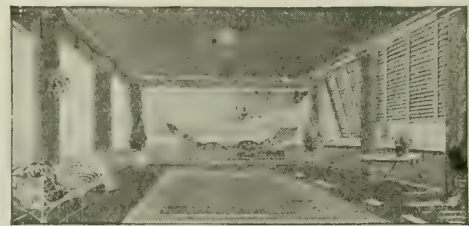
The Swedish Venetian blinds ask just credit and no more than just credit for the quality of their make. Added to that excellence of make are conveniences, refinements and niceties, which, together with the perfect service and easy control, give a luxury only to be expressed by the words "Swedish Venetian."



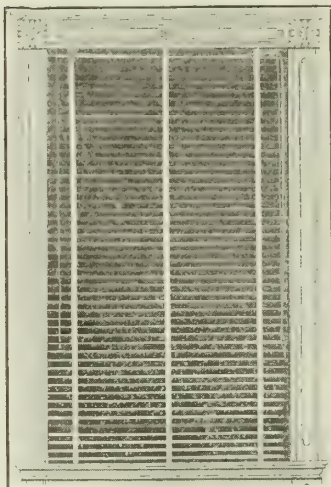
DETAIL GUIDE GROOVES



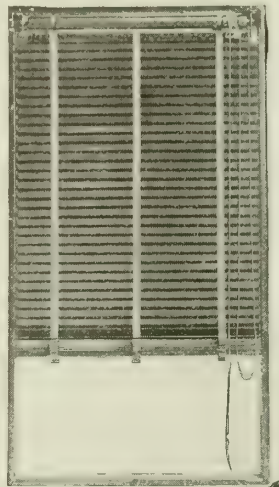
GLASS RING THROUGH WHICH CORD RUNS TO PREVENT WEARING



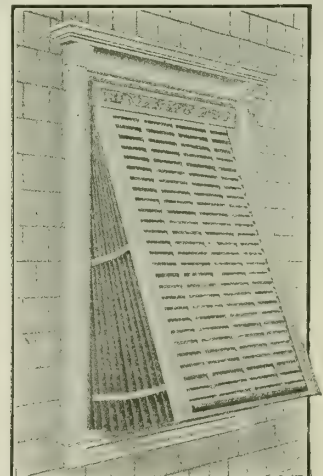
IMPORTED VENETIAN BLINDS  
Used for outside lounging room



REGULAR STYLE



SLIDING BLIND IN GROOVES



OUTSIDE BLIND AND AWNING COMBINED  
Slats running in grooves with extension frame and side slats



# LUTHER O. DRAPER SHADE CO.

Adjustable Window Shades  
SPICELAND, IND.

## Products.

DRAPER'S ROLLER SHADES: "SANITARY," "NUMBER 2," "NUMBER 3."

ADJUSTABLE FOLDING SHADES: BELL, ECLIPSE "A."

## Draper's Adjustable Window Shades.

For controlling the quantity and position of outside light admitted and excluded through a window opening and for regulating the desirable area of vision or ventilation and its location in the opening.

The roller may be either at the top or bottom of the unrolled shade, and may be moved at will, up or down, to any desired horizontal position in the window, thus controlling the location while the area is regulated by the amount of the shade unrolled.

All shades are made to order, to fit exact measurements sent us. No shades are carried in stock.

The Draper sanitary roller shade and the Bell adjustable folding shade are especially constructed to withstand the abuses to which shades are subjected by ordinary usage.

**CANVAS**—One solid cloth (not pieced), the highest grade of ducking used in any canvas shades; carried in stock in 2 colors: white and tan.

**ROLLERS**—Specially built; large and strong; provided with positive stop or locking device that automatically catches the roller by means of a gravity hook the moment the operator releases his hold on the bottom pull.

**PULLEYS**—Automatic in action. No sharp edges

to cut cord; clutches cord between 2 smooth inclines.

**MEASUREMENTS**—May be given for placing either between the stops or in the face of casings overlapping the opening. See detail drawing below.

**OPERATION**—The cord is always in a vertical position; to stop the shade it is only necessary to *let go* and the natural spring in the cord causes it to strike a hump in the top and front of the pulley frame, which deflects the cord into the spiral grooves of the pulley and automatically locks. The shade can be rolled up at the bottom and at the same time lowered from the top.

**INSTALLATION**—Shades are shipped complete and fully adjusted; to hang, they require only the insertion of 2 screws through the pulley into the window cap.

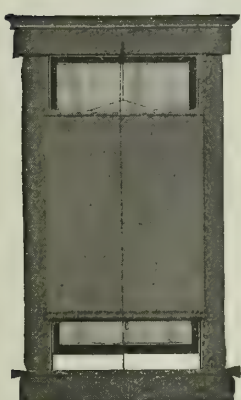
**SAMPLES**—Will be sent explaining the working in detail with application for estimates.

## Draper's Adjustable Roller Shade.

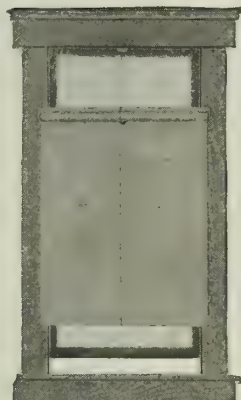
Made in accordance with the previous description, and in the types shown at bottom of this page.

## Bell Adjustable Folding Shade.

Same general principles and operation as described—shade lowers from the top and folds from the bottom. Any number of intermediate bars or slats are used. By using several, shade can be folded to one-seventh its length or less: the single bar, however, folds most easily.



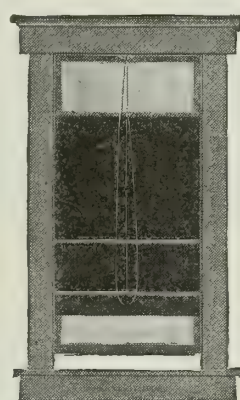
DRAPER "SANITARY"  
ROLLER SHADE



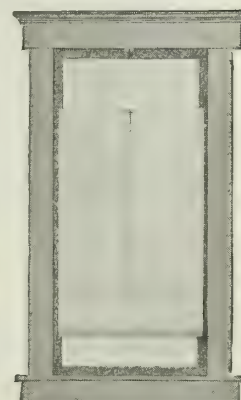
DRAPER No. 2 SHADE  
Single suspension



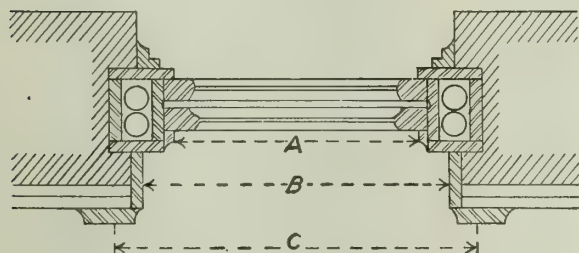
DRAPER No. 3 SHADE  
2-cord shade



BELL ADJUSTABLE  
FOLDING SHADE



ECLIPSE "A" ADJUSTABLE  
FOLDING SHADE



PLAN SHOWING METHOD OF HANGING  
ADJUSTABLE SHADES

It is recommended that shades hang as at "C." If to be hung at "A" or "B," give exact width of shade cloth. When measurement is taken at "A" or "B," give exact width of margin, leaving this company to make the necessary allowance for margin at ends of roller. If window stools are over 3 ft. from floor, give height, so that extra length cord can be furnished



Shading All the Window Light Top and Bottom Shading Lower Portion All the Window for Lighting  
POSITIONS OF DRAPER ADJUSTABLE ROLLER SHADE

# HIGHLAND GLASS COMPANY

WASHINGTON, PA.

BRANCH OFFICE: CHICAGO, ILL., 186 North La Salle Street

## Products.

ROLLED GLASS, including Hammered Cathedral and Smooth Cathedral in plain colors and combination of colors; RIPLE GLASS in white and colors; FIGURED GLASS in Colonial, Florentine, Moss, Mystic and Peerless in white and plain colors; PRISM GLASS; and ROUGH and RIBBED SKYLIGHT GLASS.

WIRE GLASS in Liberty, Colonial, Florentine, Moss, Prism, Rough and Ribbed.

POLISHED GLASS in Ideal and Wire Glass.

## Production.

This company has the largest assortment of any rolled glass manufacturer in the United States.

## Adaptability.

Highland white figured glass with its smooth surface is especially desirable on account of its bright and attractive appearance in all places where the maximum of light is required in combination with obscurity of vision.

The perfection of imprint and surface gives exceptional brilliancy in door panels, interior partitions, transoms, etc.

## Advantages.

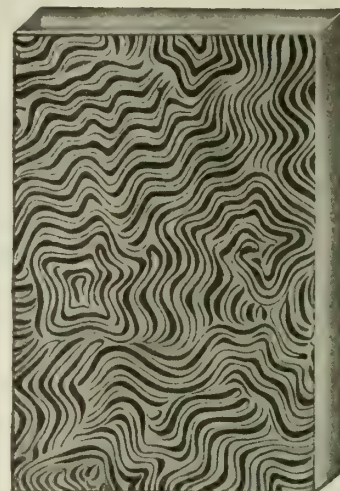
Highland white glass will not change color when exposed to the sun.

Highland products are recognized the country over for their superiority in brilliancy, color, durability, good cutting quality, and all that goes to make up a superior article at no greater cost than inferior products.

Where an especially rich and attractive effect is desired, Liberty, or Liberty wire glass, Colonial, or Colonial wire glass is strongly recommended.

## Wire Glass Sizes.

Liberty, Colonial, Florentine, rough and ribbed, in  $\frac{1}{4}$ - and  $\frac{3}{8}$ -in. thicknesses; widths, up to and includ-



COLONIAL FIGURED GLASS

ing 44 ins. Lengths, figured, up to 110 ins.; rough and ribbed, up to 144 ins.

Prism wire glass in scant  $\frac{3}{8}$ -in. thickness; widths, up to and including 42 ins.; lengths, up to 144 ins.

## White Figured Glass Sizes.

In  $\frac{1}{8}$ - and  $\frac{3}{16}$ -in. thicknesses; widths, up to and including 44 ins.; lengths, up to 120 ins.

## Prism Glass Sizes.

Up to 60 ins. high; lengths, up to 138 ins.

## Rough and Ribbed Skylight Glass Sizes.

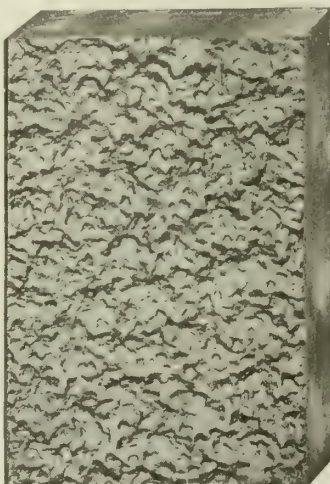
In  $\frac{1}{8}$ -,  $\frac{3}{16}$ -,  $\frac{1}{4}$ - and  $\frac{3}{8}$ -in. thickness; widths, up to and including 44 ins.; lengths, up to 144 ins.

## Cathedral Glass Sizes.

In leading thickness; widths, 30 ins.; lengths, up to 90 ins.



FLORENTINE FIGURED GLASS



MOSS FIGURED GLASS



MYSTIC FIGURED GLASS



**Official Indorsement.**

Our wire glass has been thoroughly tested and approved by the National Board of Fire Underwriters, and information to this effect can be found on file at the different offices of the Underwriters' Bureaus.

**Where Obtainable.**

Highland products may be secured from leading jobbers throughout the United States, Canada and Mexico.



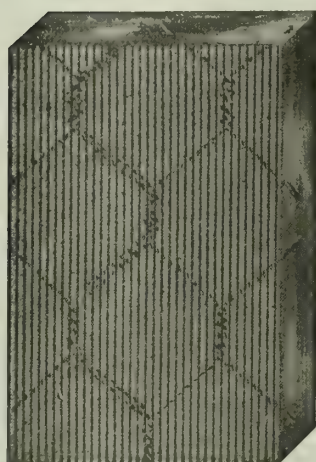
LIBERTY WIRE GLASS



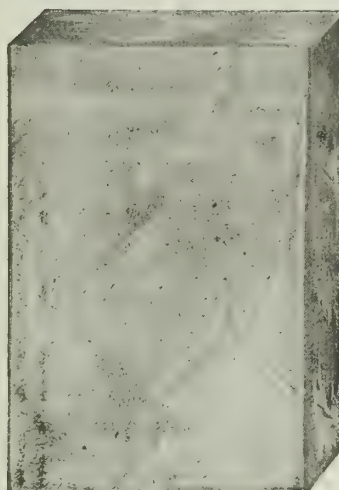
COLONIAL WIRE GLASS



PRISM WIRE GLASS



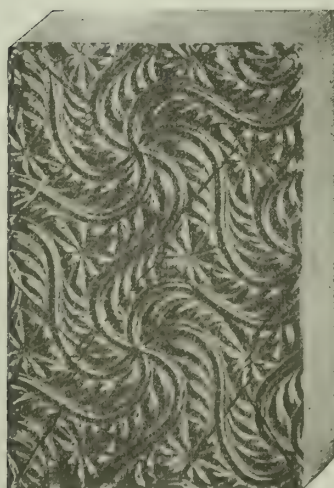
RIBBED WIRE GLASS



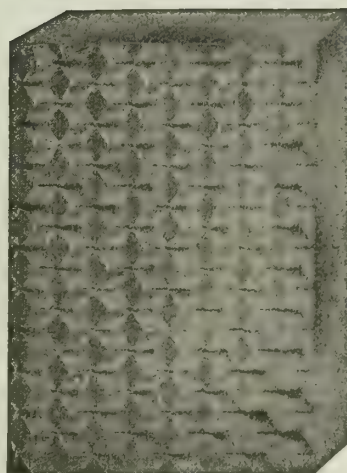
ROUGH WIRE GLASS



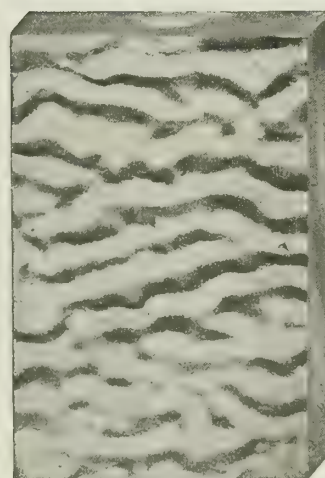
PRISM GLASS



MYSTIC WIRE GLASS



POLISHED IDEAL GLASS



RIPPLE GLASS



## MISSISSIPPI GLASS CO.

220 Fifth Avenue

NEW YORK, N. Y.

TELEPHONE:

MADISON SQUARE 9370

BRANCH OFFICES

CHICAGO, ILL., 7 West Madison Street

ST. LOUIS, MO., 4070 North Main Street

**Products.**

The best quality of FIGURED BUILDING GLASS and STANDARD ROUGH and RIBBED GLASS for Skylights.

**Description.**

Apex is a very high quality figured glass with the smooth surface polished, making it most brilliant and desirable for high class work. All other patterns are figured rolled glass with a natural smooth surface.

**Adaptability.**

Our various patterns make it possible while erecting a building to install a figured glass which correctly conforms with any style of architecture.

**Advantages.**

Brilliance, strength, true cutting surface, power of light diffusion, uniformity of color, originality of design and excellence of manufacture, combined with moderate cost.

**Light Diffusion.**

The experiments conducted by Prof. Charles L. Norton of the Massachusetts Institute of Technology, on behalf of the Associated Factory Mutual Insurance Companies of New England, demonstrated that a proper combination of glass surfaces insures for a given floor area a vastly increased efficiency of light over that to be had by plain glass. Our Ribbed Maze, and other figured surfaces of glass are designed in accordance with the basic requirements developed by Professor Norton's experiments.

DATA, PLAIN FIGURED BUILDING GLASS AND STANDARD ROUGH AND RIBBED GLASS

Type	Thickness, ins.	Maximum width, ins.	Maximum length, ins.	Approximate weight per sq. ft., lbs.
Factrolite.	$\frac{1}{8}$	48	130	2
Factrolite.	$\frac{1}{4}$	48	130	2½
Maze.	$\frac{1}{8}$	48	130	2
Maze....	$\frac{1}{4}$	60	130	2½
Florentine	$\frac{1}{8}$	48	130	2
Florentine	$\frac{1}{4}$	60	130	2½
Syenite...	$\frac{1}{8}$	48	130	2
Syenite...	$\frac{1}{4}$	60	130	2½
Muranese	$\frac{1}{8}$	42	110	2
Ondoyant.	$\frac{1}{8}$	30	100	1½
Fig. No. 2	$\frac{1}{8}$	42	110	2
Fig. No. 2	$\frac{1}{4}$	42	110	2½
Rough....	$\frac{1}{8}$	48	130	2
Rough....	$\frac{1}{4}$	48	130	2½
Rough....	$\frac{1}{4}$	48	130	3¼
Rough....	$\frac{1}{8}$	48	130	5¼
Rough....	$\frac{1}{2}$	48	130	7½
Ribbed...	$\frac{1}{8}$	48	130	2
Ribbed...	$\frac{1}{4}$	48	130	2½
Ribbed...	$\frac{1}{4}$	48	130	3¼
Ribbed...	$\frac{1}{8}$	48	130	5¼
Ribbed...	$\frac{1}{2}$	48	130	7½
Pentecor.....	$\frac{1}{8}$	48	130	2
Pentecor.....	$\frac{1}{4}$	48	130	2½



IDENTIFICATION LABEL



42D STREET AND MADISON AVENUE BUILDING, NEW YORK  
All corridor doors and partitions glazed with Mississippi glass



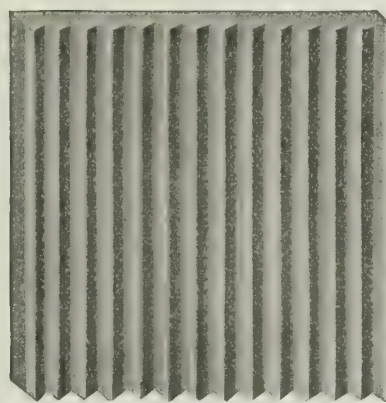
**Ordering.**

Glass being one of the last materials to go into a building, it is often not ordered far enough ahead to give the manufacturer time to cut the glass to sizes and make shipment in time to enclose the building, by the date desired. It is therefore advisable to give this point consideration in due time, as the tremendous demand for figured glass necessitates orders taking their turn as they are received.

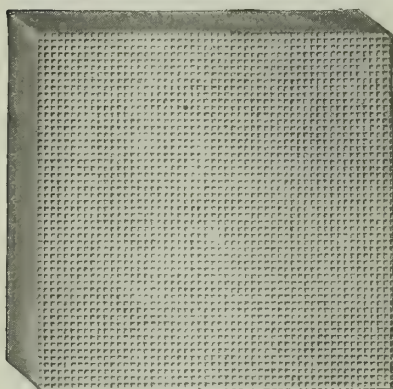
In ordering, always specify width first.

**Specifying.**

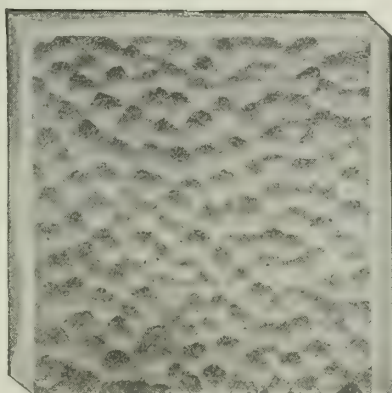
By specifying any of the following patterns manufactured by the MISSISSIPPI GLASS Co., you insure yourself against the substitution of inferior glass.



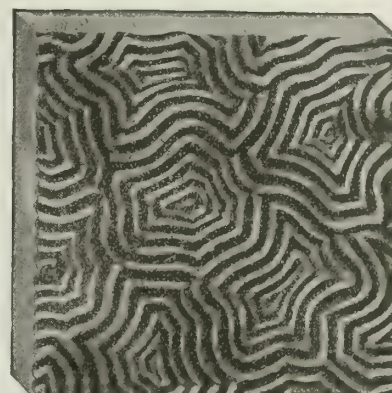
—Width—  
PENTECOR GLASS



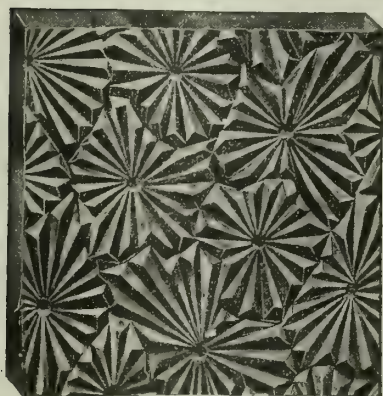
—Width—  
FACTROLITE GLASS



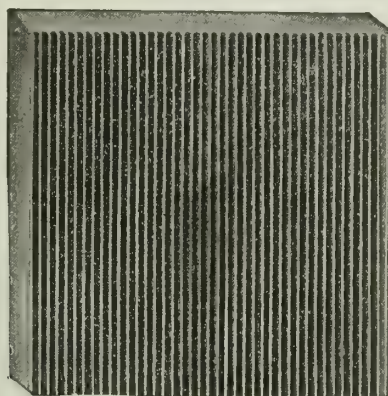
—Width—  
ROUGH GLASS



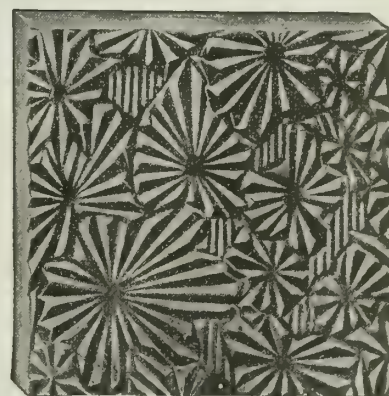
—Width—  
FIGURE NO. 2 GLASS



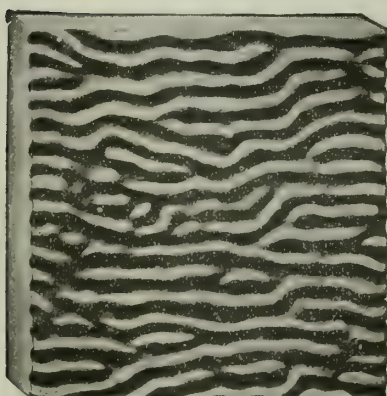
—Width—  
MURANESE GLASS



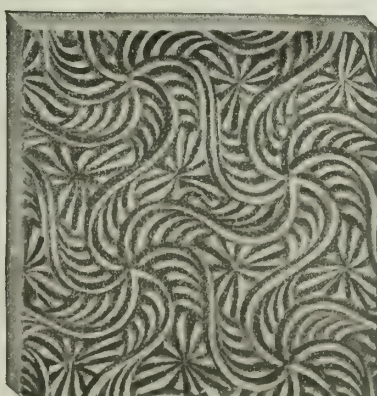
—Width—  
RIBBED GLASS



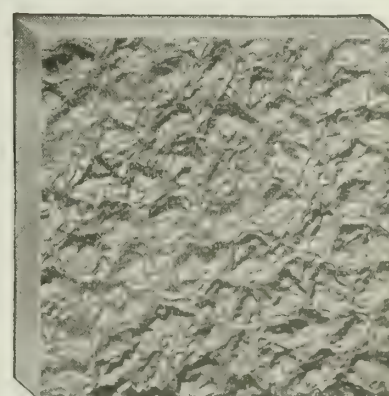
—Width—  
FLORENTINE GLASS



—Width—  
ONDOYANT GLASS



—Width—  
MAZE GLASS



—Width—  
SYENITE GLASS



## MISSISSIPPI WIRE GLASS CO.

220 Fifth Avenue  
NEW YORK, N. Y.

TELEPHONE:  
MADISON SQUARE 9370

CHICAGO, ILL., 7 West Madison Street

BRANCH OFFICES

ST. LOUIS, MO., 4070 North Main Street

### Products.

"WIRE GLASS": VAULT LIGHTS.

### Mississippi "Wire Glass."

The MISSISSIPPI WIRE GLASS CO. is the original manufacturer of solid "Wire Glass," and its product is universally recognized as the standard wire glass, being the material upon which the Underwriters' standard was based in 1899.

By our process of manufacture, Standard "Wire Glass" is cast solid, and has an average of less imperfections than any sub-standard product on the market.

"Wire Glass" is rolled plate glass having a wire netting embedded equidistant from either surface. This process is automatically effected while the glass is in a molten state and, therefore, insures homogeneous and solid wire glass.

The quality of metal and process of manufacturing Standard "Wire Glass" produce the very highest quality, with a tensile strength second to none.

### Adaptability.

The object of "Wire Glass" is to afford perfect and constant fire protection at a minimum cost, at the same time admitting and diffusing the light. It is particularly suitable for use in windows, doors, transoms, monitors, skylights and all places where fire or breakage protection is required.

### Light Diffusion.

The light may be increased in a room 30 ft. or more deep to from 3 to 15 times its present effect by using Maze, Syenite, Factrolite or Ribbed "Wire Glass," instead of plain glass in the upper sashes.

### Conducting Condensation.

"Pentecor," when installed in skylights set at a proper angle, will conduct condensation and prevent dripping.

### Advantages.

When employed as above mentioned, "Wire Glass" may be fractured by severe heat or sudden shock, but the wire mesh will hold the shattered pieces in place, preventing their falling and causing serious injury or loss of life. It will also prevent draught and hold a fire within the bounds of its origin.

### Underwriters' Requirements, Extract from Rules—1906

(2) SIZE OF GLASS—(a) The unsupported surface of the glass allowed shall be governed by the severity of exposure and be determined in each case by the Underwriters having jurisdiction, but in no case shall it be more than 48 in. in either dimension or exceed 720 sq. ins. (b) The glass to be of such dimensions, after selvage is removed, that the bearing in the groove or rabbet is not to exceed  $\frac{1}{4}$  in. less than the full depth called for in rules 7 and 8. (c) The glass to be retained by the structural part of the frame or sash independently of the material which may be used for weatherproof purposes. Only non-inflammable material to be used in setting glass in the sash.

### Advantageous Sizes of Glass.

In considering the above extract, it is well to bear in mind the following sizes when planning window, door and partition openings, to be glazed with Standard "Wire Glass," as these are the most advantageous sizes where glass is not to exceed 720 sq. ins.:

15 x 48 ins.    18 x 40 ins.    20 x 36 ins.    24 x 30 ins.



THIS LABEL (PRINTED IN RED) APPEARS ON EVERY PIECE OF STANDARD "WIRE GLASS"

THICKNESSES, MAXIMUM SIZES AND APPROXIMATE WEIGHTS OF MISSISSIPPI "WIRE GLASS" AND VAULT OR FLOOR LIGHTS

Type	Thickness, ins.	Maximum width, ins.	Maximum length, ins.	Approximate weight per sq. ft., lbs.
<b>"WIRE GLASS"</b>				
Polished.....	$\frac{3}{8}$	48	130	4
Polished.....	$\frac{5}{8}$	30	72	8
Maze.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$
Maze.....	$\frac{3}{8}$	48	130	$5\frac{1}{4}$
Factrolite.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$
Factrolite.....	$\frac{3}{8}$	48	130	$5\frac{1}{4}$
Syenite.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$
Rough.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$
Rough.....	$\frac{3}{8}$	48	130	$5\frac{1}{4}$
Ribbed.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$
Ribbed.....	$\frac{3}{8}$	48	130	$5\frac{1}{4}$
Pentecor.....	$\frac{1}{4}$	48	130	$3\frac{3}{4}$

### VAULT OR FLOOR LIGHTS

Rough "Wire Glass"	$\frac{3}{4}$	12	12	$9\frac{3}{4}$
Ribbed "Wire Glass"	$\frac{3}{4}$	12	12	$9\frac{3}{4}$
Ground "Wire Glass"	$\frac{3}{4}$	12	12	$9\frac{3}{4}$



MISSISSIPPI "WIRE GLASS" IN THE ASCH BUILDING FIRE

In the Asch Building (New York City) destroyed by fire, as here shown, contrast the condition of fire escape and window openings of common glass, as compared with the "Wire Glass" and metal frames in the adjacent building, which, though severely exposed, acted as a barrier, behind which the firemen stood and fought the fire in the Asch Building by forcing their hose nozzles through the holes here seen





NEW YORK TELEPHONE CO. BUILDING, NEW YORK, N. Y.  
Mississippi "Wire Glass" installed in approved metal frames



RAILWAY EXCHANGE BUILDING, ST. LOUIS, MO.

Has the greatest floor area of any building in the world, and, excepting the ground floor, is completely equipped with Mississippi products. Interior partitions, doors and transoms, Mississippi  $\frac{1}{8}$  in. Romanesque. All windows above ground floor, Mississippi Polished "Wire Glass" and Rough "Wire Glass"



VIEW OF INTERIOR ROOM FORMED BY USE OF METAL AND GLASS PARTITIONS

Note amount of light obtained by using a prismatic Figured Pattern of Mississippi "Wire Glass".

### Samples.

Sent on application, or full line of our samples may be seen at office of Architects Samples Co., Park Avenue and 40th Street, New York, N. Y.

### Mississippi Evidence of Quality.

The fact that Mississippi "Wire Glass" is installed in all the better class buildings, like those shown herewith, is unquestionable evidence of its superior quality and uniformity of color. Factory facilities enable us to furnish glass without unnecessary delay. At all times prompt service will be given.



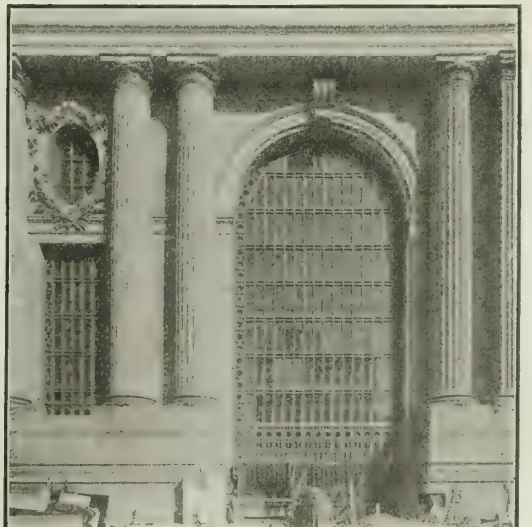
WOOLWORTH BUILDING, NEW YORK, N. Y.

Mississippi Polished "Wire Glass" and Mississippi  $\frac{1}{4}$ -inch Maze "Wire Glass" installed



POSTEX COTTON MILLS, POST, TEX.

An example of modern fireproof mill construction. Substantially built of reinforced concrete and metal frames in which Mississippi "Wire Glass" is installed



GRAND CENTRAL STATION, NEW YORK, N. Y.

Magnificent detail in one of the large windows. Frame is of cast iron reinforced by steel framework and glazed with Mississippi Polished "Wire Glass," which was given preference over all sub-standard products submitted



**Ordering.**

Glass being one of the last materials to go into a building, it is often not ordered far enough ahead to give the manufacturers time to cut the glass to sizes and make shipment in time to enclose the building by the date desired.

It is therefore advisable to give this point consideration in due time, as the tremendous demand for Standard "Wire Glass" necessitates orders taking their turn as they are received.

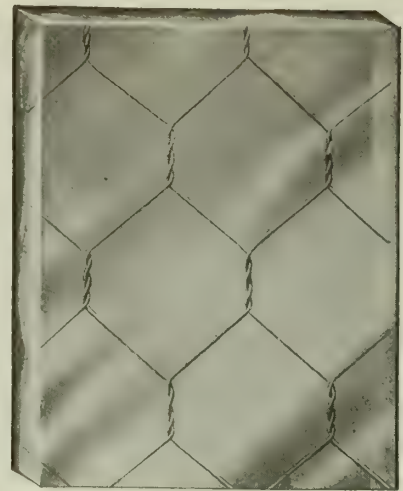
In "Wire Glass," the twist of the wire runs with the length of the sheet and should be set vertically.

In ordering always specify width first.

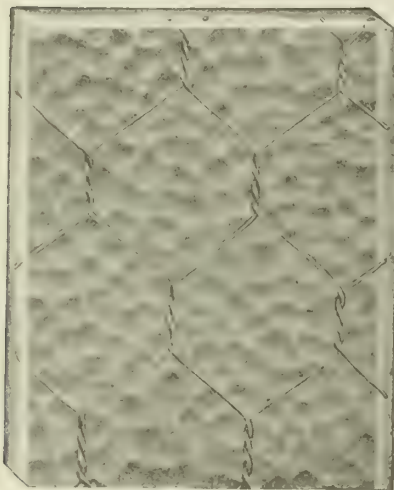
**How to Specify.**

"Wire Glass" shall be installed in [specify location] and in all places marked "W. G." on plans and elevations.

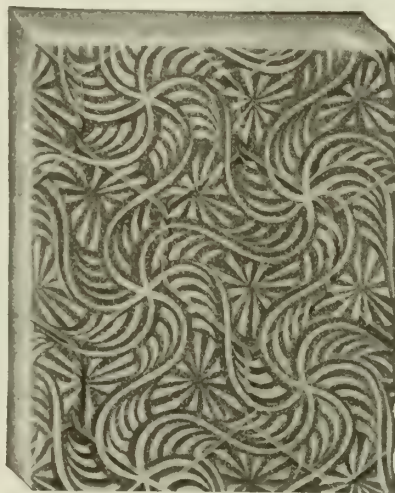
The "Wire Glass" to have a thickness of at least  $\frac{1}{4}$  in. at thinnest point. Wire mesh to be not larger than  $\frac{7}{8}$  in., and no wire used for such mesh to be smaller than No. 24, B. & S. gage. Plane of the wire mesh to be practically midway between the two surfaces of the glass.



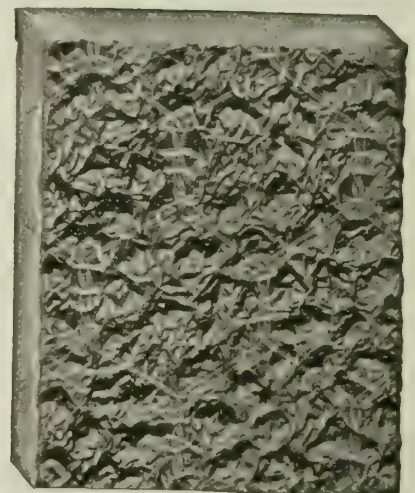
—Width—  
POLISHED "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thickness about  $\frac{1}{8}$  in.  
Special  $\frac{5}{8}$  in. thick for port lights



—Width—  
ROUGH "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thicknesses  $\frac{1}{4}$  and  $\frac{3}{8}$  ins.



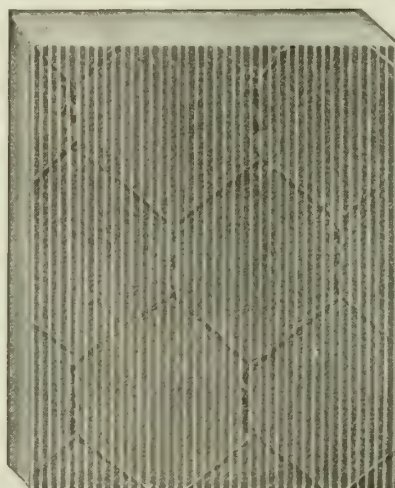
—Width—  
MAZE "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thicknesses  $\frac{1}{4}$  and  $\frac{3}{8}$  ins.



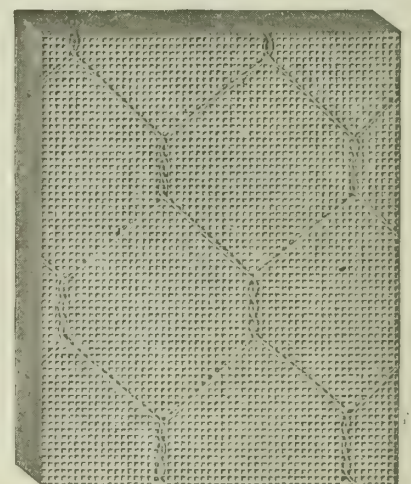
—Width—  
SYENITE "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thickness  $\frac{1}{4}$  in.



—Width—  
PENTECOR "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thickness  $\frac{1}{4}$  in.



—Width—  
RIBBED "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thicknesses  $\frac{1}{4}$  and  $\frac{3}{8}$  ins.



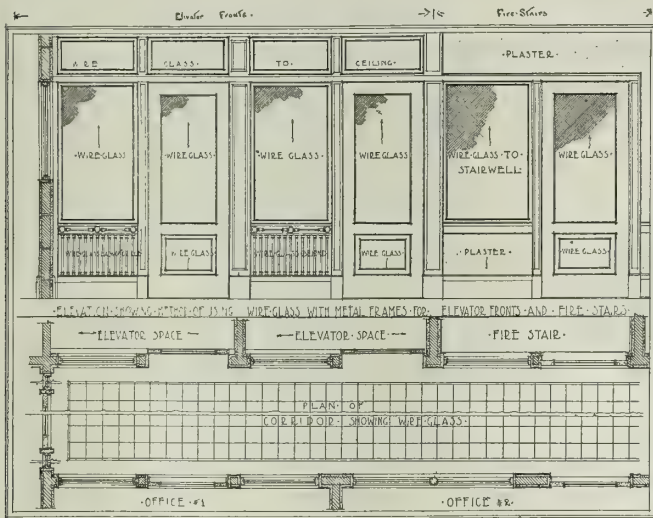
—Width—  
FACTROLITE "WIRE GLASS"  
Sizes up to 48 ins. wide and 130 ins. long  
Thicknesses  $\frac{1}{4}$  and  $\frac{3}{8}$  ins.



Selvage shall be removed from glass before framing.

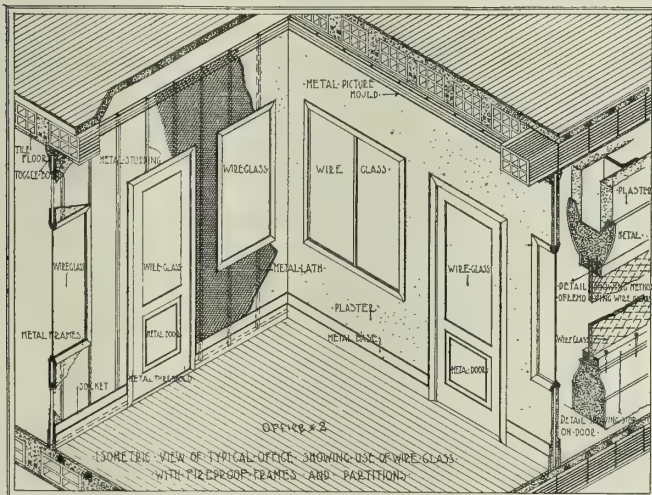
[State here type or types of glass to be used and where.]

NOTE—Where the recognized standard and perfected product is required, specifications should call for "Wire Glass," the product of MISSISSIPPI WIRE GLASS CO."



TYPICAL EXAMPLE OF ELEVATOR FRONTS AND CORRIDOR ENTRANCE TO FIRE STAIR

Of hollow tile and plaster, metal frames and "Wire Glass"



CORRIDOR WALL AND PARTITION WALL BETWEEN OFFICES

Constructed entirely of non-combustible materials; namely, I-beam studdings metal lath and plaster, metal doors and window frames, in which "Wire Glass" is installed

This type of partition can be erected very economically

## References.

The following are a few of the many prominent buildings equipped with recognized Standard "Wire Glass" made by the MISSISSIPPI WIRE GLASS CO., giving location, owner, type of building and architect.

### OAKLAND, CAL.

City of Oakland, City Hall, Palmer, Hornbostel & Jones  
Hotel Oakland, Hotel, Bliss & Faville  
Kahn Bros. Dry Goods Co., Department Store, C. W. Dickey

### SAN FRANCISCO, CAL.

Adler Building, Sanitarium, MacDonald & Applegarth  
First National Bank, Bank, D. H. Burnham & Co.  
Ferry Building  
Hewes Building, Reid Bros.  
Humboldt Bank, Bank, Meyer & O'Brien  
Pacific Building, C. F. Whittlesey

### WASHINGTON, D. C.

S. W. Woodward, Office, Harding & Upman  
Frank A. Munsey, Office, McKim, Mead & White  
Pennsylvania and Baltimore & Ohio R. R., Union Station,  
D. H. Burnham & Co.

### CHICAGO, ILL.

Butler Brothers, D. H. Burnham & Co.  
Chicago & Northwestern R. R., Northwestern Station, Frost & Granger  
Chicago Telephone Co., Bell Telephone Building, Holabird & Roche  
C. C. Heisen, Transportation, Purdy & Henderson  
The Drake Hotel Co., Blackstone Hotel, Marshall & Fox  
Insurance Exchange Building, D. H. Burnham & Co.  
The People's Gas Co., D. H. Burnham & Co.  
J. P. Smith Shoe Co., H. R. Wilson & Co.

### ALBANY, N. Y.

Hudson Hotel Co., Hotel, Frank M. Andrews & Co.  
New York State, Educational, Palmer & Hornbostel

### BUFFALO, N. Y.

The Larkin Co., Warehouse, R. J. Reidpath & Son  
Marine National Bank, Bank, Green & Wicks  
New York Telephone Co., Office, McKenzie, Voorhees & Gmelin

### NEW YORK, N. Y.

Brewster & Co., Manufacturing, Stephenson & Wheeler  
Adams Express Co., Office, F. H. Kimball  
Aeolian Co., Office, Warren & Wetmore  
Bankers' Trust Co., Office, Trowbridge & Livingston  
City of New York, Municipal, McKim, Mead & White  
City Investing Co., Office, F. H. Kimball  
Gimbel Brothers, Department Store, D. H. Burnham & Co.  
Guaranty Trust Co., Bank and Office, York & Sawyer  
Metropolitan Life Insurance Co., Office, N. Lebrun & Sons  
Pennsylvania R. R., Terminal, McKim, Mead & White  
New York Central R. R., Grand Central Station and Biltmore Hotel, Reed & Stern and Warren & Wetmore Associates  
Singer Manufacturing Co., Office, Ernest Flagg  
A. G. Vanderbilt, Hotel, Warren & Wetmore  
West Street Building, Office, Cass Gilbert  
F. W. Woolworth, Office, Cass Gilbert

### PITTSBURGH, PA.

Pittsburgh Athletic Association, Club House, Janssen & Abbott  
First National Bank, Office, D. H. Burnham & Co.

### SEATTLE, WASH.

Burns Lyman Smith, L. C. Smith Building, Gaggin & Gaggin

### PHILADELPHIA, PA.

Curtis Publishing Co., Publishing, C. Roberts & Co. and E. V. Seeler

### BROOKLYN, N. Y.

Bush Terminal Co., Warehouse, Wm. Higginson

### NEWARK, N. J.

L. Bamberger & Co., Department Store, Jarvis Hunt  
Kinney Estate, Office, Cass Gilbert

### HOBOKEN, N. J.

North German Lloyd, Piers, W. F. Whittemore, Engineer

### SPRINGFIELD, MASS.

City, Municipal, Pell & Corbett

### BALTIMORE, MD.

Johns Hopkins, Phipps Clinic, G. Atterbury

### ATLANTA, GA.

Southern Railroad, Depot and Office, D. W. Lum  
Texas Oil Co.

### HARTFORD, CONN.

Travelers' Insurance Co., Office, Donn Barber

### NEW HAVEN, CONN.

City, Courthouse, Allen & Williams

### WINNIPEG, CAN.

Canadian Northern R. R., Terminal, Warren & Wetmore

### ROSSFORD, OHIO

Ford Plate Glass Co., Factory, Devore & McGormeleay Co.

### RICHMOND, VA.

Virginia Railway & Power Co., Office, A. C. Bossom

WALTER COX, PRESIDENT

# PENNSYLVANIA WIRE GLASS COMPANY

CABLE ADDRESS:  
"WIRE GLASS, PHILADELPHIA"

EXECUTIVE OFFICE  
Pennsylvania Building  
PHILADELPHIA, PA

WORKS  
DUNBAR, PA.

NEW YORK OFFICE, 20 West 34th Street

## Products.

WIRE GLASS:  
Aqueduct Rough  
Cobweb Polished  
Corrugated Florentine  
Ribbed  
( $\frac{1}{8}$  to 1 in. in thickness).



TRADE-MARK

tive cabled strand spaced approximately 10 ins. apart in each sheet of glass manufactured.

## Advantages.

Wire glass is a valuable fire retardant and, therefore, a safeguard to human life and an important factor in the reduction of insurance rates.

It is insisted upon by insurance underwriters in all instances where there is any fire hazard. It is a practical building economy.

## Quantities and Samples.

Quantities will be listed from drawings furnished the company and approximate estimates provided. This department offers gratuitous advice on all glass problems.

Requests for samples should be made to the main office in Philadelphia, Pa., where they will be promptly acknowledged.

## Specifications.

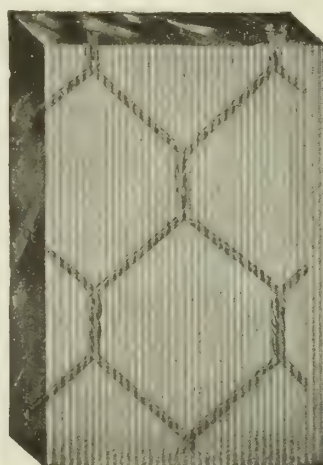
Call for "Solid Wire Glass manufactured by the PENNSYLVANIA WIRE GLASS COMPANY," and "to comply with the rules and regulations of the National Board of Fire Underwriters."

Specify thickness and type for each use, thus:

SKYLIGHTS— $\frac{1}{4}$ -in. Aqueduct or Corrugated.  
WINDOWS— $\frac{1}{4}$ -in. Aqueduct, Polished or Ribbed.  
DOORS— $\frac{1}{4}$ -in. Aqueduct, Cobweb or Ribbed.  
PARTITIONS— $\frac{1}{4}$ -in. Aqueduct, Cobweb or Rough.  
TRANSOMS— $\frac{1}{4}$ -in. Aqueduct, Cobweb or Rough.  
ELEVATORS— $\frac{1}{4}$ -in. Aqueduct, Polished or Rough.  
ROOFS AND SIDE WALLS—Corrugated Wire.  
DIFFUSION OF LIGHT— $\frac{1}{4}$ -in. Aqueduct, Cobweb or Corrugated.



Polished Wire  
Made in  $\frac{1}{4}$  in. and  $\frac{3}{8}$  in.  
thicknesses



Ribbed Wire  
Made in  $\frac{1}{8}$  in.,  $\frac{3}{16}$  in.,  $\frac{1}{4}$  in. and  
 $\frac{3}{8}$  in. thicknesses



Rough Wire  
Made in  $\frac{1}{8}$  in.,  $\frac{3}{16}$  in.,  $\frac{1}{4}$  in. and  
 $\frac{3}{8}$  in. thicknesses



Cobweb Wire  
Made in  $\frac{1}{8}$  in.,  $\frac{3}{16}$  in.,  $\frac{1}{4}$  in. and  
 $\frac{3}{8}$  in. thicknesses

## TYPES OF PENNSYLVANIA WIRE GLASS



### Aqueduct Wire Glass.

This type is the very highest standard of wire glass quality that has been produced and is made for general use. No detail, however slight, is neglected. It possesses the greatest strength, the highest light diffusion

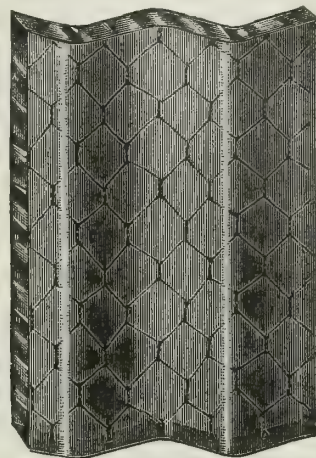


**AQUEDUCT WIRE GLASS**  
Made in  $\frac{1}{4}$  in. and  $\frac{3}{8}$  in. thicknesses

### Corrugated Wire Glass.

The latest production in wire glass and an innovation that combines economy and efficiency in industrial construction.

The corrugations are of the same character and



**CORRUGATED WIRE GLASS**  
Made in  $\frac{1}{4}$  in. thickness

characteristics and fire retardant qualities, while the cost is no more than that of ordinary wire glass.

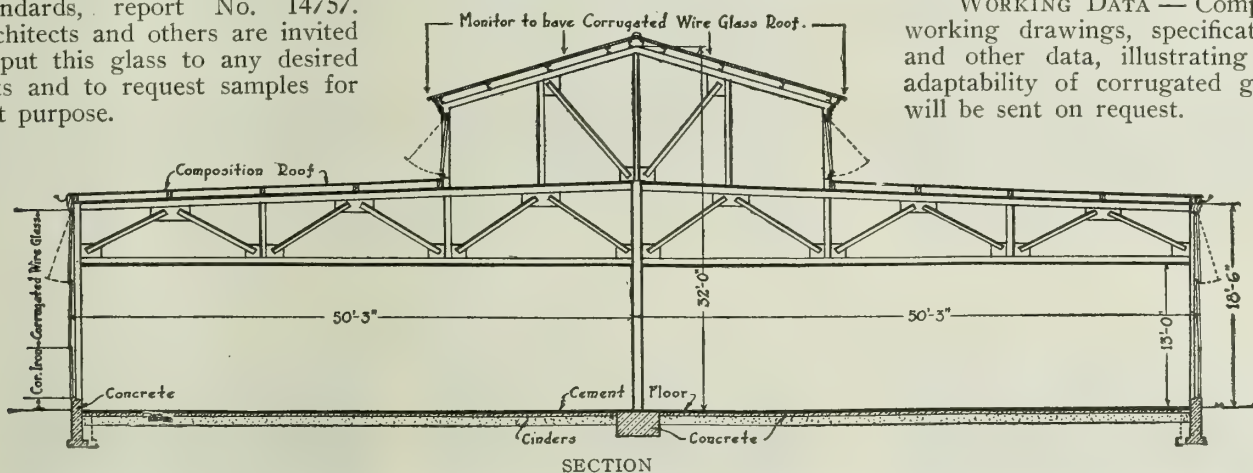
Aqueduct wire glass has the distinction of being the only known glass that prevents condensation drip from skylights.

**TESTS**—See tests of United States Bureau of Standards, report No. 14757. Architects and others are invited to put this glass to any desired tests and to request samples for that purpose.

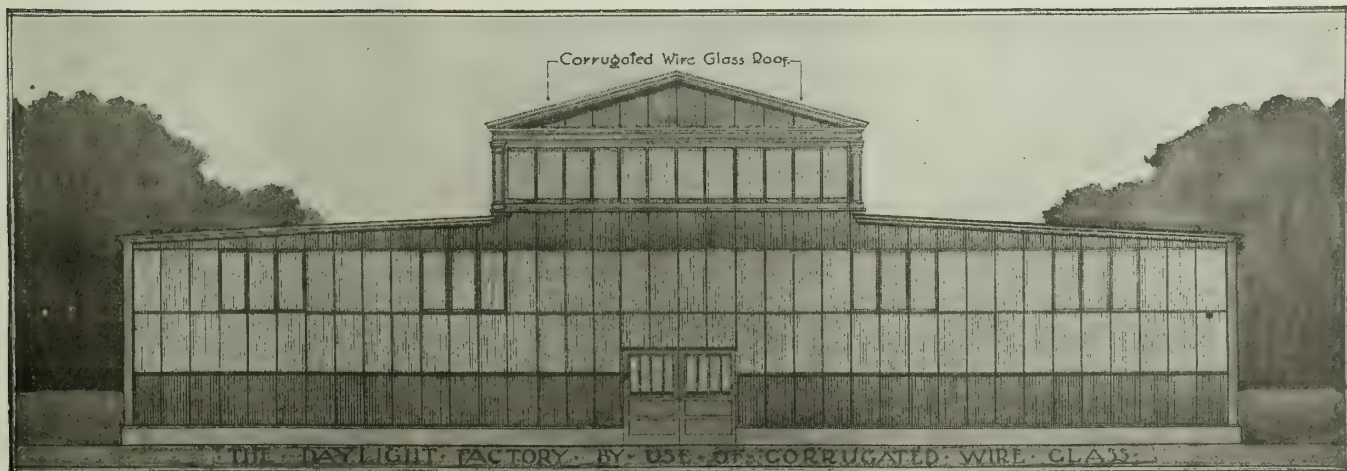
contour as those of corrugated steel and asbestos, and the sheets of glass are interwoven with them as daylight demands.

The separation and diffusion of light rays, due to the corrugations, eliminate all shadows; and the peculiar heat resisting qualities insure uniform interior temperature.

**WORKING DATA**—Complete working drawings, specifications and other data, illustrating the adaptability of corrugated glass, will be sent on request.



SECTION



END ELEVATION OF THE DAYLIGHT BUILDING

By the use of corrugated wire glass on side walls and roofs, a modern daylight factory is obtained without any annoying shadows; also, maximum amount of light and minimum amount of heat are transmitted.

A complete set of plans, details and specifications for this building will be sent free on request of architects and contractors



# THE WESTERN GLASS COMPANY

Manufacturers of Figured and Wire Glass

STREATOR, ILL.

## Products.

FIGURED GLASS.  
WIRE GLASS, Plain and Figured.  
ROUGH and RIBBED GLASS.  
SHEET PRISM GLASS.

## Figured Glass.

This is designed for use in hallways, areas, interior partitions, and similar constructions, where the admission of light without transparency is desired.

Made of the best materials obtainable and moulded in attractive patterns, it adds materially to the decorative effects of such installations.

Its distinctive advantages for this service have given it an established reputation.

**DESIGNS**—Our figured glass is made up in a large number of designs, some of which are illustrated in the accompanying cuts. This glass can be supplied to match any style of architecture and to conform to architect's or builder's requirements.

**SIZES and WEIGHTS**—Figured glass is made in thicknesses of  $\frac{1}{8}$ ,  $\frac{3}{16}$  and  $\frac{1}{4}$  in., to meet various building conditions and specifications.

It can be furnished in all widths up to 48 ins. inclusive, to suit special demands.

Packed for shipment, our rolled glass, whether rough, ribbed, figured, or wire glass, weighs per square foot as follows:

Thickness—ins.	Weight—lbs.
$\frac{1}{8}$	2½
$\frac{3}{16}$	3½
$\frac{1}{4}$	4½
$\frac{3}{8}$	6
$\frac{1}{2}$	8
$\frac{3}{4}$	11

## Wire Glass.

Wire glass can be furnished in any of the regular figured designs or in polished transparent sheets, as desired.

All thicknesses, in sizes up to and including 48 ins. wide by 132 ins. long.

It is made by a single-pour process and the reinforcement is a special wire fabric of our own design, with 3 twists and 5 loops at the vertical strand.

By our method of manufacture, this fabric is incorporated in the sheet of molten glass while it is being rolled.

This makes the finished product better able to stand severe strains and sudden temperature changes.

The wire strand used is so thin that it does not obstruct the light and is scarcely noticeable under ordinary conditions.

**FIRE and ACCIDENT PREVENTION**—The main reason for using wire glass is the reduction of the fire and accident hazards.

Properly installed, wire glass furnishes an effective barrier to the spread of flames through exposed windows.

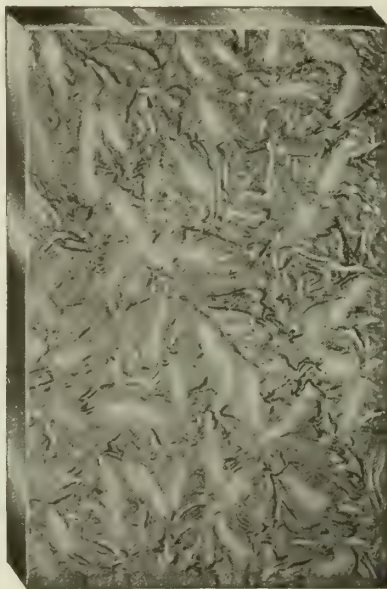
In this connection our product has stood the severe tests imposed by the Underwriters' Laboratories and has been fully approved by the Fire Underwriters' Association.

Each sheet bears the identification marks of the Underwriters' Laboratories.

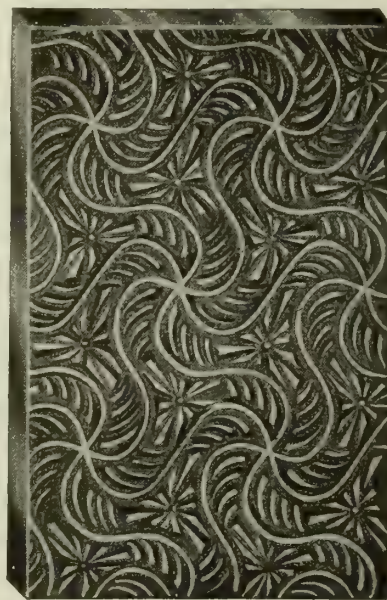
In windows subject to heavy wind pressures or liable to injury from carelessness or from flying bodies, the installation of wire glass insures against injury to pedestrians from falling glass and against the resulting damage suits.



MOSS FIGURED GLASS



CARNATION FIGURED GLASS



COMET FIGURED GLASS



**SIZES**—Standard wire glass is made as near as possible to  $\frac{5}{16}$ -in. thick.  
All kinds of wire glass furnished in the standard  $\frac{1}{4}$  and  $\frac{3}{8}$  in. thicknesses, not to exceed 720 sq. ins. in area nor 48 ins. in either dimension.

**Rough and Ribbed Glass.**

This product is made in all thicknesses, and is especially adapted for heavy service in skylights, partitions and factory windows.

**Sheet Prism Glass.**

Where it is desired to project daylight well back into an interior, our sheet prism glass is an effective glazing medium for producing the maximum lighting efficiency.

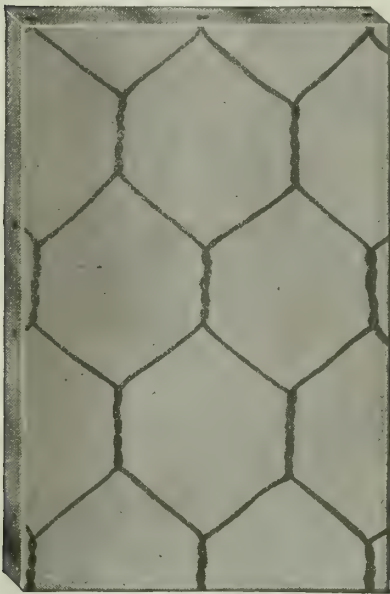
**Extreme Sizes Manufactured.**

**FIGURED GLASS**

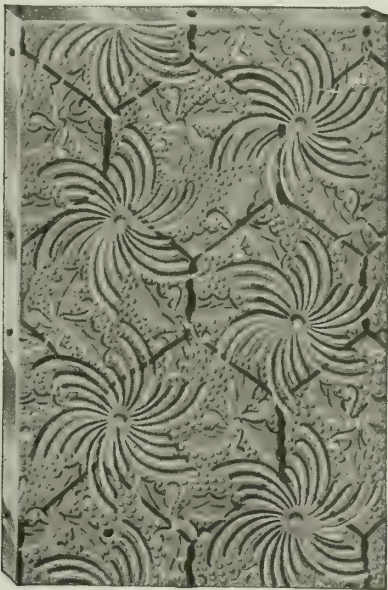
Thickness—ins.	Area—ins.
$\frac{1}{8}$	48 x 120
$\frac{3}{16}$	48 x 132
$\frac{1}{4}$	48 x 142

**ROUGH AND RIBBED GLASS**

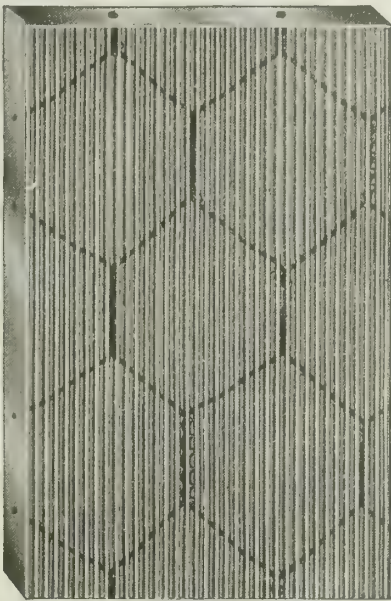
Thickness—ins.	Area—ins.
$\frac{1}{8}$	48 x 120
$\frac{3}{16}$	48 x 132
$\frac{1}{4}$	48 x 132
$\frac{3}{8}$	48 x 132
$\frac{1}{2}$	48 x 132



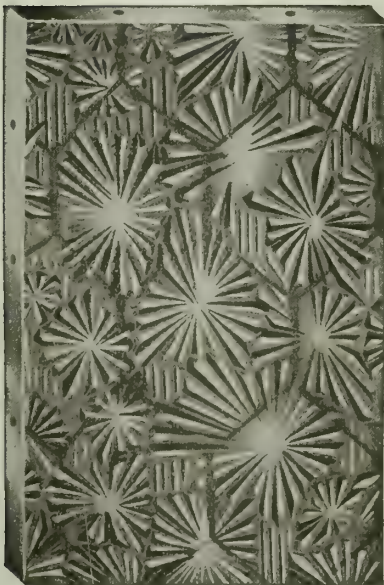
POLISHED WIRE GLASS



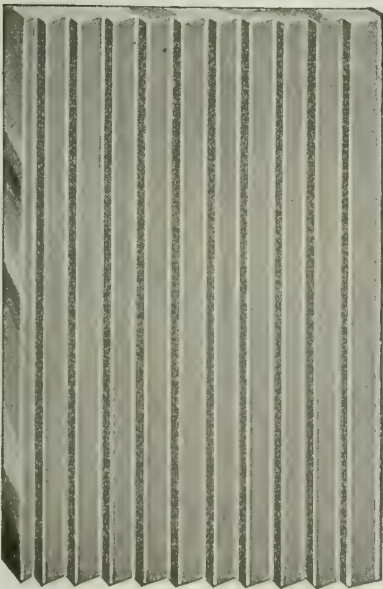
HOLLY WIRE GLASS



RIBBED WIRE GLASS



RADIANT WIRE GLASS



SHEET PRISM GLASS



ROUGH WIRE GLASS



# PRESSED PRISM PLATE GLASS COMPANY

25 North Dearborn Street  
CHICAGO

44 East 23rd Street  
NEW YORK

## Products.

"IMPERIAL" PRISM-PLATE GLASS in large plates; "IMPERIAL" PRISM SKYLIGHT GLASS (unit plates 18 ins. by 60 ins.); "IMPERIAL" PRISM-PLATE ORNAMENTAL GLASS in five styles.

## Description.

The products illustrated are ground and polished *plate* glass in standard plate glass thickness and quality, having beautiful, clean cut, prismatic patterns *pressed* on one side.

## Advantages.

All these products are strong, durable and easily cleaned. The patterns are uniform and have none of the disfiguring waves or roller marks common to all other figured glasses. They harmonize, as no other figured glass can, with the plate glass windows which characterize modern building elevations and interiors.

## "Imperial" Prism-Plate Glass.

Supplied as it is in solid one-piece plates of any size up to 82 by 72 ins., this is beyond question the most beautiful, efficient and sensible product ever



devised for directing daylight into dark interiors.

## "Imperial" Prism-Plate Ornamental Glass.

Numerous installations of corridor doors, transoms, side lights, partitions, ceilings and fixtures in all kinds of buildings throughout the country indicate the adaptability of this beautiful product. The various patterns will harmonize with any style of finish and a wide range of modern architecture. Sizes up to 72 by 84 ins.

## "Imperial" Prism Skylight Glass.

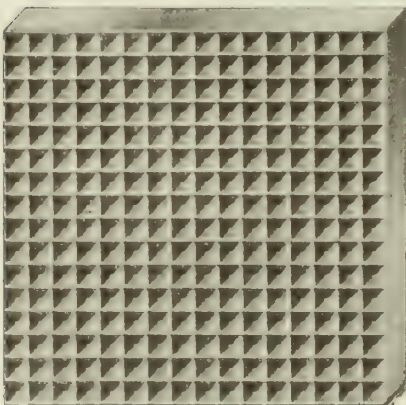
Maximum lighting and minimum leakage for store skylights, railway sheds, factory roofs, etc.

## Samples and Quotations.

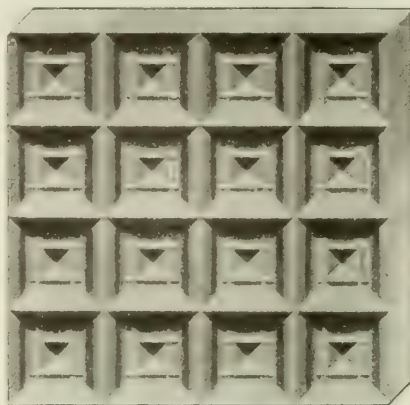
Plate glass jobbers carry these products in stock and will be glad to make prices. A card to either office will bring samples and further information.

## Specifications.

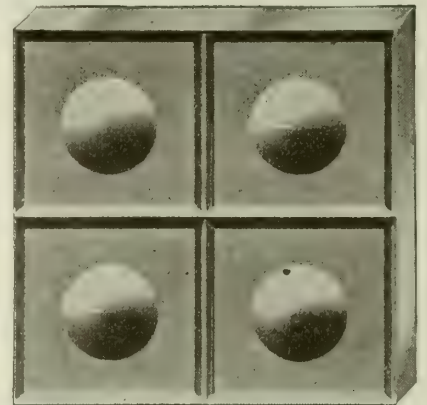
To preclude the possibility of substitution, always use the word "Imperial" in specifying.



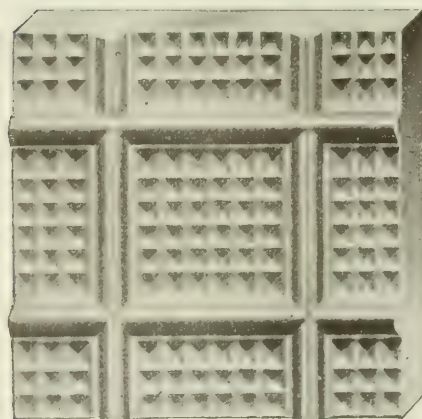
"IMPERIAL" PRISM-PLATE ORNAMENTAL, STYLE O-1



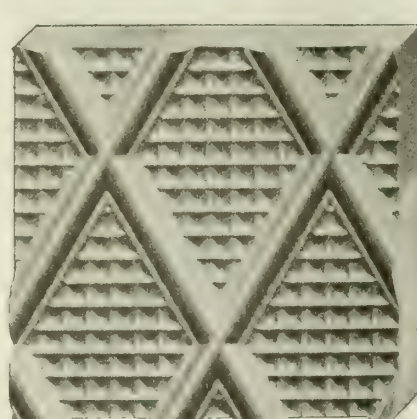
"IMPERIAL" PRISM-PLATE ORNAMENTAL, STYLE O-2



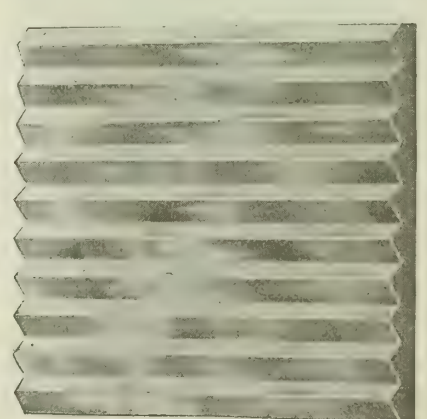
"IMPERIAL" PRISM-PLATE ORNAMENTAL, STYLE O-3 (TRANSPARENT)



"IMPERIAL" PRISM-PLATE ORNAMENTAL, STYLE O-4



"IMPERIAL" PRISM-PLATE ORNAMENTAL, STYLE O-5



"IMPERIAL" PRISM-PLATE GLASS



# AMERICAN 3-WAY PRISM CO.

Distributors of 3-Way and Luxfer Prism Products

MAIN OFFICE AND FACTORY  
CICERO, ILL.

EASTERN OFFICE AND FACTORY  
NEW YORK, N. Y.

BRANCH OFFICES AND REPRESENTATIVES IN ALL LARGE CITIES

## Products.

PRISM GLASS: 3-way and Luxfer Pressed Prism Tile; Glazed Tile Transom Lights with Plain or Colored Ornamental Border; Transom Ventilators with and without Screens; SIDEWALK LIGHTS, FLOOR LIGHTS and SKYLIGHTS, including Fresnel Simplex, Screw Glass Simplex, Standard Simplex Vault Light and Skylight Constructions, Paschall Interlocking Vault Light and Skylight Constructions, Ransom Reinforced Concrete Sidewalk Lights and Floor Lights; DOORS and SPECIALTIES, including Flush Watertight Sidewalk Doors and Coalhole Covers; METAL WALL PLUGS; FINGER CLING ANCHORS; AMERICAN 3-WAY GROUNDS.

Flat Back Pressed Prism Tile, Flat Back Sheet Prism, Wired Sheet Prism, Glazed Sheet Prism in ornamental designs, Canopies of Pressed Prism Tile, Diffusing Sash of Pressed Prism Tile or Sheet Prism; Cast Iron Vault Light Constructions, Extension Skylights; Vent Doors, Sidewalk Grating and other cast iron paving and sidewalk specialties.

## Adaptability and Service of 3-Way Prism Products.

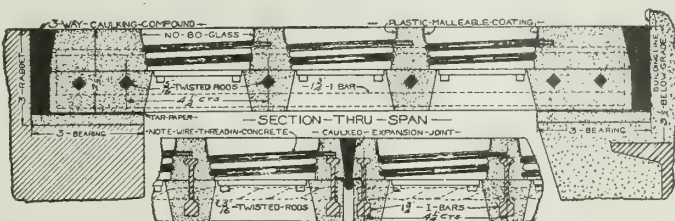
The efficiency of 3-Way products has been demonstrated by the many thousands of installations embodying millions of square feet. Many years of experience have equipped this company to successfully solve the most difficult daylighting problems.

## Simplex Sidewalk Light Construction.

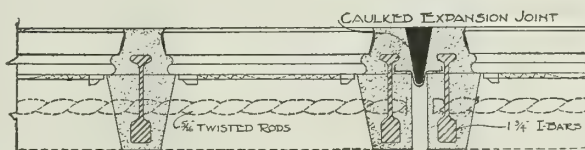
All glass made replaceable in round glasses  $3\frac{1}{8}$  and  $3\frac{3}{8}$  ins. in diameter; also, in square glasses  $3\frac{1}{8}$  and 4 ins., and for floor lights and skylights in  $6\frac{1}{8}$  ins.

(Send for new details.) All glass made in both plain and prism of "Lazilite" quality, specially annealed and guaranteed not to turn pink. All sidewalk light and

skylight glass coated with plastic malleable compound to protect against expansion and contraction.



SIMPLEX REPLACEABLE SCREW GLASS SIDEWALK LIGHT CONSTRUCTION

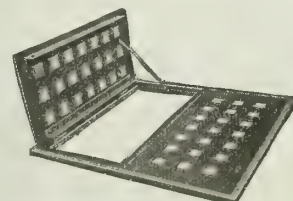


CROSS SECTION OF FRESNEL SIMPLEX SIDEWALK LIGHT CONSTRUCTION

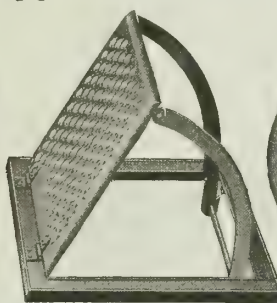
Showing I-bar reinforcing and method of making watertight joints between sections. Maximum surface light area 71%, greatest of any known

## Sidewalk Doors.

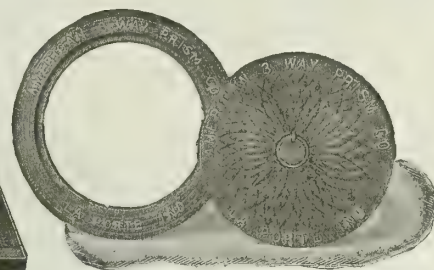
Illustration shows 3-Way Type "D" flush watertight sidewalk door with illuminated top, provided with brass hinges, flush ring lift, one cross bar, automatic hook locking device; gutter drilled and tapped for drain pipe connection. Also made in plain and diamond top.



TYPE "D" WATERTIGHT SIDEWALK DOOR

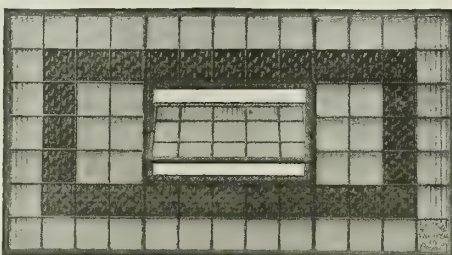


Sidewalk Ventilator

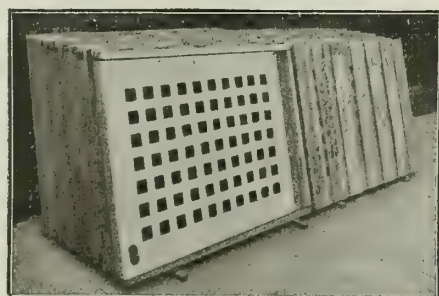


Coalhole Cover

SHOWING TWO OF OUR MANY STYLES



GLAZED 3-WAY, 4-INCH PRESSED PRISM TILE WITH ORNAMENTAL BORDER AND TRANSOM VENTILATOR



FACTORY FINISHED REINFORCED CONCRETE SIDEWALK LIGHTS

Crated and received on job ready to set over openings. Furnished plain lens, 3-way prism, multiprism and pendent prism



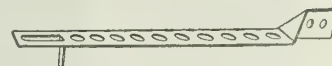
PASCHALL INTERLOCKING VAULT LIGHT CONSTRUCTION

Made in plain lens, 3-way prism and pendent prism  $2\frac{3}{8}$  ins. square. For skylights and floor lights made with glass in 6-in. square

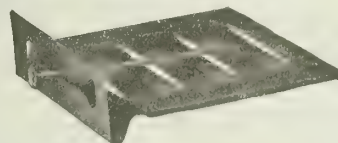


AMERICAN 3-WAY GROUND

The modern method of providing nailing space to hold interior trim



FINGER CLING ANCHOR  
For application to side of joists



MONARCH METAL WALL PLUG

## Catalogues and Service.

Special catalogues, blue print details, price lists, etc., sent on request. Large modern plant insures prompt execution of the largest orders.



# BROOKLYN VAULT LIGHT COMPANY

262-272 Monitor Street  
BROOKLYN, N. Y.

## Products.

SAFETY DUPLEX COALHOLE COVER with VENTILATOR.

REINFORCED CONCRETE ALL-GLASS UNDERSURFACE VAULT and ROOF LIGHTS.

CAST IRON VAULT and ROOF LIGHTS, Bullseye or Prismatic Lenses.

EXTERIOR WALL VENTILATORS, Movable Shutters or Louvred.

ILLUMINATING DOORS for Cellars and Hatchways.

## Safety Duplex Coalhole Cover and Ventilator.

Constructed to give proper protection to coalhole, and to furnish, by means of easy manipulations, ventilation when desired. Cone lock (see illustration) is a fastening for ventilating grate and top cover.

INSTALLATION—Ordinarily set flush with sidewalk. Cone lock holds both covers by chain, fastened in cellar. Top cover is unhooked, removed, and replaced with grating for ventilation. Installed by any mason. Detail No. 1.

SIZES AND PRICES — Diameter of opening 20 and 24 ins., stocked. Prices quoted on application.

## Reinforced Concrete All-glass Undersurface Lights (Patented).

An all-glass undersurface, non-sealing light consisting of prismatic lenses embedded in reinforced concrete. Lenses are 3 ins. square on top and 4 ins. square on bottom. They are

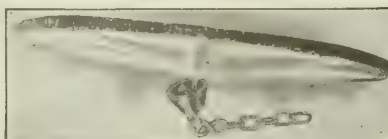


COVER SHOWING RELATION OF PARTS

- A. Bearing Lugs
- B. Cover
- C. Cone Lock
- D. Grating



GRATING IN PLACE FLUSH WITH SIDEWALK



COVER SHOWING REINFORCEMENT



DUPLEX VENTILATING COALHOLE COVER AND RING

arranged to form, with their wider underside, one continuous glass undersurface. Will sustain a load of 700 lbs. per sq. ft. safely. Detail No. 2.

While the cost of this vault light construction is higher than for the ordinary, greater efficiency, durability, and beauty commend it for high class work.

## Cast Iron Frame Lights.

KNOB PROTECTED BULLSEYE—Cast iron plate frames furnished with elongated or round knobs to protect glass and prevent slipping. Bullseye lenses 1 5/8 ins. diameter, 3/4 in. thick; or 2 ins. diameter, 5/8 in. thick. Detail No. 5.

CONCRETE—Cast iron skeleton frame. Lenses set in cement bed with or without brass protecting bands. Bands overcome effects of expansion and contraction, and increase life of lenses. Lens diameters 2 and 3 ins. Detail No. 4.

PRISMATIC—Cast iron skeleton frame. Lenses set in cement bed. Lenses furnished 3 ins. sq., plain or pendant. Detail No. 3.

## Exterior Wall Ventilators.

Durable and efficient cast iron construction. For installation in sidewalk, or on roof, at exterior wall. Furnished with movable shutters or louvred. May be fitted with cast iron "loafer cushion" or vault light top. Detail No. 6.

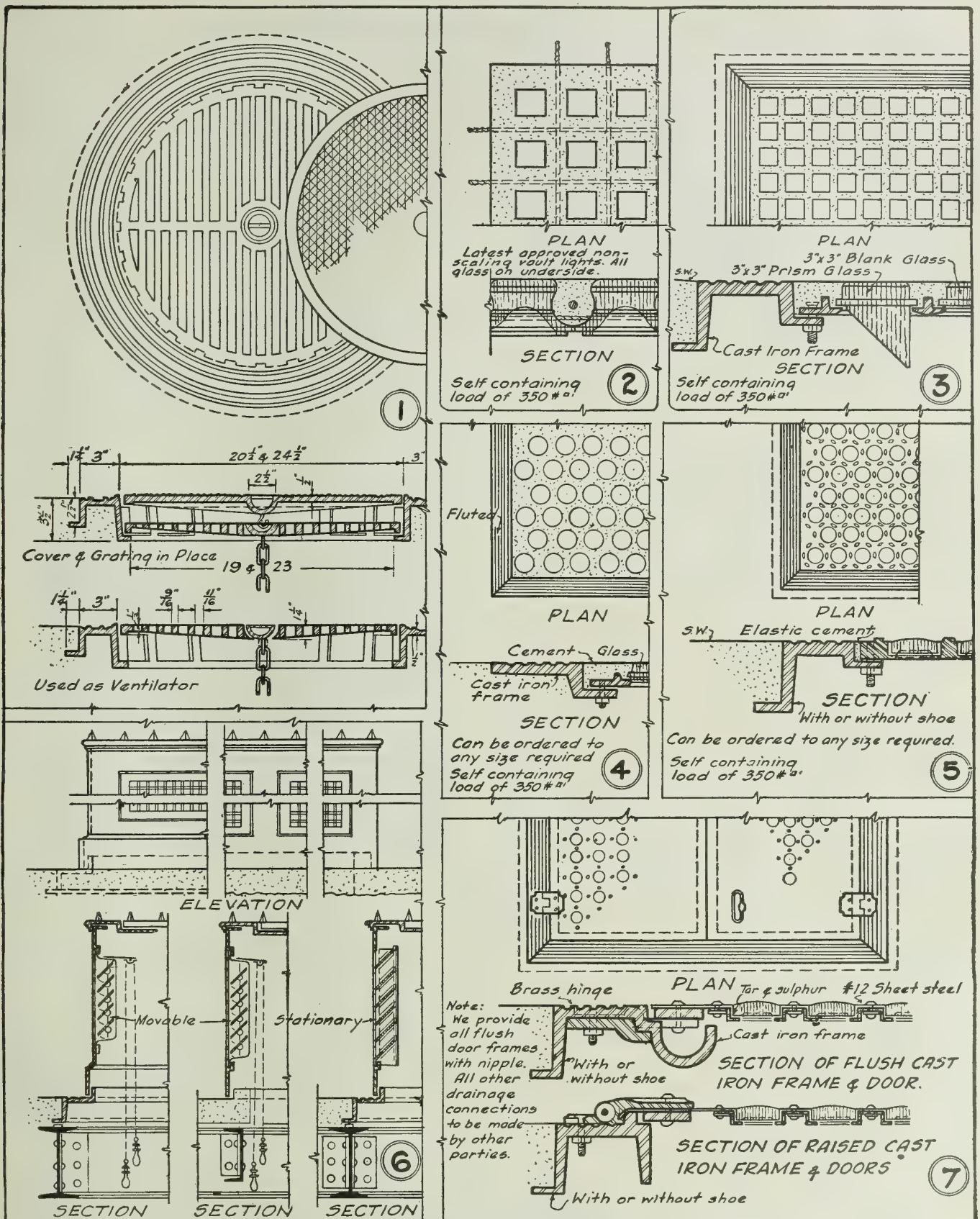
## Illuminating Doors (Patented).

Made up of 2-in. round lenses, set in malleable iron cups riveted to No. 12 steel sheet strongly reinforced on under side. Doors hung to cast iron frame by means of heavy brass hinges. For sidewalk elevators, hatchways, etc. Detail No. 7.

## Facilities.

As this company has its own foundry and pattern shop, orders can be filled quickly. Work is fabricated from architects' design and specification, and to suit individual conditions and requirements. This means a substantial guarantee of efficiency and durability. Products shown in this catalogue can be made any size desired.





TYPICAL DETAILS

1. Duplex Safety Coalhole Cover and Ventilator
2. Reinforced Concrete Vault Lights, All-glass Undersurface
3. Prism and Blank Glass Set in Cast Iron Frame and Cement
4. 2-in. and 3-in. Concrete Lights
5. Elongated Knob Protected Lights
6. Movable and Stationary Ventilators
7. Latest Improved Sheet Steel Patent Light Doors

# P. M. BRUNER GRANITOID CO.

Frisco Building  
ST. LOUIS, MO.

## ALBERT GRAUER & COMPANY

216 Columbia Street, East  
DETROIT, MICH.

### Manufacturers and Builders of Reinforced Concrete Specialties

#### BRANCH OFFICES AND AGENCIES

AKRON, OHIO, FLOWER MANTEL Co.  
ATLANTA, GA., STRAFFORD R. HEWITT  
BUFFALO, N. Y., ALBERT GRAUER & COMPANY  
CLEVELAND, OHIO, ALBERT GRAUER & COMPANY  
DAYTON, OHIO, JOHN G. POOL Co.  
FORT WAYNE, IND., JOCELYN-SCHULZ Co.  
MONTREAL, CAN., WINDOW

KANSAS CITY, MO., J. P. SPRAGUE Co.  
LANSING, MICH., W. T. BRITTEN  
PITTSBURGH, PA., J. B. BOOTH & Co.  
ROCHESTER, N. Y., AMERICAN CLAY & CEMENT CORPORATION  
TOLEDO, OHIO, THE BUILDING PRODUCTS Co.  
WASHINGTON, D. C., SOUTHERN BUILDING SUPPLY Co., INC.  
STRIP & SUPPLY Co., LTD.

#### Products.

The "BRUNER" SYSTEM of REINFORCED CONCRETE SIDEWALK LIGHTS, SKYLIGHTS and FLOOR LIGHTS, used in sidewalks, floors, vestibules, roof gardens, fireproof porch floors, tunnels, subways, etc.

Flush Plain and Illuminating Doors, with concealed hinges; Coalhole Covers and Rings; Vent Doors.

For Dustless Cement Floor Finish, see page 337.

#### Method of Construction—Sidewalk Lights.

Fig. 1 shows a cross section of the construction. The lights are carried on temporary metal forms assembled on the job, which are removed after the concrete has set, leaving only concrete and glass exposed below. The glass slab is carried by reinforced concrete ribs, spaced  $4\frac{5}{8}$  ins. on centers, and  $3\frac{1}{2}$  ins. or more in depth, according to the span, and set in the direction of desired light refraction. Wire hangers place the main reinforcing rods where they will give the best results and prevent exposure and serve also to tie the ribs to the slab. This method allows the laying out of the work at the place of installation and produces the best results all around.

**EXPANSION JOINT**—Waterproof joints of tested reliability and durability are placed as required, usually 12 to 15 ft. on centers (Fig. 1).

**GLASS**—The glass used in the "Bruner" system is made for us by well-known manufacturers exclusively. It is thoroughly annealed and meets every requirement of strength, efficiency and durability.

**Plain Glass No. 47** ( $3\frac{1}{4}$  ins. sq.), indented slightly to increase efficiency, admits light direct without deflecting rays.

**Multiprism No. 52** ( $3\frac{1}{4}$  ins. sq.) is made with 4 prisms, each at a different angle, to effect the widest

possible distribution of light from each, without directing it to the next prism in front.

**Triple Angle Prism No. 46** ( $3\frac{1}{4}$  ins. sq.) concentrates the light back into deep basements.

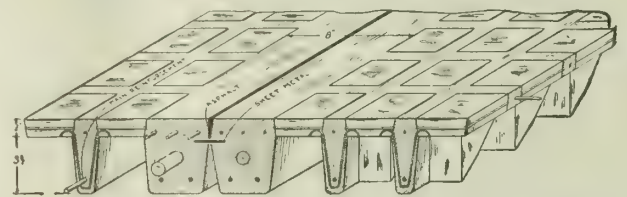


FIG. 1. CROSS SECTION OF SIDEWALK LIGHTS, SHOWING EXPANSION JOINT

**BEARINGS**—If possible, a rabbet 4 by 4 ins. should be provided on 4 sides; yet the flange of a beam at the building and 3 or 4 ins. on the area wall will suffice.

**WIDE SPAN WITHOUT BEAMS**—The concrete ribs of the "Bruner" system can span 16 ft. in clear; lights and slab can be made in one span without extra support which would eliminate the light at those points, be unsightly and reduce headroom (Fig. 7).

**THIN SLABS**—The "Bruner" system is based on a slab 1 in. thick, which allows free passage of oblique rays of light into basement, even without the use of prisms. This also facilitates annealing, and the flat surface below can be easily cleaned. A thick slab requires a thick glass that is harder to anneal, and if the glass is hollow below,

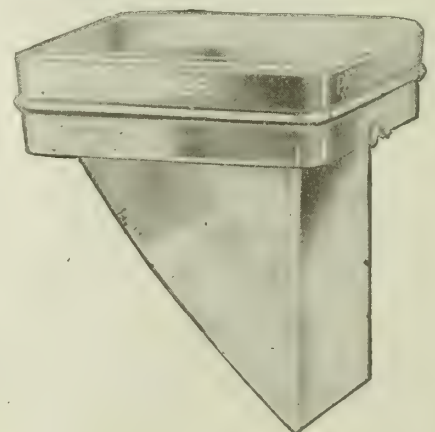


FIG. 4. TRIPLE ANGLE PRISM NO. 46

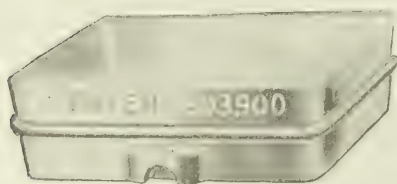


FIG. 2. PLAIN GLASS NO. 47



FIG. 3. MULTIPRISM NO. 52



dust collects in this cavity. Also it can not throw light obliquely, but admits perpendicular rays only.

**LOADS**—Even more important than its light distributing efficiency is the strength of an installation of sidewalk lights. The "Bruner" system provides strength without sacrificing lighting efficiency. It weighs approximately 40 lbs. per sq. ft. and is constructed to carry an evenly distributed load of 300 lbs. per sq. ft., twice the usual requirement.

**BUCKLING AND SAGGING**—Buckling and sagging are obviated by depth of ribs. Standard ribs extend  $3\frac{1}{2}$  ins. below the glass, with proper reinforcing.

### "Bruner" Skylights.

Figs. 5, 6 and 11 show the "Bruner" skylight construction recently placed on the market. Like other "Bruner" products it surpasses anything previously attempted in this line, and is rapidly replacing all older forms of metal skylights. Spans are made up to 18 ft. without auxiliary supports. This construction is admirable for roofs, porches, etc., and is sufficiently strong to be walked on when the span does not exceed 12 ft. Specify Glass No. 10.

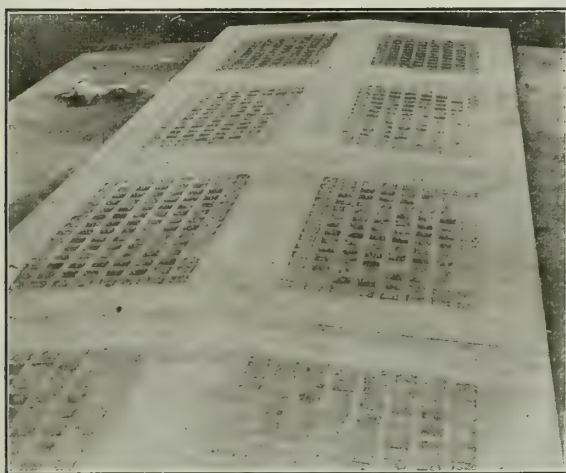


FIG. 5. "BRUNER" SKYLIGHT CONSTRUCTION

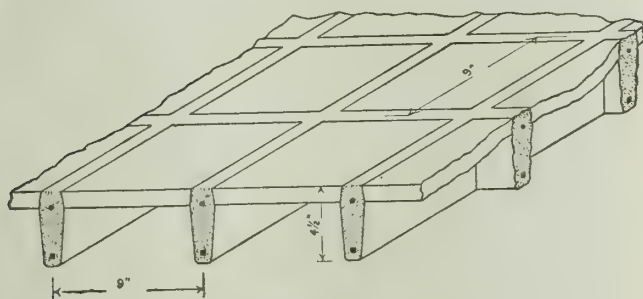


FIG. 6. DETAIL OF "BRUNER" SKYLIGHT CONSTRUCTION

### Basement Lighting.

The "Bruner" system gives the greatest possible effectiveness in basement lighting, unlike the tendency observable among some other manufacturers to lessen cost at expense of efficiency by reducing glass area to a minimum. Many installations at the present time possess a lighting efficiency in the basement 50% less than that of the "Bruner" system, while the cost of

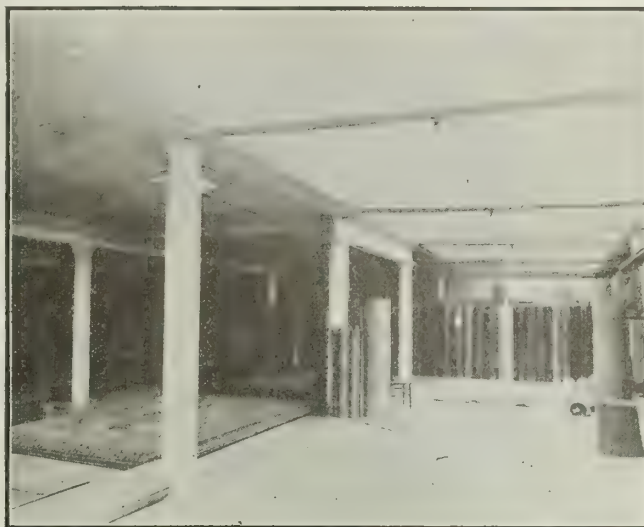


FIG. 7. BASEMENT ILLUMINATION FROM 13 FT. WIDTH OF GLASS NO. 46

Total span between supports, 16 ft.

same shows a reduction of only 20%; and, at their reduced prices, the purchaser undoubtedly paid about 40% more than its efficiency merits.

When some of these inferior constructions are specified in company with the "Bruner" system of construction it is impossible to compete successfully. The latter construction has been and always will be made to secure great strength and durability, combined with the maximum lighting efficiency that science can produce, irrespective of price. This company gives the greatest value for the money expended.

### "Bruner" Floor Lights.

Figs. 8 and 10 give an idea of "Bruner" floor light construction. Large areas of these lights have been placed in the roofs of mausoleums designed by the leading architects of the country. On account of the monumental character of these buildings the "Bruner" system was selected from among competitors because it is designed to be as near everlasting as the other parts of the building.

The accompanying illustrations show the adaptability of the "Bruner" floor lights for effective use as skylights or roofs of various types.

Spans are made up to 10 ft. without auxiliary supports. Specify Diffusing Glass No. 88 or Plain Glass No. 89.

**NO-SLIP PLUG**—Fig. 9 shows top of a glass in which is inserted a non-slipping abrasive plug. This is placed in the center of the glass where it is most effective, but cuts out not over 2% of the light. Plugs are firmly set, but are easily replaced where worn. Specify

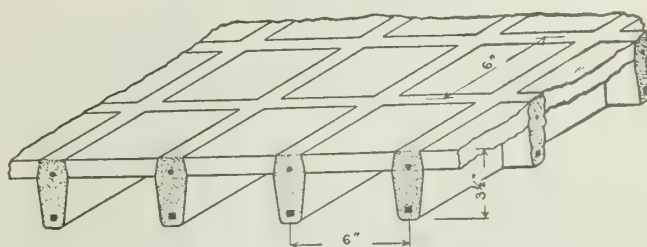


FIG. 8. DETAIL OF "BRUNER" FLOOR LIGHT CONSTRUCTION



Prism No. 90, Multiprism No. 96, or Plain Glass No. 97.

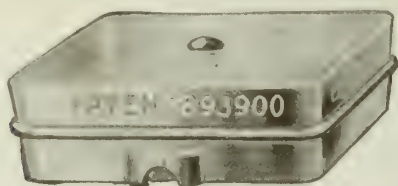


FIG. 9. PLAIN GLASS NO. 97  
No-slip Surface

### Patented Repairing Feature.

Glass may become injured by hard usage or accident, but the "Bruner" system is so designed that glass can be renewed readily, and the construction is not injured thereby, nor is the appearance of the work affected. This method is patented. Other makes of lights repaired by the "Bruner" method.

### Record.

The "Bruner" system has seen practical use and given satisfactory service for a period of over 24 years.

### Installation.

Installations of the "Bruner" system are made in all parts of the United States and Canada, by skilled workmen, insuring perfect workmanship. Complete ready-to-set panels made up to any specification, at any "Bruner" workshop.

### Guarantee.

Every installation is guaranteed to remain waterproof and in first class condition for 2 years.

### Prices.

Catalogues and prices are gladly furnished on request.

The cost of an installation is determined by the quantity, the span and location and the style of glass selected. This company's prices are scheduled and do not fluctuate. They are always lower than others when the lighting results and service are considered.

### Specifications.

(1) Vault lights shall be constructed according to the "Bruner" System. The glass shall be "Bruner" No. .... (In case reflecting lights are wanted, say: "The prism part shall be entirely below bottom of concrete slab. The paving shall be capable of carrying a uniform load of 300 lbs. per sq. ft. without injury to pavement.")

Glass shall be guaranteed for 2 years, and construction shall be guaranteed against leakage or defects of workmanship and material, or

(2) The vault lights shall be constructed of reinforced concrete and no metal shall be exposed above or below. The construction shall consist of a flat slab with ribs below, between rows of glass in one direction. The glass shall be 1 in. thick, flat; 4 point prism; triple angle pendant. (State which is wanted.) The glass shall not be made hollow below; the reflecting part of prisms shall be entirely below bottom of slab. The main reinforcement shall be held in suspended wire yokes; the reinforcement perpendicular to ribs shall be round rods placed between rows of glass. The concrete shall consist of 1 part of first class Portland cement and 1½ parts of sharp, clean sand, or its equivalent.

### Co-operative Service.

As originators of reinforced concrete sidewalk lights, this company offers without charge, the benefit of 25 years' experience in the design of such installa-

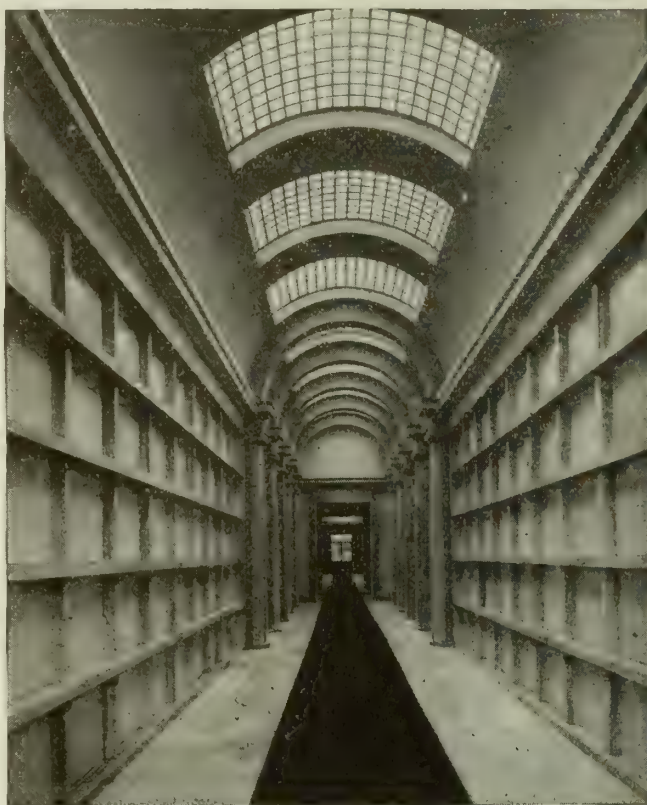


FIG. 10. "BRUNER" FLOOR LIGHT CONSTRUCTION



FIG. 11. SKYLIGHTS NO. 10, TECHNICAL HIGH SCHOOL, BUFFALO, N. Y.

tions. Work has been designed for the largest railroad companies and for architects which was quite impossible with any other system.



# DAVIS CARPENTER & CO., INC.

Sidewalk Doors, Coalhole Covers, Ornamental Iron Work

OFFICE AND PLANT  
216 East Forty-first Street  
NEW YORK, N. Y.

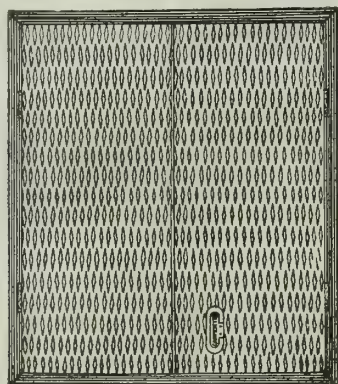
## Products and Services.

VAULT LIGHTS, SIDEWALK DOORS, SAFETY COALHOLE COVERS and FRAMES, ORNAMENTAL and BUILDERS' IRON WORK.

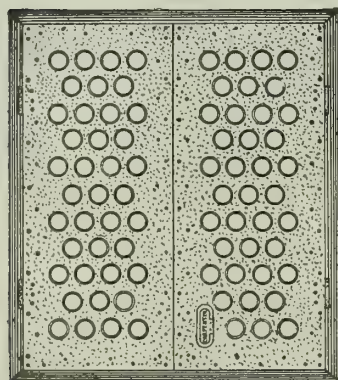
Manufacturers of and contractors for Ray-Placeable System Vault, Floor, Roof, Train Shed and Sidewalk Lights and the Ransome System Vault, Floor, Roof and Sidewalk Lights; Elevator Bows.

## Ray-Placeable Sidewalk Doors.

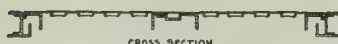
The special feature of the Ray-Placeable sidewalk doors is the non-slip margin, made so that it is safe for pedestrians and will not rust. The doors are made up with vault light top, checkered steel plate and plain sheet steel, as shown in detail. The doors are flush and abso-



PLAN OF CHECKERED PLATE DOORS



PLAN OF VAULT LIGHT DOOR



CROSS SECTION

VAULT LIGHT AND CHECKERED PLATE SIDEWALK DOORS

lutely watertight with welded frames and are heavily reinforced with angles to prevent sagging.

SPECIFICATIONS FOR DOORS—Sidewalk doors shall be extra heavy sheet steel with vault light lenses or plain sheet



REGISTERED TRADE-MARK

steel or checkered plate with special non-slip wrought iron frame, as manufactured by DAVIS CARPENTER & Co., INC. Doors and frame shall be constructed to be watertight and to stand a load of 300 lbs. per sq. ft. Special concealed brass hinges shall be used and constructed to

keep doors in vertical position when open.

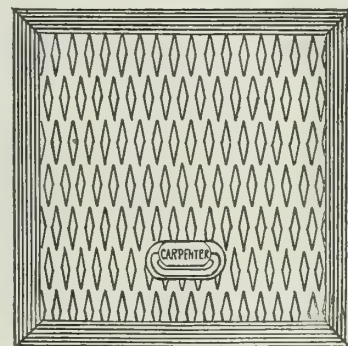
## Clean-out Doors and Trap Pit Covers.

Sheet steel clean-out doors made in all sizes with steel frames, hinges and catch; also trap pit covers in checkered steel plate vault light and sheet steel top. In sending measurements always give the inside opening.

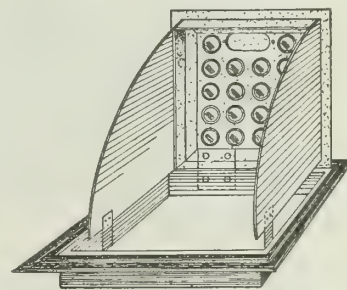
## Safety Coalhole Covers and Frames.

This company's safety coalhole covers and frames absolutely protect pedestrians from accidents so common with the old-fashioned cast iron cover and ring.

The illustrations show cover when closed and also the protection when open. These covers are made up with vault light, sheet steel or checkered steel plate top. The frames are made with a special non-slip and non-rusting surface.



CHECKERED STEEL PLATE SAFETY COALHOLE COVER CLOSED



SAFETY COALHOLE COVER OPEN

## Ornamental Iron Work.

This company specializes in ornamental and builders' iron work of all kinds. Plans and specifications are invited for estimate.



ORNAMENTAL GATEWAY

# CONCRETE SPECIALTIES MANUFACTURING CO.

Manufacturers of Vault Lights and Curb Guards

26th Street and Pennsylvania Avenue  
PHILADELPHIA, PA.

## Products.

REINFORCED CONCRETE VAULT LIGHTS, with Unbreakable Glazed Porcelain Cups; CURB GUARDS.

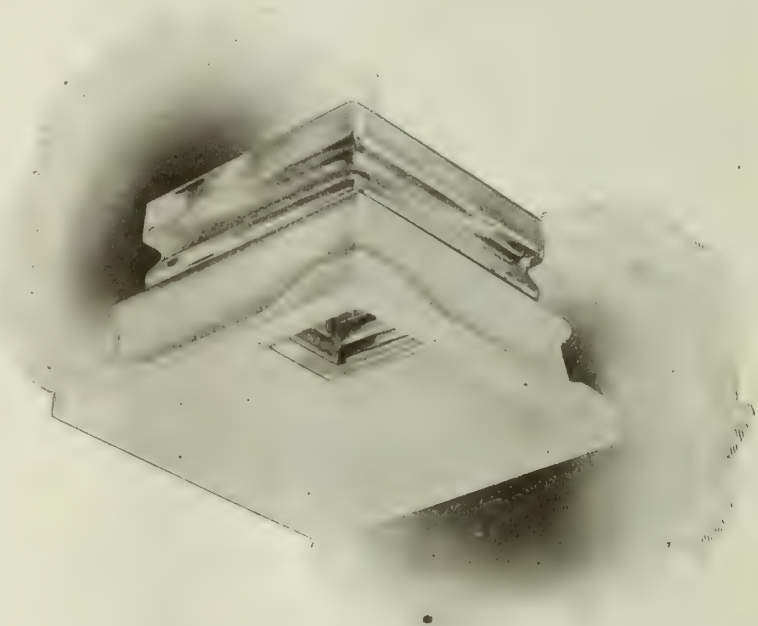
### Advantages of Reinforced Concrete Vault Lights.

GLAZED PORCELAIN CUPS—Reinforced concrete vault lights are so well known that they need no comment—but *unbreakable porcelain cups* are a new invention and a great improvement over the ordinary reinforced concrete vault lights. The glazed porcelain cups increase the volume of light by reason of the light which is refracted from their glazed surfaces; they can be readily cleaned, whereas the ordinary concrete vault lights can not be cleaned on their undersurface and soon become so dirty and grimed with dust and dirt as to have no light refractory value.

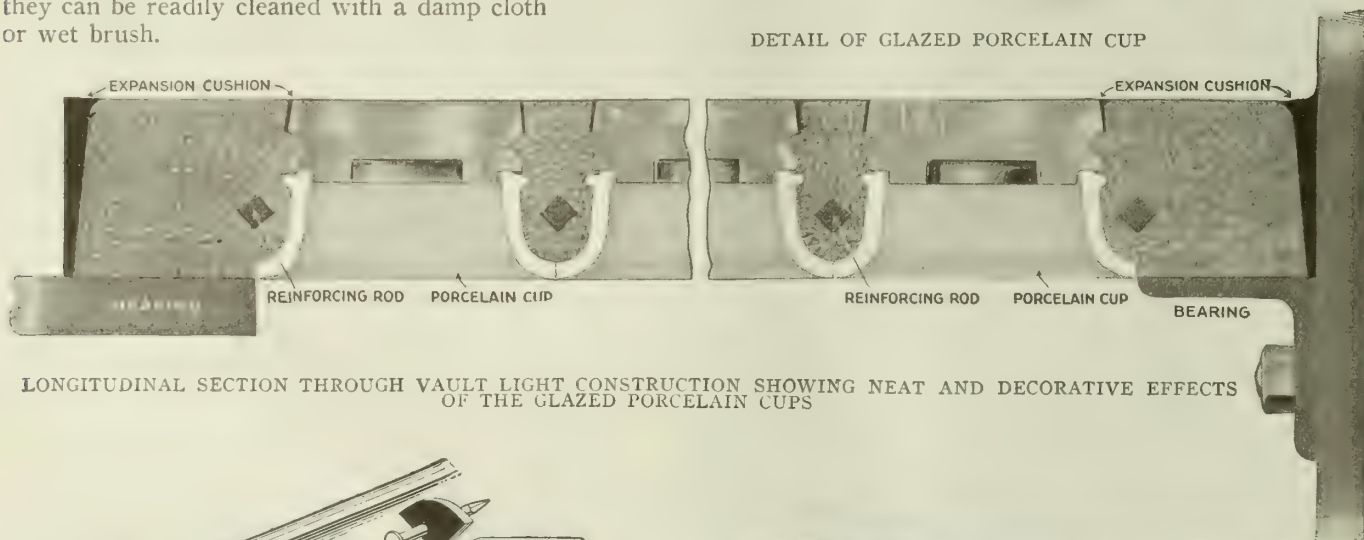
The appearance of the undersurface or soffit of these unbreakable glazed porcelain cups is very ornate and beautiful and makes an ideal ceiling for salesrooms, barber shops, restaurants or other rooms located in basements where a decorative effect is desired; and, at the same time, they serve a practical purpose in thoroughly illuminating the room with light rays akin to natural daylight.

The porcelain cups are practically indestructible and their design is such that it is impossible to dislodge them from the concrete structure without destroying the whole vault light. The glazing of the porcelain cups prevents permanent discoloration or staining, as they can be readily cleaned with a damp cloth or wet brush.

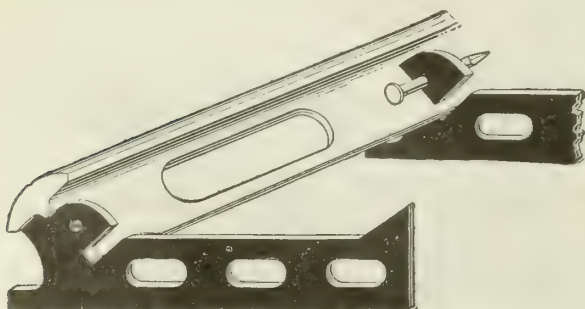
GLASS—The glass used in this construction is the very best obtainable for vault lights and is made especially for the purpose intended. Every lens is protected by a coating of expansive material around its upper outside edge and is so designed that in case of break or fracture it can be readily replaced without destroying or chipping the surrounding concrete.



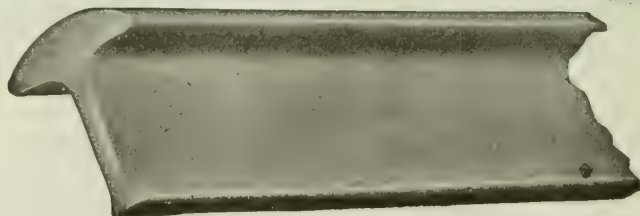
DETAIL OF GLAZED PORCELAIN CUP



LONGITUDINAL SECTION THROUGH VAULT LIGHT CONSTRUCTION SHOWING NEAT AND DECORATIVE EFFECTS OF THE GLAZED PORCELAIN CUPS



"ANCHOR" GALVANIZED CURB GUARD



"T-HEAD" GALVANIZED CURB GUARD



# JEANETTE GLASS COMPANY

JEANETTE, PA.

---

## Product.

Sole manufacturers of LAZALITE GLASS for Sidewalk and Vault Light Construction.

## Former Glass Unsatisfactory.

In former years, the glass used for sidewalk and vault light purposes was ordinary pressed glass differing slightly, if at all, from that entering into the manufacture of inkstands, paper weights, etc. Consequently, the glass could not withstand the extreme heat and cold, and atmospheric changes. Not only did it chip off and shale, but it turned an iridescent purple tint, which daylight could not penetrate.

## Steps Toward Improvement.

So unsatisfactory were the results, that the leading sidewalk and vault light companies concluded that a special sidewalk glass, made from a special mixture and specially annealed, would be necessary.

The JEANETTE GLASS COMPANY possessed special facilities for research along the lines suggested by the vault light companies. Its chemists and engineers were at once put to work making a special sidewalk glass which would have a specific hardness and a certain elasticity, and which would resist the pressure exerted against it by the cement in which it was embedded.

## Old Method of Annealing.

In studying the coefficient of expansion of glass and its coefficient of thermal endurance, the JEANETTE GLASS COMPANY discovered that the all important secret lay in the thorough annealing of the glass during its stay in the annealing chamber, commonly known as a lehr, which is nothing more than a brick tunnel with openings at both ends, with heat applied at one end.

The glass companies making the glass formerly used for vault and sidewalk lights passed this glass along with tableware and bottle glass, through open end lehrs in which it was impossible to pass the sidewalk glass at a regulated speed. The influence of the outside temperature, which might be zero in winter and 80° in summer, made itself felt within the lehr through the open ends and thus occasioned a rising and falling temperature within the lehrs, frequently varying 200°.

Examination of glass annealed by this process, when tested under the polariscope, has shown that a majority, and more often all of it, contained stresses or strains, and was therefore not perfectly or thoroughly annealed.

In addition to irregular or uncompleted annealing, it was discovered that the mixture used in making the old glass contained manganese, and that the presence

of this substance in the glass caused it not only to change color under the action of the sun's rays, but to disintegrate as well.

## Over Five Years Experimenting.

The experts of the JEANETTE GLASS COMPANY spent over 5 years experimenting with new ingredients and new processes of heat treatment, with the object of overcoming these two fundamental defects of the old sidewalk glass.

## Lazalite Glass Perfection.

Finally a new formula was discovered and a perfected method of heat treating adopted, which resulted in creating a sidewalk glass as nearly perfect as can be expected, and named Lazalite.

## Manganese Eliminated.

The formula utilized in the making of Lazalite provides for the admixture of an increased proportion of lead, and dispenses entirely with the use of manganese. The result is a glass that will not turn pink or purple, and is absolutely free from stresses or strains.

## Perfect Annealing.

The secret of perfect annealing has been solved by heat treating Lazalite glass in an entirely new type of oven, specially designed and constructed with the object of insuring uniform soaking heat with slow and gradual cooling.

It does not require much reflection to force the conclusion that glass thus carefully and methodically tempered must be infinitely superior to glass annealed by the old process.

## Careful Inspection.

As an extra precaution every piece of Lazalite glass is passed through a polariscope and examined for defects before being packed for shipment. The word Lazalite, adopted as a trade-mark, is stamped in the glass, and each piece so marked carries the guarantee that it is made under these highly improved and scientific processes and is the last word in glass for this purpose.

## Styles of Glass.

The different styles of glass are designed to scientifically diffuse or refract the light rays to various distances, and none of the styles are exactly alike or give the same results.

## Extensive Use.

A number of the leading vault light companies of the United States have contracted with this company for Lazalite glass, and are using it extensively.

# RICHARDS & KELLY MANUFACTURING CO.

Manufacturers of Prismatic Lights

309-311 West Twenty-third Street  
CHICAGO, ILL.

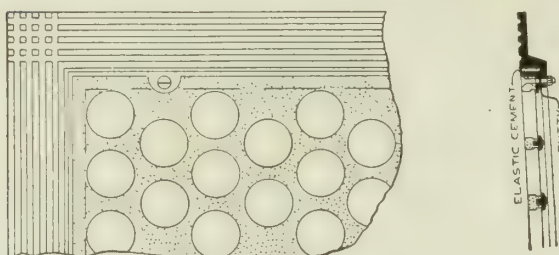
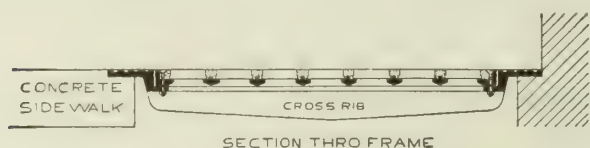
## Products.

Manufacturers of CAST IRON SIDEWALK LIGHTS, REINFORCED CONCRETE SIDEWALK LIGHTS, FLOOR LIGHTS; SIDEWALK DOORS; COALHOLE COVERS.

Cast Iron Skylights and Sidewalk Gratings.

## Cast Iron Sidewalk Lights.

These lights are constructed of cast iron panels set in cast iron framework. The panels are glazed with glass set in concrete, or with the old style knob or Hyatt light, in which the glass is set with brimstone cement.



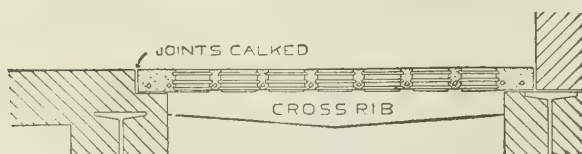
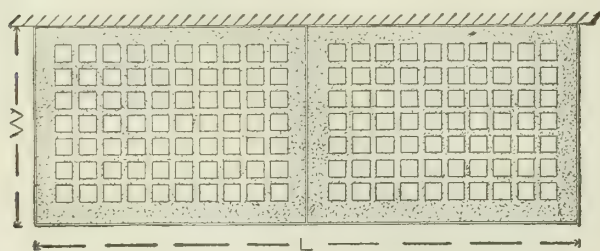
DETAILS SHOWING CONSTRUCTION OF CAST IRON SIDEWALK LIGHTS, CONCRETE SETTING

## Floor Lights.

Floor lights are constructed of cast iron panels glazed with either 4-in. or 6-in. square glass.

## Reinforced Concrete Sidewalk Lights.

These lights are constructed of a body of concrete  $1\frac{7}{8}$  ins. thick, reinforced with  $\frac{1}{4}$ -in. steel bars, with 4-in. centers, in which the glass is set.



DETAILS SHOWING CONSTRUCTION OF REINFORCED CONCRETE SIDEWALK LIGHTS

## Glass.

### CAST IRON CONSTRUCTION—

2-in.,  $2\frac{1}{2}$ -in., 3-in. diameter, 3 ins. square,  $2\frac{1}{2}$  by  $3\frac{1}{2}$ -in. plain lenses; 2-in. and 3-in. diameter pendent lenses;  $2\frac{1}{2}$  by  $3\frac{1}{2}$ -in. double pendent lens; knob light glass  $1\frac{5}{8}$ -in. diameter, plain and pendent lenses.

### REINFORCED CONCRETE CONSTRUCTION—

$2\frac{3}{4}$  by  $2\frac{3}{4}$ -in. plain lens, multiprism lens, pendent lens; 3-in. diameter plain lens.

All glass for reinforced concrete construction has elastic coating.

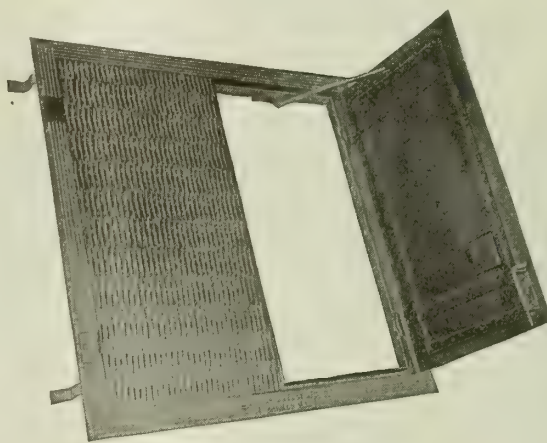
## Sidewalk Doors.

Doors are manufactured of plain or diamond steel, or of cast iron glazed with plain or refracting lens glass set in concrete or brimstone cement.

Doors are fitted with hooks to hold open, with lift rings, brass hinges, and slide bolts to lock from under side.

On flush doors the frames have a gutter around inside edge to carry off water which seeps through the joints between the frame and the door.

Doors can be furnished with worm gears if required.



SIDEWALK DOORS

## Coalhole Covers.

A complete stock of covers and grates, 16, 18, 20, 24, 26 and 28 ins. in diameter, plain or with glass, manufactured and carried in stock. Also rings and thimbles to fit the various covers and grates.

## Sketches and Prices.

Send sketches or dimensions of work required and estimates will be furnished promptly. Prices given f.o.b. cars or set in place at building.



# KEPPLER GLASS CONSTRUCTIONS, INC.

Pavement, Roof and Floor Lights and Glass Walls

OFFICE

Architects Building, 101 Park Avenue  
NEW YORK, N. Y.

FACTORY, NEW YORK, N. Y., 1799 First Avenue

## Products.

KEPPLER ROOF LIGHTS, GLASS WALLS and PARTITIONS, GLASS FLOORS, PAVEMENT LIGHTS, VAULT LIGHTS—Glass Unit Formation, Steel Reinforced Cement Ribs, fireproof, low maintenance; CRYSTAL CEILINGS and DOMES.

Fireproof Windows.

**KEPPLER**  
Glass Constructions N Y

TRADE-MARK

STRENGTH—Roof lights support 70 lbs. per sq. ft. with a factor of safety of 4 at 5 ft. between supports.

Pavement lights support a load of 300 lbs. per sq. ft. with a factor of safety of 4 at 4 ft. between supports.

## Keppler Roof Lights, Vault Lights and Glass Floors.

**MORE LIGHT**—The large top glass area admits plenty of light. The units widen into an all-glass undersurface, permitting most of the light to pass right through.

**BETTER APPEARANCE**—Because the undersurface is almost all glass, the construction looks like one large glass panel instead of numerous small units. The top surface is even; cleaning and snow removal are easy.

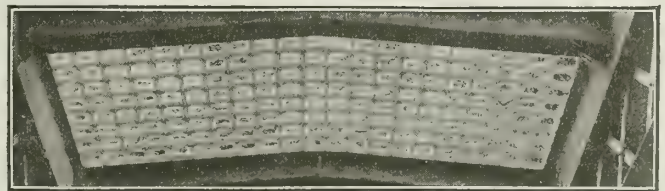
**FIREPROOF AND RUSTPROOF**—Reinforcing is embedded in concrete. No metal is exposed to fire or rust.

**LOW MAINTENANCE**—The company insures against any maintenance for 2 years free, and for a longer period, if desired, at a nominal cost per year.

Single units can be replaced easily without disturbing any other units. All expansion joints run through the entire depth of the plate.

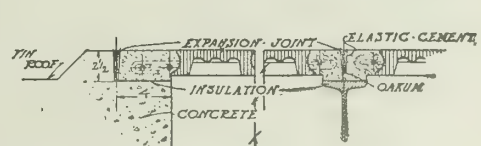
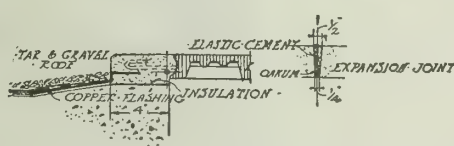
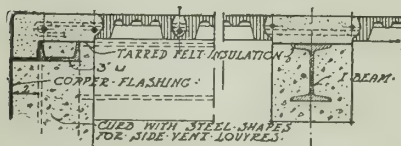
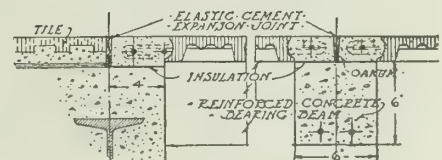
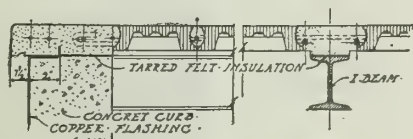
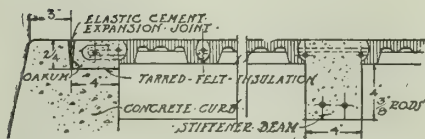
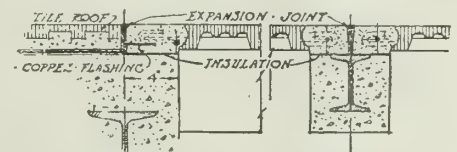
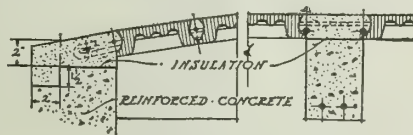
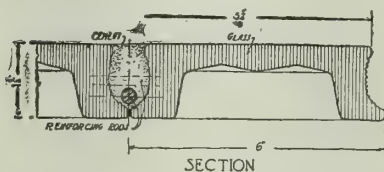


Top View

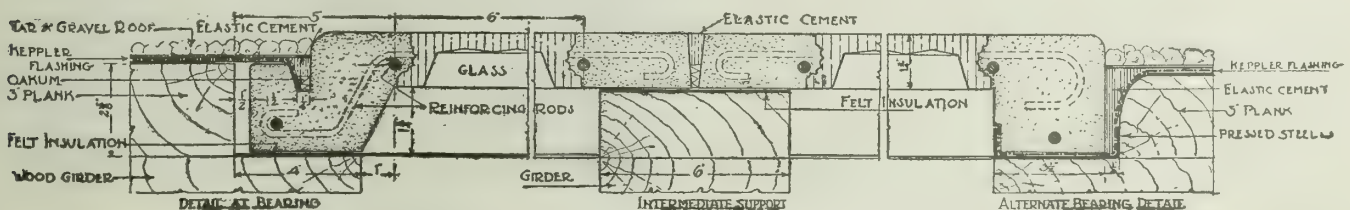


Roof Lights Seen From Below

KEPPLER ROOF LIGHTS, LEHIGH VALLEY R.R., BUFFALO, N. Y.  
E. B. ASHBY, Chief Engineer LINCOLN T. BUSH, Consulting Engineer  
KENNETH M. MURCHISON, Architect



SECTIONS THROUGH ROOF LIGHT CONSTRUCTION AND SUGGESTIONS FOR WATERPROOF CONNECTIONS WITH ROOF, GIVING AMPLE OPPORTUNITY FOR EXPANSION AND CONTRACTION



DETAILS OF KEPPLER ROOF LIGHTS IN MILL CONSTRUCTION INSTALLATIONS



**ADAPTABILITY**—They have been used in leading factories, large office buildings, banks and apartment houses, railroads and United States Government buildings.

**WEIGHT AND SIZES**—Roof lights weigh 16 lbs. per sq. ft., size of units 6 by 6 ins., thickness  $1\frac{3}{4}$  ins.

Pavement lights weigh 21 lbs. per sq. ft., size of units 4 by 4 ins., thickness 2 ins.

Installed at job or furnished complete in preassembled panels.

**IMMEDIATE DELIVERY**—No special parts or metal work required.

### Keppler Glass Walls and Partitions—Translucent and Fireproof.

Composed of glass units and steel reinforced cement cores. Units are clear glass, made translucent by design, giving privacy with maximum transmission of light. They give more the effect of masonry than of glass.

**FIREPROOF**—Tested up to  $1800^{\circ}$  Fahr.; then subjected to force of water from fire hose, they withstood the sudden cooling and shock.

**EXPANSION AND CONTRACTION**—Provided for by elastic cushion around each unit and properly designed expansion joints.

**INSTALLATION**—Any bricklayer or tilesetter can install, or will ship complete in preassembled panels.

If desired, the company will attend to the installation.

**NO MAINTENANCE**—The company has never had a single glass unit break from ordinary wear and tear.

**WEIGHT**—15 lbs. per sq. ft., average.

**SIZE**—6 by 6-in. units; thickness  $1\frac{1}{2}$  ins.

**IMMEDIATE DELIVERY; NO DELAYS**—Composed of stock parts.

### Keppler Translucent Crystal Ceilings and Domes.

For stores, libraries, public buildings, railway stations, fine residences, etc.

Constructed of clear or amber glass units, ornamented in relief, making them translucent. The greater character and depth of the units eliminates entirely the thin feeling of glass.

Units are held together by means of electrolytically deposited copper—a strong, permanent fastening.

Panels are installed on steel or concrete framework at the building.

**MORE LIGHT**—They transmit evenly diffused light, and reduce the need of artificial illumination by day.

**DECORATIVE AND ORNAMENTAL**—Any design can be carried out in this construction. Sketches will be submitted on request.

**FIRE SAFE**—Keppler crystal ceilings are as fire resisting as the best wire glass, and require no maintenance.

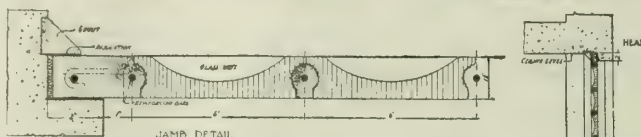
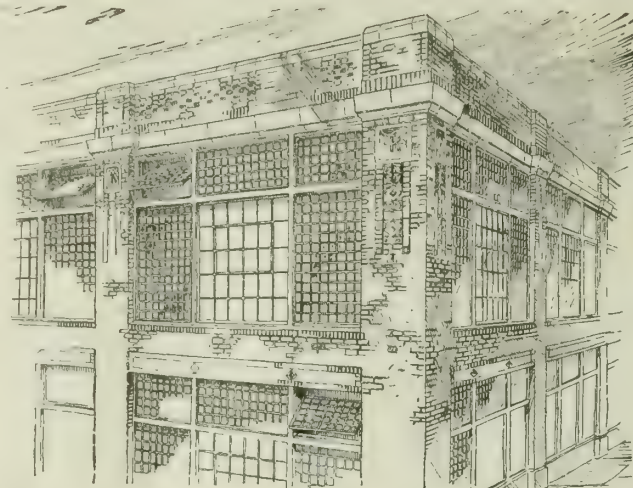
**WEIGHT**—Average 9 lbs. per sq. ft.

**COST**—\$1.50 per sq. ft. up, depending on the design and size of installation.

**QUICK DELIVERIES**—The Keppler factory in New York City is equipped to execute any design desired in reasonably short time.

### Further Information about Keppler Constructions.

Photographs, detail drawings, specifications and complete data on all Keppler constructions will be sent on request.

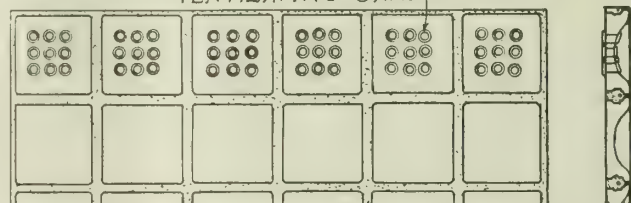


#### KEPPLER GLASS WALL CONSTRUCTION

Admits maximum daylight. Handsome and substantial in appearance. Keeps out the heat of summer and cold of winter better than ordinary window construction. Snow will not lodge on it and obstruct light.

Ventilation can be provided for by means of holes pressed in a number of the units

#### VENTILATING UNITS



SHOWING HOLES PRESSED IN UNITS FOR VENTILATION



KEPPLER CRYSTAL CEILING, CHAMBER OF COMMERCE BUILDING, ROCHESTER, N. Y.  
CLAUDE BRAGDON AND FOSTER & GADE, Associate Architects





# THE KENNEY MANUFACTURING COMPANY

## Manufacturers of Plumbing Fixtures

TELEPHONE:  
BROAD 3692

59-61 Pearl Street  
NEW YORK, N. Y.

### Products.

Original owners and sole manufacturers of the FLUSHOMETER, the original of this type of valve.

IONIA WATER CLOSETS, URINALS, and high class PLUMBING FIXTURES.

This company has no connections whatever with any other Kenney or Kenny or Kennedy companies.

### Flushometer.

The Flushometer fulfills the modern demand for an efficient sanitary device for the operation of flushing a water closet or urinal under any water pressure.

Over 160,000 in steady use, many in continuous service from 16 to 20 years, meet best of references for satisfaction and low maintenance.

FEATURES—The following features are embodied in the 1907 model Flushometer.

It stops the roaring and hissing noise of water running into the bowl. Noiseless operation is thus assured with its installation.

No tank is necessary. Water is supplied from street main direct, on same supply as other fixtures.

It can be regulated by anyone. It prevents the waste of water and possible flooding.

### Literature.

Pamphlets containing illustrations of Flushometer combinations and sectional view giving names of the component parts of the Flushometer mailed on request.

TRADE  
**FLUSHOMETER**  
MARK

### References.

A partial list of buildings equipped with Flushometers, also the number of devices installed, follows:

Hotel Ansonia, New York, N. Y.	550
Canadian Pacific Railway Depot, Montreal and Hotels, some	500
Pennsylvania Railroad, Philadelphia, Pa.	400
King Edward Hotel, Toronto, Canada	400
St. Francis Hotel, San Francisco, Cal.	400
New City Prison, New York, N. Y.	378
Prudential Life Insurance, Newark, N. J.	322
Robert Treat Hotel, Newark, N. J. (new)	320
Fifth Avenue Building, New York, N. Y.	307
Broad Exchange Building, New York, N. Y.	282
Hotel Imperial, New York, N. Y.	275
U. S. Custom House, New York, N. Y.	265
Macy Building, New York, N. Y.	242
U. S. Express Building, New York, N. Y.	194
Hotel Majestic, Philadelphia, Pa.	187
Youngs Hotel, Honolulu, Hawaii	180
Hotel Manhattan, New York, N. Y.	177
Wall Street Exchange Building Assn., New York, N. Y.	177
U. S. Treasury Building, Washington, D. C.	136
Chalfonte Hotel, Atlantic City, N. J.	126
New York Produce Exchange, New York, N. Y.	117
Lying-in Hospital, New York, N. Y.	111
U. S. Naval Academy, Annapolis, Md.	109
Hotel Aldine, Philadelphia, Pa.	109
Hotel Gregorian, New York, N. Y.	107
Hotel Dennis, Atlantic City, N. J.	106
Pittsburgh, Lake Erie & Western Depot, Pittsburgh, Pa.	106
U. S. Mint, Philadelphia, Pa.	99
U. S. Geological Survey, Washington, D. C.	97
Tiffany Building, New York, N. Y.	96
Strawbridge & Clothier, Philadelphia, Pa.	90
Importers & Traders Building, New York, N. Y.	85
State Capitol, Providence, R. I.	80
Central R.R. of N. J., Liberty St. Ferry, New York, N. Y.	78
Standard Oil Building, New York, N. Y.	65
Hudson Building, New York, N. Y.	56
Union Trust Company, Providence, R. I.	56
Hotel McAlpin, New York, N. Y., new addition	25



SIPHON JET VITREOUS WATER CLOSET WITH  
FLUSHOMETER

Plate 101. Patented "Ionia," plain, hardwood seat and lid



VITREOUS URINAL WITH FLUSHOMETER

Plate 400. Patented siphon jet urinal; trap combined in earthenware with brass wall waste outlet



# THOMAS MADDOCK'S SONS CO.

Manufacturers of Vitreous China Sanitary Plumbing Fixtures

TRENTON, N. J.

## Products.

A complete line of improved VITREOUS CHINA SANITARY PLUMBING FIXTURES.

## Advantages.

"Maddock's" vitreous china sanitary ware is a solid white china product, non-absorbent throughout, and covered with an absolutely impervious transparent glaze, which is applied to the vitreous chinaware and subjected in our kilns to so intense a heat as to chemically amalgamate all substances used, thereby assuring the most sanitary product, of the greatest consistency and durability.

Vitreous china plumbing fixtures can not become discolored through usage, and are kept clean with but ordinary attention, the glaze permanently maintaining its lustrous gloss.

## Utility.

"Maddock's" white vitreous china sanitary plumbing fixtures are used in bathrooms, toilets, kitchens, pantries, laboratories, operating rooms, etc. In construction they meet the requirements of all plumbing codes, and also conform in design to architectural ideas as to style and adaptability.

## Official Indorsement.

"Maddock's" white vitreous china meets the requirements of all government, state and municipal bodies throughout the United States.

## Provisions in Plans.

Complete measurements are given in connection with each illustration. Roughing-in measurements of water closets are given on page 842.

## Distribution.

Goods are carried in stock by plumbing supply houses, in addition to those in the extensive warerooms at the pottery.

## Facilities.

This company has the largest unit sanitary pottery plant in the United States, with a capacity of 16 kilns operating under a systematized management, with offices in the manufacturing plant and at New York, Chicago, St. Louis and San Francisco.



TRADE-MARK

The owners give personal attention to every order and shipment, no matter of what size, assuring competent service in every detail.

All goods are carefully packed by the most experienced men, and railroad spurs extending into the yards insure quick and accurate shipments to all points.

## Special Features.

All "Madbury" lavatories are furnished with the integral supply feature.

All "Ariston" and "Madera" closets are also made in the juvenile 13-in. height, having, however, the same roughing-in measurements as the regular "Ariston" and "Madera" closet.

## Prices.

Plumbing contractors and plumbing supply houses throughout the United States can immediately furnish estimates and quote prices on all fixtures illustrated in this catalogue. However, the prices shown in this section will give an approximate idea of the cost to consumer. Plate numbers are identical with those in our trade catalogues, which are extensively distributed, thus providing immediate service when required.

## Specifications.

Complete specification wording is given with every fixture illustrated herein.

## Guarantee.

This company manufactures but one grade of goods. The "Anchor" trade-mark is stamped under the glaze on all fixtures—a guarantee of quality that THOMAS MADDOCK'S SONS CO. has lived up to for more than 58 years.

## Consequential Damages.

Any goods proving defective in use because of manufacturing defects will be replaced, but no claim for labor or damages will be allowed.

## References.

The company refers to reputable plumbing supply houses and plumbing contractors who have purchased and installed "Maddock's" goods for more than 58 years.



MADBURY, PLATE GS-2000

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl, hooded overflow, antisplash rim, plain square pedestal and nickelplated brass wall brackets. Fitted with compression supply valves with china cross arm handles and escutcheons, and pop-up waste fixture with china knob and escutcheon. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

DIMENSIONS			
Lavatory slab, ins.	20 x 24	22 x 28	24 x 32
Bowl, ins.	16 x 12 x 6	18 x 13 x 6	18 x 13 x 6

LIST PRICES			
Complete as specified, less trap and supply pipes.	\$56.00	\$69.72	\$86.99



MADRID, PLATE GS-2003

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory; size (see below), with hooded overflow, antisplash rim, plain square pedestal and nickelplated brass wall brackets. Fitted with nickelplated brass combination supply and pop-up waste fixture with china knob; compression supply valves with china cross arm handles and escutcheons. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

DIMENSIONS			
Lavatory slab, ins.	20 x 24	22 x 28	24 x 30
Bowl, ins.	16 x 12 x 6	16 x 12 x 6	18 x 12 x 6

LIST PRICES			
Complete as specified, less trap and supply pipes.	\$71.20	\$87.27	\$92.00
Lavatory slab only, no fittings.	36.00	52.07	56.80
Hooded overflow.			
Pedestal only.			



MADRID, PLATE GS-2200

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory; size (see below), with hooded overflow, antisplash rim, vitreous china leg and rod and nickelplated brass wall brackets. Fitted with pop-up waste fixture with china knob and escutcheon and nickelplated brass compression faucets with china cross arm handles. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

DIMENSIONS	
Lavatory slab, ins.	20 x 24
Bowl, ins.	16 x 12 x 6

LIST PRICES	
Complete as specified, less trap and supply pipes.	\$45.71
Lavatory slab only, no fittings.	28.00
Hooded overflow.	
Vitreous leg with rod.	



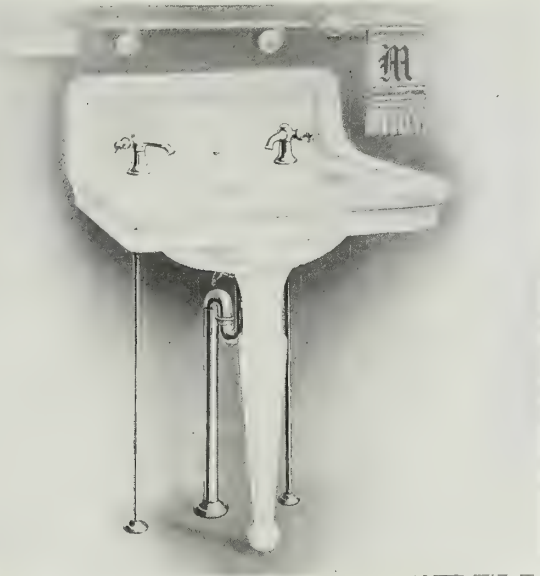
MADBURY, PLATE GS-2201

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl, hooded overflow, antisplash rim, vitreous china leg and rod with nickelplated brass wall brackets. Fitted with compression supply valves with china cross arm handles and escutcheons and pop-up waste with china knob and escutcheons. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

DIMENSIONS		
Lavatory slab, ins.	18 x 20	20 x 24
Bowl, ins.	14 x 10 x 6	16 x 12 x 6

LIST PRICE		
Complete as specified, less trap and supply pipes	\$42.00	\$48.00

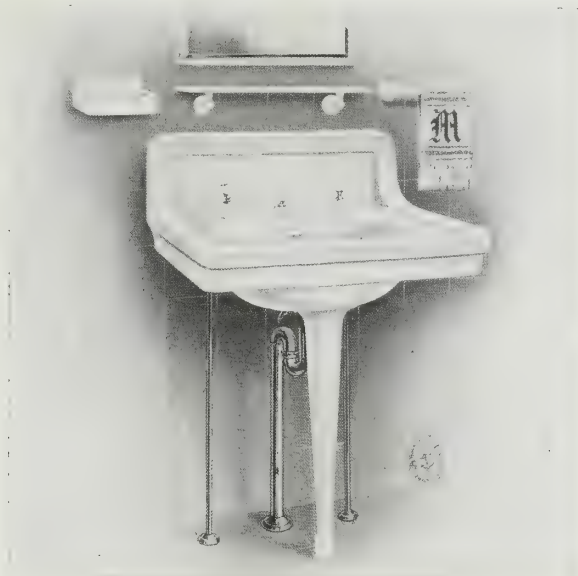




MADRID, PLATE GS-2203

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory, with 6-in. integral back and concealed hangers; size (see below), with hooded overflow, antisplash rim and vitreous china leg with rod. Fitted with pop-up waste fixture with china knob and escutcheon and nickelplated brass Fuller faucets with china handles. Nickelplated brass supply pipes to floor and nickelplated brass waste trap to floor.

DIMENSIONS		
Lavatory slab, ins.	20 x 24	
Bowl, ins.	16 x 12 x 6	
LIST PRICES		
Complete as specified, less trap and supply pipes.	\$59.05	
Lavatory slab only, no fittings.	38.70	
Hooded overflow.		
Vitreous leg with rod.		



MADBURY, PLATE GS-2204

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory, with 6-in. integral back and concealed hanger; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl, hooded overflow, antisplash rim and vitreous china leg and rod. Fitted with compression supply valves with china cross arm handles and escutcheons and pop-up waste with china knob and escutcheon. Nickelplated brass supply pipes to floor and nickelplated brass waste trap to floor.

DIMENSIONS		
Lavatory slab, ins.	20 x 24	
Bowl, ins.	16 x 12 x 6	
LIST PRICE		
Complete as specified, less trap and supply pipes.	\$56.22	

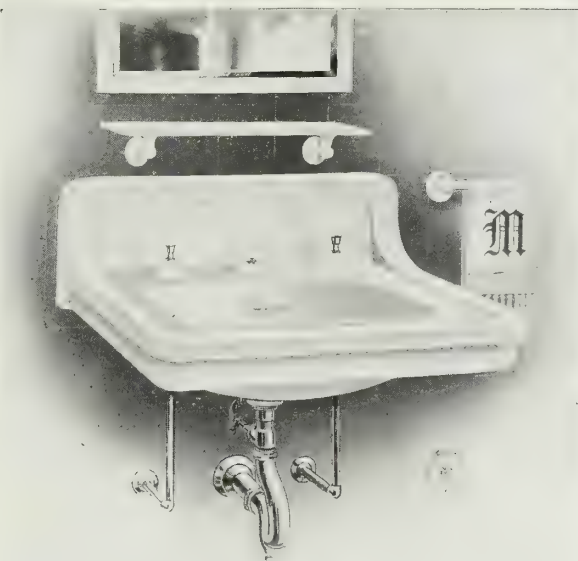


MADRID, PLATE GS-2230

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory, with hooded overflow and antisplash rim; size (see below), on galvanized iron standard. Fitted with nickelplated brass compression faucets with china indexed handles and nickelplated brass 1¼-in. outlet plug with nickelplated brass chain stay and rubber stopper.

NOTE—Specify number desired in battery.

DIMENSIONS		
Lavatory slab, ins.	18 x 20	20 x 24
Bowl, ins.	16 x 12 x 6	16 x 12 x 6
LIST PRICES		
Complete as specified.	\$139.32	\$164.44



MADBURY, PLATE GS-2403

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory, with 6-in. integral back and concealed hanger; size (see below), with integral supply nozzle, cleansing overflow feature, square bowl, hooded overflow and antisplash rim. Fitted with compression supply valves with china cross arm handles and escutcheons and pop-up waste with china knob and escutcheon. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

DIMENSIONS		
Lavatory slab, ins.	20 x 24	
Bowl, ins.	16 x 12 x 6	
LIST PRICE		
Complete as specified, less trap and supply pipes.	\$51.20	



MADRID, PLATE GS-2407

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Lavatory, with 6-in. integral back and concealed hangers; size (see below), with antisplash rim. Fitted with pop-up waste fixture with china knob and escutcheon and nickelplated brass compression faucets with china indexed handles. Nickelplated brass supply pipes to wall and nickelplated brass waste trap to wall.

## DIMENSIONS

Lavatory slab, ins.	18 x 20
Bowl, ins.	14 x 10 x 6

## LIST PRICES

Complete as specified, less trap and supply pipes.	\$34.10
Lavatory slab only, with antisplash rim and concealed hangers no fittings.	20.35



MADENTA, PLATE GS-2451

How to SPECIFY—"Maddock's" White Vitreous China Straight Front Dental Lavatory, with 5-in. integral back and concealed hangers with integral supply nozzle; size, 14 x 13 ins. Fitted with compression supply valves with china cross arm handles and escutcheons, waste plug provided with loose china grid instead of stopper.

NOTE—This fixture is especially useful in that it overcomes the unsanitary conditions caused by washing the teeth in the regular lavatory. Can also be used to advantage, in small first-floor toilet rooms.

## DIMENSIONS

Lavatory slab, ins.	14 x 13
Bowl, ins.	9½ x 7½ x 4½

## LIST PRICE

Complete as specified, less trap and supply pipes.	\$29.70
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MADORIAN, PLATE GS-2800

How to SPECIFY—"Maddock's" White Vitreous China Pedestal Drinking Fountain; height (see below), with vitreous china bubbling cup. Fitted with ¾-in. supply and 1¼-in. waste fixture, inside of pedestal, with loose key stop and self-closing valve on side.

## DIMENSIONS

Height, ins.	26	30	36
Diameter of base, ins.	14½	14½	14½
Diameter of top, outside, ins.	11	11	11

## LIST PRICES

Complete as specified.	\$40.80	\$40.80	\$46.30
Pedestal fountain only, no fittings.	21.56	21.56	25.96



MADOLA, PLATE GS-2806

How to SPECIFY—"Maddock's" White Vitreous China Wall Hanging Drinking Fountain; size, outside diameter of bowl, 12 ins., projection from wall, 15 ins., extreme height on wall, 9 ins.; with integral housing for fittings and vitreous china bubbling cup. Fitted with ¼-in. supply and 1-in. waste fixture with trap; supply controlled by loose key stop and self-closing valve with china oscillating handle.

## LIST PRICES

Complete as specified.	\$31.90
Fountain only, no fittings.	11.77
Vitreous china bubbling cup only.	1.65





MADelta, PLATE GS-2828

How to Specify—"Maddock's" White Vitreous China Flushing Rim Pedestal Bidet Pan; height 15 ins., with fixture shelf and integral supply nozzle in rim. Fitted with nickelplated brass 1¼-in. pop-up waste fixture with china knob; 1¼-in. (outside dimensions) tail piece; hot and cold compression supply valves with china cross arm handles and metal escutcheons. Less trap and supply pipes.

For roughing-in measurements, see page 842.

DIMENSIONS	
Length over all, ins.	23
Width, ins.	14½
Opening of bowl, ins.	15

LIST PRICE	
Complete as specified, less trap and supplies.	\$33.66



MADet, PLATE GS-2829

How to Specify—"Maddock's" White Vitreous China Flushing Rim Pedestal Bidet Pan; height 15 ins., with douche and fixture shelf. Fitted with nickelplated brass 1¼-in. pop-up waste fixture with china knob; 1¼-in. (outside dimensions) tail piece; hot and cold compression supply valves to douche, and hot and cold compression supply valves to rim; supply valves fitted with china cross arm handles and china escutcheons. Less trap and supply pipes.

For roughing-in measurements, see page 842.

DIMENSIONS	
Length over all, ins.	25
Width, ins.	14½
Opening of bowl, ins.	15½

LIST PRICE	
Complete as specified, less trap and supplies.	\$49.50



ARISTON, PLATE GS-2900

How to Specify—"Maddock's" White Vitreous China Silent Action Siphon Jet Closet, with extended top inlet and floor outlet, 2-in. brass spud, extended front lip, and cut-back rim, flushed all the way around. Height 14½ ins.; opening of bowl 16 ins.; water surface 14 x 10 ins.; sanitary rim with 1¼-in. downward projection inside of bowl; water seal 3 ins. and trap opening conforming with government specifications. White celluloid-covered saddled seat, no cover, open front and back, with heavy nickelplated brass bar hinge. One-piece white vitreous china flush pipe cover and white vitreous china bolt caps. White vitreous china swelled front low down tank with underpull lever.

For roughing-in measurements, see page 842.

LIST PRICES	
Combination complete as specified.	\$64.76
Closet only.	21.20
Tank only with fittings, GS-3104.	28.38
White vitreous china flush pipe cover.	2.20
White celluloid-covered seat.	12.10



ARISTON, PLATE GS-2905

How to Specify—"Maddock's" White Vitreous China Silent Action Siphon Jet Closet, with 1½-in. brass spud, side inlet and floor outlet, extended front lip and cut-back rim, flushed all the way around. Height 14½ ins., opening of bowl 16 ins.; water surface 14 x 10 ins.; sanitary rim with 1¼-in. downward projection inside of bowl; water seal 3 ins., and trap opening conforming with government specifications. Genuine mahogany saddled seat, no cover; open front and back with heavy nickelplated brass bar hinge; white vitreous china bolt caps and nickelplated brass flushing valve.

For roughing-in measurements, see page 842.

LIST PRICES	
Complete as specified.	\$57.53
Closet only.	23.20
Seat only.	11.22



MADERA, PLATE GS-3001

**HOW TO SPECIFY**—"Maddock's" White Vitreous China Siphon Jet Closet, with extended top inlet, floor outlet and 2-in. brass spud. Height 15 ins., opening of bowl 12 ins., water surface  $12\frac{1}{2}$  x 11 ins., trap opening  $2\frac{1}{2}$  ins., water seal 3 ins. Genuine mahogany saddled seat and cover with heavy nickelplated brass bar hinge; white vitreous china bolt caps. White vitreous china swelled front low-down tank with underpull lever.

For roughing-in measurements, see page 842.

## LIST PRICES

Combination complete as specified.....	\$53.17
Closet only.....	17.86
Tank only, with fittings, GS-3104.....	27.06
Seat only.....	8.25

MADISON, PLATE GS-3017  
Also furnished with lip, GS-3018

**HOW TO SPECIFY**—"Maddock's" White Vitreous China Reversed Trap Siphon Action Closet with back inlet, floor outlet and 2-in. brass spud. Height 15 ins., opening of bowl 12 ins., water surface 10 x 8 ins., water seal 3 ins. Birch mahogany seat and cover with heavy nickelplated brass bar hinge; white vitreous china bolt caps. White vitreous china straight front low-down tank with rounding corners with top side lever.

For roughing-in measurements, see page 842.

## LIST PRICES

Combination complete as specified.....	\$40.92
Closet only.....	11.66
Tank only, with fittings, GS-3110.....	23.76
Seat only.....	5.50
Closet only, with lip.....	15.18

**NOTE**—This closet can also be furnished with jet.



MADERNO, PLATE GS-3023

**HOW TO SPECIFY**—"Maddock's" White Vitreous China Siphon Action Washdown Closet, with back inlet, extended heel outlet and 2-in. brass spud. Height 15 ins., opening of bowl, 13 ins., water surface, 7 x 7 ins., sanitary rim with  $1\frac{1}{4}$  in. downward projection inside of bowl and 3-in. water seal. Special birch mahogany saddle seat and cover with concealed post hinge. White vitreous china bolt caps and 4 closet screws. G-3111 Madera vitreous china straight front low-down tank and cover with rounding corners; capacity  $6\frac{1}{2}$  gals. Fitted with double acting top side lever with china handle, elevated ball cock, standard pattern flush valve with  $1\frac{1}{4}$ -in. overflow tube, 4 x 5-in. solderless copper float,  $\frac{3}{8}$ -in. No. 11-gauge nickel-plated brass supply pipe and nickelplated brass flush connection.

**NOTE**—This closet combination is always sold complete—closet, seat and tank, as described above.

For roughing-in measurements, see page 842.

## LIST PRICES

Combination complete as specified.....	\$38.00
Combination complete as specified, with white seat and cover.....	46.70



MADAWAN, PLATE GS-3030

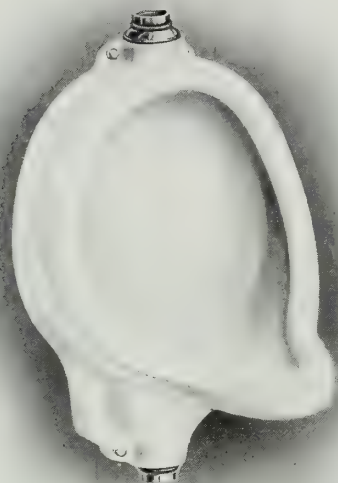
**HOW TO SPECIFY**—"Maddock's" White Vitreous China Extra Heavy Hopper and Trap, with back inlet, floor outlet,  $1\frac{1}{2}$ -in. brass spud and integral china seat. Height 15 ins., opening of bowl  $10\frac{1}{2}$  ins., water surface  $5\frac{1}{2}$  x  $5\frac{1}{2}$  ins., water seal  $2\frac{1}{2}$  ins. Weight 59 lbs. White vitreous china 8-gal. high-up tank with pull fittings and china handle.

For roughing-in measurements, see page 842.

## LIST PRICES

Combination complete as specified.....	\$48.03
Closet only, as shown.....	17.93
Closet only, with seat attachment.....	15.73
Tank only, with fittings, GS-3115.....	30.10





MADESTA, PLATE GS-3200

HOW TO SPECIFY—"Maddock's" White Vitreous China Flat Back Siphon Jet Urinal; size (see below), with lip and flushing rim, top inlet and bottom outlet. Fitted with nickelplated brass 1-in. inlet and 2-in. outlet spuds.

DIMENSIONS

	No. 1
Top of inlet spud to bottom of outlet spud, ins.....	23
Width over all, ins.....	14 <sup>3</sup> / <sub>4</sub>
Wall to front of lip, ins.....	14 <sup>1</sup> / <sub>4</sub>

LIST PRICES

Complete as specified.....	\$20.90
Urinal only.....	18.92



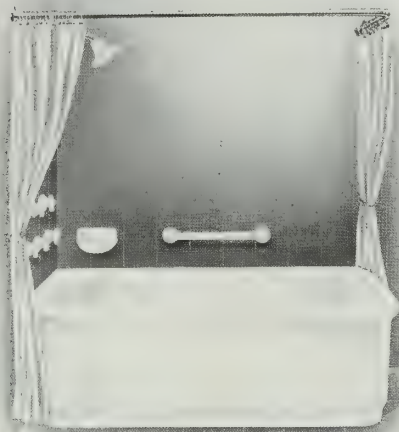
MADSTONE, PLATE GS-3210

HOW TO SPECIFY—"Maddock's" White Vitreous China Siphon Jet Pedestal Urinal, with back inlet, floor outlet and 1<sup>1</sup>/<sub>2</sub>-in. brass spud; high back, extended front lip and flushing rim. Dimensions: floor to top of back 32 ins., floor to top lip of 24 ins., opening of bowl 18<sup>1</sup>/<sub>2</sub> ins., face of spud to front of lip 21 ins., water surface 6 x 6 ins., water seal 3 ins., trap opening 2 ins. White vitreous china bolt caps and white vitreous china 6-gal. high-up tank with automatic fittings.

NOTE—The action of the "Madstone" urinal is the same as that of the modern siphon jet closet, which feature with the large trap opening easily disposes of the refuse that finds its way into the ordinary urinal. The connection to the soil pipe is made the same as that of a regular closet. This urinal is also made with top inlet and juvenile height.

LIST PRICES

Complete as specified.....	\$53.20
Urinal only, including 1 <sup>1</sup> / <sub>2</sub> -in. brass spud.....	27.06
Tank only, with fittings, GS-3115.....	26.14



PORNER, PLATE GS-5015

HOW TO SPECIFY—"Maddock's" White Porcelain Light Weight Bath, with integral base and square end; to tile in back, end and floor, in right or left hand corner ("A" or "B" quality); size (see below), end outlet. All exposed surfaces glazed. Fitted with concealed combination supply and standing waste fixture with 1<sup>1</sup>/<sub>2</sub>-in. outside dimension tail piece on waste and 1/2-in. supply valves; waste and supply valves having china cross arm handles and escutcheons on front of wall. Shower with 1/2-in. built-in compression valves with china cross arm handles and escutcheons on front of wall; bent arm and 4<sup>1</sup>/<sub>2</sub>-in. white vitreous china shower head; nickelplated brass curtain holder with 2 white duck curtains with snaps and holdback hooks.

DIMENSIONS

	5 ft.	5 ft. 6 ins.
Length outside.....	31 ins.	31 ins.
Width outside.....	17 ins.	17 ins.
Depth inside.....		

LIST PRICES

Complete as specified, "A" quality.....	\$231.55	\$242.55
Complete as specified, "B" quality.....	198.55	206.25

NOTE—This tub can be furnished with bottom outlet whenever specified and takes the same price and measurements as the end outlet.



MADIATOR, PLATE GS-3310

HOW TO SPECIFY—"Maddock's" White Vitreous China Slop Sink, with 13-in. integral back; size 18 x 22 ins., depth of sink 10 ins.; vitreous china wall outlet trap standard with clean-out plug, nickelplated brass outlet strainer and plug connecting sink and trap standard, nickelplated compression faucets with china indexed handles.

LIST PRICES

Complete as specified.....	\$78.21
Sink only, no fittings.....	51.26
Vitreous pedestal trap only, with nickelplated brass clean-out plug.....	12.32



PORPAN, PLATE GS-5035

HOW TO SPECIFY—"Maddock's" White Porcelain Straight Front Roll Rim Pantry Sink, with 2 integral drainboards and 10-in. integral back and 2 porcelain legs with white enamel painted straps to wall ("A" and "B" quality); size, length, 50 ins., depth inside, 7½ ins., width inside, 15 ins. Fitted with heavy nickelplated brass quick compression faucets with china lever handles with shut-off, threaded ¾-in. iron pipe, female; nickelplated brass outlet plug with strainer top arranged for 1½-in. brass trap.

LIST PRICES

Complete as specified, less trap, "A" quality.....	\$103.40
Complete as specified, less trap, "B" quality.....	77.44



PORTRAY, PLATE GS-5055

HOW TO SPECIFY—"Maddock's" White Porcelain All Roll Rim Laundry Tub, battery of 3, and white enamel painted iron legs, with white enamel painted straps to wall ("A" or "B" quality); size (see below). Fitted with nickelplated brass compression faucets with ½-in. galvanized iron piping, necessary to supply each tub with hot and cold water, nickelplated brass plug with stopper.

NOTE—The above tubs may also be furnished with white porcelain legs in place of white enamel painted iron legs.

DIMENSIONS

Tub outside, ins.....	2	x 24	26 x 30	24 x 36
Depth, ins.....	17		17	17
Depth inside, ins.....	15½		15½	15½

LIST PRICES

Complete as specified, less trap, "A" quality....	\$123.10	\$132.00	\$188.43
Complete as specified, less trap, "B" quality....	100.52	107.05	151.80

**Complete Roughing-in Measurements Covering "Maddock's" Vitreous China Water Closets.**

These measurements will be found of great value in determining the application of fixtures; especially where sizes of wall and rooms are settled, or where alteration work is being done and it is desirable to replace old fashioned closets with the modern, improved fixtures, as illustrated in this catalogue. These measurements are subject to very slight changes because of variations in firing, and are guaranteed only on goods ordered during 1918.

PLATE GS-2828 PAGE 839

Height of bidet.....	15"
Width of bidet.....	14½"
Length over all.....	23"
Center to center of supplies.....	8"
Center of supplies to back of shelf.....	21"
Center of supplies to center of outlet.....	2½"

PLATE GS-2829 PAGE 839

Height of bidet.....	15"
Width of bidet.....	14½"
Length over all.....	25"
Center to center of supplies.....	8"
Center of supplies to back of shelf.....	4½"
Center of supplies to center of outlet.....	2"

PLATE GS-2900 PAGE 839

Height of closet.....	14½"
Center of inlet to center of outlet.....	8"
Center of inlet to center of seat attachment.....	6"
Center of seat attachment to front of rim.....	19"
Center to center of seat attachment.....	5½"
Outside width of rim.....	14"

PLATE GS-2905 PAGE 839

Height of closet.....	14½"
Center of side inlet to center of outlet.....	1½"
Center of seat attachment to front of rim.....	19"
Center to center of seat attachment.....	5½"
Outside width of rim.....	14"

PLATE GS-3001 PAGE 840

Height of closet.....	15"
Center of inlet to center of outlet.....	6½"
Center of inlet to center of seat attachment.....	6"
Center of seat attachment to front of rim.....	16½"
Center to center of seat attachment.....	5½"
Outside width of rim.....	13½"

PLATE GS-3017 PAGE 840

Height of closet.....	15"
Center of outlet to face of inlet spud.....	4½"
Center of seat attachment to front of rim.....	16½"
Center to center of seat attachment.....	5½"
Outside width of rim.....	14"

PLATE GS-3018 PAGE 840

This is Plate GS-3017 with Lip

Height of closet.....	15"
Center of outlet to face of inlet spud.....	4½"
Center of seat attachment to front of lip.....	18"
Center to center of seat attachment.....	5½"
Outside width of rim.....	13½"

PLATE GS-3023 PAGE 840

Height of closet.....	15"
Center of outlet to face of inlet spud.....	3½"
Center of seat attachment to front of rim.....	17½"
Center to center of seat attachment.....	5½"
Outside width of rim.....	13½"

PLATE GS-3030 PAGE 840

Height of closet.....	16½"
Center of outlet to face of inlet spud.....	10½"
Face of spud to front of rim.....	19½"
Outside width of rim.....	15"



# THE MONUMENT POTTERY COMPANY

TRENTON, N. J.

## Products.

MONUMENT PORCELAIN BATHTUBS, LAVATORIES, KITCHEN SINKS, LAUNDRY TRAYS, URINALS, etc.; VITREOUS CHINA LAVATORIES, DRINKING FOUNTAINS.

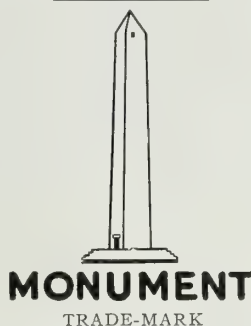
"Vitrico" Urinals and Sinks; Vitreous China Water Closet Bowls and Tanks.

## Facilities.

We own and operate the largest individual sanitary pottery in the United States with a capacity of 24 kilns, and other most modern equipment.

## Distribution.

Our goods are handled by plumbing supply houses throughout the United States.



## Prices.

Plumbing contractors may obtain prices on our goods from any supply house with whom they deal. List prices only are given in this catalogue.

## Trade-mark.

All Monument goods are trade-marked with label as shown on this page. Look for our imprint in the ware.

## Special Note.

This catalogue, while not by any means complete, represents a line of high grade goods designed to meet the requirements of the average modern building.



PLATE M-1700. "TRAYMORE" MONUMENT PORCELAIN CORNER BATH

Glazed white inside and outside; fitted with combination bell supply and waste fixture with hot and cold compression supply valves, and waste handle through wall, with all china handles and escutcheons. Bath is made for right or left corner as desired or to set into a recess.

Sizes			List Prices, Bathtubs Only	
Length over all	Width over all	Depth inside	"A" Quality	"B" Quality
5 ft.	31 ins.	17 ins.	\$100.00	\$70.00
5 ft. 6 ins.	31 ins.	17 ins.	110.00	77.00

List price, supply and waste fixture as above shown and described for all sizes of baths, \$30.00

If exposed nickelplated fixtures are desired, bath can be furnished upon specification.



PLATE M-1790. "TRAYCOVE" MONUMENT PORCELAIN RECESS BATH

Glazed white inside and outside; fitted with combination bell supply, and waste fixture with hot and cold compression supply valves, and waste handle through wall, with all china handles and escutcheons. Bath is made for fittings at right- or left-hand end as well as at back wall.

Sizes			List Prices, Bathtubs Only	
Length over all	Width over all	Depth inside	"A" Quality	"B" Quality
5 ft.	31 ins.	17 ins.	\$90.00	\$63.00
5 ft. 6 ins.	31 ins.	17 ins.	100.00	70.00

List price, supply and waste fixture as above shown and described for all sizes of baths, \$30.00



PLATE M-1775. "STUYVESANT" MONUMENT PORCELAIN CORNER BATH

Glazed white inside and outside; fitted with specially designed nickelplated brass concealed combination bell supply and waste fixture, with china handle on waste, and all china handles on hot and cold supply valves. Bath is made for right or left corner as desired. This bath is also made for fittings at exposed end.

Sizes			List Prices	
Length over all	Width over all	Depth inside	"A" Quality	"B" Quality
5 ft.	32 ins.	19 ins.	\$140.00	\$98.00
5 ft. 6 ins.	32 ins.	19 ins.	150.00	105.00
6 ft.	32 ins.	19 ins.	170.00	119.00

List price supply and waste fixture as above shown and described for all sizes of baths, \$30.00



PLATE M-1910. MONUMENT PORCELAIN SHOWER RECEPTOR

Glazed white inside and outside; specially designed for use with marble, glass or tile shower stall.

Sizes		List Prices, Receptor Only	
Over all outside	Height outside	"A" Quality	"B" Quality
36x36 ins.	8 ins.	\$75.00	\$52.50
42x42 ins.	8 ins.	110.00	77.00

List price, outlet strainer and floor flange for all sizes, \$6.00



PLATE M-2020. "POTOMAC" MONUMENT VITREOUS CHINA LAVATORY

Lavatory with open overflow supported by iron concealed wall hanger, and fitted with nickelplated combination supply and pop-up waste; fitted with 1½-in. nickelplated brass waste trap to wall.

Sizes	List Prices, Lavatory Only
20x18 ins. with 6-in. integral back.....	\$14.00
24x20 ins. with 6-in. integral back.....	23.00
List price, on the nickelplated combination supply and pop-up waste fitting for all sizes.....	\$12.00
1½-in. waste trap.....	3.45



PLATE M-2050. "MOHICAN" MONUMENT SOLID PORCELAIN LAVATORY ON SOLID PORCELAIN PEDESTAL

Fitted with combination supply and pop-up waste fitting.

List Prices		List Prices	
Sizes	Lavatory and Pedestal	Sizes	Lavatory and Pedestal
24x21 ins. "A" \$32.00 "B" \$22.40		30x24 ins. "A" \$40.00 "B" \$28.00	
27x22 ins. "A" 36.00 "B" 25.20		33x24 ins. "A" 46.00 "B" 32.20	



PLATE M-2000. "BLACKSTONE" MONUMENT VITREOUS CHINA LAVATORY ON VITREOUS CHINA PEDESTAL

Fitted with nickelplated combination supply and pop-up waste fitting.

List Prices		List Prices	
Sizes	Lavatory and Pedestal	Sizes	Lavatory and Pedestal
24x20 ins. \$28.00		28x22 ins. \$37.50	
26x22 ins. 33.00		30x24 ins. 41.50	



PLATE M-2010. "DELPHIA" MONUMENT VITREOUS CHINA LAVATORY ON VITREOUS CHINA LEG

Lavatory with open overflow fitted with nickelplated combination supply and pop-up waste fitting.

List Prices	
Sizes	Lavatory and Leg Only
20x18 ins. with 6-in. integral back.....	\$18.00
24x20 ins. with 6-in. integral back.....	27.00
26x22 ins. with 6-in. integral back.....	33.00





PLATE M-2430. MONUMENT SOLID PORCELAIN INTEGRAL BACK KITCHEN SINK AND LAUNDRY TRAY

Glazed white, supported on one pair solid porcelain legs with wall straps. Length over all, 50 ins.; wall to front over all, 22 ins.; back, 6 ins. high; size of sink, 20x15 ins.

List price, sink and legs only, Class "A" \$72.00, Class "B" \$48.40

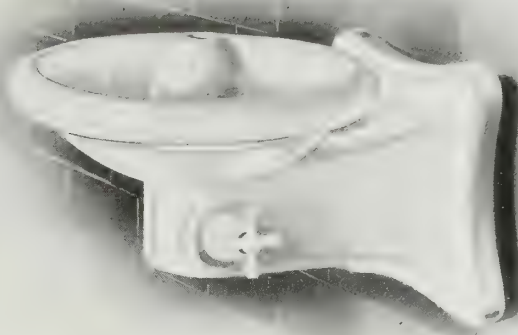


PLATE M-2500. "MANITOU" MONUMENT VITREOUS CHINA DRINKING FOUNTAIN

With vitreous bubbling cup; concealed iron hanger; concealed brass waste and supply connections and nickelplated self-closing stop. Diameter of bowl, 9½ ins.; wall to front, 13 ins.; back, 9 ins. high.

List price, complete as described, \$25.00

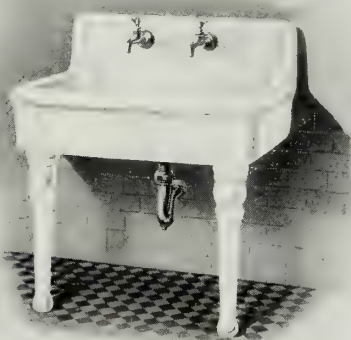


PLATE M-2250. MONUMENT PORCELAIN KITCHEN SINK WITH INTEGRAL BACK

Supported on one pair solid porcelain legs and wall straps.

List Prices, Sink Only

Sizes	Height back	"A" Quality	"B" Quality
24x22 ins.	9 ins.	\$24.00	\$14.80
27x22 ins.	9 ins.	28.00	19.50
27x26 ins.	9 ins.	30.00	21.00
30x22 ins.	9 ins.	30.00	21.00
30x26 ins.	9 ins.	35.00	24.50
36x26 ins.	9 ins.	40.00	28.00
42x26 ins.	9 ins.	45.00	31.50
48x26 ins.	9 ins.	65.00	45.50

Porcelain legs and straps, per pair, "A" quality \$12.00, "B" quality \$8.40

Regular height of rim to floor, 32 ins.; other heights if desired.

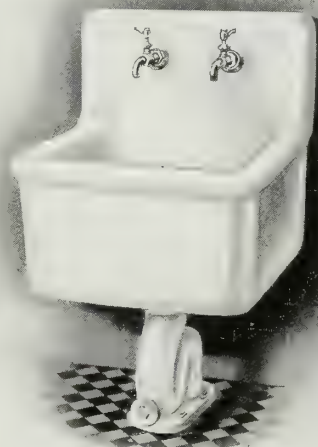


PLATE M-2400. MONUMENT PORCELAIN SLOP SINK

Slop sink set upon iron pedestal trap standard and fitted with nickelplated bibbs and nickelplated waste strainer.

List Prices, Sink Only

Sizes	Height back	"A" Quality	"B" Quality
20x18 ins.	12 ins.	\$21.00	\$14.70
22x20 ins.	12 ins.	26.00	18.20
24x22 ins.	12 ins.	31.00	21.70

	List Price
Iron trap.....	\$12.00
Nickelplated waste strainer.....	5.00
Nickelplated cocks, per pair.....	4.50

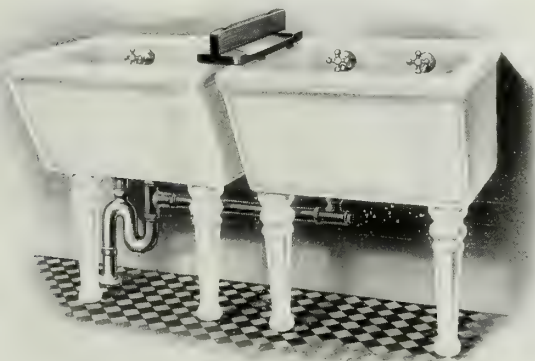


PLATE M-2325. MONUMENT PORCELAIN ALL ROLL RIM LAUNDRY TUBS

		List Prices Each, Tub Only	
Sizes	Depth inside	"A" Quality	"B" Quality
24x24 ins.	15 ins.	\$19.00	\$13.30
26x24 ins.	15 ins.	20.00	14.00
30x26 ins.	15 ins.	21.00	14.70
36x26 ins.	15 ins.	35.00	25.75

Porcelain legs and straps, per pair, "A" quality \$9.00, "B" quality \$6.30

List price, wringer bases, each, \$7.00

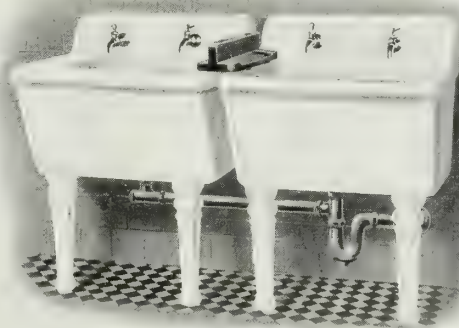


PLATE M-2300. MONUMENT PORCELAIN INTEGRAL BACK LAUNDRY TUBS

Sizes	Depth inside	Height back	List Prices Each, Tub Only
			"A" Quality      "B" Quality
26x26 ins.	15 ins.	6 ins.	\$32.00      \$22.40
30x26 ins.	15 ins.	6 ins.	36.00      25.20
36x26 ins.	15 ins.	6 ins.	40.00      28.00

Porcelain legs with straps, per pair, "A" quality \$9.00; "B" quality \$6.30

	List Price
Wringer bases, each.....	\$7.00
Nickelplated laundry tub cocks, per pair.....	4.50
Nickelplated continuous waste with plug for two tubs.....	12.50
Nickelplated trap to floor.....	5.50

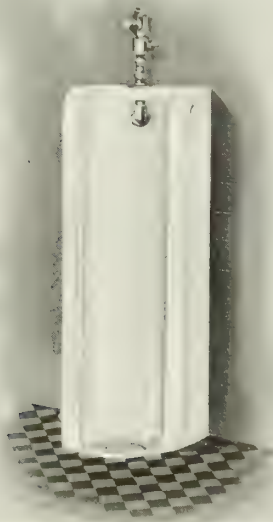


PLATE M-2618. "CONSERVOR" MONUMENT PORCELAIN URINAL STALL WITH paneled sides

Glazed all over; fitted with nickelplated competition self-closing flush valve, loose key shut-off valve; nickelplated inlet connection and spreader; nickelplated and vitreous china outlet strainer with floor connection.

Width, 15 ins.; over all height, 40 ins.; above floor height, 37 ins.; wall to front, 6 ins.; lip set into floor 3 ins.

	List Price	
	"A" Quality	"B" Quality
Stall only.....	\$35.00	\$24.50
Competition flush valve with shut-off valve.....		\$10.00
Inlet connection and spreader, each.....		2.50
Nickelplated strainer and outlet connection, each.....		5.00
Vitreous china strainer.....		1.00

NOTE.—This urinal weighs 110 lbs. net; 160 lbs. gross crated



PLATE M-2600. MONUMENT PORCELAIN URINAL STALLS

Glazed all over, and fitted with nickelplated self-closing flush valve, loose key shut-off valves; nickelplated inlet connections and spreaders; nickelplated and vitreous china outlet strainer and connections; nickelplated flush valve with shut-off valve.

		Measurements	
		No. 1 size	No. 2 size
Width.....		18 ins.	24 ins.
Over all height.....		46 ins.	48 ins.
Above floor height.....		42 ins.	44 ins.
Wall to front.....		11 ins.	13½ ins.
Lip set into floor.....		4 ins.	4 ins.
		List Price, Stall Only	
"A" quality, each.....		\$40.00	\$55.00
"B" quality, each.....		28.00	38.50
Nickelplated self-closing flush valve, loose key shut-off valve.....			\$20.00
Inlet connection and spreader, each.....			2.50
Nickelplated strainer and outlet connection, each.....			5.00
Vitreous china strainer.....			1.00



PLATE M-2610. "BENEFACITOR" MONUMENT PORCELAIN URINAL STALLS WITH PORCELAIN SEAM COVERS BETWEEN STALLS

Stalls and seam covers glazed; fitted with nickelplated brass "Watometer" self-closing flush valves with loose key shut-off valves; nickelplated spreaders and inlet connections; nickelplated or vitreous china outlet strainers and outlet connections.

		Measurements	
		No. 1 size	No. 2 size
Width.....		18 ins.	24 ins.
Over all height.....		46 ins.	48 ins.
Above floor height.....		42 ins.	44 ins.
Wall to front.....		11 ins.	13½ ins.
Lip set into floor.....		4 ins.	4 ins.
Seam cover projects.....		3 ins.	3 ins.
		List Price, Stall Only	
"A" quality, each.....		\$40.00	\$55.00
"B" quality, each.....		28.00	38.50
Seam cover, "A" quality.....			\$12.00
Seam cover, "B" quality.....			8.40
Nickelplated "Watometer" flush valve, each.....			17.00
Nickelplated spreader with inlet connection, each.....			2.50
Nickelplated or vitreous china strainer and outlet connection, each.....			5.00

Allow 2 ins. for each partition.



PLATE M-2625. MONUMENT PORCELAIN URINAL STALLS WITH INTEGRAL EXTENDED SHIELDS

Stalls with paneled sides glazed all over; fitted with nickelplated "Royal" self-closing flush valves, with loose key shut-off valves; nickelplated inlet connections and spreaders; nickelplated or vitreous china outlet strainers with floor connections.

		Measurements	
		No. 1 size	No. 2 size
Width.....		18 ins.	24 ins.
Over all height.....		46 ins.	48 ins.
Above floor height.....		42 ins.	44 ins.
Wall to front.....		13½ ins.	16 ins.
Lip set into floor.....		4 ins.	4 ins.
		List Price, Stall Only	
"A" quality.....		\$45.00	\$60.00
"B" quality.....		31.50	42.00
"Royal" flush valve with shut-off valve, each.....			\$20.00
Inlet connection and spreader, each.....			2.50
Nickelplated strainer and outlet connection, each.....			5.00
Vitreous china strainer and brass outlet connections, each.....			5.00



# MANUFACTURING EQUIPMENT & ENGINEERING CO.

## Metal Washbowls and Bubbling Fountains

136 Federal Street  
BOSTON, MASS.

WORKS AND MAIL ADDRESS, FRAMINGHAM, MASS.

### Products.

#### SANITARY WASHBOWLS; SANITARY BUBBLING FOUNTAINS.

Water Heaters and Instantaneous Mixers; Improved Soda Kettles; All-metal Sanitary and Fire-proof Equipment for factories, foundries, gymnasiums, public buildings, department stores, offices, hospitals, etc.; Work Benches; Legs.

For Metal Lockers and Shelving, see page 1422.

#### Individual Washbowls in Batteries.

Consist of any number of individual bowls in battery, with common waste and water supply. Either open or closed waste furnished, but open waste deemed more sanitary.

**SPECIFICATION DATA**—Plain, galvanized iron, or vitrified porcelain enameled iron bowls; single or double battery; for cold or tempered, or hot and cold water; with plain nozzle, compression or self-closing bibb.

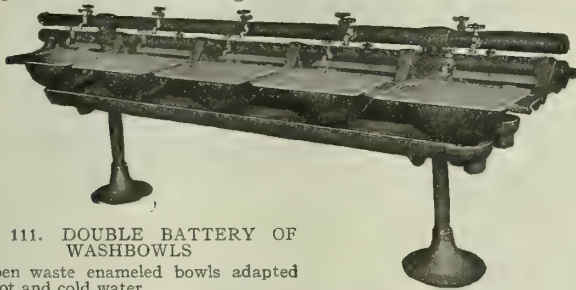


FIG. 111. DOUBLE BATTERY OF WASHBOWLS

Open waste enameled bowls adapted for hot and cold water

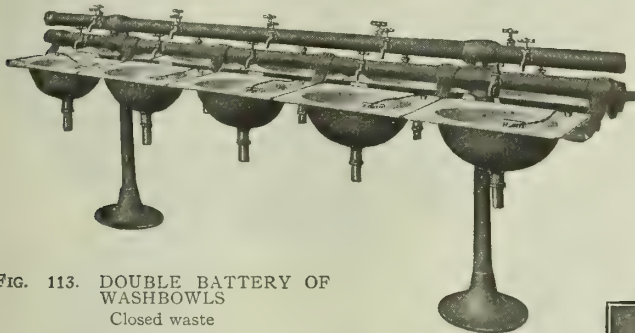


FIG. 113. DOUBLE BATTERY OF WASHBOWLS

Closed waste

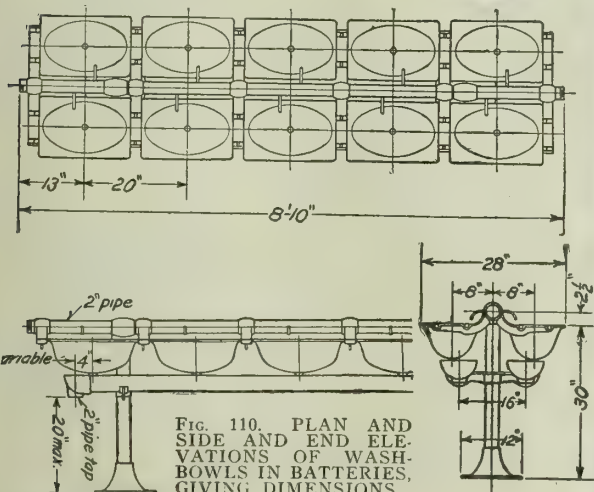


FIG. 110. PLAN AND SIDE AND END ELEVATIONS OF WASHBOWLS IN BATTERIES, GIVING DIMENSIONS

**MEASUREMENTS**—2-in. steel pipe used. Floor space indicated in Fig. 110.

**PRICES**—Made on each bowl as a unit, varying from \$5.00 upwards per bowl, according to type and equipment. Discounts on application.

#### Sanitary Bubbling Drinking Fountains.

With or without ice tank. Tank holds 75 lbs. of ice; is heavily cork jacketed and has 15½ coils of ½-in. brass pipe. Waste bowl cast iron, enameled on inside; stops nickelplated. Automatically regulated Keith Bubbler used.

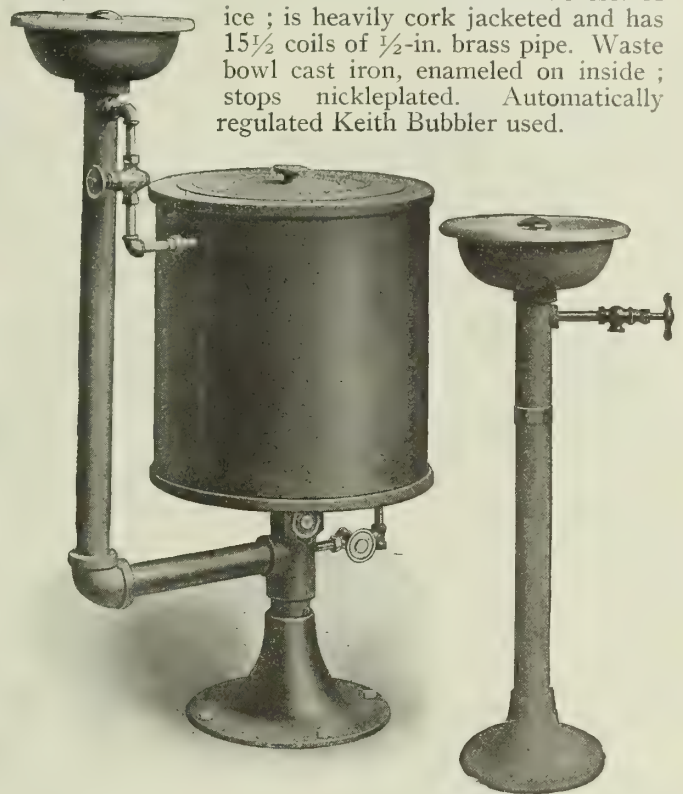
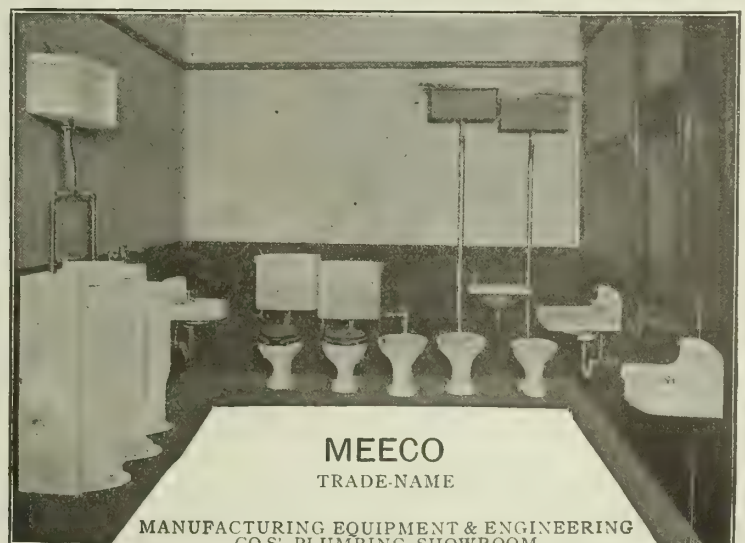


FIG. 604. BUBBLER DRINKING FOUNTAIN WITH ICE TANK  
List price \$50.00

FIG. 602. BUBBLER DRINKING FOUNTAIN  
List price \$12.00



MANUFACTURING EQUIPMENT & ENGINEERING CO.'S PLUMBING SHOWROOM

# ALLRIGHT MANUFACTURING COMPANY

Manufacturers of Unbreakable Closet Seats

RURAL HALL, N. C.

## Products.

"ALLRIGHT" STEEL BOUND CLOSET SEATS.

## Protected by Patents.

"Allright" closet seats are patented, and are made only by us. A neat transfer with our name and guarantee is on every seat.

## Description.

"Allright" closet seats are designed to meet the demand for seats that will not come apart or crack open in use, and, at the same time, avoid unsanitary methods of reinforcement.

They are so constructed that the finished seats have the appearance of being in one big piece, and have no place whatever for germs to lodge.

They have been on the market since 1912 and have been installed in the finest hotels, residences and office buildings in the country.

## Construction.

A groove is cut around the underside of the seat, about the width of a lead pencil and  $\frac{1}{2}$  in. deep. Into this we shrink an electrically welded steel hoop, while it is warm and slightly expanded. When it cools it contracts just enough to bind all around the ring. A wooden spline is fitted in over the hoop, filling the groove to match the grain of the seat. This is forced in and cemented and is moisture proof; when planed off is hardly visible.

Atmospheric conditions have little effect on these seats.

## Finish.

Only the best grade waterproof varnish is used and expert workmanship employed.

A better looking or more durable finish can not be had.

## Special Shapes or Finishes.

All seats are hinged to fit standard bowls, unless otherwise specified. If special shape or finish is wanted, we will quote prices on application.

## Prices.

Prices no higher than other guaranteed seats. Furnished on request.

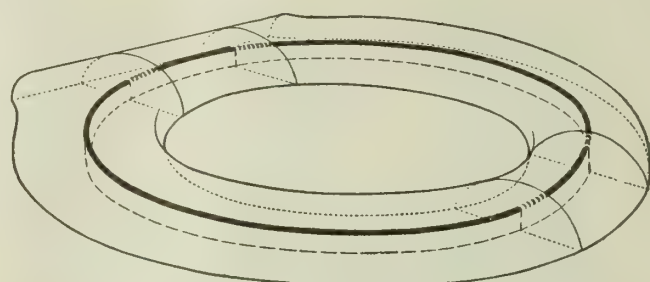
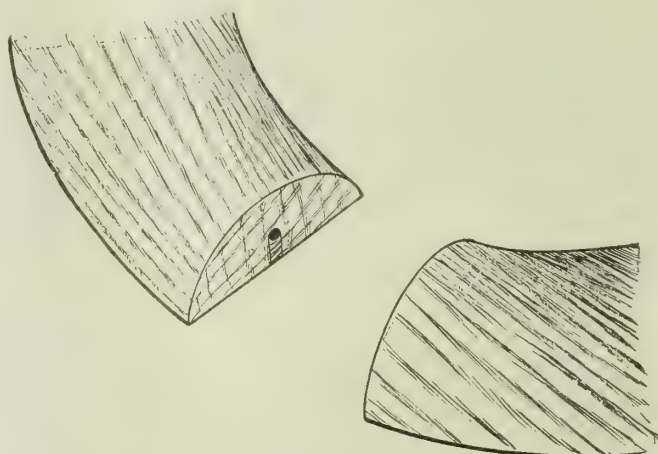


DIAGRAM ILLUSTRATING THE METHOD OF CONSTRUCTION OF "ALLRIGHT" SEAT WITH THE HOOP IN PLACE

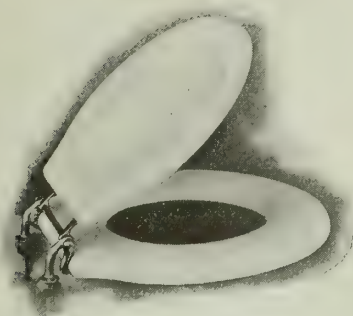


X-RAY VIEW OF FINISHED SEAT SHOWING HOOP INSIDE THE WOOD



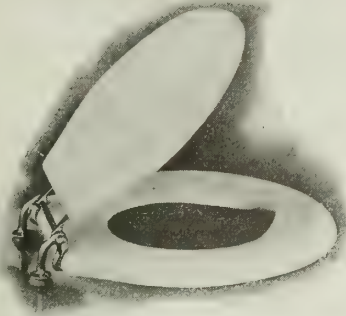
SECTIONAL CUT THROUGH SEAT—SHOWING LOCATION OF STEEL HOOP AND APPLICATION OF WOOD SPLINE





NO. 230 "ALLRIGHT" CLOSET SEAT,  
OVAL SHAPE (WHITE)  
1¼-in. seat, with No. 600 bar hinge

"Allright" pure white seats are finished by a special process. Will not crack, craze or discolor. Guaranteed for 5 years.



NO. 350 "ALLRIGHT" CLOSET SEAT,  
SADDLE SHAPE (WHITE)  
1¼-in. seat, with No. 600 bar hinge



NO. 230 "ALLRIGHT" CLOSET SEAT,  
OVAL SHAPE

No. 500 bar hinge; 1¼-in. seat, perfectly matched straight grain.

Finished in golden, natural or antique oak, or birch mahogany.

Approximate weight packed, 10 lbs.



NO. 400 "ALLRIGHT" CLOSET SEAT,  
OVAL SHAPE

No. 400 straight post bar hinge. 1¼-in. seat, perfectly matched, straight grain.

Finished in golden, natural or antique oak or birch mahogany.

Approximate weight packed, 12 lbs.



NO. 630 "ALLRIGHT" CLOSET SEAT,  
OVAL SHAPE

No. 630 post hinge. 1¼-in. seat, perfectly matched straight grain.

Finished in golden, natural or antique oak or birch mahogany.

Approximate weight packed, 10½ lbs.



NO. 450 "ALLRIGHT" CLOSET SEAT,  
OVAL SHAPE

No. 450 post hinge. 1¼-in. seat, straight matched grain.

Finished in golden, natural or antique oak or birch mahogany.

Approximate weight packed, 10½ lbs.



NO. 350 "ALLRIGHT" CLOSET SEAT,  
FULL SADDLE SHAPE

No. 500 bar hinge. 1¼-in. seat straight matched grain.

Finished in golden, natural or antique oak or birch mahogany.

Approximate weight packed, 10½ lbs.



NO. 350 "ALLRIGHT" CLOSET SEAT,  
FULL SADDLE SHAPE

No. 630 post hinge. 1¼-in. seat, straight matched grain.

Finished in golden, natural or antique oak or birch mahogany.

Approximate weight packed, 10½ lbs.



NO. 100 "ALLRIGHT" CLOSET SEAT,  
STRIP BACK, OVAL SHAPE

With nickelplated brass flat hinge, 1¼-in. seat, straight, matched grain.

Finished in golden oak.

Approximate weight packed, 9 lbs.

# DAIL STEEL PRODUCTS CO.

## Waterless Chemical Toilets

LANSING, MICH.

### Products.

WATERLESS CHEMICAL TOILETS.  
VITREOUS CHINA TOILET BOWLS.

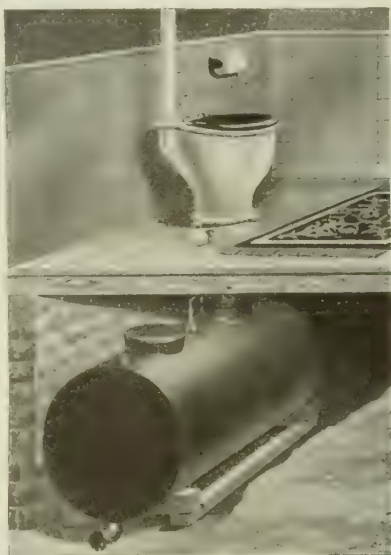
### Wolverine Waterless Chemical Toilets.

Quite often water flush toilets are impractical, and in all such cases, architects will find the Wolverine line of waterless chemical closets adaptable.

Toilets are a necessity, and chemicals solve the problem where water pressure and sewers are not available.

The Wolverine line is complete. This company can solve toilet problems, no matter how large or how small. Two styles of Wolverine vaults are manufactured—square and round. Ten different sizes of vaults are carried in stock.

Wolverine waterless toilets are beyond the experimental stage. Sanitary engineers, state and local Boards of Health, and the Federal Health Bureau have been carefully studying and observing chemical toilets for several years, and all agree that they are sanitary and may be used successfully where running water and sewers are not available.



SINGLE UNIT INSTALLATION  
WATERLESS CHEMICAL TOILET

Chemical toilets must be ventilated and it is well for architects, wherever possible, to plan on connecting the ventilating pipe from the toilets with the chimney flue. If this is not done, then provision must be made for the toilet ventilating pipe to go out through the roof.

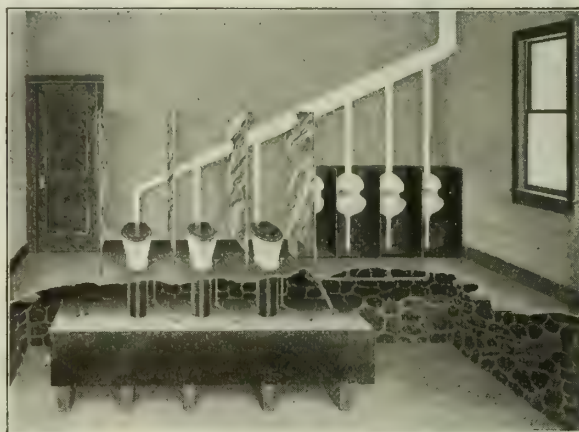
### Wolverine Vitreous China Bowls.

Made of heavy white vitreous china in attractive shape and design. Fitted with birch mahogany seat and cover, with nickel trimmings and self-closing spring.

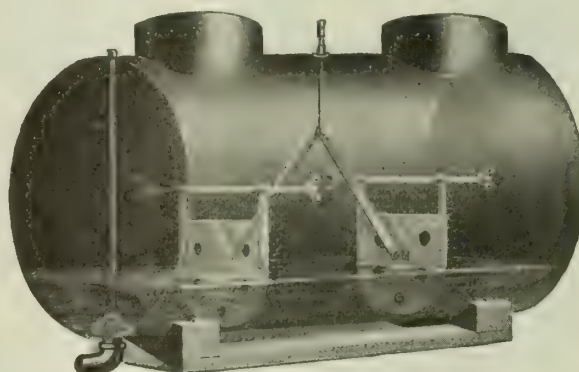
### Co-operative Service.

This company maintains a complete and experienced waterless toilet engineering department. Estimates will be furnished without charge.

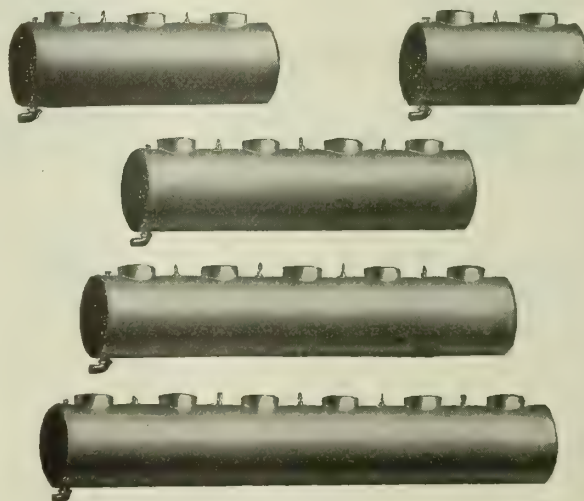
Architects, engineers, contractors and builders are invited to submit their toilet problems to the company and a satisfactory solution is assured.



BATTERY INSTALLATION WATERLESS CHEMICAL TOILETS  
Illustrating the adaptability of large vaults to schools, factories, railroad shops, fair grounds, resorts, hotels, etc.



WOLVERINE VERTICAL FAN AGITATOR  
The most efficient agitator in use in chemical closets



TYPES OF ROUND VAULTS FOR CHEMICAL TOILETS  
Carried in stock for immediate shipment



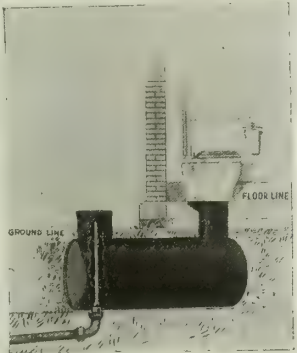
KAUSTINE COMPANY, INC.  
Manufacturers of Waterless Toilets (Chemical)  
BUFFALO, N. Y.

Products.

CHEMICAL WATERLESS TOILETS and VENTILATING URINALS for use where sewers and water supply are not available; KAUSTINE CHEMICAL PRODUCTS.

Adaptability and Uses.

The Kaustine waterless toilet, made and sold by the above company, is expressly intended for use in districts where sewers and water supply are not available. It is suited to, and largely in use in, schools, factories, railroad shops and stations, halls, churches, fair grounds and resorts, rural homes and cottages. It is installed singly or in batteries up to any number of units.



Features of the System.

Chemical sterilization and liquefaction; ventilation and aeration; and chemical agitation are the main features of the Kaustine system.

The Chemical Kaustine.

Kaustine (furnished exclusively by the KAUSTINE COMPANY, INC.) is a flaked green crystal, prepared for use by dissolving in water. It accomplishes three distinct results:

- (1) Softens and disintegrates the sewage solids and toilet paper.
- (2) It destroys all germ life. It eliminates the odors of organic matter.
- (3) It changes the vegetable and animal matter to a pure chemical state and prevents putrefaction and decomposition, rendering the contents of the tank into preserved purity—a state from which these contents may be converted into a fertilizer or disposed of by a very simple method.

Standard Tank Table.

The following table shows various sizes and capacities of tanks and number of bowls or individual urinals they are supposed to accommodate. Each tank is designated by a number, which should always be used in specifying when ordering.

Number	Diameter, ins.	Length, ins.	Capacity, U. S. gals.	Number bowls intended	Lbs. Kaustine required
T-125	27	50	125	1	30
T-200	29	70	200	1	50
T-250	29	88	250	2	60
T-375	32	108	375	3	90
T-500	32	144	500	4	120
T-625	32	180	625	5	150
T-750	32	216	750	6	180

NOTE—T-200 tank is intended for use with one bowl, or one bowl and one individual urinal. There are conditions where it can be used to advantage.

Kaustine System (Toilet and Ventilating Urinal).

CONSTRUCTION—Kaustine material and workmanship are of the highest quality. All the metal parts are of Armco ingot iron.

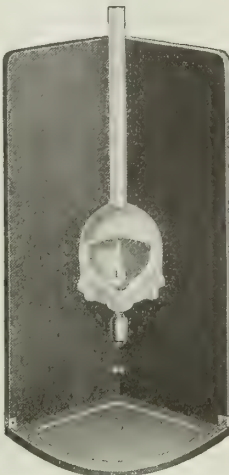
Specifications.

CLOSET BOWL—Vitreous china, equipped with oak or birch-mahogany seat, nicked hinges and fittings.

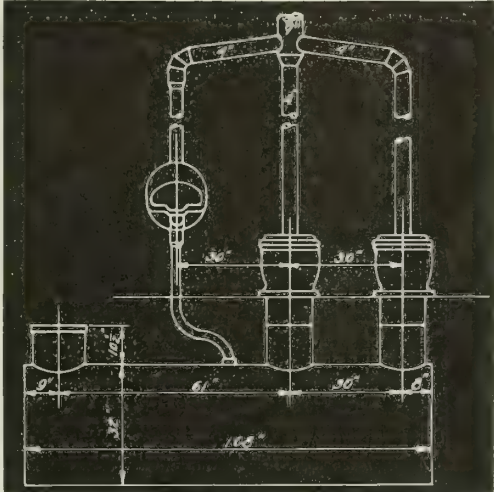
CHEMICAL TANK—Of Nos. 12- and 14-gauge Armco ingot iron, electro-welded, extremely well made and durable. Form cylindrical.

VENTILATING SYSTEM—Pipes of Armco iron, enameled or galvanized to suit surroundings. Equipped with vent cap, roof safe and all the necessary connections.

AGITATOR—The highly efficient Kaustine rotary agitator is installed inside each tank. In both single and multiple systems it operates with a handle or lever.



KAUSTINE VENTILATED URINAL, CORNER TYPE  
Also provided in other types and sizes



INSTALLATION OF TWO BOWLS AND A URINAL  
For dimensions of tanks, see adjoining table

Plans and Estimates.

The company supplies, through its Engineering Department, plans and estimates without charge. The seats are installed same as water closets, requiring, however, proper ventilating facilities and location for tank. Tanks may be buried, or held by supports or suspended from ceiling. Must be directly under closet bowl.

Operation and Cost of Chemical.

The 125-gal. tank (the family size) requires emptying twice a year. It is re-charged with Kaustine each time. Average cost per family \$5.00 to \$6.00 per year. Price of Kaustine permanently guaranteed. Local distributing stations are maintained in Northwest, Southwest, West, South and Canada. To empty, the tank contents are pumped or drained out.

# THE CENTRAL BRASS MANUFACTURING COMPANY

Faucets and Other High Grade Brass Goods for Plumbers and Water Works

6117-6207 Cedar Avenue, S. E.

CLEVELAND, OHIO

## Products.

BALL COCKS, BASIN COCKS, BATH COCKS, BATH FIXTURES, BIBBS, DRINKING FOUNTAINS, LAVATORY FIXTURES, STOP-AND-WASTE COCKS, VALVES—all made in Quick-pressure and Automatic Quick-pressure Work; Refrigerator Traps and Compression Work.

Bath Wastes and Overflows, Bath and Basin Supplies, Couplings, Ground Key Work, Lavatory Traps, Vent Fittings and other Brass Specialties for plumbing purposes.

## Trade-marks.

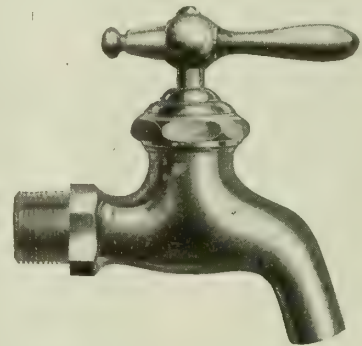
Quick-pressure. This mark is clearly stamped on all Quick-pressure plumbing fixtures. All Automatic Quick-pressure fixtures are also clearly stamped. Both types were originated, designed and patented, and are made only by THE CENTRAL BRASS MANUFACTURING COMPANY. Other Central Brass products are stamped with the "Central, Cleveland" trade-mark. For absolute protection against inferior brass goods and long time satisfaction for your clients, these trade-marks should be specified by name. Years of experience have demonstrated the importance of explicit specifications for plumbing fixtures.



## Advantages of Quick-pressure.

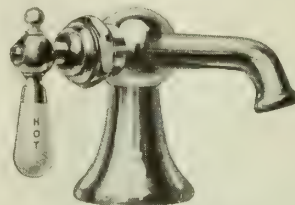
Quick-pressure combines the positive seat and good-wearing qualities of compression work with the quick, quarter-turn operation of Fuller work. It gives the rigidity and solidity of compression work minus the slow opening; it gives the convenience of the quick

opening of Fuller work minus the hammering, the wearing down of the ball, the loosening up of parts, and the necessity of frequent repair. Illustration shows detailed Quick-pressure advantages.



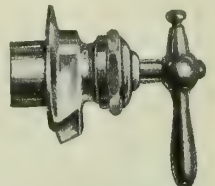
QUICK-PRESSION PLAIN IRON PIPE BIBB

Furnished with iron pipe thread, with male or female flange, in the hose or plain pattern. Finished brass or nickelplated with porcelain or brass handles



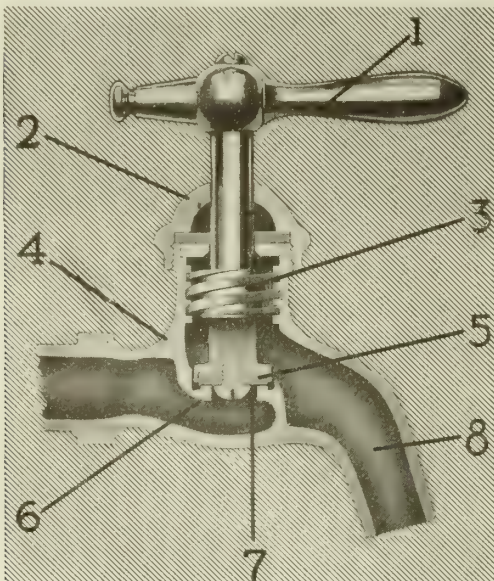
NO. 5 QUICK-PRESSION BASIN COCK

Can be furnished with brass or porcelain side handles. Always furnished nickelplated. Shanks furnished  $2\frac{1}{4}$  or 3 ins. long, also furnished with china base



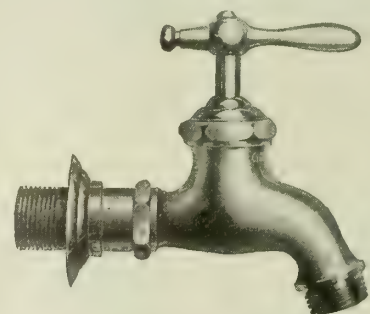
QUICK-PRESSION STUB WASH TRAY BIBB

Shank threaded male or female. Can be furnished with hose connection on spout. Comes in brass or nickel finish, with brass or porcelain lever handles



MECHANICAL VIEW OF QUICK-PRESSION BIBB

- 1—Opens to a free flow and closes with a quarter-turn of the handle
- 2—Combined cap nut and stuffing box—no leaking around stem
- 3—Threads quick acting, engaging their whole length
- 4—Entire bibb cast of all new metals—no scrap
- 5—Seat washer incased in brass wall to prevent spreading
- 6—Seat cut from thick metal wall, raised high—perfectly machined
- 7—Pull even water way
- 8—Spout cast at angle to prevent splashing and insure convenient filling of utensils



QUICK-PRESSION HOSE ADJUSTABLE SET SCREW FLANGE BIBB

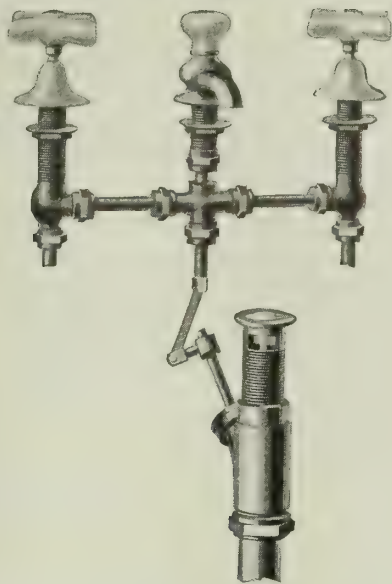
Can be furnished with plain spout, with brass or porcelain lever handles, in brass or nickelplated finish, with set screw (as in illustration) or with threaded flange



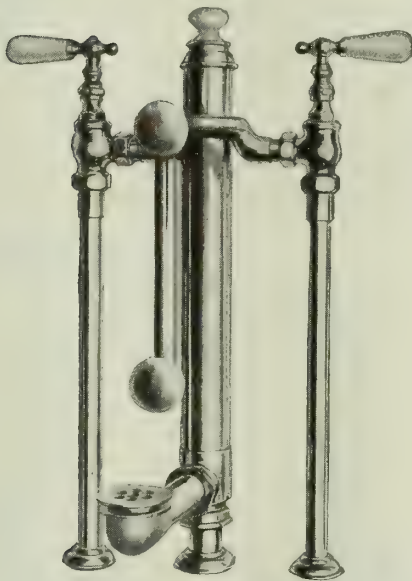
NO. 1 QUICK-PRESSION BASIN COCK

Can be furnished with brass or porcelain lever handles. Spouts made  $3\frac{1}{4}$  or 4 ins. from center of body. Shanks can be furnished from  $2\frac{1}{4}$  to 3 ins. long. Always furnished nickelplated





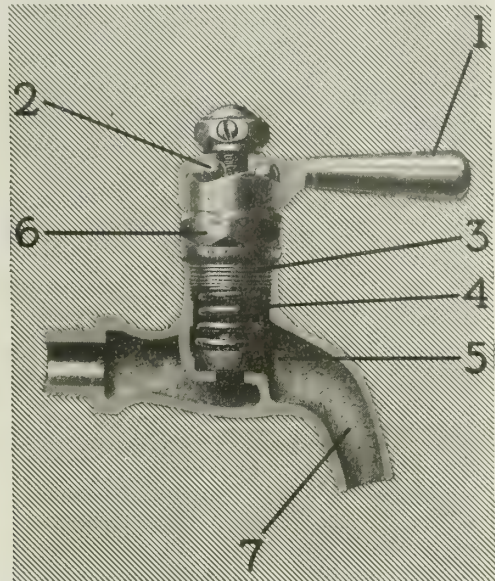
**QUICK-PRESSION LAVATORY FIXTURE**  
Can be furnished for any size basin  
Can also be furnished with porcelain lever handles



**QUICK-PRESSION BATH FIXTURE**  
Can be furnished for any style of tub  
Made only with porcelain lever handle  
Furnished for top or bottom bells

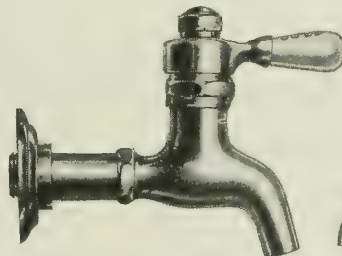
### Advantages of Automatic Quick-pression.

Automatic Quick-pression has all of the Quick-pression advantages with automatic closing added. It opens in either direction with a quarter turn. The action is regulated by ball bearings, and is smooth,



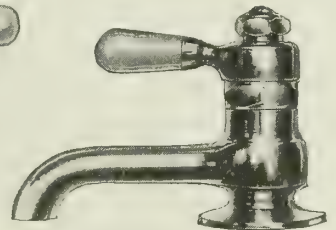
**MECHANICAL VIEW OF AUTOMATIC QUICK-PRESSION BIBB**

- 1—Opens with a quarter turn, and closes automatically. Handle turns in either direction
- 2—The action is regulated by ball bearings, and is therefore easy to operate
- 3—Threads are quick acting, engaging their whole length
- 4—Closing spring controls automatic action, which closes without jarring or hammering
- 5—Washer is tight fitting and easily replaced
- 6—Nut insures a tight joint, preventing leakage around the stem
- 7—The spout is cast at an angle to prevent splashing and insures convenient filling of utensils



**AUTOMATIC QUICK-PRESSION PLAIN ADJUSTABLE BIBB**

Can be furnished with 6-ball brass or porcelain lever handles. Made in iron pipe male, female or adjustable flange. Finished brass or nickelplated



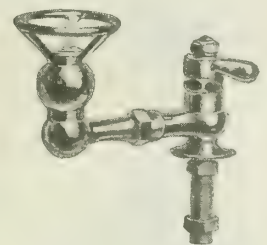
**NO. 1 AUTOMATIC QUICK-PRESSION BASIN COCK**

Furnished in two lengths of spouts, 3½ or 4 ins. Both styles are made with brass and porcelain lever; 6-ball or brass lever with index handles. Shanks measure 2¼ and 3 ins. Always furnished nickelplated

quick, and so easy that a child can operate it. Automatic Quick-pression closes without jarring or hammering. The working parts are few and simple, and can all be removed in one unit without disconnecting them from one another. The washer can thus be reached and replaced in a few seconds. Further details are shown in the illustration.

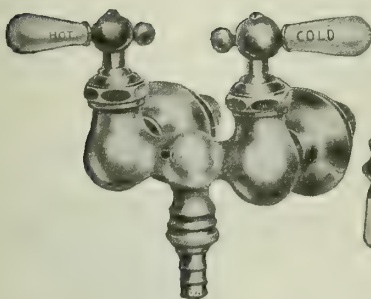
### Automatic Quick-pression Drinking Fountain.

Always furnished nickel-plated, with the single bubble head or single bubble head and extra spout for filling vessels. Can be furnished to fit pedestal, sink, or basin fixture.



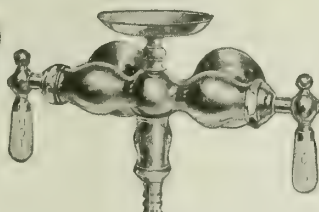
**AUTOMATIC QUICK-PRESSION DRINKING FOUNTAIN**

Can be furnished with brass or porcelain lever handles, or 6-ball brass handles, brass or porcelain cups, and with shanks to fit any style stand or fixture. Always furnished nickel-plated



**NO. 1 QUICK-PRESSION BATH COCK**

Measures 3¾ ins. between centers of shanks  
Can be furnished with brass or porcelain handle with any style coupling or supply



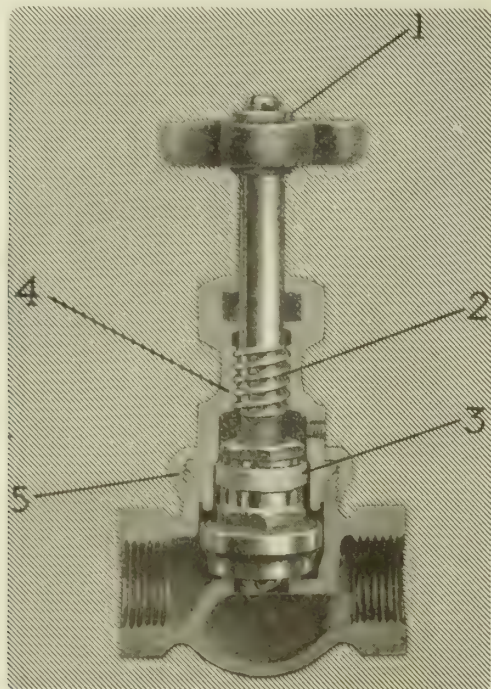
**NO. 5 QUICK-PRESSION BATH COCK**

Can be furnished without soap cup. Measures 3¾ ins. between centers of shanks. Furnished with brass or porcelain lever handle. Any style of coupling or supply fits this bath cock



**Advantages of Quick-pressure Stop-and-Waste Valves.**

Quick-pressure stop-and-waste valves possess all the advantages of Quick-pressure in durability and quick, convenient action. They will not leak nor stick



MECHANICAL VIEW QUICK-PRESSION STOP-AND-WASTE VALVE

- 1—Just an easy turn does the work. That is real convenience
- 2—No springs in the construction. Every action is direct and controlled by a single screw
- 3—A sure acting plunger closes the waste the instant that pressure is admitted. No flooded cellars
- 4—Never leaks or sticks, be the water hot or cold
- 5—A universal joint permits turning waste in any direction

under any conditions, even on hot water or under ground. They are supplied with universal joints so that the waste can be turned in any direction, making the valve easy to install. They open to full flow with exactly one turn, and shut off so quickly that no overflow can occur from the pressure end. Construction is extra heavy throughout.

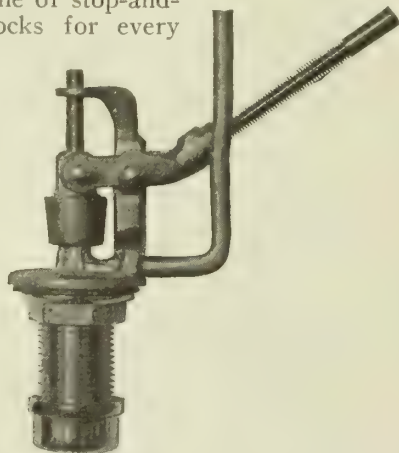
The illustration with accompanying descriptions gives detailed advantages of this design. The importance of stop-and-waste cocks should not be overlooked. Protection against the damage which often comes as a result of faulty cocks is indeed worth while.

The "Central, Cleveland" products include the following complete line of stop-and-waste valves and cocks for every



QUICK-PRESSION STOP-AND-WASTE VALVE

Can be furnished in all sizes between  $\frac{1}{2}$  and 2 ins., also with socket head for underground work



QUICK-PRESSION BALL COCK

Made in 2 styles. No. 3 fits either high or low tanks  
No. 4 is furnished for low tanks

possible purpose: "Central cap stop-and-waste cocks," "Central patent stop-and-waste cocks," "Central special cap stop-and-waste cocks," "Central cap curb cocks." The products will cover all architectural requirements. Central Brass service department will gladly prepare complete specifications appropriately covering any work contemplated.

**Advantages of "Central" Products.**

The same skill and extreme care exercised in the making of Quick-pressure work is given to the production of all "Central" products. Central compression work represents the highest type of plumbing fixtures in its respective class. Under this trade name there is a complete line of products, also a most appropriate type of fixture for every style of building. "Central" products cover them all.

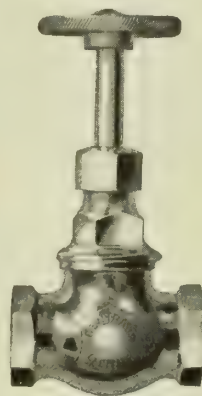
CENTRAL COMPRESSION WORK—Central compression work has the following special points of superiority which must be seriously considered in the preparation of plumbing specifications. The patterns are extra heavy; uniformity and interchangeability are assured; the waterway is full and even; the seat washers are encased in a brass wall which prevents spreading. Each design is inspected, tested and guaranteed. A number of compression types are illustrated on these pages.

For specifications which must include compression work, "Central" is the one safe trade-name. While this type is gradually being displaced by Quick-pressure types, there is still a demand for it, in its best quality.



COMPRESSION SILL COCK

Regularly furnished for  $\frac{1}{2}$  and  $\frac{3}{4}$ -in. pipe with wheel or loose key handles in the rough or nickelplated finish



Globe Valve

Regularly furnished nickelplated. Can also be furnished in the rough nickel-plate or brass finish. Wheel or loose key handles. Furnished for  $\frac{3}{8}$ -,  $\frac{1}{2}$ - and  $\frac{3}{4}$ -in. pipe



Angle Valve

LAVATORY GLOBE AND ANGLE VALVES

**Sanitary Refrigerator Trap.**

To install this sanitary trap, no cutting of floors, no lead pipes, pans or traps are needed. As it is always sealed, no sewer gas can escape. It can not become clogged because lifting the cap instantly removes dirt, sediment, etc. There is nothing to get out of order, and no detachable part to get lost.

It is manufactured exclusively by THE CENTRAL BRASS MANUFACTUR-



SANITARY REFRIGERATOR TRAP

Can be furnished with 7- or 8-in. pans. The 7-in. is tapped for  $1\frac{1}{4}$ -in. iron pipe, and the 8-in. can be furnished for  $1\frac{1}{4}$ - or  $1\frac{1}{2}$ -in. pipe



ING COMPANY, and should be specified as follows:

"The floor opening for refrigerator connections is to be fitted with the Cleveland deep seal refrigerator trap, made by THE CENTRAL BRASS MANUFACTURING COMPANY of Cleveland."

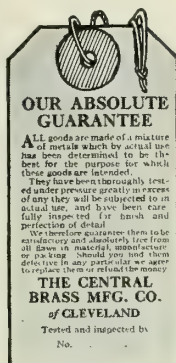
### Central Brass Service.

"Safety First" should be applied freely to the brass goods question and "Definite Specifications" is the first step in its application. That architects generally appreciate this fact, is proved by the extensive use of Central Brass service.

This service involves sufficient study of the requirements of each particular job to prepare schedules covering the most suitable fittings from the standpoint of style, design and price. It is not dictatory but suggestive and helpful. It is a service that is free and without the slightest obligation. When desired, it embraces valves and fittings used in the complete piping work as well as the plumbing fixtures.

### Guarantee.

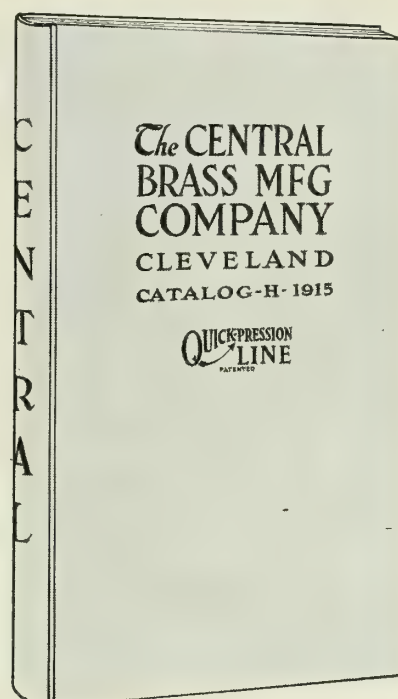
All products of this company are made of the best metal for the purpose for which they are intended. They have been thoroughly tested under pressure greatly in excess of any they will be subjected to in actual use, and have been carefully inspected for finish and perfection of detail. They are, therefore, guaranteed to be satisfactory and absolutely free from all flaws in material, manufacture or packing. Should they be found defective in any particular, they will be replaced or money refunded.



CENTRAL  
GUARANTEE  
TAG

### Catalogues.

New catalogues and circulars are published frequently, and sent on request. They cover complete information concerning Quick-pressure, Automatic Quick-pressure, and all our other products, accessories and supplies.



CENTRAL CATALOGUE "H"

Contains full information on Quick-pressure and all other Central products

### Specifications (General).

To insure the use of highest grade goods and most advanced construction only, specifications should be issued in the following form:

All valves, bibbs, cocks, wastes, traps, supply pipes and other brass goods required in plumbing work to be those manufactured by THE CENTRAL BRASS MANUFACTURING COMPANY, of Cleveland.

SPECIFICATIONS (Sinks)	Where non-automatic bibbs are used.	{ Brass Porcelain	Sinks to be fitted with Quick-pressure flanged bibbs, } Handle, }	Nickelplated Brass	} Finish.
	Where automatic or self-closing bibbs are used.	{ Brass lever Porcelain lever Six-ball	} Handle,	Nickelplated Brass	} Finish.
SPECIFICATIONS (Lavatories)	Where non-automatic cocks are used.	{ Nickelplated brass Porcelain	} Handle,	Nickelplated finish.	
	Where automatic or self-closing cocks are used.	{ Porcelain lever Nickelplated brass lever Six-ball	} Handle,	Nickelplated finish.	
SPECIFICATIONS (Bathtubs)	Bathtubs to be fitted with Quick-pressure bath cocks,	{ Porcelain Nickelplated brass	} Handle,	Nickelplated finish.	
SPECIFICATIONS (Wash trays)	Wash trays to be fitted with Quick-pressure stub wash tray bibbs,	{ Porcelain Brass	} Handle,	Nickelplated Brass	} Finish.
SPECIFICATIONS (Stop-and-waste cocks)	All lines to be controlled by Quick-pressure stop-and-waste valves.				
SPECIFICATIONS (Refrigerator traps)	The floor opening for refrigerator connections is to be fitted with a Central deep seal refrigerator trap.				

# GLAUBER BRASS MFG. CO.

Finest Brass Goods Made for Plumbing, Gas and Water Works

GENERAL OFFICES AND WORKS

CLEVELAND, OHIO

BRANCHES

NEW YORK, N. Y.

CHICAGO, ILL.

ST. LOUIS, MO.

SAN FRANCISCO, CAL.

## Products.

GLAUBER CONCEALED VALVE BATH FITTINGS, COMBINATION LAVATORY FITTINGS, FAUCETS and COCKS for lavatories, tubs and sinks; SHOWER BATH FITTINGS, PANTRY COCKS, ICE WATER COCKS, SANITARY BUBBLER DRINKING FOUNTAINS, and all other Brass Goods for Plumbers and Gas and Water Companies.

## Metal.

All Glauber products are made from a rich bronze metal containing 86% copper, 6% tin, 4% zinc and 4% lead, a formula which has been adopted almost without any changes by the water departments of ten of the leading cities in the United States, whose engineers agree with us that only rich red metal can withstand the ravages of time.

## Guarantee.

All goods made by GLAUBER BRASS MFG. CO. are sold under an absolute *five-year guarantee*, fully insuring the customer against loss and annoyance inevitably encountered in the use of inferior goods.

## Glauber Combination Lavatory Fittings; Bath Fittings.

The combination fitting combines and mixes hot and cold water, delivering a flow of any desired temperature through the spout—cold, warm or hot. This is an improvement over the individual basin cock, because it permits one to *wash in running water* which is the only sanitary way.

They can be applied to any standard make of enameled or vitreous lavatories, and are readily adjustable to meet variations in punchings in relation to each other and to the hole for spout; also thickness of lavatory top.

Both valves and spout "break" on top of the lavatory, where all wrench work is done, and the adjustability makes it possible to install on any standard make of lavatory, and in a fraction of the time required to install any other combination lavatory fitting on the market.

The only repair ever necessary (once in two or three years) is a re-washing of valve. This is done from the top of the lavatory, but a moment being required for the operation. The washer is incased, which prevents spreading and premature wear, in addition to which the life of the washer and of the fitting itself is increased by the non-rising stem mechanism.

The seat washer does not rotate, but travels vertically in its shaft.

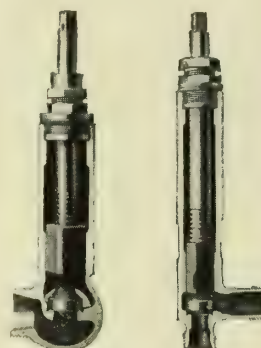
Cocks and faucets in which seat washers rotate require frequent attention, because the rotary movement grinds washer on the seat, especially when water contains grit.

These fittings are furnished for any make of enameled iron, vitreous or porcelain ware.

Specify make and plate number of lavatories and tubs selected and then add "to be trimmed with Glauber [mention name of Glauber fixture desired]."

## Basin and Bath Valve Construction.

Glauber basin and bath valves, for combination fixtures, are made with non-rising stem, either with thread of regulation pitch or "Nu-rapid" (quick acting).



DETAILS OF NON-RISING STEM BASIN AND BATH VALVE CONSTRUCTION.

## Glauber Shower Mixing Valve.

Realizing the necessity of a shower that is mechanically perfect, the Glauber patent shower mixing valve is presented, in which perfect mixing of hot and cold water is accomplished by the delivery of the waters in a chamber from which they have to force their way through a narrow slot or crevice, thereby forcing the two waters to mix before they reach the shower head.

There is a separate compartment for the working parts of the valve. As practically all waters contain minerals or alkalis in a greater or lesser degree, this construction, which eliminates all possibility of the water acting on the working parts of the valve, is of vital importance.

This valve closes with the pressure. No springs or threads are necessary for the operation, thereby minimizing friction and wear on the valve.

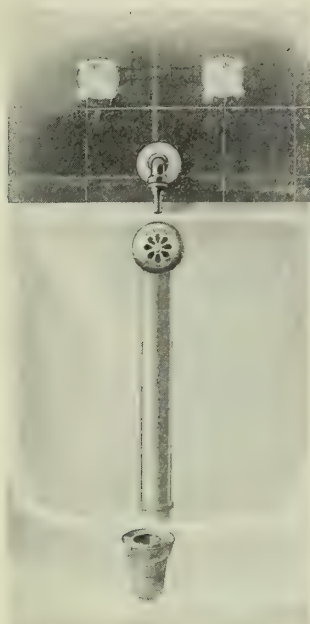
This mixing valve is shown further on in the shower bath section.

## Glauber Combination Regulating, Stop and Check Valve.

It is recommended that each Glauber mixing valve be ordered with the combination regulating, stop and check valves. They make it impossible for hot water to back up into cold supply or vice versa, which would otherwise take place by reason of an unequal pressure, due to drawing or shutting off of either hot or cold water in other parts of building.

This combination valve also makes it possible to cut down the flow to any desired point, so that shower will strike the user with exactly the desired force, as well as to entirely shut off the water for repairing the mixer.

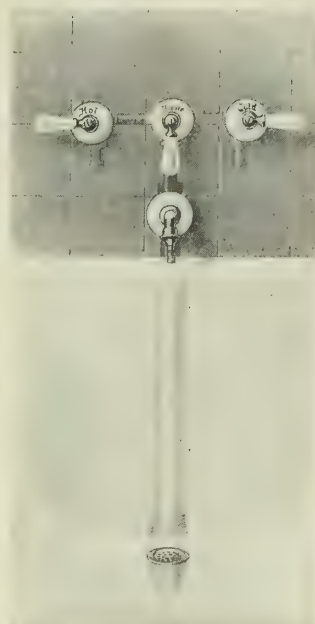




H-200 "CUYAHOGA" BATH FIXTURE FOR RECESS OR CORNER BUILT-IN TUB

Compression non-rising stem valves with ground joint unions; top supply (over rim); concealed supply and waste and overflow with chain and plug; vitreous china 4-arm handles and escutcheons; brass fittings between valves and spout.

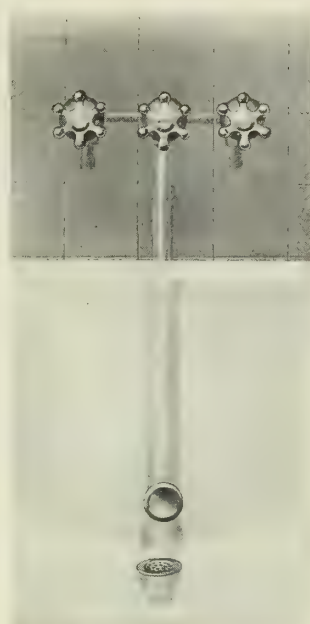
Guaranteed for 5 years. Fits all standard makes of enameled iron and porcelain tubs. Specify make and plate number of tub "to be trimmed with Glauber Cuyahoga Bath Fitting."



H-210 "ST. LAWRENCE" BATH FIXTURE FOR RECESS OR CORNER BUILT-IN TUB

Compression non-rising stem valves with ground joint unions; top supply (over rim); concealed supply and waste and overflow; lift waste; vitreous china lever handles and china escutcheons; brass fittings between valves and spout.

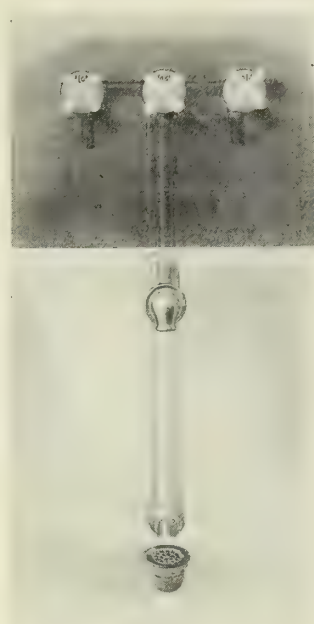
Guaranteed for 5 years. Fits all standard makes of enameled iron and porcelain tubs. Specify make and plate number of tub "to be trimmed with Glauber St. Lawrence Bath Fitting."



H-205 "MISSOURI" BATH FIXTURE FOR RECESS OR CORNER BUILT-IN TUB

Compression non-rising stem valves with ground joint unions; low bell supply; lift waste; 6-ball china indexed handles and metal escutcheons; brass fittings between valves and to bell.

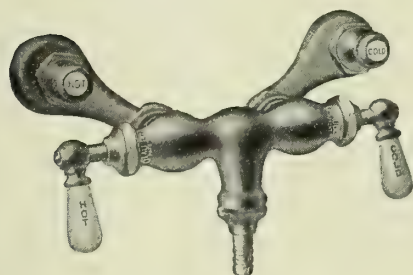
Guaranteed for 5 years. Fits all standard makes of enameled iron and porcelain tubs. Specify make and plate number of tub "to be trimmed with Glauber Missouri Bath Fitting."



H-206 "SACRAMENTO" BATH FIXTURE FOR RECESS OR CORNER BUILT-IN TUB

Compression non-rising stem valves with ground joint unions; top nozzle supply; concealed supply and waste; lift waste; vitreous china 4-arm handles and china escutcheons; brass fittings between valves and spout.

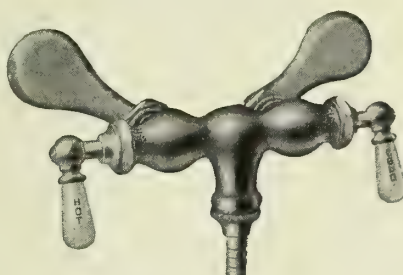
Guaranteed for 5 years. Fits all standard makes of enameled iron and porcelain tubs. Specify make and plate number of tub "to be trimmed with Glauber Sacramento Bath Fitting."



H-126. THE "LAKESIDE-ONTARIO" DOUBLE SHAMPOO OR SINK FIXTURE

For kitchen, slop sinks, laundry trays and shampoo "Nu-rapid" mechanism, china indexed sleeve lever handles

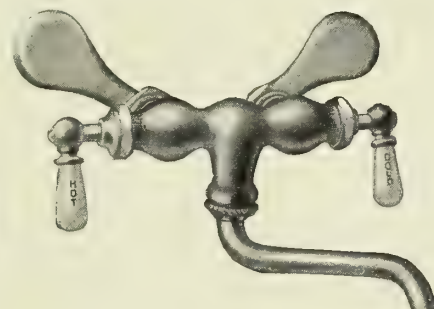
Adjustable to fit centers from  $3\frac{3}{8}$  to 10 ins.



H-241. THE "LAKESIDE-ERIE" BATH FIXTURE

For recess and corner built-in tub. "Nu-rapid" mechanism china indexed sleeve lever handles

Adjustable to centers from  $3\frac{3}{8}$  to 10 ins.

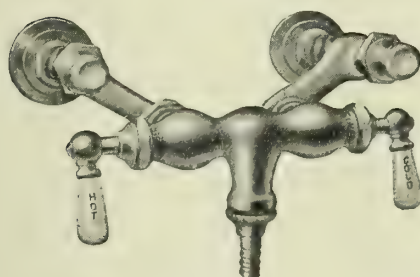


H-242. THE "LAKESIDE-HURON" BATH FIXTURE

"Nu-rapid" double cock with swinging spout and china index sleeve handles

Adjustable to centers from  $3\frac{3}{8}$  to 10 ins.

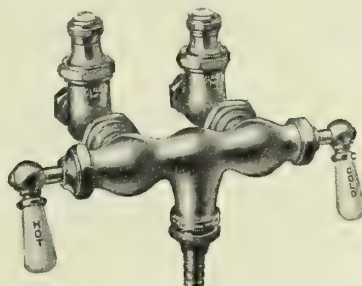
Spout:  $9\frac{1}{2}$  ins. from wall to center of spout



H-243. "THE LAKESIDE-MICHIGAN" BATH FIXTURE

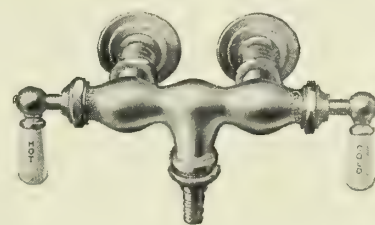
For recess or corner built-in tub. "Nu-rapid" bath cock with integral loose key stop; extension shanks and spiral flanges

Adjustable to fit centers from  $3\frac{3}{8}$  to 10 ins.



H-245. THE "LAKESIDE-PACIFIC" BATH FIXTURE

For recess or corner built-in tub. "Nu-rapid" double bath cock with integral loose key stops, and china indexed sleeve lever handles. Spread of stops,  $3\frac{3}{8}$  ins. center to center



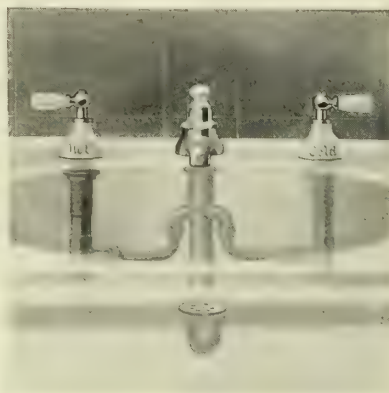
H-246. THE "LAKESIDE-SUPERIOR" BATH FIXTURE

For recess or corner built-in tub; "Nu-rapid" double bath cock with spiral adjustable flanges. Spread of shanks;  $3\frac{3}{8}$  ins. center to center



H-100. THE "MIAMI" BASIN FIXTURE

"Miami" compression non-rising stem valve basin fixture; pop waste; vitreous china 4-arm handles and vitreous china indexed escutcheons. Also made with "Nu-rapid" valves



H-104. THE "YOSEMITE" BASIN FIXTURE

"Yosemite" compression non-rising stem valve basin fixture; lift waste; vitreous china lever handles and vitreous china indexed escutcheons. Also made with "Nu-rapid" valves



H-103. THE "SAN JOAQUIN" BASIN FIXTURE

"San Joaquin" compression non-rising stem valve basin fixture; lift waste with vitreous china indexed knob, vitreous china 4-arm handles and indexed escutcheons. Also made with "Nu-rapid" valves



H-120. THE "COLORADO" BASIN AND SHAMPOO FIXTURE

"Colorado" compression non-rising stem valve, combination shampoo and basin fixture; plug and chain; 4-ball china indexed handles with metal escutcheons. Also made with "Nu-rapid" valves



H-101. THE "OHIO" BASIN FIXTURE

"Ohio" compression non-rising stem valve basin fixture; pop waste; vitreous china lever handles and vitreous china indexed escutcheons. Also made with "Nu-rapid" valves



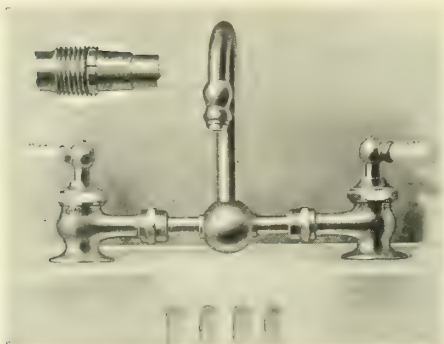
H-102. THE "TENNESSEE" BASIN FIXTURE

"Tennessee" compression non-rising stem valve basin fixture; pop waste; 4-ball china indexed handles and metal escutcheons. Also made with "Nu-rapid" valves



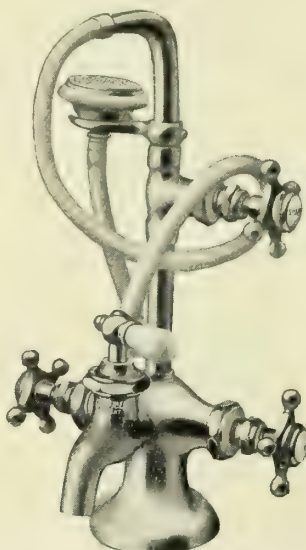
H-121. THE "NEBRASKA" BASIN FIXTURE

"Nebraska" compression non-rising stem valve combination fixture with gooseneck spout; for basin or sink; plug and chain; 4-ball china indexed handles and metal escutcheons



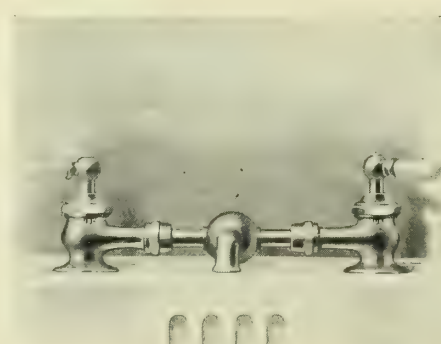
H-124. THE "SALINAS" "NU-RAPID" DOUBLE BASIN COCK

"Salinas" "Nu-rapid" combination basin fixture with gooseneck spout and china indexed lever handles. Also with nickelplated brass handles. The sectional view shows this company's "Lockjaw" slip joint connection, the lack of which is alone sufficient to account for the failure of all other fixtures of this type.



H-247 THE "COMMODORE" DOUBLE BASIN AND SHAMPOO COCK

Nickelplated. Also made for double lavatory, with 2 spouts



H-125. THE "CONVERTO" "NU-RAPID" DOUBLE BASIN COCK

"Converto" "Nu-rapid" combination basin fixture with china indexed lever handles. The "Converto" has our "Lockjaw" connections, holding the spout rigidly in place



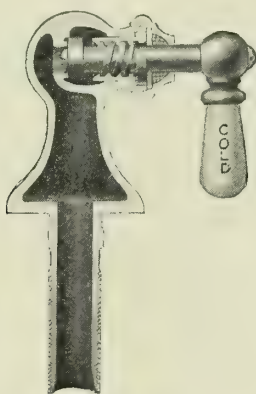
**"Nu-rapid" Construction.**

Has all the advantages of the quick opening "Fuller" faucet with its lever-eccentric construction, as well as the durability and high pressure resistance of the "compression" faucet with its screw-stem construction.

Handle is securely and rigidly fitted to a square head stem, completely eliminating the disadvantages found in other makes, having round corrugated stems and handles.

Handle and working parts can be readily changed to any position without detaching handle or dismantling faucet.

The only repair ever necessary is the replacing of washers and this is easily accomplished by unscrewing the cap nut, the working parts being removed as a unit.

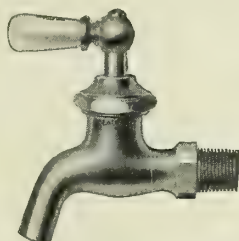


DETAIL OF "NU-RAPID" CONSTRUCTION AS USED IN GLAUBER BASIN COCKS, BIBBS AND BATH COCKS



H-1032 "JUNO" "NU-RAPID" BASIN COCK

With china index lever handle



H-1001-H "NU-RAPID" NICKEL-PLATED PLAIN BIBB

For iron pipe china index lever handle



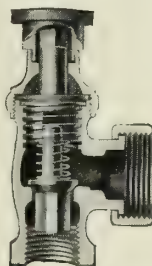
H-1050 "THE COLONEL" "NU-RAPID" PANTRY COCK

With china index lever handle

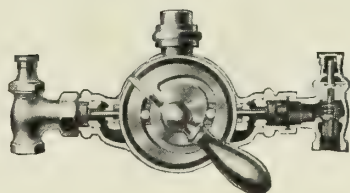


H-1030 "BAYSIDE" "NU-RAPID" BASIN COCK

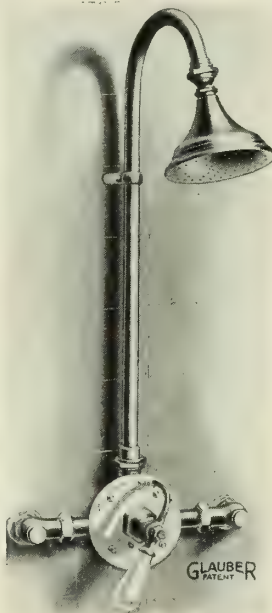
With china index lever handle



DETAIL OF COMBINATION REGULATING STOP AND CHECK VALVE



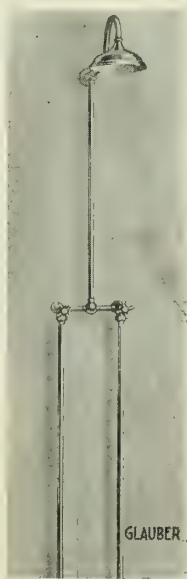
GLAUBER SHOWER MIXING VALVE  
Front view of valve exposed  
Distance center to center of supplies, 10½ ins.



H-25 THE "CAROLINA" EXPOSED SHOWER MIXING VALVE  
5-in. shower head. Center to center of supplies 10½ ins.



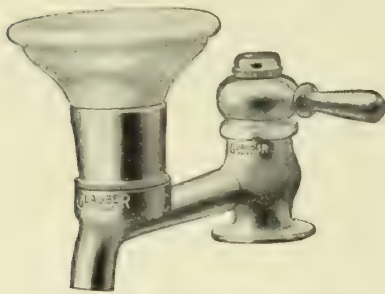
H-31 THE "LOUISIANA" EXPOSED SHOWER MIXING VALVE  
5-in. shower head. Center to center of supplies 10½ ins.



H-52 THE "IOWA" SHOWER WITH CHINA INDEXED EXPOSED COMPRESSION VALVES  
5-in. shower head



H-26 THE "MARYLAND" CONCEALED SHOWER MIXING VALVE  
5-in. shower head. Center to center of supplies 10½ ins.



H-510 THE "PRINCETON" VITREOUS CHINA BUBBLER  
With ball bearing, self-closing basin cock



THE "MUSKOGEE" NO. 2 BUBBLER



H-502 THE "CORNELL" VITREOUS CHINA BUBBLER

Ring control, self closing stop, operated by turning either direction



H-516 THE "VASSAR" VITREOUS CHINA DRINKING FOUNTAIN

Diameter of bowl, 10½ ins.; wall to front of bowl, over all, 12 ins.; top to bottom on wall, 10½ ins. "Harvard" bubbler with push button set in wall



H-517 THE "DART-MOUTH" VITREOUS CHINA DRINKING FOUNTAIN

Height, 30 ins.; diameter of base, 15 ins.; diameter of top, 10½ ins. "Cornell" bubbler



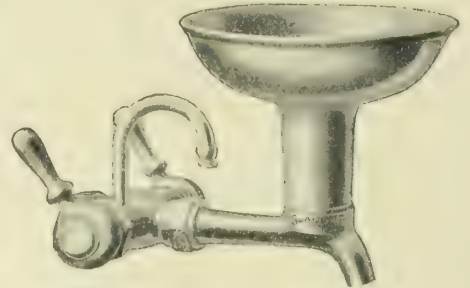
H-518 THE "CARLISLE" VITREOUS CHINA DRINKING FOUNTAIN

Diameter, 13½ ins.; height, 30½ ins.; diameter of iron base, 14 ins. "Harvard" bubbler with self closing stop



H-501 THE "HARVARD" VITREOUS CHINA BUBBLER

For pedestal or wall fountains



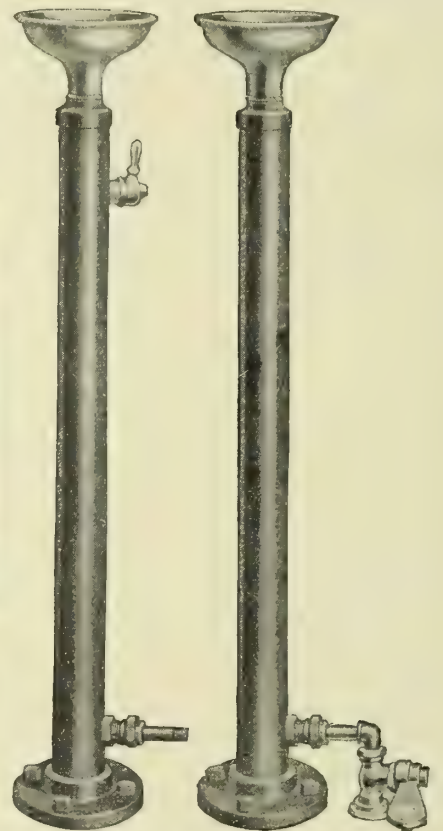
THE "CONGRESSIONAL" BUBBLER



THE "PRACTICOL" NO. 1 DRINKING FOUNTAIN

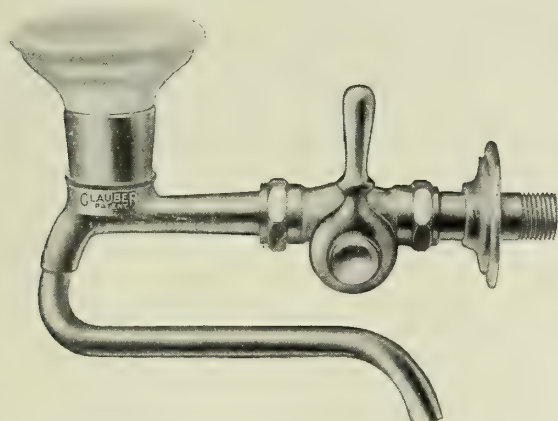


THE "PRACTICOL" NO. 2 DRINKING FOUNTAIN



The "Practico" No. 1 The "Practico" No. 2 DRINKING FOUNTAINS





H-506 THE "ANNAPOLIS" VITREOUS CHINA BUBBLER

With self-closing stop and set screw flange; back drain spout. Made with a variety of handles, but usually with lever handle as shown

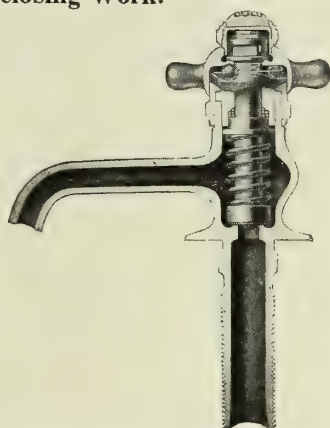
### Glauber Ball Bearing Self-closing Work.

This type of work is as near mechanical perfection as it is possible to come. It has stood the test of time; thousands of Glauber self-closing cocks have been in use in all classes of buildings throughout the country for many years.

Opening and closing of the cocks is effected by three phosphor bronze balls traveling up and down inclines located in the head and bonnet.

Pitch of the incline is such that the balls change their position with each operation of the handle, making it impossible for the balls to wear flat, as is the case with roller bearing type of self-closing work. The slightest operation of handle gives sufficient flow of water.

They will not open because of pressure even though it should run up to 200 lbs.

DETAILS OF CONSTRUCTION  
GLAUBER BALL BEARING SELF-CLOSING WORK

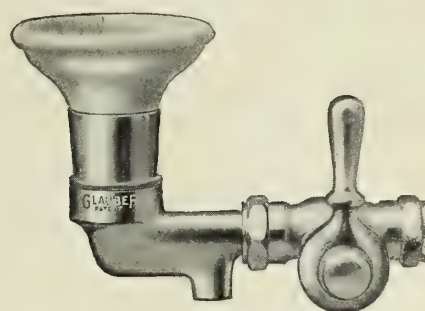
### "Underim" Bath Fixtures.

The "Underim" is an innovation in bath cock construction, it having the advantage of eliminating almost all of the exposed nickelplated work, as in concealed installations, yet it is adaptable for use on any standard leg tub. It requires no special punching, the spout coming through the overflow hole.

It sells at as low a price as one would expect to pay for a good compression bath cock of the standard type and is even more readily installed than the regulation bath cock outfit.

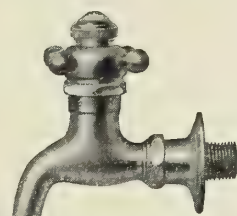
The beauty of the fixture makes a universal appeal and convinces this company that the "Underim" is destined to soon replace the bath cock combinations that up until now have been regarded as standard equipment for leg tubs.

The "Underim" is suitable also for use in connection with concealed installations, in which class of work it effects a material saving, as it costs much less than other fixtures for use with concealed tubs.



H-503 THE "YALE" VITREOUS CHINA BUBBLER

With self-closing stop, nickelplated, 3 in. integral return spout, or when ordered 6 in.



BALL BEARING SELF-CLOSING PLAIN BIBB

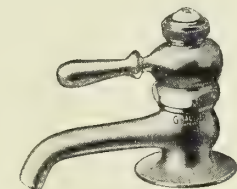
4-ball china indexed handle; male flange, iron pipe. Finished brass or nickelplated

H-804 THE "VAN BUREN"  
BALL BEARING SELF-CLOSING BASIN COCK  
Side lever handleH-803 THE "WASHINGTON"  
BALL BEARING SELF-CLOSING BASIN COCK

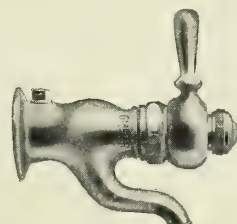
China indexed 4-ball handle

H-810 THE "MADISON" BALL  
BEARING SELF-CLOSING BASIN COCK

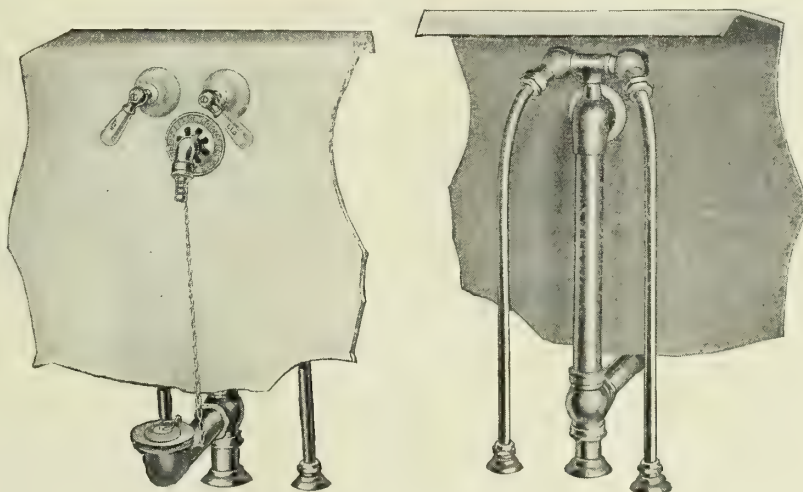
China indexed tee handle

H-807 THE "MONROE"  
BALL BEARING SELF-CLOSING BASIN COCK

China indexed lever handle

H-841 THE "MORRISON"  
BALL BEARING SELF-CLOSING ICE WATER COCK  
With flow regulating screwH-840 THE "BENSON"  
BALL BEARING SELF-CLOSING ICE WATER COCK

With flow regulating screw



Front View "UNDERIM" BATH FIXTURES

Back View

# FOUNTAIN FAUCET COMPANY

DULUTH, MINN.

## Products.

FOUNTAIN FAUCETS.  
DRINKING FOUNTAINS.  
HOT and COLD WATER FAUCETS.

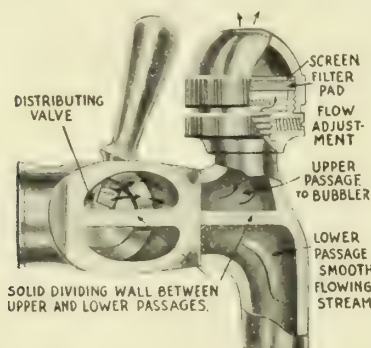
## Description of Fountain Faucets.

The fountain faucet is a combination of the ordinary faucet with a sanitary drinking fountain. Flow of water is through the bubbler when handle is turned up, and from faucet in a full, solid stream as an ordinary faucet when handle is turned down.

Furnished for hot and cold water, right and left setting; the hot water type without bubbler.

Bubbler furnished with or without filter. High grade felt pad used, easily removed for cleaning. Only drinking water passes through the filter. A smooth flowing stream is always assured. Rate of flow and height of jet regulated by setting lower portion of bubbler.

Whole faucet very heavily constructed of best brass,



SECTION THROUGH FOUNTAIN FAUCET SHOWING DISK VALVE AND TWO WATER PASSAGES

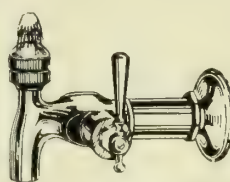
85% copper, and well nickelplated. Closure is positive when handle is horizontal. Outlet chamber divided into 2 passages leading to bubbler or spout and a disk valve directs the water through one or the other as the handle is turned up or down. Valve stem spring is compression packed to prevent leaking.

## Special Uses.

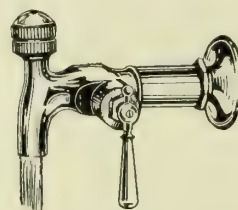
The fountain faucet is especially suited for homes where convenience and safety of a drinking fountain has not been recognized, also in offices or public buildings. It is an added convenience wherever an ordinary cold water faucet is used.

## Later Information.

This company is introducing several new patterns. The latest bulletins describing these new patterns will be sent on request.



Handle Up  
A convenient bubbler



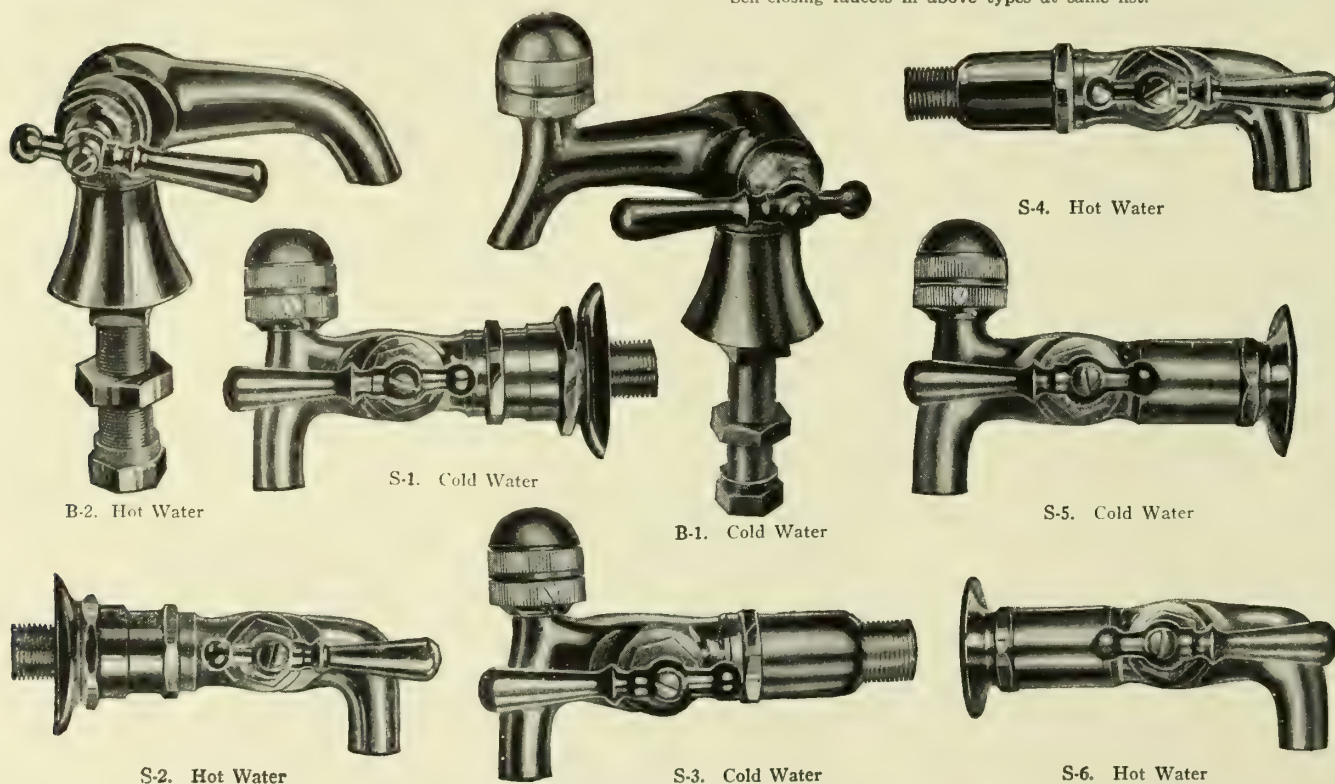
Handle Down  
A full flow of water

## FOUNTAIN FAUCETS

### LIST PRICES

No.	Description	Price
B-1	Basin faucet, cold water, with bubbler.....	\$6.00
B-2	Basin faucet, hot water, without bubbler.....	5.20
S-1	Sink faucet, adjustable flange, cold water, with bubbler.....	5.50
S-2	Sink faucet, adjustable flange, hot water, without bubbler.....	4.70
S-3	Sink faucet, plain nipple, cold water, with bubbler.....	5.00
S-4	Sink faucet, plain nipple, hot water, without bubbler.....	4.40
S-5	Sink faucet, solid flange, cold water, with bubbler.....	5.00
S-6	Sink faucet, solid flange, hot water, without bubbler.....	4.40

Self-closing faucets in above types at same list.



VARIOUS TYPES OF FOUNTAIN FAUCETS



HOFFMANN & BILLINGS MFG. CO.

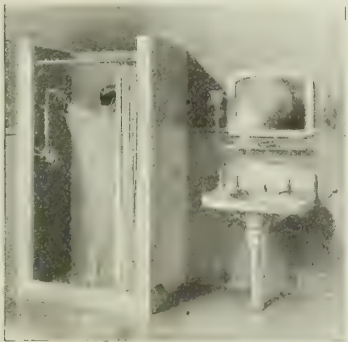
Manufacturers of Plumbing Fixtures

MILWAUKEE, WIS.

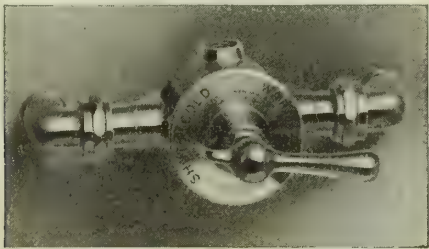
**Products.**  
"NIEDECKEN MIXER" ANTISCALDING SHOWER CONTROL VALVES.  
SHOWER and NEEDLE BATHS with "NIEDECKEN MIXERS."  
Shampoo and Hospital Fixtures with "Niedecken Mixers"; High Grade Plumbing Fixtures; Bell Supply Fixtures; Plumbers' Brass Work; Compression Work; Fuller Work; Self-closing Work; Basin Cocks; Bath Cocks.

**"Niedecken Mixer."**  
The illustration gives an idea of the general appearance of the "Niedecken Mixer."  
The construction is the most substantial possible, and the principle, being compression, eliminates all cams and springs.  
The valve seats are renewable, making it possible to keep the valve at all times in perfect condition, even after years of use.  
The antiscalding feature is especially important, and consists of a device by means of which the valve can be set to a predetermined temperature.

This type of installation permits bather to adjust shower before water strikes body, and location of the shower head enables bather to take simply a body bath without wetting head.

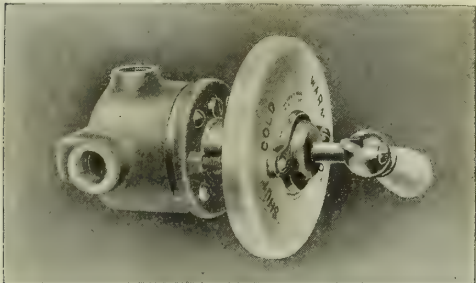


N 5070X HOTEL AND RESIDENCE INSTALLATION



"NIEDECKEN MIXER" (PATENTED)

N 4000X	1/2-in. inlets and discharge.....	\$22.00
N 5002X	3/4-in. inlets and discharge.....	30.00
N 5005X	1-in. inlets and discharge.....	45.00



CONCEALED "NIEDECKEN MIXER" (PATENTED)

N 4015X	1/2-in. inlet and discharge.....	\$22.00
N 5017X	3/4-in. inlet and discharge.....	30.00
N 5020X	1-in. inlet and discharge.....	45.00

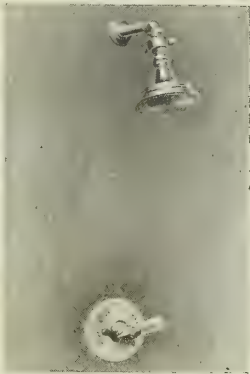
**Hotel and Residence Installation.**  
N 5070X shows the typical hotel and residence type of shower installation, namely, the fixture on side near front of shower stall. The shower head is placed 5 ft. 6 ins. above floor.



N 4050X



N 4055X

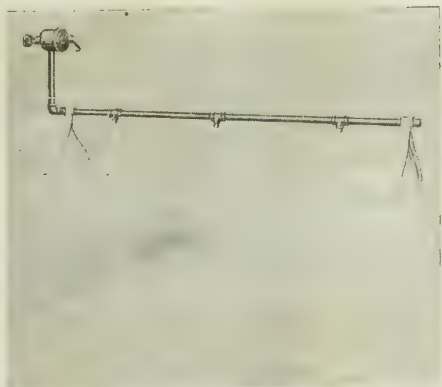


N 4100X

N 4050X	1/2-in. supplies.....	\$34.00
N 4055X	1/2-in. supplies.....	41.00
N 4100X	1/2-in. supplies.....	27.00



NIEDECKEN INDUSTRIAL SHOWER  
\$23.00



FACTORY WASH SINK INSTALLATION  
WITH "NIEDECKEN MIXER" CONTROL

NOTE: The "Niedecken Mixer" can be furnished so that it can be supplied directly with steam

W. N. MATTHEWS, PRESIDENT AND TREASURER

MARTIN J. WOLF, VICE-PRESIDENT

CLAUDE L. MATTHEWS, VICE-PRESIDENT AND SECRETARY

**W. N. MATTHEWS & BROTHER, INC.**

Manufacturers of Water Heating Devices

ST. LOUIS, MO.

CANADIAN DISTRIBUTERS

THE NORTHERN ELECTRIC COMPANY, LTD.

MONTREAL, HALIFAX, TORONTO, WINNIPEG, CALGARY, REGINA, VANCOUVER, VICTORIA

**Product.**

MATTHEWS STEAMIX WATER HEATER.

**Description.**

Matthews Steamix is a device for mixing cold water and live steam and instantly producing warm or hot water of any desired temperature and in unlimited quantities.

Matthews Steamix is made in several different types which can be easily attached to steam and cold water outlets where hot and cold water is desired. Temperature of the water can be maintained so perfectly that it will not vary 2° either way if the water is allowed to run all the time.

They occupy no valuable space; can easily be installed by any one understanding pipe fitting, and will require no further attention once they are installed and adjusted.

All series of Matthews Steamix for washroom purposes are assembled with steam connection on left side, to conform with established custom of making hot water connections.

The screw regulating valves are set at mid-opening. To reduce the flow of either water or steam, turn the screw plug to the right. To increase the flow, turn the screw plug to the left. A cap covers the opening to the adjusting screw and must be removed before a change can be made in the adjustment of the valve.

**Advantages.**

Matthews Steamix will give all of the hot water wanted, at any temperature desired, as long as it is wanted and only when and where it is wanted.

Heats only the exact amount of water needed, no lost heat.

Does away with heavy first cost and maintenance of bulky hot water apparatus. A cold water line and a steam line are all that are needed.

They are absolutely *noiseless*.

Saves time, water and fuel.

Gives a uniform mixture at once without depending on a thermostat for regulation.

Matthews Steamix enables the one using hot water to perform all of the service of operating it—from generating the hot water to automatically closing the valves.

Self-cleaning, because the heated water passes out immediately and therefore leaves no sediment or deposit. Low upkeep expense.

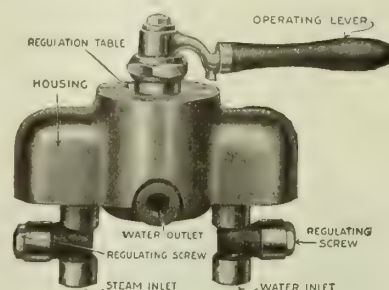
**Series 100 Matthews Steamix.**

Matthews Steamix Series 100 is a refined, neat device for use on showers in clubs, hotels, etc. Made up

complete ready for steam and water connections. Steam and water inlets are provided with a regulating device for adjusting the volume of water and steam admitted to the heating and mixing chamber.

Inlet openings are clearly indicated by the words on the casting, "Steam" or "Water."

Valves of Series 100 are not interchangeable, on account of a difference in the seats. In assembly for shower use, the steam connection is on the left, as you face the regulating table, discharge outlet pointing upward. Not made for other than shower use.



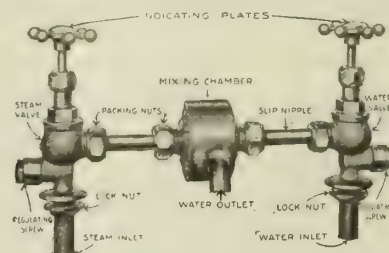
SERIES 100 MATTHEWS STEAMIX, ARRANGED FOR BASIN INSTALLATION

**Series 200 Matthews Steamix.**

Illustration shows this series assembled ready for installation. The control valves have long threaded shanks and lock nut for convenience in attaching to lavatory tap. By removing the lock nuts, the unit as assembled can be dropped into place on top of lavatory, fastened rigidly in place with the lock nuts and supply connections made.

For shower fixtures this series is assembled with the valve inlets 9 ins. center to center. Riser, goose-neck and spray head are shipped detached.

This series is less costly than the Series 100. It is very efficient, but there is a chance of getting live steam or water of a scalding temperature at first if steam side is turned on before the water side.



SERIES 200, NO. 200 MATTHEWS STEAMIX ARRANGED FOR BASIN INSTALLATION

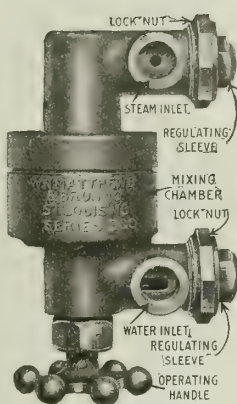


**Series 300 Matthews Steamix.**

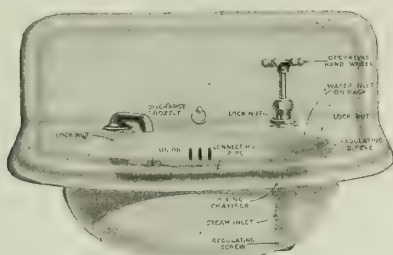
These are absolutely anti-scalding devices for both shower and basin service.

Can be furnished either with a rough unfinished outside for industrial plant use, or nickel-plated and finely finished outside for shower use, and are very popular in industrial plants, office buildings, etc.

Operated by hand lever or hand wheel. Lever or wheel is in closed position when turned to extreme right. The operating shaft gives a cam movement to parts that open the water and steam valves and consequently revolves without moving from its position.



SERIES 300, NO. 300  
MATTHEWS STEAMIX

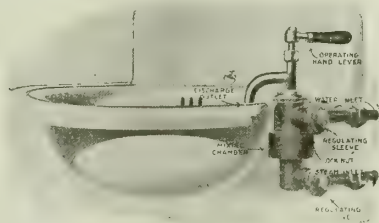


BASIN INSTALLATION SERIES 300,  
NO. 301 MATTHEWS STEAMIX

A half revolution is sufficient to open both valves.

Upper inlet is for water and is provided with a regulating sleeve for adjusting the water flow.

Lower inlet is for steam and is provided with a screw regulating valve for adjusting the flow of steam.



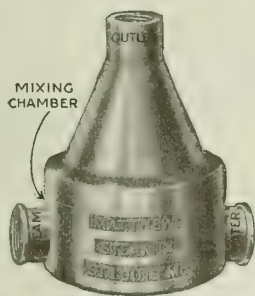
BASIN INSTALLATION SERIES 300,  
NO. 302 MATTHEWS STEAMIX

**Series 400 Matthews Steamix.**

The three types shown are without valves and are used for furnishing large volumes of hot water for manufacturing operations.

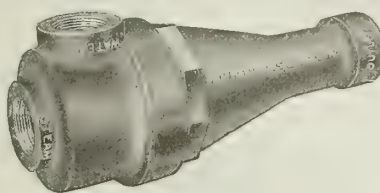
Inlets for steam and water are indicated on the casting. Inlet pipe sizes vary from 1/2 to 3 ins., depending on size of supply pipe.

No valves are furnished with Series 400 Steamix. Where accurate regulation in flow and temperature is not essential, no screw regulating valves are necessary.

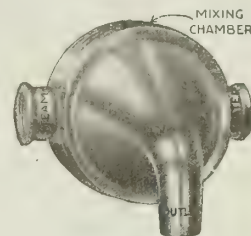


SERIES 400, NO. 400  
MATTHEWS STEAMIX

Any standard valve can be used on inlet connections if regulation is desired.



SERIES 400, NO. 402 MATTHEWS  
STEAMIX



SERIES 400, NO. 401  
MATTHEWS STEAMIX

**Ordering Information.**

In ordering, state the purpose for which the Steamix is to be used, and steam and water pressures under which it will operate.

For lavatory use, give measurement from center to center of holes in top of lavatory, or at back of splash board, if connections are brought through the back.

For showers the normal measurement is 4 ins. center to center of inlets for Series 100 and 9 ins. for Series 200 and patterns.

Inlet connections for standard pipe. Size of water connections govern the size of the heater.

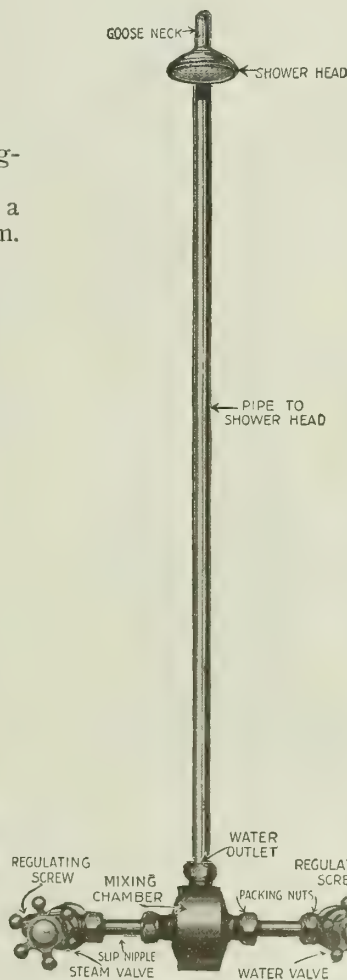
Complete details furnished on application and suggestions gladly given.



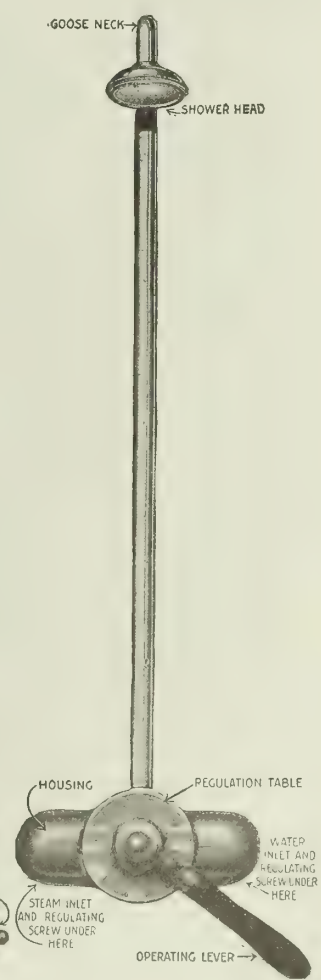
GOOSE NECK  
SHOWER HEAD



GOOSE NECK  
SHOWER HEAD



SERIES 200 MATTHEWS STEAMIX  
INSTALLED FOR SHOWER



SERIES 100 MATTHEWS  
STEAMIX INSTALLED FOR  
SHOWER

# THE MURDOCK MFG. & SUPPLY CO.

Drinking Fountains and Hydrants

426-430 Plum Street  
CINCINNATI, OHIO

## Products.

Manufacturers of DRINKING FOUNTAINS and HYDRANTS.

Sole makers of ANTIFREEZING DRINKING FOUNTAINS for outdoor use.

Dealers in General Water, Gas and Steam Supplies and Tools.

## Murdock Antifreezing Drinking Fountains.

Selecting drinking fountains for open air installation requires special thought.

(1)—Outdoor conditions are entirely different. Severe weather and changing temperatures require special construction.

(2)—Porcelain, enamel and china chip easily or air-crack in time and become most unsanitary.

(3)—Outdoor fountains must withstand the abuse of the irresponsible public and the elements.

The Murdock long experience in making open air antifreezing devices has produced a thoroughly practical outdoor fountain.

The Murdock patent antifreezing "Bubble-Font" is a scientifically designed pedestal type drinking fountain.

Attention is called to the following distinctive features. The solid working valve and the supply regulator are located in the ground *below frost line*. A foot treadle opens the valve and permits water to rise to the bubbler. A separate waste pipe conducts overflow from the basin back to a point below frost line. Releasing foot treadle causes water to drain from supply pipe into sewer. This automatic drainage prevents water standing in fixture to become warm and stagnant in summer or to freeze and burst it in winter.

Every piece is made substantially heavy and all inner parts are brass. There is no flimsy self-closing cock to get out of order. The only wear is where the leather washer of a well made valve rides the bronze stem, and this will last as long as a pump plunger. The integral trap prevents sewer gases from rising to the bubbler.

By removing treadle bolt and two top bolts treadle and inner working parts may be lifted out. Thus valve can be re-

packed or any part replaced without digging up fixture. This advantage should appeal to all.

## Original Murdock Antifreezing Bubble-Font.

Ideal for public streets, parks, playgrounds, school-yards, railroad yards, cemeteries, and other outdoor installations. Strong and practical for shelter houses, comfort stations and all semiexposed places.

Outer shell cast iron, simply ornamented, and painted green. Other colors to order.

Furnished for interior installation by reducing the shank below pedestal to 6 ins., omitting trap at the base and placing outlet opposite or at an angle to the inlet. Ideal for shop and factory use where strong pedestals that will withstand rough use are desired. Indoor fountains can be drained into open receptors.



ORIGINAL MURDOCK  
ANTIFREEZING  
BUBBLE-FONT

Furnished for any depth of bury desired; anything shorter than 2 ft. takes 2 ft. list. Regularly made 34 ins. above ground, but can be made 30 ins. if desired.

## Lily White Bubble-Font.

A pure white, painted, cast iron shell fountain free of all ornamentation, made for outdoor or indoor use with same interior mechanism as the Original Murdock. Finished in pure white vitrolite which can be renewed as often as desired or necessary. The bubbler and the basin are made of solid bronze—nickelplated. This all metal feature makes them practically everlasting.

Ideal for installation in hospitals and medical institutions, churches, public buildings, comfort stations, industrial plants, etc. Also furnished with Murdock patent antifreezing parts to any depth desired below ground when a fountain of pure white, simple design is preferred for outdoor use.

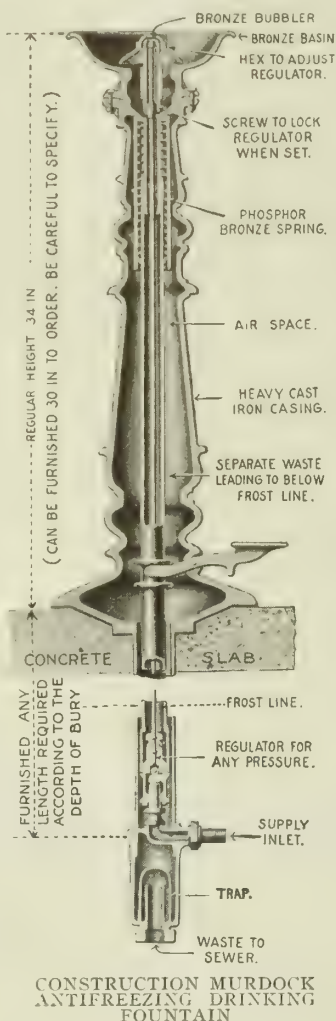


LILY WHITE  
BUBBLE-FONT

**INSTALLATION**—The Murdock Lily White Bubble-Font may be installed in several ways. It is particularly adapted for concrete construction, both supply and waste may be placed just below surface in a space of less than 2½ ins. in depth. Fountain may be connected to circulating ice water systems or to separate iced coils in boxes. In old buildings having wood floors construction of fountain permits installing trap in space between floor and ceiling or beneath ceiling of story below.

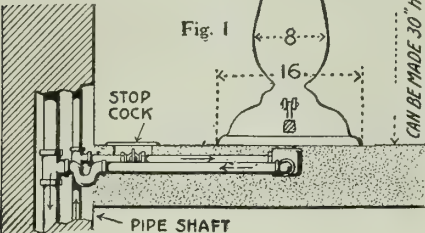
For installation see five methods on next page.

**DIMENSIONS**—Regular height of Lily White pedes-





tal 36 ins. above floor, but can be furnished 30 ins. to order; diameter of basin 12 ins., diameter of bulge 8 ins., diameter of base 16 ins. Four 1/2-in. bolt holes on 14 1/2-in. diameter of circle. Treadle protrudes 1 in. beyond base.



FIVE DETAILS OF INSTALLATION OF MURDOCK LILY WHITE BUBBLE-FONT

- (1) Concrete floor. Working parts accessible without disturbing fixture.
  - (2) Concrete floor. 2 1/2 ins. from floor line to bottom of 1-in. waste pipe. 3 ins. from floor line to extreme lower end.
  - (3) Concrete floor. Method of installation with trap exposed on ceiling of story below. Trap regularly furnished rough brass, but may be polished and nickelplated to order.
  - (4) Wood floor. Trap between floor and ceiling.
  - (5) Wood floor. Trap beneath ceiling of story below as in detail 3.
- NOTE—Inlets and outlets can be placed at any angle facing pedal, if so specified when ordering. Bottom fittings without traps, shown in 1 and 2, having a measurement of 3 ins. over all, may also be used as shown in 3, 4 and 5, when trap is otherwise placed. Bottom fittings with trap measure 8 ins. over all. This does not include elbows nor nipples. Can also be furnished with antifreezing parts for outdoor use.

Information for Ordering and Prices.

WHEN ORDERING OUTDOOR FOUNTAINS—Be careful to specify depth of bury, or length required below the surface of ground, sufficient to have valve and all working parts below a possible freezing point.

WHEN ORDERING INDOOR FOUNTAINS—Specify kind and thickness of flooring and whether the supply and drain is to be concealed or exposed.

OUTDOOR FOUNTAIN LIST PRICES

Depth of bury	Original Murdock	Murdock Lily White
2 ft.	\$70.00	\$82.00
3 ft.	73.50	85.50
4 ft.	77.00	89.00
5 ft.	80.50	92.50
6 ft.	84.00	96.00

Half-foot lengths between the above will be furnished at price of next longest length; i.e., a 2 1/2-ft. length takes same price as of 3-ft. length

INDOOR FOUNTAIN LIST PRICES

Description and Construction	Original Murdock	Murdock Lily White
No. 1, Short 3-in. connection for supply waste set opposite. Concealed concrete...	\$70.00	\$82.00
No. 2, Same as No. 1, except supply inlet and waste are set at right angles.....	70.00	82.00
No. 3, 6-in. connection for supply and waste with trap. Exposed concrete.....	73.00	85.00
No. 4, Same as No. 3. Concealed frame....	73.00	85.00
No. 5, Same as No. 3. For exposed frame...	73.00	85.00

“Sandow” Pedestal Fountains.

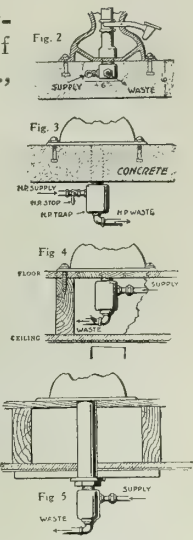
Strong, durable, heavy cast and wrought iron standards finished pure white. Equipped with special “Murdock” bubblers.

Regular 36 ins. Can be built 30 or 24 ins. to order. Supplies and wastes furnished to floor unless otherwise specified. No water control furnished with Constant Flow. Self-



Constant Flow \$25.00 Self-closing \$30.00 Pedal Acting \$35.00 “SANDOW” PEDESTAL FOUNTAINS

closing stop-cock furnished with Self-closing. Murdock pedal valve built into Pedal Acting. A good heavy duty variety for use in factories, mills, shops or other places where higher priced fountains may not be desired.



NOTE—This is the way the genuine Murdock compression hydrant is marked



COMPRESSION HYDRANT

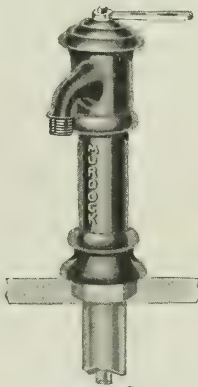
NOTE—This is the way the genuine Murdock self-closing hydrant is marked



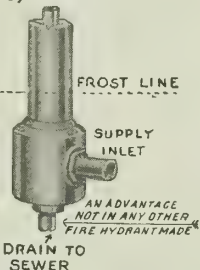
SELF-CLOSING HYDRANT

HYDRANT LIST PRICES

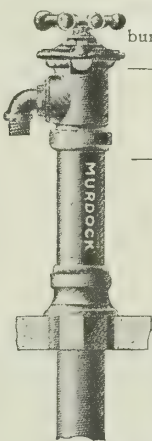
To bury ft.	Compression		Self-closing 3/4-in.
	3/4-in.	1-in.	
2	\$9.00	\$11.50	\$11.00
3	10.00	12.50	12.00
4	11.00	13.50	13.00
5	12.00	14.50	14.00
6	13.00	15.50	15.00



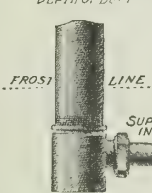
MADE FOR ANY DEPTH OF BURY



FIRE HYDRANT Can not fail to operate as it will not freeze



MADE FOR ANY DEPTH OF BURY



GROUND DRAINED HYDRANT For tanneries, stock yards, mills, factories, etc. Gives large supply



HOSE BOX Sets flush with paving. Ideal for garage or stable floor flushing

Made for 1 1/4-, 1 1/2- or 2-in. iron pipe and hose connections. Hose boxes for 3/4- and 1-in. also. Opening through hydrants and hose boxes 1 1/2 ins.

PRICES

To bury ft.	Fire Hydrant Drained to Sewer	Ground Drained Hydrant	Ground Drained Hose Boxes		
			3/4-in.	1-in.	1 1/4-, 1 1/2- or 2-in.
2	\$29.00	\$19.00	\$7.50	\$9.00	\$15.00
3	30.00	20.00	8.50	10.00	16.00
4	31.00	21.00	9.50	11.00	17.00
5	32.00	22.00	10.50	12.00	18.00
6	33.00	23.00	11.50	13.00	19.00

NOTE—In ordering be careful to give length (or depth of bury) and whether wanted for lead or iron pipe connections. Specify “Genuine Murdock” as made by THE MURDOCK MFG. & SUPPLY CO., Cincinnati, Ohio, and avoid substitutions

# THE R. F. CARPENTER MFG. CO.

## Sanitary Steel Door and Partition Sections

984 East Sixty-fourth Street  
CLEVELAND, OHIO

### Products.

Manufacturers of CARPENTER'S "SANYMETAL" PARTITIONS and DOORS for toilet rooms, dressing rooms, shower baths, urinals, etc.

CARPENTER'S GRAVITY ROLLER BEARING HINGES for all toilet doors.

**Sanymetal**  
TOILET PARTITIONS  
TRADE MARK REGISTERED

Special enamel is baked on to these partitions, giving the sheets an extra hard surface, making them impervious to moisture.

Where showers are desired in connection with a special container, or with a cement curb, these partitions are made to meet the conditions, as well as any others that may occur.

ROUND POST AND SPECIAL CONSTRUCTION—Round post partitions are constructed with special steel tubing, and are welded in the corners in the same manner as square post partitions. Partitions may be specified with galvanized iron throughout, and also with base castings extending 6 ins. into the floor.

This company makes every type of toilet partition for factory, hotel, hospital, schoolhouse, church, office building, barracks and clubhouse.

Hollow metal toilet doors are also made for special cases. These doors are flush on both sides.

DOORS—Doors are similar in construction to the partition, and are fitted with special spring or gravity roller bearing hinges, heavy cast rubber bumpers, pulls and latches.

BACKS AND VENT SPACE—When necessary, backs with U-channels attached, forming vent space, are applied with tops and vent doors, if required.

WALL POSTS—When wall partitions are not desired, wall posts are furnished to serve as jambs for end doors next to walls. If doors are not used, these wall posts are not needed.

Wall posts are also made with the U-channel, making them adjustable to uneven walls.

### Carpenter's "Sanymetal" Partitions and Doors.

ADAPTABILITY—Easily handled and erected units for toilets, showers and collateral uses. Factory finished throughout; erection only required on the work.

DESCRIPTION—"Sanymetal" partitions consist of 2 units, a partition with an integral supporting post, and a door. These units, with necessary castings for base and caps, and pipe railings for top finish, make up Carpenter's "Sanymetal" partition.

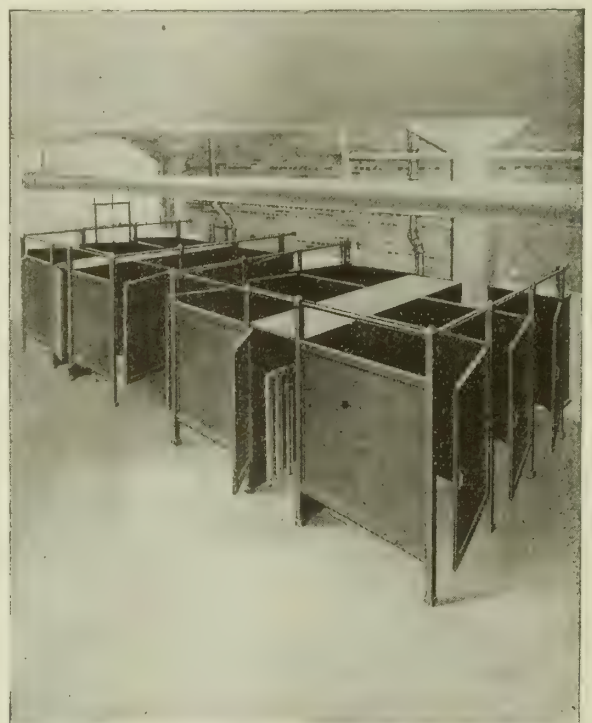
PARTITIONS—*Toilet Partition*—A heavy gage, patented, leveled, cold rolled steel sheet is electrically welded to a hollow steel vertical post, and fitted top, bottom and rear with rigid steel mouldings, all electrically welded and oxy-welded into one complete unit.

A U-channel fastens to the wall, and into this the back mould of the partition is inserted and fastened by means of bolts, after being adjusted to any unevenness in the walls. This added feature of the "Sanymetal" construction cuts the erection in half.

*Shower Partitions*—These are made of special lead coated, patented, leveled steel sheets, similar in construction to the toilet partitions.

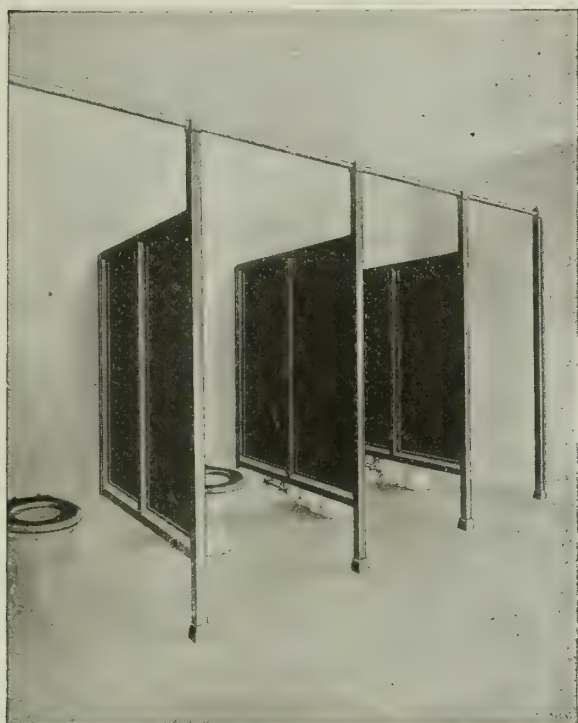


ONE OF THE INSTALLATIONS AT THE PLANT OF THE  
B. F. GOODRICH CO., AKRON, OHIO



TOILET INSTALLATION AT THE L. N. GROSS FACTORY,  
CLEVELAND, OHIO  
CHRISTIAN SCHWARZENBERG & GAEDE, Engineers and Architects  
Doors are closed when toilets are not in use





"SANYMETAL" PARTITIONS WITHOUT DOORS

Note construction of back rail and method of fastening partitions to wall



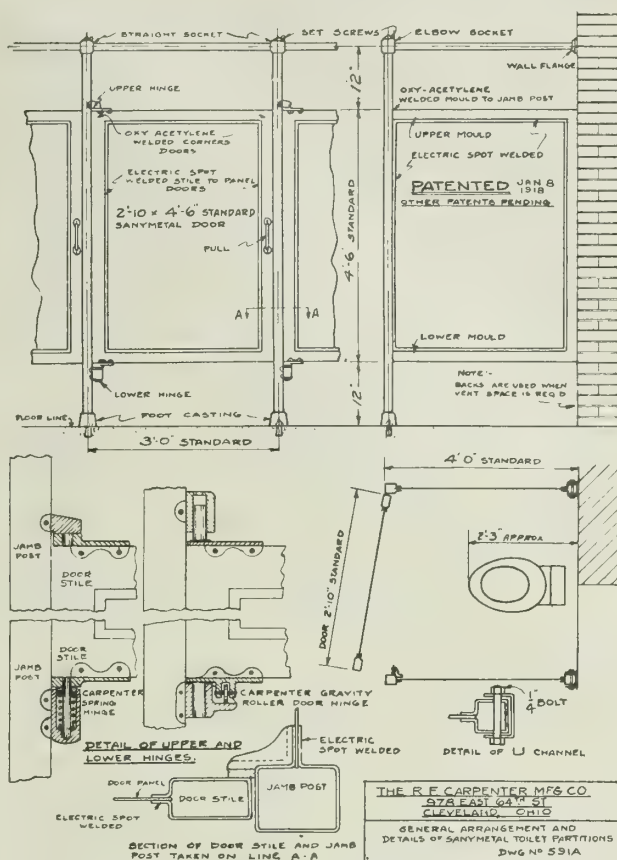
TYPICAL TOILET SCREEN INSTALLATION, WELLES BUILDING, WILKES-BARRE, PA.

**FINISH**—Particular attention is given to the finish of all work, each coat being a hard baked enamel. Standard finish is olive green. Other colors furnished are Brewster green or gray, or work can be furnished with a filler and priming coat, and finished by the painter after work is set. White enamel is best furnished in this way.

Partitions and doors present an impervious hard enameled surface.

"Sanymetal" is the ideal, economical, sanitary toilet partition.

**ERECTION**—With a little attention to detail, the erection of "Sanymetal" is a simple matter. After work has been laid out carefully, base castings are set. Into these, the hollow vertical posts are set. A set screw in the casting makes the partition adjustable to uneven floors. The rear of the panel has a moulding electrically welded to it and mitered to the top moulding, doing away with all unsightly edges. This is bolted into a U-channel, which snugly fits the back moulding of the



GENERAL ARRANGEMENT AND DETAILS, "SANYMETAL" TOILET PARTITIONS

Patented—other patents pending

partitions.

This U-channel is first fastened to the wall, and allows the partition to be adjusted to uneven walls. This simplifies the erection, especially on metal lath and plaster, brick and special composition walls, as it is an exceedingly simple matter to set a partition in the U-channel, and, by drilling two holes through the moulding, bolt it solid to the channel.

The setting of the U-channel is very easy in comparison to setting a partition against the wall. With the required number of sections erected, the drawn steel tubing is run through the top castings and fastened to the walls, forming a solid brace to hold the partition. Doors are swung on hinges, and other hardware applied.

**COST AND ESTIMATES**—"Sanymetal" is lower in cost (so far as is known) than any other material offering equal values. The practical value of the section design makes field erection much less than any other material.

Quotations are made on Carpenter's "Sanymetal" partition f.o.b. Cleveland or erected.

When desired, doors alone can be furnished for use with partitions of other material.

Other hardware, paper holders, hooks, etc., are taken care of in special detail.

### Gravity Roller Bearing Hinges.

For double and single acting doors. These hinges take the place of the spring hinges for toilets. There is nothing to get out of order; no springs to wear out; no cams to tighten; no pins to lose.

They will last as long as the door itself, and work perfectly.

The roller at the bottom does the business.

A special booklet is issued on these remarkable hinges.

# THE VITROLITE COMPANY

## Sanitary Structural Slabs

Chamber of Commerce Building  
CHICAGO. ILL.

FACTORY, PARKERSBURG, W. VA.

### Product.

VITROLITE, a White Impervious Structural Material made in Slabs.

### Description.

Vitrolite is homogeneous and opaque, and fused at a temperature of about 3,000° Fahr. The molten mass is rolled into slab form, thoroughly annealed and toughened.

**SURFACE**—Vitrolite is snow white. The exposed surface is fire polished and the reverse side corrugated.

**USES**—Vitrolite is unexcelled for toilet and shower partitions and toilet room wainscoting in clubs, office and public buildings and hospitals. Adapted for wainscoting in the halls and corridors of the class of buildings mentioned, also for apartment building entrances.

In residences, for the bathroom, kitchen and pantry walls, table and cabinet tops.

For light shafts, Vitrolite claims consideration on the basis of its high light reflecting factor.

In the industrial field, Vitrolite is used for laboratory walls and ceilings; brine freezing rooms in ice cream factories; walls and ceilings in bakeries; walls in electric power stations; cooling rooms and refrigerators in breweries; walls in creameries and dairies.

Vitrolite for the interior of markets, bakeries, restaurants and lunch rooms is decidedly satisfactory for surfacings walls, ceilings, counters, bulkheads and basing.

In barber shops Vitrolite is used for mirror frames and wainscoting because it is sanitary and easy to keep spotlessly clean.

Vitrolite is widely used in hospitals where the demand for asepticism in everything that enters into the construction and equipment of an operating, diet or utility room is insistent.

Vitrolite is aseptic and can be installed in large slabs so that seams and joints are reduced to a minimum. No chemicals can stain or react with it, it does not craze and can be sterilized without injury.

Permanence is an important feature of Vitrolite walls and ceilings; they last a lifetime, look clean and sanitary and eliminate redecorating expense.

**VITROLITE**  
"Better than Marble"  
TRADE-MARK

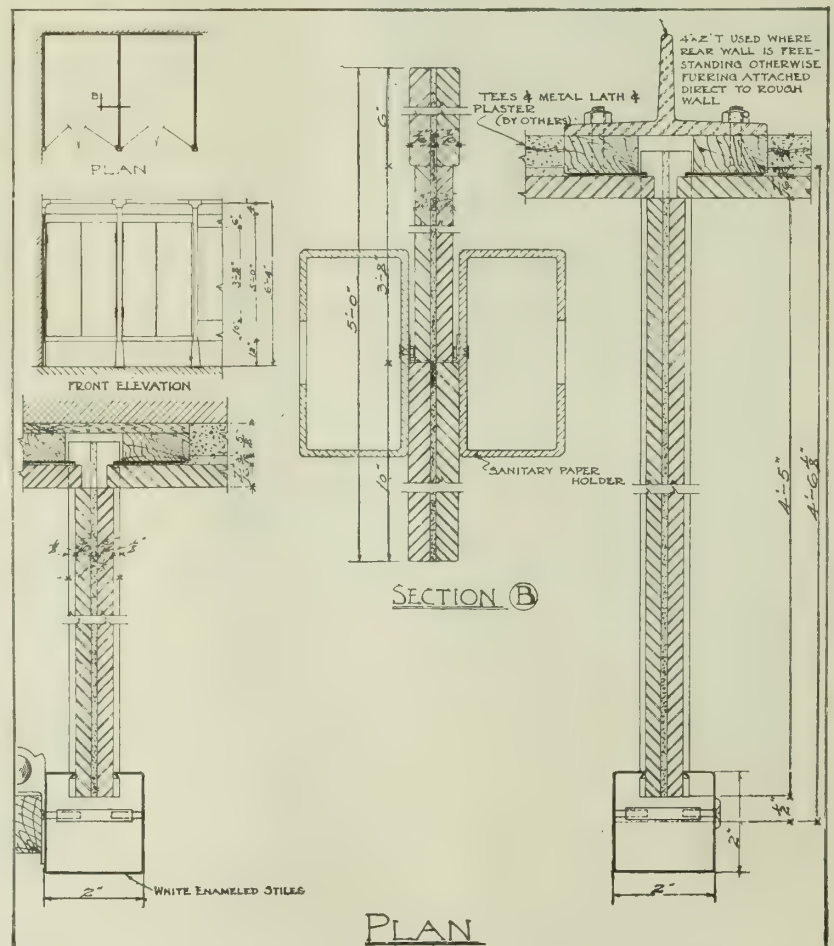
### Vitrolite Gravity Toilet Partitions.

The Vitrolite gravity toilet partition is recommended by the company, but the fact is recognized that other types of Vitrolite partitions have found favor with certain architects, and therefore they will be built whenever specified.

The gravity partitions are constructed in units, standardized throughout, and are factory assembled and fitted. All parts interchangeable, giving the greatest degree of flexibility and permitting quick installations. Constructed in conformance with the principle of gravity settlement, partition is held rigidly in slotted stiles, but without strain or stress at any point.

The entire absence of bolts, screws or nuts in the construction (not a single hole drilled in the Vitrolite) is a new and highly desirable feature.

Vitrolite partition is  $\frac{3}{4}$  in. thick, double faced, and



DETAILS OF VITROLITE TOILET CONSTRUCTION, GRAVITY PRINCIPLE TYPE



contains within itself a shock absorbing cushion, which absolutely protects it against the most severe shocks.

**BASE**—Vitreous china base when set in tile or terrazzo floor forms a sanitary coved joint.

**GUARANTEE**—Any partition which it can be proved has been damaged as a result of floor settlement will be replaced, because the construction is based on the right principle and will meet all conditions in actual service.

### Specifications for Toilet Partitions.

All water closet partitions and backs shall be of Vitrolite constructed in the following manner, in accordance with shop drawings submitted by the contractor doing this work and subject to the approval of the architect.

Provide a vitreous china standard 12 ins. high with sanitary cove at base and top recessed to receive 2-in. square section metal stile hereinafter described.

All stiles to be of sheet metal 2-ins. square in section with spring lipped channel extending throughout its length. The lower end to telescope into the vitreous china standard at least 1-in., the upper end finishing with a cast metal tee connection 6 ft. and 5 ins. above the finished floor.

The head rail shall be secured in a workmanlike manner to the tee castings at the top of each stile. The hardware, such as spring butts, strikes, etc., shall be thoroughly secured. All structural metal work is to be rustproofed and to receive four coats of celluloid enamel.

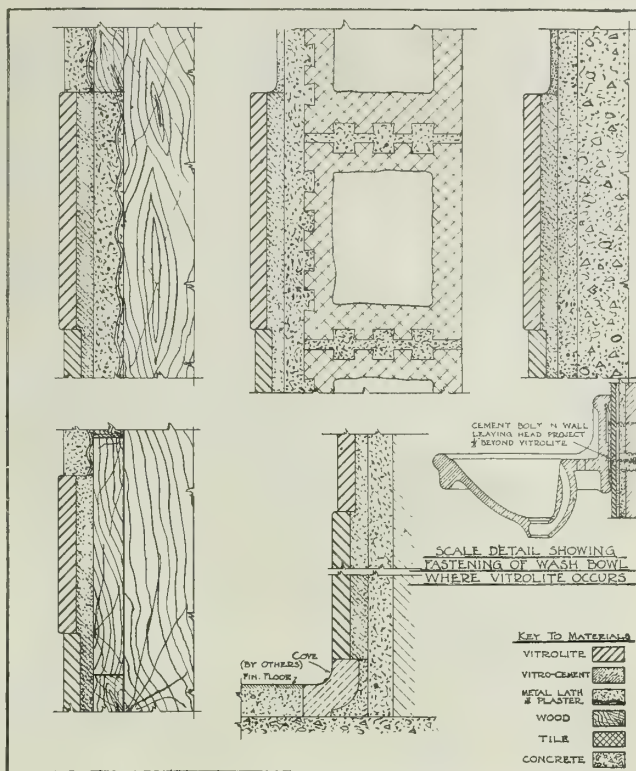
Each partition to consist of base 10 ins. high, panel 44 ins. high and cap 6 ins. high; the base to be supported at the front by a vitreous china standard and at the wall to rest upon a Vitrolite base 12 ins. high, which shall have been previously set along the wall. The various members of this partition shall be constructed as follows:

Base and cap shall be made up of two pieces of Vitrolite  $\frac{1}{16}$  in. thick, mounted back to back with plastic cement upon a felt core. The vertical faces of the Vitrolite shall be grooved to a depth of  $\frac{1}{8}$  in. along the short ends. These grooves to engage the spring lipped channel of the stile at the front and to receive rustproofed sheet metal strips at the end engaging the wall. The panels or die shall be made up of two  $\frac{9}{16}$ -in. pieces of Vitrolite mounted in a similar manner. In assembling this partition, sheet metal dowels shall be inserted into the top edge of the base embedded in the plastic cement between the Vitrolite and the felt and shall extend into the plastic cement core of the die. In a similar manner the top edge of the die and bottom edge of the cap shall be doweled together, thus insuring the alignment of all members.

The partition shall be erected as above described and the use of bolts and angles or the drilling of holes will not be permitted.

Unless otherwise specified doors to be furnished by general contractor. In public work where statutes prohibit the specification of a single product, the words "or other similar fire finished product" may be inserted.

All necessary holes for plumbing, etc., must be drilled by Vitrolite men.



DETAILS SHOWING WALL CONDITIONS FOR SECURING VITROLITE



VITROLITE FOR INDUSTRIAL LUNCH ROOMS, AMERICAN TOBACCO CO., NEW YORK, N. Y.



VITROLITE WALLS AND CEILINGS, DIET ROOM, ST. JOHN'S HOSPITAL, ST. LOUIS, MO.



VITROLITE PARTITION IN TOILET, SAFETY DEPOSIT VAULT, CHAMBER OF COMMERCE BUILDING, CHICAGO



# COMPOUND INJECTOR & SPECIALTY CO.

Sole Manufacturers of Dehn's Sanitary Safeguards

LONG DISTANCE TELEPHONES:  
AUSTIN 1861 and 1862

419-421 North Laramie Avenue  
CHICAGO, ILL.

CABLE ADDRESS:  
"COMPOUND"

## Products.

GARAGE, LAUNDRY and STABLE FLOOR DRAINS; HYGIENIC and "ACME" GREASE TRAPS, with and without Water Coolers.

"Acme" Adjustable Floor Drains, with and without Automatic Back-water Valves; Dehn's Automatic Water Softening and Scale Removing Devices, "Peerless" Water Softener; "Kompost" Bricks, "Acme" Closed-end Adjustable Closet Bends and Extensions; Iron Drum Traps, Clean-out Tees, End Ferrules, Refrigerator Drains, Blow-off, Catch and Gravel Basins, and other accessories to make a complete, perfectly sanitary plumbing drainage system.

Originators, designers and sole manufacturers of Dehn's Sanitary Safeguards.

## Sanitary Safeguards.

Architects, sanitary engineers and contractors will safeguard the health and property of their clients by specifying this company's sanitary devices. As the trade-names "Acme" and "Peerless" imply, they are unexcelled in design and operation. They are durable in make and in *every way reliable*; no other devices on the market may be substituted without *risk* for the "Dehn" line as being "equally as good." The essential parts of these devices are patented.

This company manufactures the largest and most complete line of sanitary plumbing drainage specialties in the United States.

Further information gladly furnished, together with illustrated catalogue, on request.

## Garage Floor Drains.

The following regulations governing drainage from garages and other establishments where gasoline, oils or inflammable materials are used or stored, have been adopted by a great many cities throughout the United States.

Garage floor drains (cast iron) shall be installed to avoid explosions, choked sewers, prevent accidents from

## "ACME"

FLOOR DRAINS

## "PEERLESS"

FLOOR DRAINS

## "KOMPOST"

(Registered in U. S. Pat. Office)  
BRICKS

## "PEERLESS"

WATER SOFTENER

TRADE-MARKS

formation of gases and other complaints, and nuisances common in automobile garages and other establishments.

Other establishments shall be classified according to the construction, size of the building, and number of persons employed on the premises.

The following schedule of capacities of "Peerless" garage and floor drains must be according to the following specifications here described and referred to as authority.

CLASS "A"—Every public or large private garage housing approximately from 1 to 25 automobiles hereafter constructed in the city of \_\_\_\_\_, shall install a system of drainage basin (cast iron) measuring 20 ins. diameter at top, and not less than 38 ins. deep, to be provided with a removable receptacle (cast iron) inside of the basin to receive the mud and other material washed into it. The basin must be provided with an air chamber in the receiver, with a separate compartment constructed in such a manner that the direct discharge of water and other material cannot come in direct contact with the fluid in the basin. The inlet of the receptacle in the basin must be provided with a guard (cast iron), having a solid top of sufficient size to entirely conceal the opening of the receptacle when discharging water or other material into the basin. The air chamber compartment must be provided with at least two 2-in. vent hub connections. Top of basin to be provided with bar grate (cast iron). Two 2-in. vent stacks must be connected with the air chamber, and must be extended outside of the building or through the roof; 1 vent pipe should be several feet higher than the other in order to establish a continuous circulation.

CLASS "A"—Where from 1 to 50 automobiles are housed, two Fig. 62 "Peerless" garage floor drains, 20 ins. diameter at top and 38 ins. deep, shall be installed.

CLASS "A-1"—Where from 1 to 25 automobiles are housed one Fig. 62 "Peerless" garage floor drain, 20 ins. diameter at top and 38 ins. deep, shall be installed.

CLASS "B"—Where from 1 to 10 automobiles are housed, one Fig. 62 "Peerless" garage floor drain, 20 ins. diameter at top and 30 ins. deep, shall be installed.

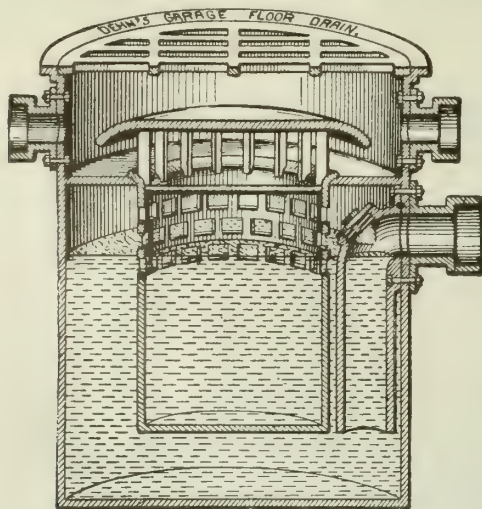
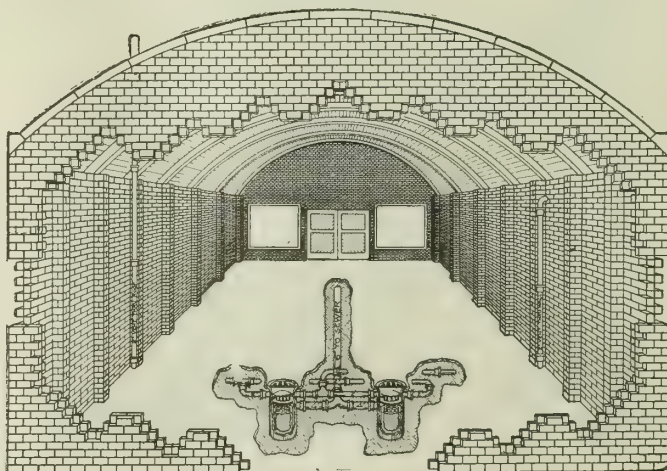


FIG. 62. "PEERLESS" GARAGE FLOOR DRAIN (Patented)

Diameter of top, ins. ....	20	20	20	20
Size of waste outlet, ins. ....	4	4	4	4
Depth over all, ins. ....	30	38	46	54
Vent hub connections, ins. ....	2	2	2	2
Approximate weight, lbs. ....	400	500	600	700
Price, iron top and strainer, each. ....	\$50.00	65.00	80.00	95.00



SHOWING INSTALLATION OF "PEERLESS" GARAGE FLOOR DRAIN



CLASS "C"—Where from 1 to 5 automobiles are housed, one Fig. 61 "Peerless" garage floor drain, 15 ins. diameter at top and 24 ins. deep, shall be installed.

CLASS "D"—Where 1 automobile is housed, one Fig. 60½ "Peerless" garage floor drain, 12 ins. diameter at top and 14 ins. deep, shall be installed.

Dehn's "Acme" Grease Traps.

Designed to keep the water in the basin at a low temperature. By connecting the cold water supply pipe leading to the kitchen sink or other fixtures with the water jacket in the basin, the water in the basin will be continually chilled to a very low temperature.

As soon as the greasy water enters the basin, the grease congeals and floats to the top of the water. This grease can be very easily removed by anyone. The handhole is provided with a malleable iron saddle and heavy thumbscrew.

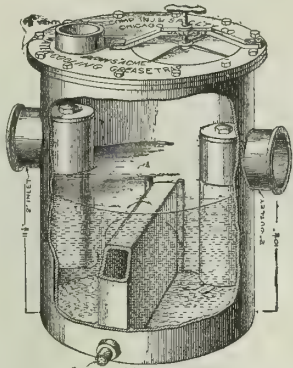
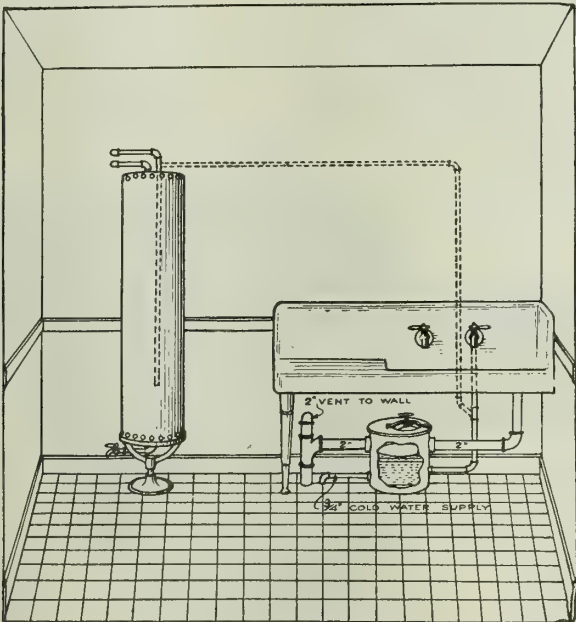


FIG. 113. DEHN'S "ACME" DOUBLE TRAPPED WATER COOLING GREASE TRAP (Patented)

DIMENSIONS (INS.) AND PRICES								
Number.....	15-1	18-1	24-1	30-1	38-1	24-2	30-2	38-2
Diam. of top...	12	12	20	20	20	24	24	24
Depth over all..	15	18	24	30	38	24	30	38
Size of waste inlet connection.	2	2	4	4	4	4	4	4
Size of waste outlet connection.....	2	2	4	4	4	4	4	4
Size of vent hub connection...	1½	1½	2	2	2	4	4	4
Size of water supply connection.....	3-4	3-4	1	1	1	1	1	1
Price, painted..	\$28.00	30.00	45.00	55.00	70.00	55.00	70.00	85.00

These grease traps can be furnished enameled inside, if desired. Prices quoted on application.



SHOWING DEHN'S "ACME" GREASE TRAP PROPERLY INSTALLED IN KITCHEN

SCHEDULE OF CAPACITY—The following schedule of capacity applies to Dehn's "Acme" grease traps when installed in residences, restaurants, hotels, boarding houses, large and public institutions.

No. 15-1—12 ins. diameter of top, 15 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 25 people with 3 meals each day.

No. 18-1—12 ins. diameter of top, 18 ins. deep, double trapped water cooling grease trap will fill the requirements

when supplying from 1 to 35 people with 3 meals each day.

No. 24-1—20 ins. diameter of top, 24 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 75 people with 3 meals each day.

No. 30-1—20 ins. diameter of top, 30 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 100 people with 3 meals each day.

No. 38-1—20 ins. diameter of top, 38 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 150 people with 3 meals each day.

No. 24-2—24 ins. diameter of top, 24 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 100 people with 3 meals each day.

No. 30-2—24 ins. diameter of top, 30 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 150 people with 3 meals each day.

No. 38-2—24 ins. diameter of top, 38 ins. deep, double trapped water cooling grease trap will fill the requirements when supplying from 1 to 200 people with 3 meals each day.

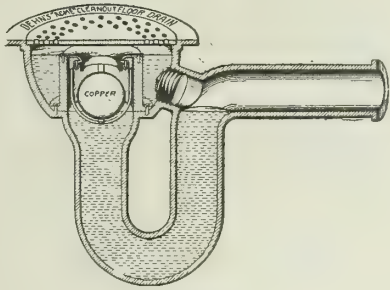
SUGGESTION FOR GREASE TRAP INSTALLATION—For large institutions, it is suggested that a grease trap be installed for each individual sink, dishwasher, etc. For such installations, the minimum capacity of grease trap should be installed. When Dehn's "Acme" double trapped water cooling grease traps are installed and properly connected—i. e., the main cold water supply pipe connected with the inlet of the water cooler in the grease trap and the outlet of the water cooler with the cold water supply to range boiler or storage tank, and also with all the cold water faucets on the premises; including the cold water supply pipes to the closet tanks—the installation will permit the continuous circulation of cold water through the water cooler in the grease trap, hence, the grease accumulating in the grease trap will be congealed where it can easily be removed by any one. Not a particle of grease can find its way out of the basin through the outlet into the sewer when Dehn's "Acme" double trapped water cooling grease traps are installed and connected according to these directions.

When the grease traps are installed in restaurants, hotels, large and public institutions, the grease should be removed from the grease trap at least 3 times each week.

From this it will be readily understood that the results to be obtained from the grease traps depend largely upon the plumbing contractor who has the supervision of the installation of the grease traps, and the owner whose duty it is to appoint or elect some one to give the grease traps the required attention.

Dehn's "Acme" Deep Seal Floor Drains.

These drains, with continuous pipe traps and automatic backwater valves, are also provided with large brass taper-threaded cleanout plugs and seamless metal ball floats. These floats prevent flooding of cellars; can not get down into trap outlets and become air-bound, and can be easily removed with cage by unscrewing the four brass screws.



DEHN'S "ACME" DEEP SEAL FLOOR DRAIN

DIMENSIONS AND PRICES			
Number.....	Fig. 9		
Size of outlet, ins.....	2	3	4
Water seal, ins.....	4	4	4
Diameter of top, ins.....	9	10	12
Depth over all, ins.....	11	13	16
Length over all, ins.....	18	20	24
Receiver above outlet, ins.....	2	2	2
Approximate weight, lbs.....	30	40	65
Price, with iron top and strainer.....	\$7.50	\$10.00	\$14.00
Price, with finished brass top and strainer..	13.50	17.00	22.00
Price, with nickelplated brass top and strainer	15.50	19.00	25.00

# CRAMPTON-FARLEY BRASS CO.

Manufacturers of Plumbers' Specialties

KANSAS CITY, MO.

## Products.

FLOOR DRAINS: the SAN-SEAL-O and the SIGNET.  
Noxall Floor Drains, Noxall Clean-outs, Star Hopper Valves and other plumbing specialties.

## San-Seal-O Drains.

The San-Seal-O floor drains are made of heavy cast iron, except the back water trap parts which are made of cast brass. The body of drain is made in one piece, with flange on inside to support the J-shaped inner, which is held in place by four brass screws.

A rubber gasket forms the joint.

Access to soil pipe is obtained by removing the inner.

## Signet Drains.

The Signet floor drains are made of heavy cast iron, with cast brass working parts.

Access to soil pipe is obtained by removing clean-out cap, which is very accessible.

## Construction and Operation.

Both the San-Seal-O and Signet drains have submerged back water trap.

They work by gravity, and being submerged work easily.

The grease, lint, etc., rises to surface, insuring a clean seat and a positive seal.

The water seal is large, and the openings full size with no obstruction to prevent the free overflow of water.

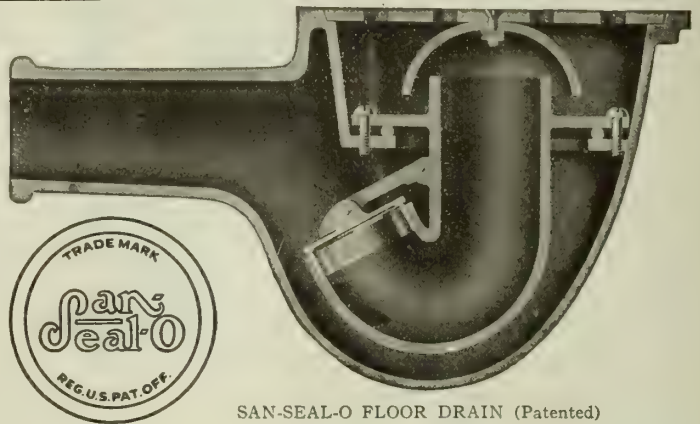
They are a positive insurance against back water or sewer gas, either wet or dry.

The quality of material, the superiority of design, the absolute safety and reliability of operation recommend the San-Seal-O and Signet drains for all high class work where permanent satisfaction is sought.

## Discount.

Discount will be given on application.

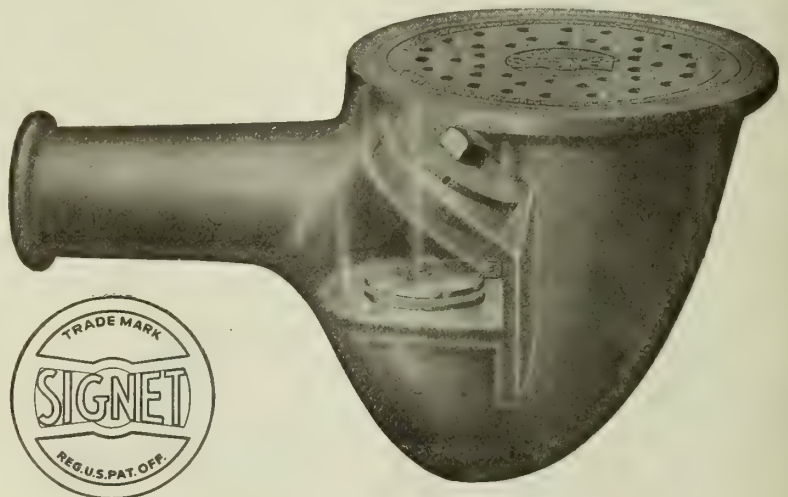
Write for descriptive circular.



SAN-SEAL-O FLOOR DRAIN (Patented)

SIZES, STYLES AND LIST PRICES

No.	Approximate weight, lbs.	Distance from top center to outlet, ins.	Style and diameter of top	Depth, ins.	Style and size of outlet	Price list with backwater trap	
						Iron top	Polished brass top
S-0	18	8	Round 8 ins.	8	Tapped for 1½-in. iron pipe	\$6.25	\$8.75
S-00	20	8	Round 8 ins.	8	Tapped for 2-in. iron pipe	6.50	9.00
S-1	20	9½	Round 8 ins.	8	For 2 in. soil pipe	6.00	8.50
S-2	33	13	Round 11 ins.	8½	For 2-in. soil pipe	8.00	13.00
S-3	55	13½	Round 13½ ins.	12	For 3-in. soil pipe	13.00	19.00
S-4	80	16½	Round 15 ins.	14½	For 4-in. soil pipe	18.00	28.00



SIGNET FLOOR DRAIN (Patented)

SIZES, STYLES AND LIST PRICES

No.	Approximate weight, lbs.	Style and size of outlet	Depth in clear, ins.	Distance from top center to end of outlet, ins.	Depth from top to end of outlet, ins.	Size of top, ins.	Price list	
							Iron top	Brass top
D-2	20	2-in. iron pipe	8½	8	11¼	8	\$6.50	\$9.00
2	20	2-in. soil pipe	8½	9½	1¼	8	6.00	8.50
3	50	3-in. soil pipe	12	14¾	2	13	13.00	19.00
4	65	4-in. soil pipe	14	16¾	2¼	14¾	18.00	28.00



THE EAGLE-PICHER LEAD COMPANY

Manufacturers of Plumbers' Lead Goods

CINCINNATI, OHIO

Products.

EAGLE ALL-LEAD ROOF FLANGE; EAGLE ANTI-SIPHON TRAPS; EAGLE PURE WHITE LEAD, Dry and in Oil.

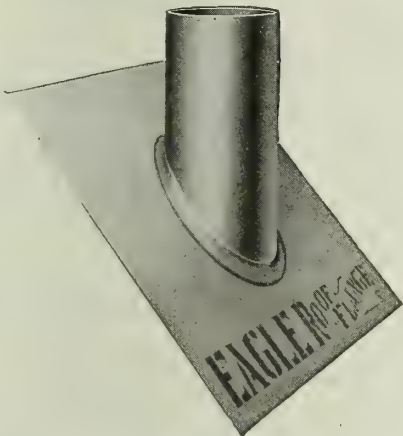
Also the following, all of high grade: Lead Pipe, Plumbers Standard Lead Goods, Bar Wire Tape, Babbitt Metals, Type Metals, Bar Tin, Block Tin Pipe, Glaziers' Lead, Eagle Refined Pot Lead, Eagle Strictly Pure Red Lead, Oxides, Pig Lead and Spelter, Sublimed White Lead and Blue Lead.

The Eagle All-lead Roof Flange.

This is the only flange that is made entirely of lead. It has lead burned joints. No solder whatever is used in its construction.

The flange plate is made for a slope of 45° or 22½°, or for a level surface; but can easily be adjusted to any irregular angle because it is made of pure lead of the finest quality.

The Eagle all-lead flange seals the opening in the roof so effectually that no calking is necessary. It can be installed before the roofing is put on. The plumber who uses it saves time, labor and money.



THE EAGLE ALL-LEAD ROOF FLANGE

Eagle Anti-siphon Traps.

Eagle anti-siphon traps—body, inlet and outlet—are made entirely of lead. Their joints are lead burned, so that every trap is practically one piece, strong and durable. No solder is used. The clean-out caps are brass.

The fact that these traps are made entirely of lead should convince architects and builders of their value. Lead traps and pipes that are installed properly will last a very long time. Metallic lead is immune from oxidation and rust in ordinary temperatures.

Lead traps are worth all that they cost, and in the end will prove more economical than those of any other metal.

EAGLE "P" BATH TRAP No. 1-A—This trap is especially adapted to hidden work. It has no clean-out.



EAGLE "P" BATH TRAP NO. 1-A

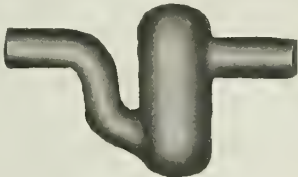
PRICES

Standard weight, each.....	\$1.50
Extra heavy, each.....	1.70

EAGLE RUNNING BATH TRAP No. 2-B—Is the

same as No. 1-A, except that it has an inlet of running shape instead of P-shape. Like that trap, it is adapted to hidden work.

No. 2-B can be furnished with inlet or outlet of any style or any size.

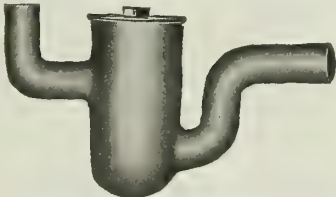


EAGLE RUNNING BATH TRAP NO. 2-B

PRICES

Standard weight, each.....	\$1.50
Extra heavy, each.....	1.70

EAGLE DRUM BATH TRAP No. 4-D—The special feature of this trap is that, even if the cover is removed, no gas can escape into the apartment. It is less expensive to use No. 4-D trap than it is to buy a drum trap of another make, and then wipe the connections. It also insures a neater installation.



EAGLE DRUM BATH TRAP NO. 4-D

PRICES

STANDARD WEIGHT	
With "A" brass top.....	\$1.90
" " "A" nickelplated top.....	1.95
" " "E" brass top.....	1.95
" " "E" nickelplated top.....	2.00

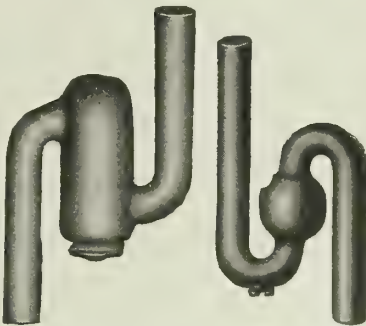
EXTRA HEAVY WEIGHT	
With "A" brass top.....	\$2.10
" " "A" nickelplated top.....	2.15
" " "E" brass top.....	2.15
" " "E" nickelplated top.....	2.20

EAGLE CLEAN-SWEEP TRAP No. 6-F—Is very desirable because of its strength and durability. It has a clean-out at the bottom.

PRICES

Size	Standard weight	Extra heavy weight
over all		
15 ins.	\$1.40	\$1.65
24 ins.	1.75	2.00
28 ins.	2.00	2.25

EAGLE DEEP SEAL TRAP No. 7-G—Like No. 6-F, this trap has a clean-out at the bottom. It is designed to meet the same requirements as No. 6-F; but as it is less bulky than that trap, and contains less lead and brass, it is more desirable for some classes of work.



EAGLE CLEAN SWEEP BATH TRAP NO. 6-F

EAGLE DEEP SEAL BATH TRAP NO. 7-G

Eagle Pure White Lead.

We make a specialty of this brand, put up dry and in oil.



BRAND-MARK

# JOSAM MANUFACTURING CO.

## Drains and Adjustable Concrete Inserts

27-31 South Fourth Street  
ST. LOUIS, MO.

EASTERN BRANCH: NEW YORK, N. Y., 7 West 45th Street

WESTERN BRANCH, SAN FRANCISCO, CAL.

SOUTHERN BRANCH: ATLANTA, GA.

All Plumbing Supply Houses in the United States are Distributors of Josam Products

### Products.

JOSAM DOUBLE DRAINAGE FLOOR AND ROOF DRAINS, DRAIN AND TRAP COMBINATIONS; PIPE FLASHINGS; CESSPOOLS and ADJUSTABLE CONCRETE INSERTS.

Pipe Hangers and Unions.

### Advantages of Josam Double Drainage Drains.

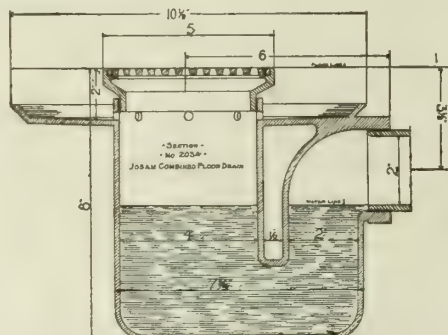
The double drainage feature of these drains prevents leakage to ceilings below at points of contact between the metal drain and flooring or roofing, which points of contact invariably work apart on account of expansion and contraction.

### Materials.

Josam drains are made of cast iron and brass or all brass, and unless otherwise specified, have nickelplated brass parts to the surface. Outlet connections have iron pipe threads which are recessed. Can be furnished galvanized or enameled. Special patterns on application.

### Drain and Trap Combinations.

200-A SERIES — Heavy cast iron body with brass strainer and collar which screws into body and is adjustable to floor thickness variations. Furnished all brass at extra cost. Strainer also furnished to fit porcelain urinal and shower receptors. Hub or screw outlet, U. S. Government type.

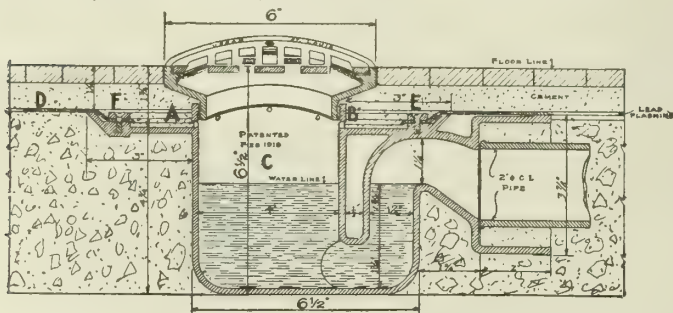


No.	200-A	201-A	202-A	203-A
Strainer.....	4"	5"	4"	5"
Outlet.....	1 1/2"	1 1/2"	2"	2"
Price.....	\$10.50	\$11.50	\$11.50	\$12.00

No.	204-A	205-A	206-A	207-A
Strainer.....	6"	6"	5"	6"
Outlet.....	1 1/2"	2"	3"	3"
Price.....	\$12.50	\$13.00	\$15.00	\$16.00

Also made with 4-in. outlet

2003-A, SPECIAL SHALLOW TYPE—Made of materials and on principle of 200-A series except for depth. White metal or Benedict nickel strainer and collar if desired; also all brass, extra. Hub or screw outlet.



DETAILS, 2003-A DRAIN AND TRAP WITH FLASHING RING AND BOLTS  
6" strainer, 2" outlet, \$18.00



### Double Drainage Drains for Floors.

100 SERIES—All Brass. For use in all constructions where no trap is required, and in the same places as the 200-A series.

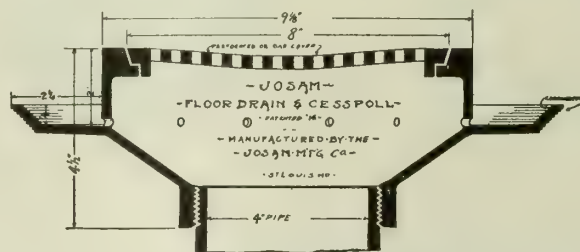


DETAILS, 100 SERIES DRAIN

No.	100	101	102	103	104
Strainer.....	2"	3"	3"	4"	5"
Outlet.....	2"	2"	3"	3"	4"
Price.....	\$6.50	\$7.00	\$8.00	\$9.50	\$11.00

### Drains or Cesspools.

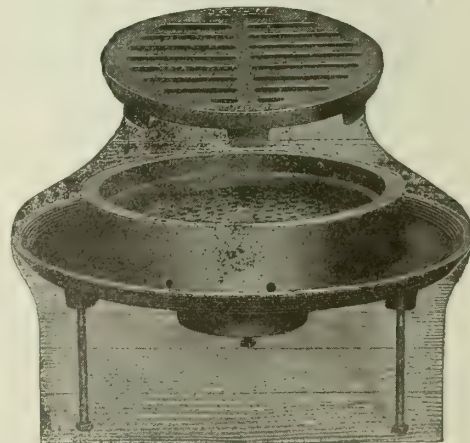
500 SERIES—Has antitilting strainer. Especially adaptable for dairy, laundry, warehouse or factory, also for promenade roofs. All cast iron. Brass grate if desired, extra.



DETAILS, 500 SERIES DRAIN

No.	500	501
Strainer.....	8"	11"
Outlet.....	4"	6"
Price.....	\$7.50	\$12.00

500-A SERIES. EXTRA HEAVY—Has levelling screws and supplementary grates with 1-in. thick antitilting top grate. Especially adapted for packing house, factory, warehouse, cold storage or dairy buildings, where heavy drainage is required.



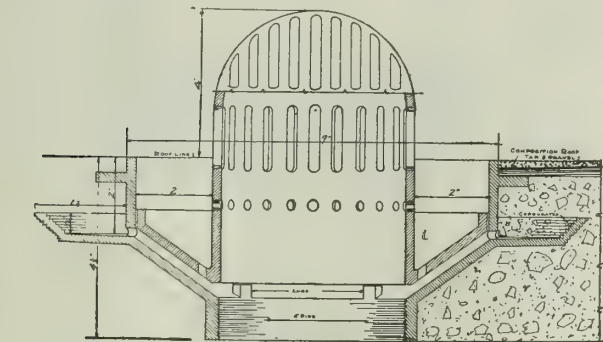
DETAILS, 500-A SERIES DRAIN

No.	500-A	502-A
Grate.....	10"	14"
Outlet.....	3"	4"
Price.....	\$10.00	\$12.00



Double Drainage Drains for Roofs.

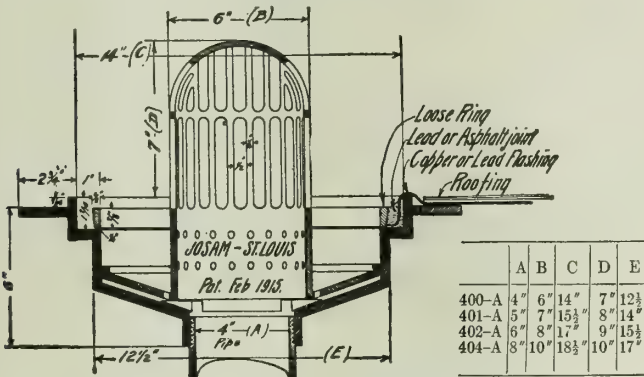
400 SERIES, FOR FLAT ROOFS—Has removable strainer and sediment cup to catch gravel, etc. Drain tapped for standard iron pipe thread. All cast iron. Soil pipe end furnished all sizes, if desired.



DETAILS, 400 SERIES ROOF DRAIN

No.	400	401	402	404
Outlet	4"	5"	6"	8"
Price	\$12.00	\$14.00	\$16.00	\$20.00

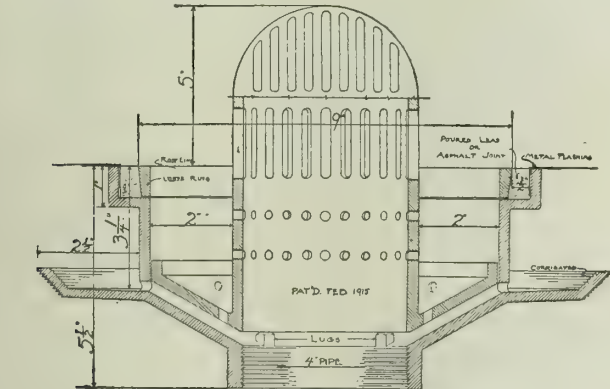
400-A SERIES, FOR FLAT ROOFS—Has combined sediment cup and strainer dome which are removable, and of 2 ins. greater diameter than outlet. Also has guard or gravel stop of height to suit roof. A loose ring forms wall for making a poured lead, pitch or asphaltum joint to tie metal flashing in place, also cast iron ledge 3 ins. wide to carry roofing composition.



DETAILS, 400-A ROOF DRAIN

No.	400-A	401-A	402-A	404-A
Outlet	4"	5"	6"	8"
Price	\$16.00	\$18.00	\$20.00	\$28.00

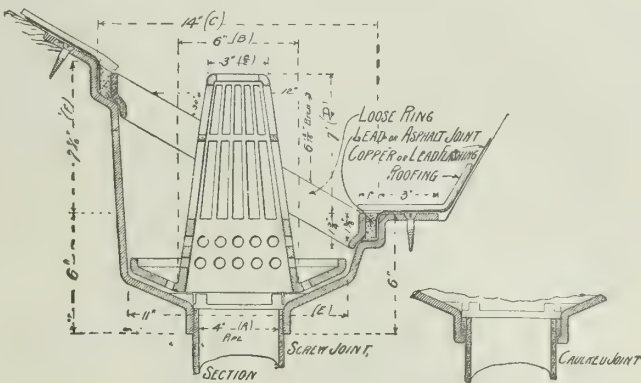
400-B SERIES—Same as 400 series with a loose cast ring in addition. This ring forms a wall for making a poured lead, pitch or asphaltum joint to tie copper or lead flashing in place.



DETAILS, 400-B ROOF DRAIN

No.	400-B	401-B	402-B	404-B
Outlet	4"	5"	6"	8"
Price	\$13.00	\$15.00	\$17.00	\$24.00

400-C SERIES, FOR SAWTOOTH ROOFS—Also for box gutters. All cast iron. Has loose ring for poured joint to tie flashing in place. Screw or calk joint.

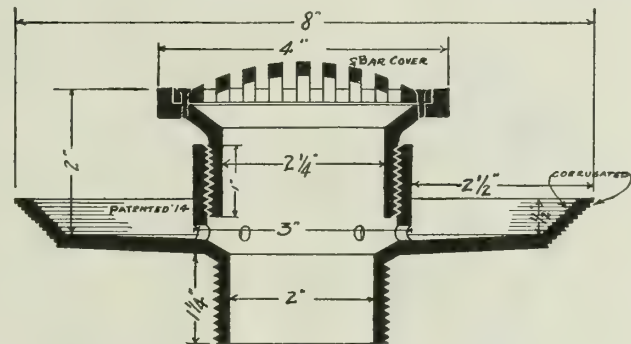


DETAILS, 400-C ROOF DRAIN

No.	400-C	401-C	402-C	404-C
Outlet	4"	5"	6"	8"
Price	\$26.00	\$28.00	\$30.00	On application

Urinal, Bath and Shower Traps.

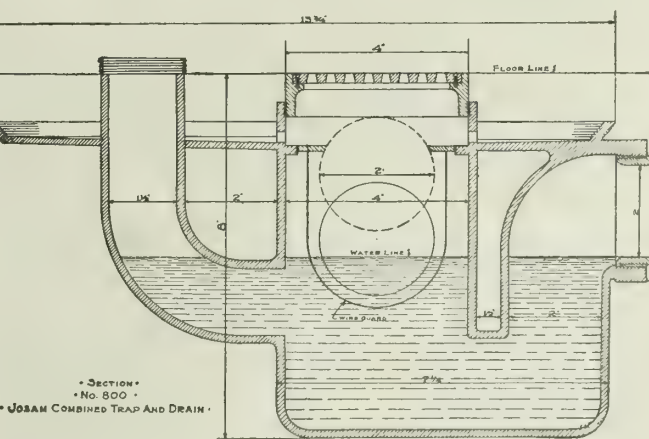
300 SERIES, WITHOUT TRAP—For porcelain urinal or shower stalls. Cast iron body and brass strainer. This drain outlet can be used with an independent trap placed wherever construction permits. Double drainage protection still applies. Strainers furnished flat, convex or concave, can be adjusted to suit floor thickness.



DETAILS, 300 SERIES DRAIN

No.	300	301
Strainer	4"	5"
Outlet	2"	3"
Price	\$6.80	\$9.60

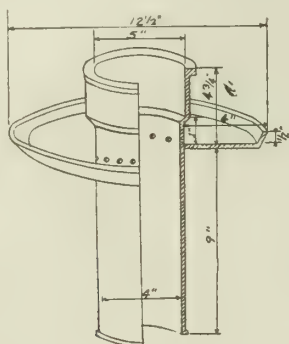
800 DRAIN AND BATH TRAP—With this drain floors may be flushed without leakage to ceiling below, and thus make dry mopping unnecessary.



DETAILS, 800 DRAIN AND BATH TRAP  
4" strainer, 2" outlet, \$24.00

**Double Drainage Pipe Flashing.**

For concrete roofs. An everlasting flashing of same principle of construction as drains.



DOUBLE DRAINAGE PIPE FLASHING

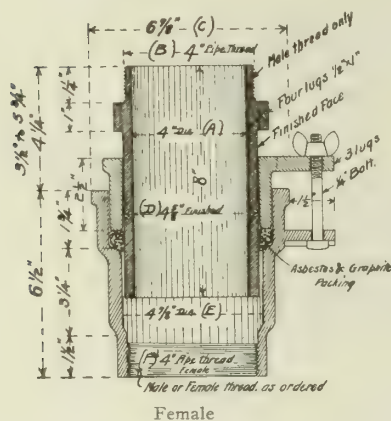
**Extras.**

Soil pipe connectors. Male or female threads for all Josam drains.

Size, ins.....	2	3	4	5	6	8
Price .....	\$0.70	\$1.25	\$1.40	\$1.60	\$1.80	\$2.50

Hinged strainers. Made to fit any Josam trap.

Size, ins.....	6	5	4
Additional .....	\$1.60	\$1.25	\$1.00



Female

JOSAM EXPANSION JOINT

Size	A	B	C	D	E	F
3"	3"	3"	5 1/8"	3 5/8"	3 7/8"	3"
4"	4"	4"	6 7/8"	4 5/8"	4 7/8"	4"
5"	5"	5"	7 7/8"	5 5/8"	5 7/8"	5"
6"	6"	6"	8 7/8"	6 5/8"	6 7/8"	6"
8"	8"	8"	10 7/8"	8 5/8"	8 7/8"	8"

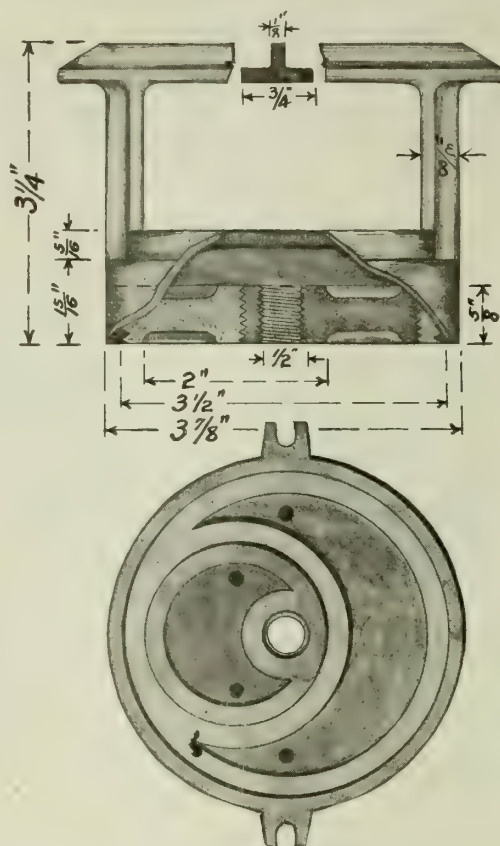


Male

EXPANSION JOINT CONNECTION FOR JOSAM DRAINS

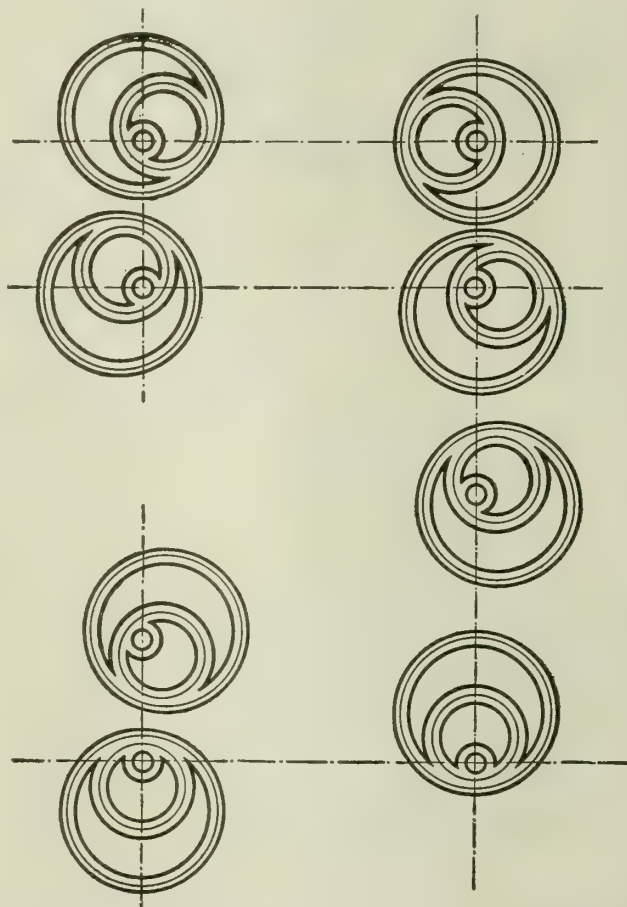
**"Josam Sureline" Concrete Inserts.**

"Josam Sureline" inserts are designed with a round 3-in. threaded socket which is fastened to the forms by the use of nails through the slotted lugs, or by a square or round wood block fastened to forms. 3-in. threaded socket will screw on the wooden blocks, thereby eliminating the cutting off of nails when forms are removed. The Josam double eccentric adjustable bushings can be inserted into the 3-in. threaded socket at any time after the forms are removed, and are tapped for any sized machine bolts 1/4 in. to 7/8 in., or iron pipe threads. Josam inserts provide for adjustment to any point within a 2 1/8-in. circle. Bolt can be fastened at any time, thereby providing for the readjustment of shafting hangers, machinery, pipe lines, or any other fixtures to be attached. Can be used for floor inserts as well, and are made to carry a load greater than the bolt will carry.



SECTIONAL VIEWS "JOSAM SURELINE" CONCRETE INSERTS

Patent pending



TO SHOW HOW "JOSAM SURELINE" CONCRETE INSERTS WILL CORRECT INACCURATE PLACING ON FORMS



# ATEN SEWAGE DISPOSAL CO.

286 Fifth Avenue  
NEW YORK, N. Y.

TELEPHONE CONNECTION

## Products and Services.

The ATEN SANITARY SYSTEM OF SEWAGE DISPOSAL, consisting of Reinforcing Forms for Concrete Walls, Cast Iron Manhole Collar and Cover, Metal Top for Concrete Roof, Automatic Sewage Siphon, Cast Iron Diverting Gate Chamber, Double Porous Disposal Tiles, and other Accessories.

ENGINEER for SEWAGE DISPOSAL. Prospective purchasers of this system (complete in every respect) may, upon application, learn, without expense or obligation, exact cost to be incurred for permanent solution of any sewage problem, by simply stating number of washstands, bathtubs, toilets, source of water supply, size of plot, character of soil, slope of land and number of users of system, when installed.

## Scope of Use.

With an adequate supply of water, the Aten sewage disposal system was designed to meet requirements of large and small country homes, clubs, hotels, plants, factories, or institutions, not connected with city sewers. It can be applied to single buildings, to groups of buildings, or to each building in a group; and, generally, each case must be treated according to local conditions.

## Aten System of Sewage Disposal.

It lasts a lifetime. Sewage is conducted from house through a soil pipe into a bacterial liquefying or septic tank (see "A" in diagrams), made of reinforced concrete; contents thereof are subjected to anaerobic bacterial action—decomposition of solid matter in bottom of tank—with consequent production of gases and breaking up and partial liquefaction of all "sludge."

System is simple; installed by unskilled labor.



TRADE-MARK

No chemicals are used. Tank and final discharge are absolutely odorless. Sewage remains in tank from 12 to 24 hours, owing to local conditions. No operating expense.

Tank overflow (sewage effluent) passes into a concrete siphon chamber (B), where a special automatic siphon completely empties the effluent, at intervals, into a cast iron diverting gate chamber (C), with gates to deflect fluid into desired subsoil percolation tile field. Gates opened and closed alternately each week.

DISPOSAL TILE FIELD—Composed of porous double tiles laid in trenches at a grade; special "Ys" distribute sewage effluent evenly into various lines of tiling. While one field is drying out, the other is being used, and, in these fields, *bacteria complete final oxidation or purification.*

## References.

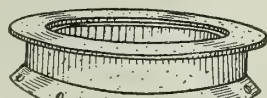
OWNERS AND LOCATION  
Thos. Hastings, Old Westbury, N. Y.  
Darragh Park, Roslyn, N. Y.

Miss E. W. Smith, Amawalk, N. Y.  
Wm. F. Schlemmer, Great Neck, N. Y.  
Arthur L. Cahn, Hartsdale, N. Y.  
W. H. Hiller, Carbondale, Pa.  
F. G. Peabody, Loudenville, N. Y.  
Robert Cluett, Rye, N. Y.  
Engineers Club, Roslyn, N. Y.  
Piping Rock Club, Locust Valley, N. Y.  
I. T. Burden, Greenvale, N. Y.  
Wm. Church Osborn, Garrison, N. Y.  
Department of Parks, New York, N. Y.  
Blind Brook Club, Port Chester, N. Y.  
Nelson Doubleday, Oyster Bay, N. Y.  
G. T. Dearborn, Rye, N. Y.  
Wm. Lyall, Passaic, N. J.

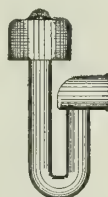
ARCHITECTS  
Carrère & Hastings  
Peabody, Wilson & Brown  
Dana & Gibson  
Mellon & Walker  
Alfred Hopkins  
C. L. Holden  
C. C. Grant  
H. B. Upjohn  
H. Craig Severance  
Guy Lowell  
Addison Mizner  
Pleasant Pennington  
Ford, Butler & Oliver  
Frank A. Moore  
H. T. Lindenberg  
Hinchman & Pilat  
Harvey Lyall



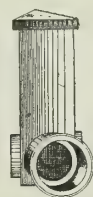
SHEET METAL TOPS  
FOR CONCRETE  
ROOFS OF TANKS



CAST IRON MANHOLE  
COVER



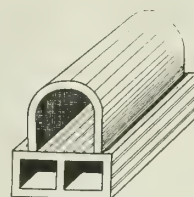
AUTOMATIC  
SEWAGE  
SIPHON



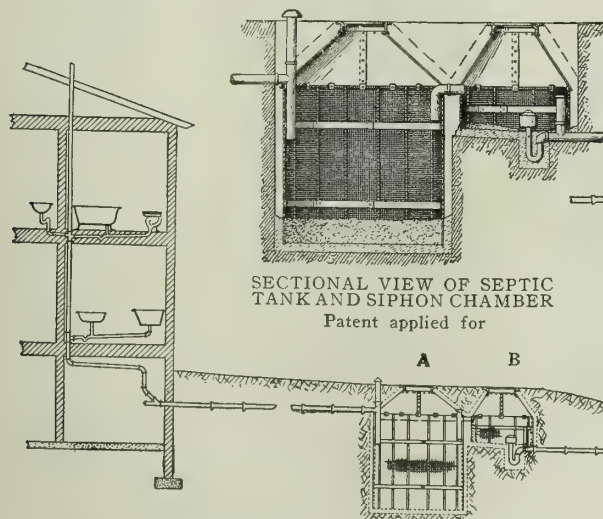
DIVERTING  
GATE  
CHAMBER



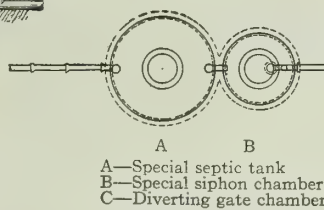
Y-BRANCH  
TILE



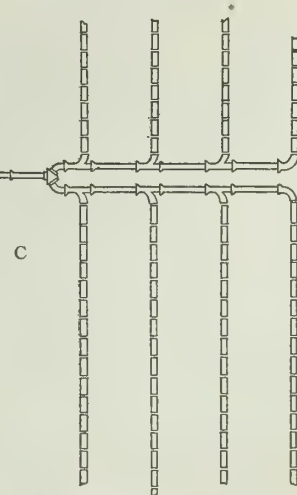
DISPOSAL TILE



SECTIONAL VIEW OF SEPTIC  
TANK AND SIPHON CHAMBER  
Patent applied for



A—Special septic tank  
B—Special siphon chamber



ARRANGEMENT OF TANKS  
AND TILE FIELDS

ELEVATION SHOWING INSTALLATION OF ATEN SANITARY SEWAGE DISPOSAL  
SYSTEM AND A FEW ACCESSORIES

# THE BLACKBURN-SMITH CORPORATION

## Sewage Ejector Systems

TELEPHONE:  
BRYANT 1364

103 West 40th Street  
NEW YORK, N. Y.

### Products.

BLACKBURN-SMITH SEWAGE EJECTOR SYSTEM, for elevating sewage in city buildings, sewage disposal plants and from low country; for lifting fluids which should not be pumped, in mines, chemical works, etc.

Blackburn-Smith Feed Water Filter and Grease Extractor for removing sediment, slime, etc., from water supply and for removing oil, grease and dirt from boiler feed water made up entirely or in part of condensed exhaust steam. Our book, "Feed Water Filtration," describing this filter, mailed on request.

### The Blackburn-Smith Sewage Ejector System.

A complete system comprises the following parts:

(1) The collecting tank, into which sewage gravitates from the drain pipes, is made of cast iron to resist corrosive action, and designed to permit easy inflow and outflow. All corners are well rounded to prevent the catching of heavy or large objects. Space is left above the sewage, into which compressed air is admitted to force the sewage, by air displacement, through an outlet to sewer. A check valve in the tank inlet prevents return of sewage into the drain pipes,

and one in the tank outlet prevents sewage backing up into the tank.

(2) The float, rising and falling with the sewage level in tank, automatically operates the control switch on top of the tank. This switch opens and closes the electric circuit through a solenoid mounted on the slate panel with air valve, which solenoid, through its lever, operates said air valve. The waterproof casing also affords fire protection from arcing.

The float is of heavy spun copper and shaped to avoid catching matter that would impede its action.

(3) The patented double acting air valve, electrically controlled, automatically admits enough compressed air each time to displace and expel the liquid from the tank. The compressed air supply may come from a general system or from a compressor and receiver serving the sewage ejector exclusively. One pipe only between this valve and the tank alternately serves as an inlet to tank for compressed air, and an outlet for exhaust of air to atmosphere after ejecting the sewage and while tank is refilling. Panel can be placed independently, and where protected from abuse or neglect.

### Operation.

The float, rising with the liquid level, slides on the rod and strikes the upper stop and lifts the rod, thus closing the switch and completing the electric circuit to the solenoid, which, through its plunger and lever, opens the lower valve, admitting compressed air for discharge of the sewage. Then the float, descending with the sewage level in tank, strikes the lower stop, carries the rod down, opens the control switch and breaks the electrical circuit, thus permitting spring to close lower valve and open the upper, relieving the air pressure through vent to atmosphere. This completes the cycle, and sewage again collects for discharge.

### Points of Superiority.

Absolutely automatic; economical operation, using power only when working; low maintenance, no wearing parts; sanitary, all openings sealed against escape of sewage or gas; airtight control valve; free flow of sewage; no heavy levers, counterweights, etc., to be moved by a float; simple in design and easy to install. The air control valve panel can be mounted anywhere outside the pit.

### Form of Specification.

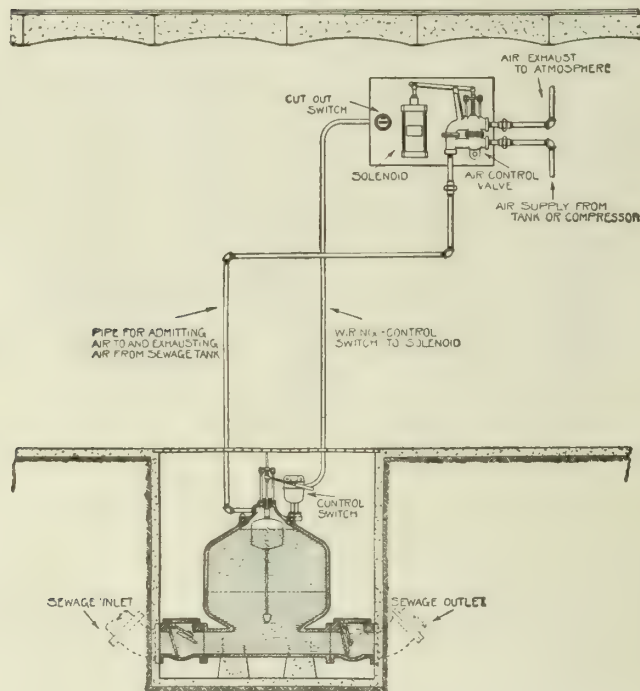
Furnish and install an Ejector System, consisting of..... complete units, each to handle ..... gallons of ..... per minute.

Install collecting tanks in pit, as shown on drawings, and make inlet pipe connections to the house drain and outlet pipe connections to lines to sewer. Necessary gate and check valves to be installed so that either or both tanks will handle the sewage or either or both may be cut out.

Place the control panel on wall of pit room about ..... feet above level of top of pit. Make pipe connections between air control valve on the panel and compressed air lines, between air control valve and collecting tank, between air control valve and vent to atmosphere.

Make wiring connections in armored conduit between binding posts on panel and tank switch.

All these connections must be properly installed and the complete system made ready for operation.



PLAN OF INSTALLATION SEWAGE EJECTOR SYSTEMS

SIZES AND CAPACITIES

Designation of systems	Capacity of system, gals. per min.	Diameter of collecting tank	Extreme height over tank switch	Minimum pit dimensions, including standard piping			Size inlet and outlet
				Length	Width	Depth	
50 Single	50	30"	61"	66"	42"	64"	4"
50 Duplex	100	30"	61"	126"	60"	64"	6"
75 Single	75	36"	63"	72"	48"	66"	6"
75 Duplex	150	36"	63"	144"	72"	66"	8"
100 Single	100	36"	69"	72"	48"	72"	6"
150 Single	150	47"	67"	80"	56"	72"	8"
200 Single	200	47"	75"	80"	56"	84"	8"

Further information and literature on request



# THE NEW YORK SEWAGE DISPOSAL CO.

## Experts in Sanitary Engineering

MEMBERS OF AMERICAN SOCIETY OF CIVIL ENGINEERS, AMERICAN CHEMICAL SOCIETY, AMERICAN PUBLIC HEALTH ASSOCIATION, SOCIETY OF AMERICAN BACTERIOLOGISTS

37-39 East 28th Street  
NEW YORK, N. Y.

### Products and Services.

Experts and specialists in the design and construction of SEWAGE DISPOSAL SYSTEMS and WATER SUPPLY PLANTS for towns, institutions, country houses, hospitals, camps, etc.

The members of this company are experts in sanitary engineering in the fullest meaning of the term.

They investigate and report on Sewerage, Drainage, Water Supply and kindred subjects. They are prepared to furnish Reports as to the Chemical and Bacterial Condition of Water.

### Experience.

Over 16 years' experience in the design and construction of *more than 1000 plants* in all parts of the country, under widely divergent conditions, has given the company an expert knowledge which renders its service one of the greatest value.

The company has designed or constructed plants ranging in size from 300 gals. per day for a bungalow to 14,000,000 gals. per day for a city.

### Description of Our Sewage Disposal System.

SEWER—Properly designed and laid.

SETTLING TANK—A tight masonry structure provided with special inlet and outlet devices, baffle and weir walls and other arrangements, so that sewage will be received and held a proper length of time to permit the maximum degree of liquefaction—ripe for oxidation.

The particular design which may be elected depends upon the nature and volume of sewage to be treated.

SIPHON CHAMBER—A tight masonry structure built in connection with the settling tank. It receives the liquid overflow and by means of an automatic siphon, *designed for the purpose*, discharges this effluent at periods.

The function of the siphon chamber is to produce periodic discharges in order to fill uniformly the tile disposal field beyond, at the same time permitting a period of rest, during which the oxidation of the effluent will progress at a maximum rate.

This company has, for its own exclusive use, a siphon (invented and patented by a member of the company) which works in an absolutely perfect manner. All the troubles which develop with water flushing siphons have been eliminated.

TILE DISPOSAL FIELD—Made up of two or three divisions, or fields, of *special sewage irrigating tiles*, laid in a series of nearly parallel trenches following the contours.

Tiles are of *special design*, consisting of a flat, hollow base upon which is set a horse-shoe tile. This arrangement permits effluent to pass out evenly along the entire length of the tile, as well as at the joints.

SPECIAL DIVERTING GATE—Provided so that siphon discharge may be deflected into either of the tile fields. Merely turning a valve in this gate chamber once a week will accomplish this result and will permit a period of rest and recovery for the field last in use, while the next field is active.

Much trouble has been had to develop an iron 2-way or 3-way gate in which the valves or gates would not quickly stick with rust. This company has a patented gate with openings in the *bottom*, provided with bronze plates, which prevent all trouble of this kind.

SPECIAL TERRA COTTA FITTING—Designed to set along the distribution lines so that the sewage will flow evenly and uniformly throughout each line of tile.

### Method of Installation.

FIRST—One of the company's engineers visits the property and makes a careful study of all local conditions.

SECOND—This engineer makes a careful layout, and by means of stakes and batter boards, indicates the exact location of the plant and the cuts necessary for excavations.

THIRD—Upon delivery of the special material required for the work, one of the company's trained foremen arrives upon the job and proceeds with the construction of the plant. The tile used in the construction are specially manufactured by THE NEW YORK SEWAGE DISPOSAL CO., and are of uniform quality.

Upon completion of the work the premises are restored as nearly as possible to the condition in which they were found, and the architect and owner are each furnished with a map showing the exact location of the plant.



TILE DISPOSAL FIELD ON THE PROPERTY OF COMMODORE ARTHUR CURTISS JAMES, AT NEWPORT, R. I.

ESTABLISHED 1886

# PENBERTHY INJECTOR CO.

Manufacturers of Automatic Cellar Drainers and Swimming Pool Heaters

DETROIT, MICH.

CANADIAN FACTORY: WINDSOR, ONTARIO, CAN.

BRANCHES

NEW YORK, N. Y.

CALCUTTA, INDIA

LONDON, ENG.

PARIS, FRANCE

## Products.

"PENBERTHY" AUTOMATIC CELLAR DRAINER; "XL-96" SWIMMING POOL HEATER.

"Penberthy" Automatic Injector; Auto-Positive Injector; "XL-96" Ejector; "Penberthy" Regrinding Valves, and a full line of Angle, Cross, Horizontal and Vertical Check, Swing Check and Globe Valves; Water Gages; Water Heaters; Oil Cups; Grease Cups; Air Locks; Carburetors, etc.

## "Penberthy" Automatic Cellar Drainer.

The "Penberthy" automatic cellar drainer is a hydraulic ejector of high capacity, with a copper float automatically operating a quick opening and closing valve, C; said valve being controlled by the float in its upward or downward movement on account of the rise or fall of the water in sump. This valve is never partially opened—it can not leak, and allows the ejector to give its greatest efficiency by working to full capacity.

The float arms are slotted at A, where they connect to the valve lever. This prevents the ejector from operating until the water has raised the float up to the highest point, and, as the water is ejected, they travel down the length of these slots before the weight of the float closes the valve. This allows the machine to work for longer periods and not so often, thus preventing considerable wear and the leakage and dribbling of water, as is so common in the majority of drainers.

The float, instead of being round, is flat on the top; it has more buoyancy and occupies less space than a round float of the same diameter. Space has been further economized by building the float around the suction pipe, B. This patented feature has the added advantage of being rigid, and overcomes all the trouble of the common loose float. The balance of the drainer is built directly above the float; this not only keeps the whole machine in as small a space as possible, but also admits of all working parts, with the exception of strainer and float, being above the water, thus preventing corrosion, or the exterior parts becoming clogged by deposits of slime, dirt or sediment. The interior parts are prevented from coming into contact with any foreign particles by the special strainer, H, which is so constructed that, instead of the water being drawn directly upward, it is taken in at the sides, allowing all sediment to collect under the strainer without being disturbed by the force of the suction.

A foot valve is also provided, inside the strainer, which closes the instant the drainer ceases operating, holding all water in the pipes,

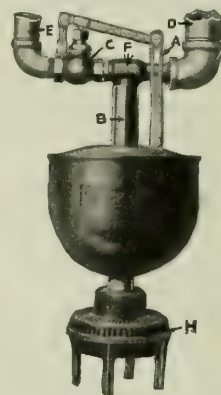


primed for starting instantly at the next filling of the sump. This also prevents flooding by the backflow.

The instantaneous opening and closing of the operating valves, by action of the water pressure, permits no slow leaks.

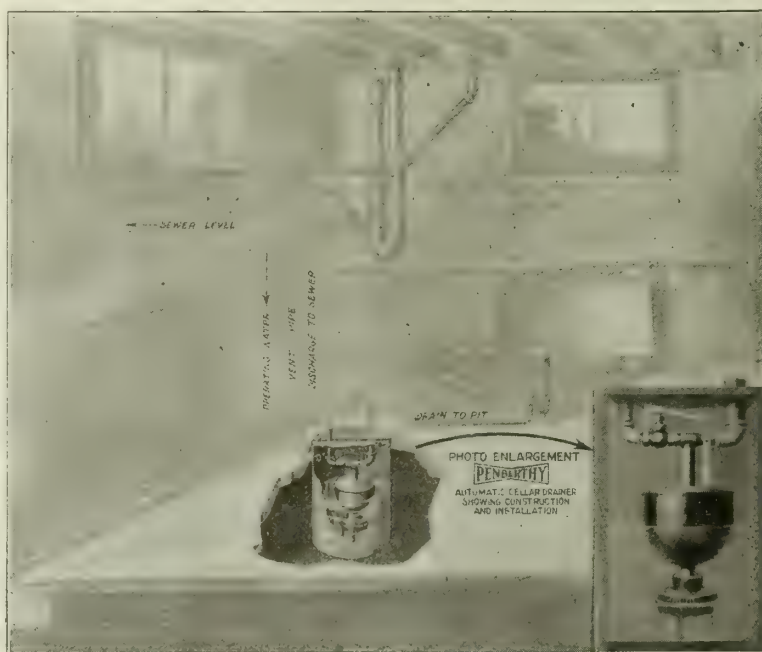
The very compact arrangement of this drainer makes it necessary to construct only a small sump, desirable because of the saving effected in both amount of space used and the cost of construction. The whole drainer is under the floor level, yet all parts are instantly accessible without disconnecting pipes or removing drainer. All working parts are conveniently located on top.

WHAT IT IS FOR AND HOW USED—A device for transferring liquids from one level to another with water under pressure or steam as power. The name cellar drainer is derived from its commonest use, that of pumping water from cellars, but its utility is not necessarily restricted to this usage. The construction of the "Penberthy" automatic cellar drainer



"PENBERTHY" AUTOMATIC CELLAR DRAINER

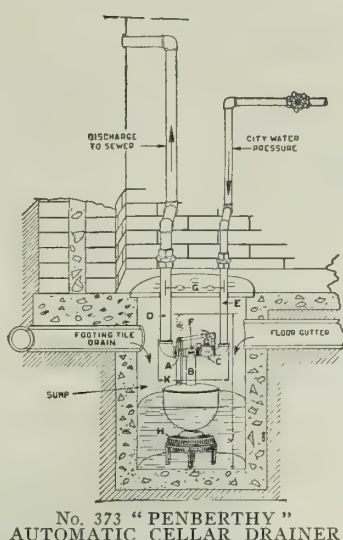
E—Water pressure pipe  
C—Water valve  
D—Discharge pipe  
F—Ejector  
B—Suction pipe



CONSTRUCTION AND INSTALLATION OF "PENBERTHY" AUTOMATIC CELLAR DRAINER



is admirably simple, being a highly efficient ejector or siphon jet, to which is attached a quick opening, float controlled valve, C. Nor is there anything complicated about its operation. The drainer is placed in the sump or place where the water or seepage collects, a line from the city water supply attached at one side, E (No. 373), and a line leading to discharge point (sewer, gutter or wherever it may be) to the other side, D (No. 373). Then turn on the water and forget it, for as the water rises in the pit the float is raised and when the right height is reached the valve is opened, instantly allowing the city water to flow through the ejector, cause a suction, and carry the sump water with it to the discharge. As the water goes down, the float follows, and when the low point is reached the valve closes to remain closed until enough water collects to again raise the float, when the whole operation is repeated.



No. 373 "PENBERTHY" AUTOMATIC CELLAR DRAINER

**GUARANTEE**—All drainers absolutely guaranteed perfect in working and workmanship.

LIST PRICES

No. 1	No. 2	No. 3	No. 4	No. 5
\$25.00	40.00	55.00	80.00	110.00

CAPACITIES AT DIFFERENT PRESSURES AND ELEVATIONS, DIMENSIONS, PIPE SIZES, WEIGHTS, ETC.

Size	Working head, ft.	Actual capacities in gallons of water per hour taken from sump and not total amount of discharged water				Pipe sizes, ins.		Dimensions over all, ins.		Shipping weight boxed, lbs.
		At 25 lbs. will elevate	At 40 lbs. will elevate	At 60 lbs. will elevate	At 80 lbs. will elevate	Supply	Discharge and suction	Height	Diam.	
1	3	230	400	530	650	1½	1	20¾	9½	18
	6	200	350	480	580					
	9		285	420	490					
	12			360	420					
2	3	430	630	820	1050	¾	1¼	22½	11¼	22
	6	320	480	700	840					
	9		400	600	780					
	12			480	620					
3	3	660	1100	1440	1650	1	1½	25¾	15¼	37
	6	520	860	1230	1440					
	9		720	1050	1320					
	12			840	1040					
4	3	960	1600	2020	2400	1¼	2	27½	18½	51
	6	760	1240	1880	1980					
	9		1040	1600	1900					
	12			1280	1440					
5	3	1280	2100	2700	3200	1½	2½	27¾	20¾	55
	6	1000	1620	2300	2820					
	9		1260	1960	2060					
	12			1560	1500					

Sizes 6, 7 and 8 made to order only. Prices subject to discount.

**SPECIAL NOTICE**—The above capacities are the actual capacities of water taken from sump, and not the combined discharge of operating and drainage water as given in most tables.

For higher elevations than shown above, special drainers can be made; also low pressure drainers for operating pressure 10 to 30 lbs.

**SPECIFICATION**—Furnish and install in a suitable sized pit (see mason specification) in cellar of building a "Penberthy" automatic cellar drainer (made by the PENBERTHY INJECTOR CO., Detroit, Mich.) in accordance with directions furnished by the manufacturers, this outfit to be placed below the basement floor and conform to the following specifications:

Size No.	Power line iron pipe size	Discharge iron pipe size	Diam. of pit, ins.	Depth of pit, ins.

**ADDITIONAL INFORMATION**—The pit should be placed so that all surplus water will drain to it, and it may be constructed of cement, brick, sewer crock or other suitable material. A cover should be provided that is not airtight and should be made in two pieces, these halves being cut out to fit around the pipes, D and E (No. 373). Below are given all necessary dimensions.

Size No.	E City water (or steam) line iron pipe size	D Discharge line iron pipe size	K Extreme diam. of drainer, ins.	J Height of drainer, ins.	G Approximate centers of pipe cut-outs in cover, ins.	Size sump suggested	
						Minimum diam., ins.	Minimum depth, ins.
1	½	1	9½	20¾	8	12	22
2	¾	1¼	11¼	22¼	9 ⅞	16	24
3	1	1½	15½	25¾	13	20	28
4	1¼	2	18½	27½	15¾	24	30
5	1½	2½	20 ⅞	27¾	17½	26	30

Letters at top of columns refer to No. 373.

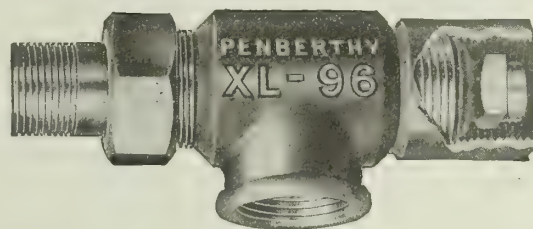
It is a good fault to have the pit a little larger than actually necessary.

"XL-96" Swimming Pool Heater.

The swimming pool of the present has called forth a development of complete systems for filtering, filling, heating, circulating, refiltering and aerating its water with regard to perfect sanitation and economy.

In this connection the PENBERTHY INJECTOR CO. has spent some time and no little money in obtaining the requisite data and perfecting the "XL-96" heater to meet the requirements of noiselessly and efficiently heating these pools.

Full information on request.



"XL-96" SWIMMING POOL HEATER

Steam pressure gage, lbs.	Capacity of pool in gallons											
	15,000		30,000		55,000		80,000		100,000		150,000	
10	Quan.	Size	Quan.	Size	Quan.	Size	Quan.	Size	Quan.	Size	Quan.	Size
	1	5 4	1	5 5	1	7 6	1	8 7	1	9 8	1	10 9
80	1	5 4	1	6 5	1	7 6	1	8 7	1	9 8	1	10 9

Prices furnished on application. Write for descriptive circular.

**Factories.**

All articles manufactured at the Detroit factory are also manufactured in the company's Canadian factory.

# SHONE COMPANY

Manufacturers of Pneumatic Sewage Ejectors

221 Institute Place  
CHICAGO, ILL.

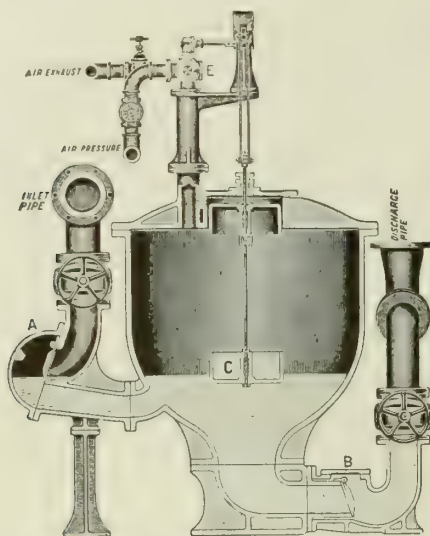
GENERAL SALES AGENTS, YEOMANS BROTHERS COMPANY (See Pages 1122-23)  
REPRESENTATIVES IN ALL PRINCIPAL CITIES

## Product.

SHONE PNEUMATIC SEWAGE EJECTORS.

## Special Features.

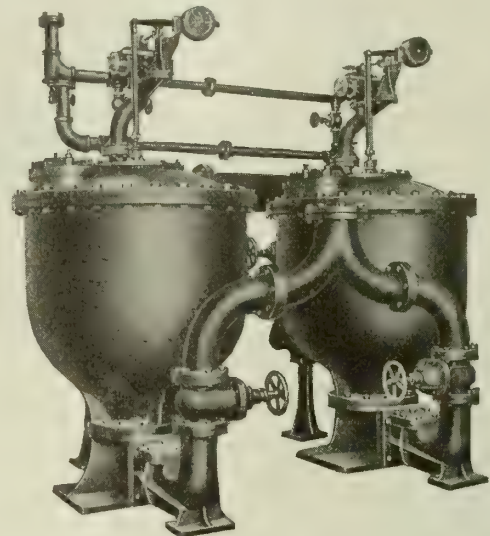
The Shone ejector has been in successful service in all parts of the world for over 35 years. First installation in this country in 1888 is still in service. Unequalled for substantial design, durability, economy and reliability in operation. No screens required; bottom discharge and no accumulation of solids; special non-clogging check valves; no airtight floats; bronze, pressure operated, quick acting piston type automatic air valves. At the World's Fair in Chicago in 1893, 52 Shone ejectors handled all sewage.



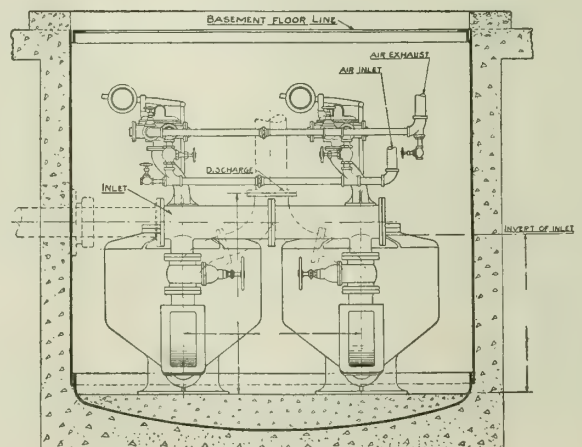
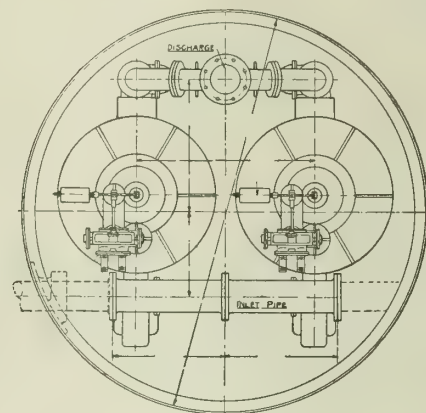
SECTIONAL VIEW OF SHONE EJECTOR

CAPACITIES AND PRINCIPAL DIMENSIONS

Gallons per minute each unit	Diameter of pit	Depth of pit below invert of inlet pipe	Size of inlet pipe	Size of discharge pipe
50 single.....	6'	3'- 1"	6"	4"
50 duplex.....	8'	3'- 1"	6"	6"
100 single.....	7'	3'- 7"	6"	5"
100 duplex.....	9'	3'- 7"	8"	8"
200 single.....	8'	5'-10"	8"	6"
200 duplex.....	11'	5'-10"	8"	8"
250 single.....	8'	6'- 5"	10"	6"
250 duplex.....	11'	6'- 5"	10"	10"
500 duplex.....	14'	8'- 0"	12"	12"
600 duplex.....	14'	8'- 9"	12"	12"
1000 duplex.....	16'	9'- 0"	16"	16"



250-GALLON SHONE DUPLEX EJECTOR



GENERAL ARRANGEMENT SHONE DUPLEX EJECTOR

## Co-operative Service.

Designs for complete pneumatic ejector plants, electric or steam operated, for city buildings, municipalities, industrial plants, etc.

## References.

Installations in city buildings and municipal sewerage systems in all parts of the world. Known to all leading architects and engineers.



# J. P. EUSTIS MFG. CO.

Manufacturers of Bathroom Accessories

12-16 Ames Street

CAMBRIDGE "A" (BOSTON), MASS.

## Products.

SANITARY TOILET PAPER HOLDERS.  
SANITARY STEEL MEDICINE CABINETS.  
A full line of Bathroom Accessories.

**The Brasscrafters**  
TRADE-MARK

**WHITE**

SYMBOL OF GUARANTEED  
WHITE FINISH

## The "Brasscrafters White" Sanitary Toilet Paper Holders.

These recess pattern toilet paper holders are made of cold rolled steel, guaranteed against corrosion.

The guaranteed finish is the "Brasscrafters White."

These holders are adapted for standard size paper and can be installed without cutting standard size tile (see dimensions in illustration).

Steel hinge-leaves (4 ins. wide) on the inside carry and balance the box. No outside hinge joints or springs are used.

Finished inside and outside, ready to be anchored in the wall by simply setting two  $\frac{7}{8}$ -in. No. 7 wood screws in the vertical sides.

It is a beautiful, rugged and everlasting fixture.

Opening required for installation, 6 by 8 by  $2\frac{3}{8}$  ins.

## The "Brasscrafters White" Sanitary Steel Medicine Cabinets.

These cabinets are made entirely of steel, secured from corrosion by several electro deposit coats of copper and other metals.

The guaranteed finish is the "Brasscrafters White."

The shelf rests are securely fixed, but instantly adjustable.

The shelves are pure white vitrolite glass, impervious to acids and chemicals.

The mirror door is plain French plate glass, in seamless metal frame, with moisture pad, flush-fitting metal back, china knob in combination with spring catch, concealed hinge flanges, and loose pin for convenience in detaching the door.

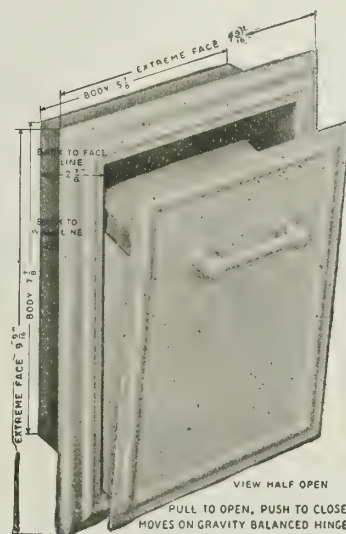
The body and moulding are integral, thus securing a cabinet without joints, seams or cracks.

These cabinets require no finishing at the building, either inside or outside. They are delivered complete, and are ready for immediate installation by simply setting 2 wood screws.

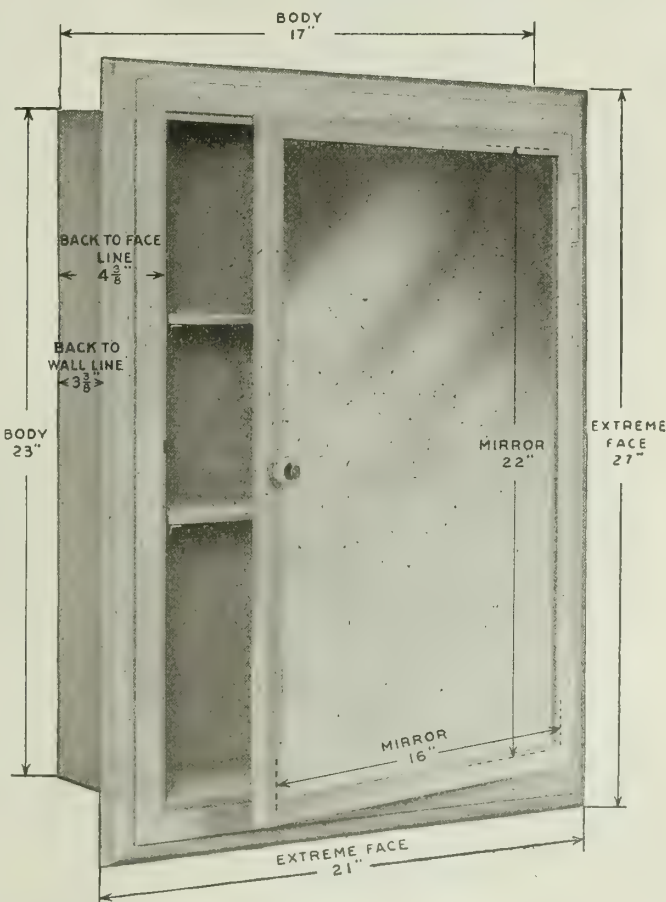
Opening required for installation,  $17\frac{1}{4}$  by  $23\frac{1}{4}$  by  $3\frac{3}{8}$  ins.

## Catalogue.

Write for catalogue showing other patterns of medicine cabinets and bathroom accessories.



THE "BRASSCRAFTERS WHITE" SANITARY TOILET PAPER HOLDER



THE "BRASSCRAFTERS WHITE" SANITARY STEEL MEDICINE CABINET

## FRANK H. GRAF MFG. CO.

## Sanitary Metal Medicine Cabinets

TELEPHONE CONNECTION

322 Seventh Avenue  
NEW YORK, N. Y.**Products.**

Manufacturers of High Class SANITARY METAL MEDICINE CABINETS; NICKELPLATED BRASS and PLATE GLASS DOORS for Shower Baths.

Open Fireplace Fixtures of Brass, Bronze and Wrought Iron.

**Description of Metal Medicine Cabinets.**

Metal medicine cabinets are constructed with a cast iron back, white porcelain enameled. The frame and door are made of brass, nickelplated. They can also be made of German silver.

Each cabinet is supplied with our own special sliding shelf supports, which permit the shelves to be set at any desired height (see illustration). These cabinets can be made 4 and 4½ ins. in depth.

The interior corners, being rounded, cabinets can be easily cleaned and are perfectly sanitary.

Cabinets are fitted with best grade of highly polished beveled French plate mirror, and polished plate glass shelves.

Cabinets can be had from any of the mantle and tile dealers, also plumbers.

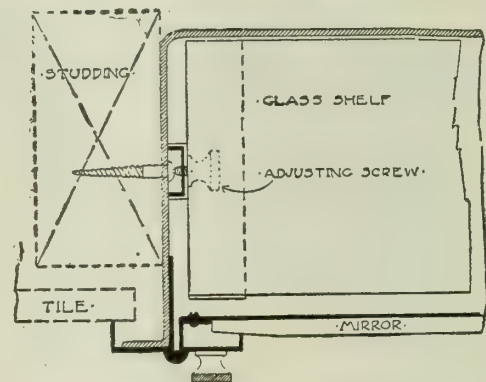
Owing to their construction, they should be installed after all tile work is finished and cleaned.

**Nickelplated Brass and Plate Glass Doors for Shower Baths.**

Detailed information sent on request.

DIMENSIONS OF MEDICINE CABINETS

Brass nickel-plated	Wall space, ins.	Metal back, ins.	Tile opening, ins.	Depth to frame, ins.	Inside depth, ins.	Mirror
No. 10	21 $\frac{1}{8}$ x 27 $\frac{3}{4}$	20 $\frac{1}{4}$ x 25 $\frac{3}{4}$	20 $\frac{3}{4}$ x 26 $\frac{1}{4}$	4 $\frac{1}{2}$	5	17 $\frac{3}{4}$ x 23 $\frac{1}{4}$
No. 20	25 $\frac{1}{8}$ x 31 $\frac{3}{4}$	24 $\frac{1}{4}$ x 30	24 $\frac{1}{4}$ x 30 $\frac{1}{2}$	4 $\frac{1}{2}$	5	21 $\frac{1}{2}$ x 27 $\frac{1}{2}$



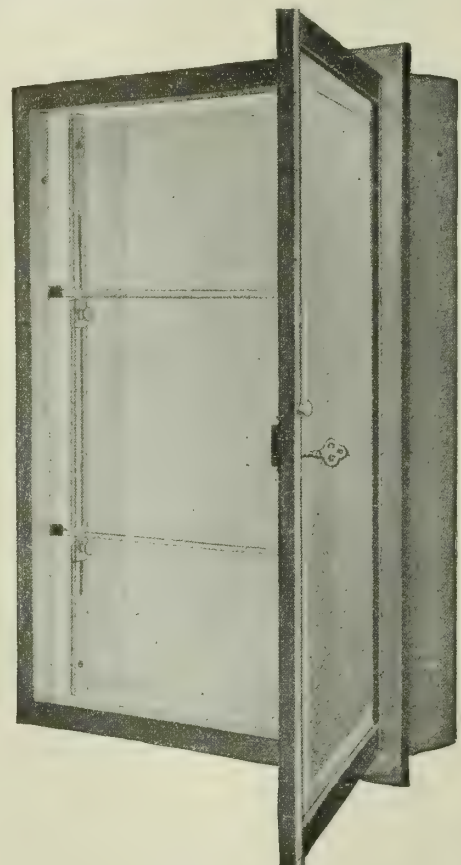
METHOD OF SECURING MEDICINE CABINET TO WALL

**Catalogue.**

Write for catalogue.



Cabinet Closed



Perspective, Showing Adjustable Shelf Supports

SANITARY METAL MEDICINE CABINET



# HESS WARMING & VENTILATING CO.

Manufacturers of Medicine Cabinets

1206B Tacoma Building  
CHICAGO, ILL.

## Products.

### ENAMELED STEEL MEDICINE CABINETS.

"Hess" Steel Clothing Lockers of all sizes and styles in enameled or japanned sheet steel; Grain Dryers and Hot Air Furnaces.

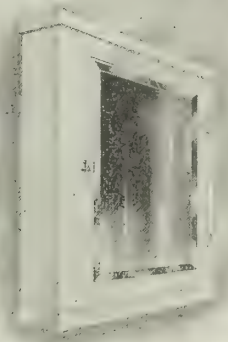
### Hess Steel Medicine Cabinet, Snow White.

The Hess steel medicine cabinet is made of smooth, soft steel, enameled inside and out with best baked enamel, snow white, everlasting. The mirrors are best American A plate glass, beveled or plain; the door closes flush with the front in a rabbeted opening, and is furnished with brass nickelplated hinges and turn catch; steel shelves, white enameled and adjustable at any desired height. Polished plate glass shelves also are supplied at an additional charge. We ship direct from factory and guarantee safe delivery.

This steel cabinet is far preferable to wood and costs no more. It may be washed with soap and water and is easily kept clean. It is germproof and vermin-proof, and is close fitting, to exclude dust. In style and finish it is suitable for the finest bathrooms.



STYLE E MEDICINE CABINET  
To recess



STYLE H MEDICINE CABINET  
To hang on wall



STYLE G MEDICINE CABINET  
To hang on wall

### The Recessed Cabinet, Styles E and F.

The recessed cabinet (styles E and F) recesses  $4\frac{1}{4}$  ins. back of the finished face of the plaster and projects  $1\frac{1}{4}$  ins. It is attached by 4 screws to the sides of the framing, resting upon the bottom crosspiece. The plaster grounds on the sides should be narrow, not over  $\frac{1}{2}$  in., as the locker extends but  $\frac{3}{4}$  in. upon the plaster, which should, therefore, be brought smooth and true up to the grounds. The framing should be accurately made of 2 by 4-in. studding, and straight, and of the sizes indicated below. Styles G and H do not recess but are attached by 4 screws to the face of the wall. All sizes indicated are carried regularly in stock, ready for immediate shipment. Illustrated booklet on request.

#### PRICES AND SIZES OF STEEL CABINETS

Number	Extreme outside dimensions, ins.	Size of mirror, ins.	Inside dimensions, ins.	Wall opening required, $4\frac{1}{4}$ ins. deep	Price with enameled shelves	With polished plate glass shelves, add	Plain door without mirror, deduct	Shipping weight, lbs.
STYLE E: TO RECESS IN WALL, WITH OPEN SHELF BELOW								
20	$21\frac{1}{2} \times 33\frac{1}{2}$	$14 \times 18$	$18\frac{3}{4} \times 21$	$19 \times 30$	\$14.50	\$2.30	\$2.00	68
21	$23\frac{1}{2} \times 35\frac{1}{2}$	$16 \times 20$	$20\frac{3}{4} \times 23$	$21 \times 32$	17.00	2.80	3.25	77
22	$25\frac{1}{2} \times 37\frac{1}{2}$	$18 \times 22$	$22\frac{3}{4} \times 25$	$23 \times 34$	19.50	3.00	4.00	85
23	$27\frac{1}{2} \times 39\frac{1}{2}$	$20 \times 24$	$24\frac{3}{4} \times 27$	$25 \times 36$	22.00	3.40	5.00	100
STYLE F: TO RECESS, WITHOUT OPEN SHELF BELOW								
30	$21\frac{1}{2} \times 25\frac{1}{2}$	$14 \times 18$	$18\frac{3}{4} \times 21$	$19 \times 22$	\$12.50	\$2.30	\$2.00	59
31	$23\frac{1}{2} \times 27\frac{1}{2}$	$16 \times 20$	$20\frac{3}{4} \times 23$	$21 \times 24$	15.00	2.80	3.25	68
32	$25\frac{1}{2} \times 29\frac{1}{2}$	$18 \times 22$	$22\frac{3}{4} \times 25$	$23 \times 26$	17.00	3.00	4.00	75
33	$27\frac{1}{2} \times 31\frac{1}{2}$	$20 \times 24$	$24\frac{3}{4} \times 27$	$25 \times 28$	19.50	3.40	5.00	90
STYLE G: TO SCREW TO FACE OF WALL, WITH OPEN SHELF BELOW								
40	$21\frac{1}{2} \times 32$	$14 \times 18$	$20\frac{1}{2} \times 23$	.....	\$17.50	\$2.30	\$2.00	70
41	$23\frac{1}{2} \times 34$	$16 \times 20$	$22\frac{1}{2} \times 25$	.....	21.00	2.80	3.25	79
STYLE H: TO SCREW TO FACE OF WALL, WITHOUT OPEN SHELF BELOW								
50	$21\frac{1}{2} \times 24\frac{1}{2}$	$14 \times 18$	$20\frac{1}{2} \times 23$	.....	\$14.50	\$2.30	\$2.00	62
51	$23\frac{1}{2} \times 26\frac{1}{2}$	$16 \times 20$	$22\frac{1}{2} \times 25$	.....	17.50	2.80	3.25	71

All lockers listed are right hand. Left hand lockers, 50c extra. Lock and key 80c extra.  
Prices, November 15, 1916, f.o.b. Chicago. Subject to change, without notice.  
A liberal discount is allowed. Tell us your needs.

STYLE F MEDICINE CABINET  
To recess

# SEARLS MANUFACTURING CO.

Manufacturers of Bathroom Accessories

NEWARK, N. J.

## Products.

BATHROOM ACCESSORIES: Metal Medicine Cabinets; Mirrors; Glass Shelves; Hand Rails for Bathtubs; Towel Racks and Baskets; Toilet Paper Holders; Tumbler Holders; Tooth Brush Holders; Soap Holders; Sponge Holders; Bathroom Hooks; Combination Mirror Fixtures for Hotels.

## Style and Quality.

This company avoids all undue ornamentation in design and adheres to plain lines, thus the fixtures obtain a rich solid effect and can be easily cleaned.

The patterns are heavy, insuring durability.

## "Searloid" China White Finish.

This company manufactures a full line of bathroom



accessories finished in "Searloid" China White, several of which are shown on these pages. This finish is durable, will stay white, and is fully guaranteed. Any fixture can be furnished in white or nickel finish.

## Other Finishes.

A complete line of bathroom accessories is also manufactured in brass and nickelplate.

Special finishes to order.

## Prices and Catalogue.

Upon receipt of information as to requirements, prices will be quoted on special finishes and designs.

Catalogue sent to interested persons on request.



RECESS METAL MEDICINE CABINETS

"Searloid" China White finish.

French plate beveled mirror and adjustable plate glass shelves; glass knob on door. Can not swell or warp like wood. Joints do not crack or split apart.

No. 4547—19 ins. high, 17 ins. wide, 5 ins. deep. Mirror, 10 by 12 ins. Opening in wall 16 $\frac{3}{4}$  ins. high, 14 $\frac{3}{4}$  ins. wide, 3 $\frac{1}{4}$  ins. deep.

No. 4548—23 ins. high, 21 ins. wide, 5 ins. deep. Mirror, 14 by 16 ins. Opening in wall 20 $\frac{3}{4}$  ins. high, 18 $\frac{3}{4}$  ins. wide, 3 $\frac{1}{4}$  ins. deep.

No. 4545—Outside cabinet. 19 ins. high, 16 ins. wide, 5 ins. deep. Mirror, 10 by 12 ins.

No. 4546—Outside cabinet. 23 ins. high, 20 ins. wide, 5 ins. deep. Mirror, 14 by 16 ins.



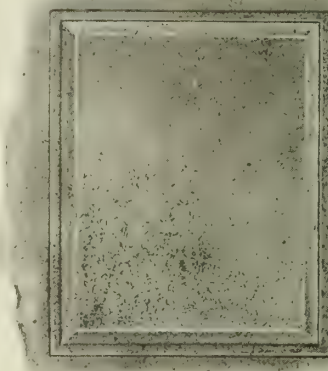
NO. 4524 GLASS SHELF

Plate  $\frac{1}{4}$ -in. thick by 5 ins. wide. One-piece cast bracket with thumb-screw to prevent sliding. Crystal or opal glass, 18, 24 and 30 ins. long



NO. 4513 GLASS SHELF

Plate  $\frac{1}{4}$  in. thick by 5 ins. wide.  $\frac{3}{4}$ -in. glass towel bar. One-piece cast bracket with thumbscrew to prevent sliding of glass. Furnished in crystal and opal glass, 24 and 30 ins. long



NO. 4559 BATHROOM MIRROR

"Searloid" China White finish; also nickelplated.

First quality French plate glass;  $1\frac{1}{4}$ -in. bevel; metal moistureproof backs; concealed hangers;  $\frac{1}{2}$ -in. plain flat frames. Can be hung in either position.

Stock sizes, 14 by 18 ins., 16 by 20 ins. and 18 by 24 ins.

Other sizes promptly furnished, and with wider frames if desired.

No. 4560—Oval mirror. "Searloid" China White finish; also nickelplated. Same stock sizes as No. 4559



GLASS SHELF IN "SEARLOID" WHITE FINISH

Any fixture can be furnished in the white finish.



NO. 3863 GLASS SHELF

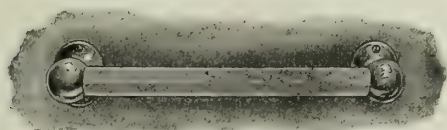
Plate  $\frac{1}{4}$  in. thick by 5 ins. wide, with railing. Furnished in crystal and opal glass, 24 and 30 ins. long



NO. 4512 GLASS SHELF

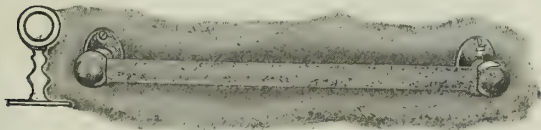
Plate  $\frac{1}{4}$  in. thick by 5 ins. wide, with cups for 2 tumblers. 24 and 30 ins. long





NO. 4561 HAND RAIL FOR BATHTUB

1½-in. diameter bar, 12 ins. long. Oval flange 1-piece cast brass standards. Furnished with bars nickelplated, or in crystal or opal glass

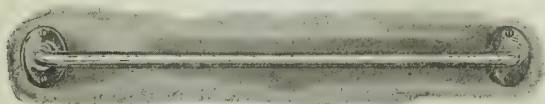
TOILET PAPER HOLDER IN  
"SEARLOID" CHINA  
WHITE FINISHNO. 4539 SOAP HOLDER  
5¾ by 3¾ ins.

TOWEL RACK WITH GLASS BAR

No. 4537—¾ in. diameter; 18, 24, 30 and 36 ins. long.  
No. 4563—¾ in. diameter; 18, 24, 30 and 36 ins. long.  
No. 4544—1 in. diameter; 18, 24, 30 and 36 ins. long.  
Furnished in crystal and opal glass

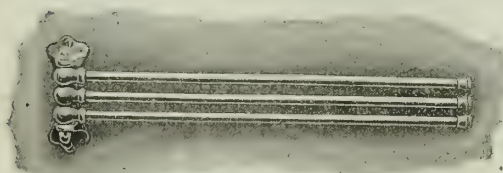
NO. 4552 TOILET PAPER  
HOLDER

For roll paper. Cast brass back  
and sides

NO. 4556 SPONGE HOLDER  
For wall. Oval pattern. 8 ins. long  
5 ins. wide, 3 ins. deep

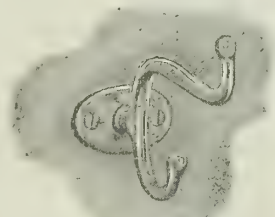
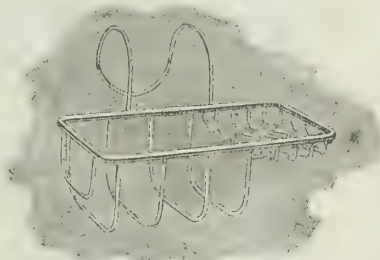
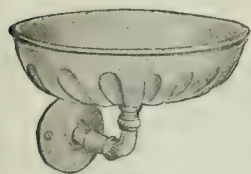
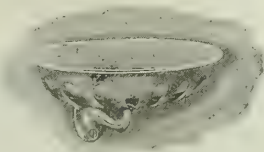
ROUND CORNER METAL TOWEL RACK

No. 4526—½ in. diameter. No. 4549—¾ in. diameter.  
Oval cast-brass flanges, 18, 24, 30 and 36 ins. long



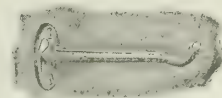
NO. 4554 FOLDING TOWEL RACK

3 bars, ¾ in. diameter, 14 ins. long, 1-piece cast brass  
wall plate

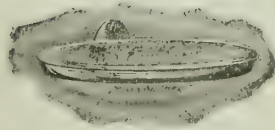
NO. 4519 COAT AND HAT  
HOOKNO. 4553 SOAP AND SPONGE  
HOLDER  
9 ins. long, 5¾ ins. wide, 3 ins. deep"Searloid" China White  
Finish

No. 4507 with opal tray

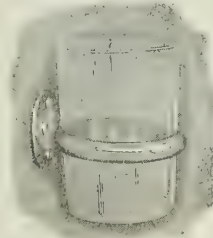
SOAP HOLDERS

No. 4521 Razor  
Strop HookNo. 4525 Double Hooks  
3 ins. across hooksNo. 4520 Single Hook  
4½ ins. long

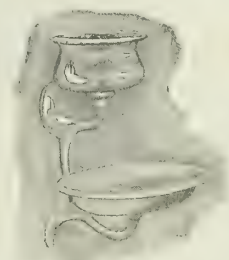
BATHROOM HOOKS

NO. 4506 1-PIECE CAST  
BRASS SOAP HOLDER  
WITH OPAL TRAYNO. 4538 TOOTH  
BRUSH HOLDER

No. 4523

No. 4505  
TUMBLER HOLDERS

No. 4500

No. 4534 For Soap and 2  
Tumblers with Opal Soap TrayNo. 4501 For Tum-  
bler and Tooth  
BrushesNo. 4531 For Soap and  
Tumbler with Opal  
Soap TrayNo. 4533 For Soap and  
Tumbler with Remov-  
able Drain

COMBINATION HOLDERS

# ALBERENE STONE CO.

Quarriers, and Manufacturers of Laundry Fixtures and Sanitary Work

TELEPHONE:

5431 GRAMERCY

223 East Twenty-third Street

NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, 216 North Clinton Street  
Telephone, 3526 Main  
PITTSBURGH, 1410 Arrott Building  
Bell Telephone, 678 Court

NEWARK, N. J., 307 Prudential Building  
Telephone, 6316 Market  
WASHINGTON, D. C.

BOSTON, 162 Dover Street  
Telephone, 5253 Beach  
PHILADELPHIA, 706 Perry Building  
Telephone, 5428 Spruce

## Products.

ALBERENE STONE (Natural Soapstone) LAUNDRY TUBS and KITCHEN SINKS, SANITARY URINALS, TOILET and SHOWER PARTITIONS, LABORATORY TABLES, HOODS and SINKS.

Photographic and Acid Tanks, Hearth Linings, Switchboards and Barriers, and other Electrical and Power Station Equipment, Flooring and Stair Treads.

## Description.

ALBERENE STONE is the name applied solely to the output of the extensive quarries of this company, and serves both to identify and to guarantee the products. ALBERENE STONE has come to be recognized after 25 years of use as a most satisfactory material for laundry and kitchen fixtures and sanitary purposes.

ALBERENE STONE is a natural, quarried stone, gray in color, close grained, non-porous, and of uniform density and hardness, and, owing to its non-absorbent quality, is kept clean with the most ordinary care.

In the manufacture of ALBERENE STONE laundry tubs and kitchen sinks, interlocking tongued and grooved joints are employed, as illustrated in Fig. 1. The density and close grain of ALBERENE STONE, together with its freedom from stratification, make possible the finest milling and jointing without spawling or shaling.

The durability of ALBERENE STONE, together with the reasonable cost and long continued and satisfactory service, renders it a most desirable material for laundry tubs and sinks in houses of every size and description.

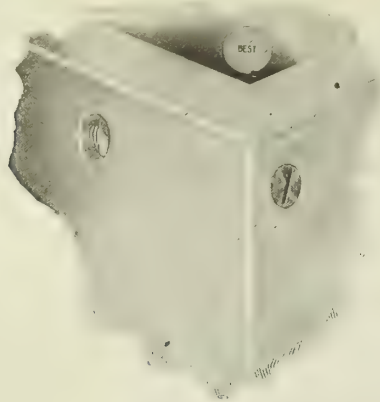


FIG. 1. TONGUED AND GROOVED JOINT

## Laundry Tubs.

Laundry tubs are furnished in 1, 2, and 3 compartments (Figs. 2, 3, and 4), with or without high backs. These 2-part and 3-part fixtures are also furnished in single compartments with abutting ends covered with

brass clamps; also, in combination with sink (Fig. 5).

These fixtures may be furnished with capping and return ends, or may be otherwise modified at slight cost to suit special conditions.

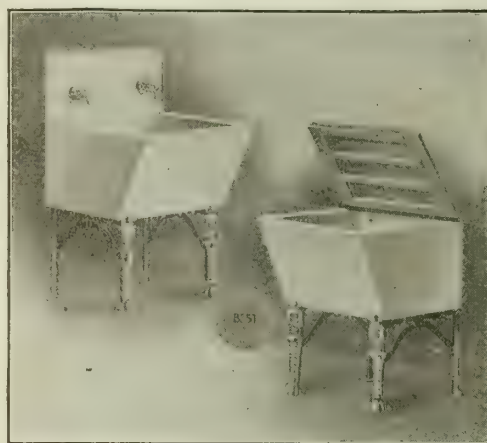


FIG. 2. SINGLE-COMPARTMENT LAUNDRY TUB

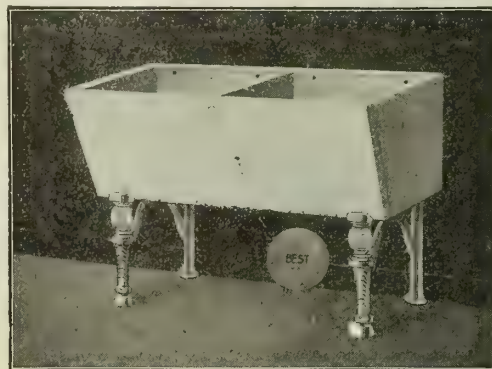


FIG. 3. TWO-COMPARTMENT LAUNDRY TUB

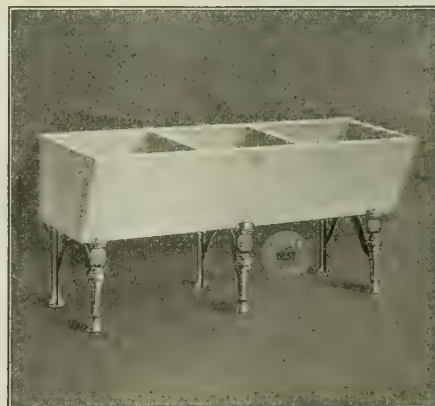


FIG. 4. THREE-COMPARTMENT LAUNDRY TUB



### Kitchen Sinks.

ALBERENE STONE kitchen sinks are particularly desirable, on account of the integral back and drain-boards, which are constructed of ALBERENE STONE and are, therefore, both clean and sanitary (Fig. 6).

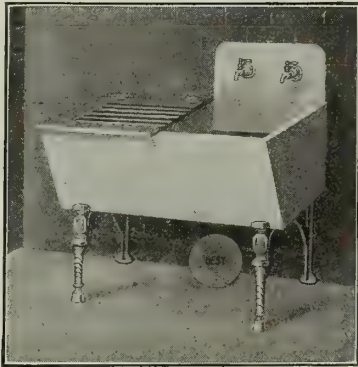


FIG. 5. COMBINATION LAUNDRY TUB AND KITCHEN SINK

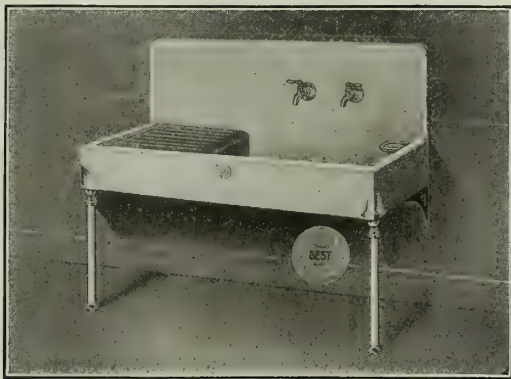


FIG. 6. KITCHEN SINK WITH HIGH BACK

### Urinals and Toilet Work.

The problem of a suitable and sanitary material for use in urinals and water closet compartments is largely solved by the erection of ALBERENE STONE for these purposes, because of the non-absorbent quality of the stone and its color, and because of the watertight joints made possible by the use of the slip-tongue (Figs. 1, 7 and 8).

Architects, engineers, Boards of Education, and industrial plants use and recommend ALBERENE STONE for such purposes. (References will be furnished upon request.)



FIG. 7. SLIP-TONGUED JOINT



FIG. 8. VENTILATED URINAL

### Shower Stalls.

For shower compartments and public baths ALBERENE STONE is giving satisfaction. The method of jointing, as shown in Figs. 1 and 7, makes the showers watertight. A heavy countersunk floor slab, grooved to receive partitions and backs, prevents leakage. Showers vary in height from 6 to 7 ft.

### Laboratory Equipment.

For many years ALBERENE STONE has been used for the tops of chemical and other laboratory tables, for chemical sinks, shelving and hoods, which are constructed *entirely* of ALBERENE STONE (Fig. 9).

The leading chemists of the country use and recommend ALBERENE STONE.

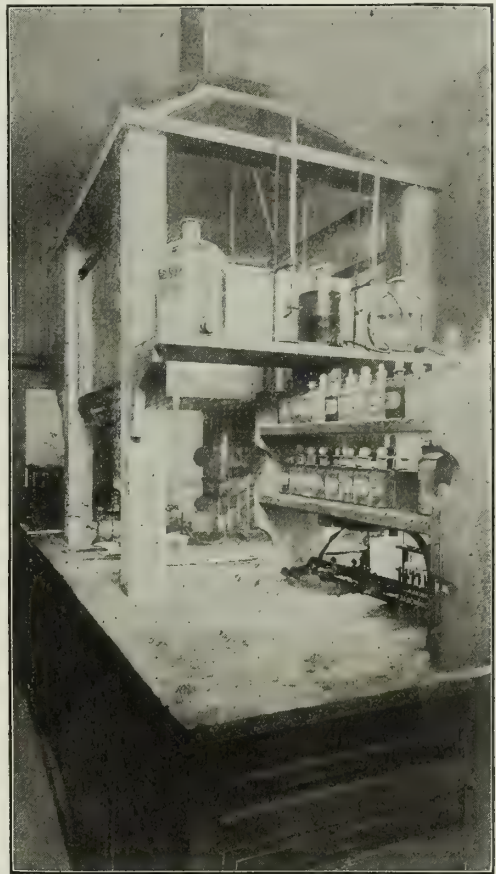


FIG. 9. ALBERENE STONE HOOD, TABLE TOP AND SHELVING

### Co-operation.

In preparing specifications, use the material given above. For further information, kindly write us. We will cheerfully furnish details of construction and erection and have a representative call if desired.

### Name Plate and Guarantee.

The distinguishing characteristics of the products furnished and installed by the ALBERENE STONE Co. are the trade-mark plate and guarantee.

These two features are the assurance to architect, owner and contractor that the products of the quarries and mills of the ALBERENE STONE Co. are warranted to give service and satisfaction. This guarantee has been attested by a record of more than 25 years of steady growth,



TRADE-MARK PLATE

ESTABLISHED 1841

**E. B. BADGER & SONS CO.**

Pantry Sinks and Hot Water Boilers

Engineering Coppersmiths

BOSTON, MASS.

NEW YORK OFFICE, 101 Park Avenue

**Products.**

PANTRY SINKS and DRAINBOARDS, of  
BADGER WHITE METAL or PLANISHED COPPER.  
COPPER HOT WATER BOILERS.

**Sinks.**

**CONSTRUCTION**—The appearance of any metal sink depends very largely on the woodwork. No matter how skillfully the metal is shaped, if the woodwork is poorly constructed or if it warps, the inferiority of the sink becomes very evident. The woodwork of Badger sinks can not possibly warp. It is made of selected quality kiln dried pine and is glued and screwed together in the company's pattern shop. This, the skill of the metalsmiths, and the high quality of the metal used, determine the excellence of Badger sinks.

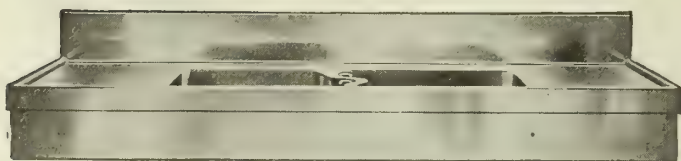
**ILLUSTRATIONS**—The sinks shown are reasonably representative. The first and second, together with the plain square sinks, are carried in stock in regular sizes. The third represents to a certain extent the special or large sinks. These can be made to sketch in practically any size or shape, and of either white metal or planished copper.



DOUBLE COMPARTMENT OR S-PARTITION PANTRY SINK



RECESSED PANTRY SINK

DOUBLE COMPARTMENT SINK  
With back and drainboards**Badger Copper Boilers.**

The Badger copper boiler is now generally regarded as the standard fixture for supplying hot water in well planned residences and other large buildings. This fact is forcefully demonstrated by the great number of cases in which the Badger boiler is definitely called for in the specifications of the best architects. The list of recent installations which is given here is, in itself, sufficient evidence of the attitude of architects and of the people who demand standard products.

**CONSTRUCTION**—The Badger copper boiler is the most economical hot water fixture made because, when correctly installed, it can not possibly deteriorate. Its usefulness is unlimited, as is demonstrated by the boilers which this company installed in the Boston City Hospital more than 50 years ago, and which are still giving excellent service. The rust that inevitably forms in galvanized steel boilers will not only pollute the water, but will soon start a series of leaks that will render the boiler entirely useless. Badger copper boilers, on the other hand, can never rust, because they are all thoroughly tinned inside.

**A BOILER SPECIFICATION**—The following is a boiler specification which is frequently used by architects, and which has been found by them to be very satisfactory:

Furnish ... gal. Badger Copper Boiler to be ... diameter x ... long; shell to be made of sheet copper weighing ... lbs. per sq. ft.; to have one longitudinal seam, said seam to be brazed and hard hammered; heads to be made of copper weighing ... lbs. per sq. ft.; said heads to be half-round type, riveted to the shell and thoroughly sweat on the inside with solder; one head to be fitted with ... x ... composition manhole and cover; all connections in head to be standard type, brazed to copper. All connections on shell to be standard flanged type riveted on outside.

Material in boiler to be tinned on the inside with block tin, and all seams and connections to be heavily backed with solder. Boiler to be tested to ... lbs. hydrostatic pressure.

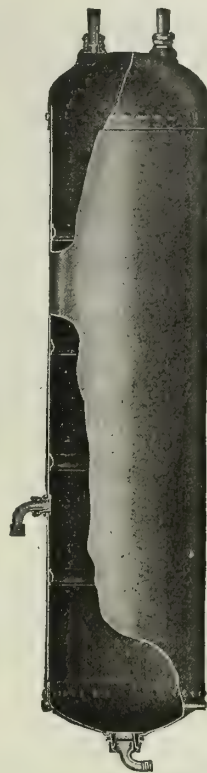
This company will supply dimensions and weights for this specification to any architect who will furnish information regarding volume of hot water required and the water pressure.

**REPRESENTATIVE INSTALLATIONS**—The following list of buildings for which Badger copper boilers have recently been specified must necessarily be short, but

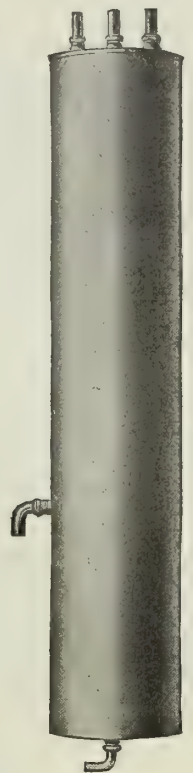


it may serve to indicate that Badger boilers are now generally accepted by most of the well-known architects as the standard fixture for supplying hot water:

- Theodore N. Vail House, Morristown, N. J.  
W. W. Bosworth, Architect
- F. W. Woolworth House, New York, N. Y.  
C. P. H. Gilbert, Architect
- Otto Kahn House, New York, N. Y.  
C. P. H. Gilbert, Architect
- Morton F. Plant House, New York, N. Y.  
Guy Lowell, Architect
- Paul Cravath House, Locust Valley, L. I.  
Guy Lowell, Architect
- Henry C. Frick House, New York, N. Y.  
Carrère & Hastings, Architects
- D. L. Luke House, Tarrytown, N. Y.  
C. P. H. Gilbert, Architect
- T. H. Gillespie House, Mountain Station, N. J.  
Stephenson & Wheeler, Architects
- F. L. Dommerich, Greenwich, Conn.  
C. P. H. Gilbert, Architect
- J. S. Ames House, Boston, Mass.  
Little & Brown, Architects
- P. S. Sears House, Brookline, Mass.  
Bigelow & Wadsworth, Architects
- A. J. Peters House, Dover, Mass.  
Bigelow & Wadsworth, Architects
- H. L. Higginson, Jr., House, Hamilton, Mass.  
Bigelow & Wadsworth, Architects
- New England Hospital, Boston, Mass.  
John Fox, Jr., Architect
- W. A. Gardner House, Beverly, Mass.  
Henry Richards, Architect
- Fidelity Trust Co., Boston, Mass.  
Clinton J. Warren, Architect
- R. H. Derby House, Dark Harbor, Me.  
Bigelow & Wadsworth, Architects
- James A. Burden House, Syosset, L. I., N. Y.  
Delano & Aldrich, Architects
- J. D. Rockefeller, Jr., Country House, Bar Harbor, Me.  
Duncan Candler, Architect



For Direct Pressure

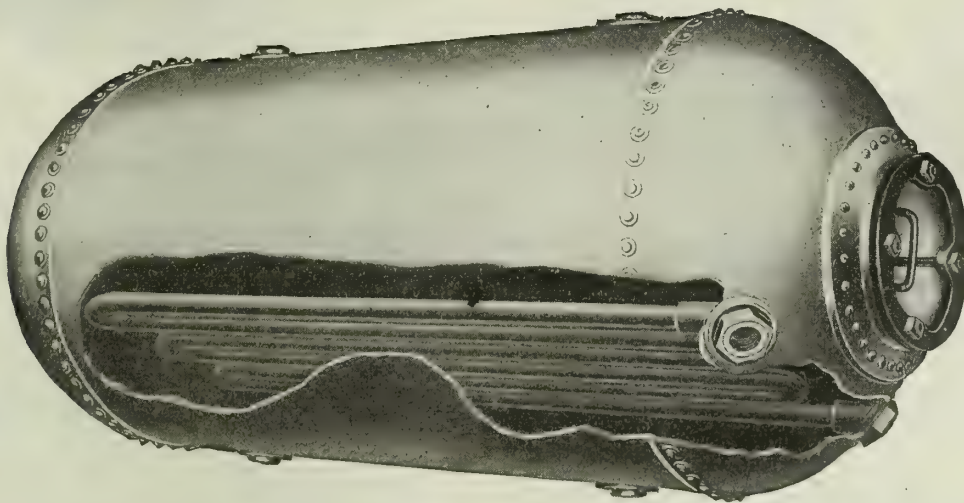


For Cistern Pressure

## BADGER VERTICAL BOILERS

Carried in stock in 30-gal. and 40-gal. sizes. The pressure boilers are made with heads and bottoms securely riveted to the shells and are reinforced with brass rings to make collapse impossible.

All Badger copper boilers are thoroughly tinned inside to prevent corrosive action where the water is limed or acidulated.



## BADGER STANDARD HORIZONTAL BOILER

Furnished with or without steam coil. For large residences, hotels, gymnasiums, public buildings—wherever there is a demand for large quantities of hot water

## LITTERER BROS. MFG. CO.

## Pantry Sinks

154-156 Whiting Street  
CHICAGO, ILL.

## Products.

GERMAN SILVER and COPPER PANTRY SINKS, GERMAN SILVER and PLANISHED COPPER DRAINBOARDS.

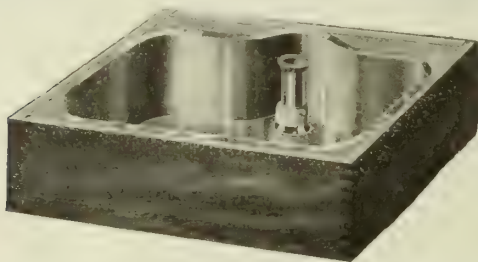
## Trade-mark.

The accompanying figure is the trade-mark which is used on all our products.

## Scope of Business.

LITTERER BROS. MFG. CO. are specialists in the manufacture of pantry sinks, for many years having devoted their time exclusively to the one line of manufacture. Pantry sinks are made in four standard styles, which may be fitted to any style of fixtures.

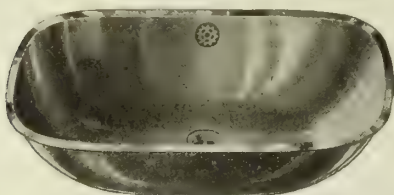
Special styles and sizes are also made.



A-501 GERMAN SILVER OR COPPER PANTRY SINK  
With recess, nickelplated standing overflow and waste, coupling and tail piece

Inside measurements (do not include recess)

14 x 20 ins.	16 x 24 ins.	18 x 30 ins.
14 x 24 ins.	16 x 30 ins.	

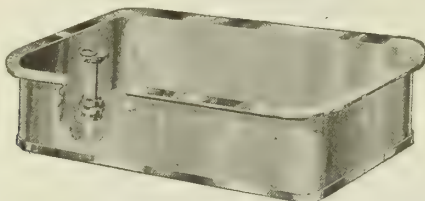


A-502 GERMAN SILVER OR COPPER PANTRY SINK

Bottom so shaped that dishes can not accumulate in center of sink and obstruct waste outlet

12 x 18 ins.	14 x 20 ins.	16 x 30 ins.
12 x 20 ins.	14 x 24 ins.	18 x 30 ins.
14 x 16 ins.	16 x 24 ins.	

Also furnished with connected side overflow, waste plug, coupling and tail piece



A-503 GERMAN SILVER OR COPPER SQUARE PANTRY SINK

With round corners, fitted with nickelplated standing overflow and waste, with coupling and tail piece

12 x 18 ins.	14 x 20 ins.	16 x 30 ins.
12 x 20 ins.	14 x 24 ins.	18 x 30 ins.
14 x 16 ins.	16 x 24 ins.	

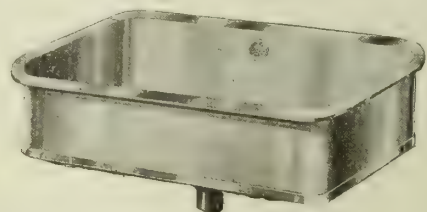
Can be furnished in either planished or tinned copper

## Prices and Estimates.

Prices on any style furnished on request. Also, estimates on any special equipment required will be quoted on receipt of complete specifications.

## Illustrations.

The four styles, A-501, A-502, A-503 and A-504, and several styles of fixtures are illustrated.



A-504 GERMAN SILVER OR COPPER SQUARE PANTRY SINK

With round corners, connected side overflow, waste plug, coupling and tail piece

12 x 18 ins.	14 x 20 ins.	16 x 30 ins.
12 x 20 ins.	14 x 24 ins.	18 x 30 ins.
14 x 16 ins.	16 x 24 ins.	

Can be furnished in either planished or tinned copper

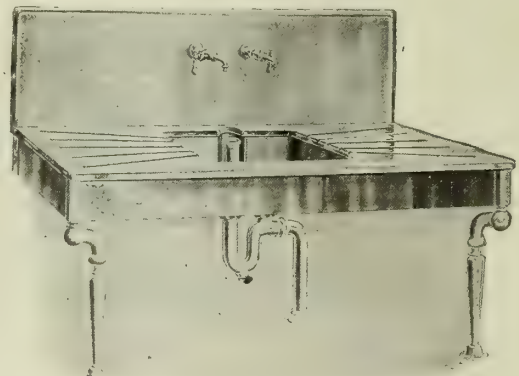


A-505 GROOVED WOODEN DRAINBOARD

Lined with German silver or copper, and German silver or copper pantry sink attached to either A-502, A-503, A-504

Can be made any size, with one drainboard, with back and end, or for recess, and any height of back required

When ordering give outside measurements, length and width, height of back, length of drainboards, size and style of sink

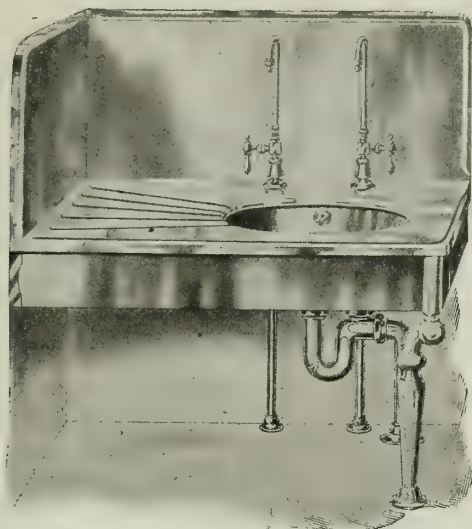


A-506 GERMAN SILVER OR COPPER LINED GROOVED WOODEN DRAINBOARD

With recess sink (A-501), with nickelplated standing overflow. Arrangement can be changed to suit requirements. As described it has German silver top. Can be furnished with heavy planished copper top and heavy copper sink, with single drainboards, or with one end or two ends if wanted for a recess

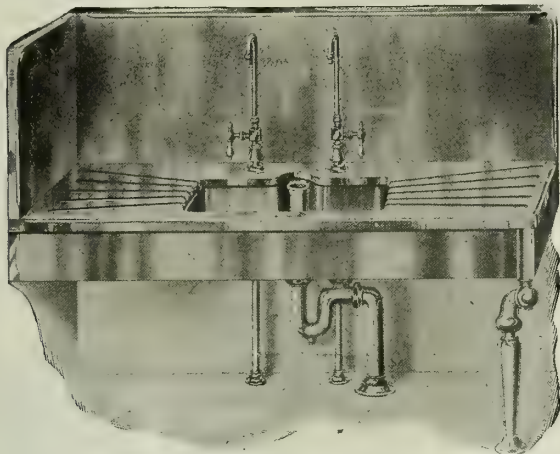
When ordering, give correct outside measurements, length and width, height of back and length of drainboard, and size and style of sink, and whether German silver or copper; or, if marble, whether Italian or Tennessee





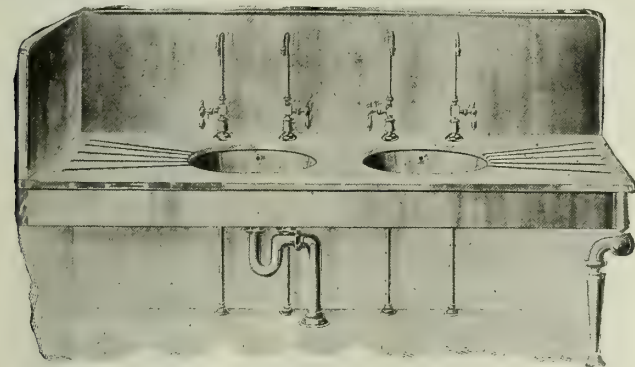
A-507 GERMAN SILVER OR PLANISHED COPPER PANTRY SINK AND TOP AND GROOVED DRAINBOARD

With marble back and end, marble apron on front and right hand end; oval sink, fitted with connected side overflow, waste plug, coupling and tail piece  
Can also be furnished with German silver or copper back, end and apron. For sizes of oval sink, see A-502



A-508 GERMAN SILVER OR COPPER RECESS PANTRY SINK AND STANDING OVERFLOW

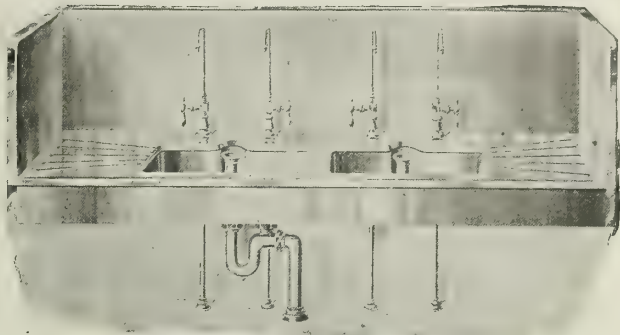
With German silver or copper lined top and grooved drainboard; Italian marble, German silver or copper back and left hand end; apron on front and right hand end



A-509 GERMAN SILVER OR COPPER DOUBLE OVAL PANTRY SINKS

Same style as A-502. With German silver or copper lined wood top, grooved for drainboards; with either German silver or Italian marble back and left hand end, with German silver or Italian marble apron on front and right hand end

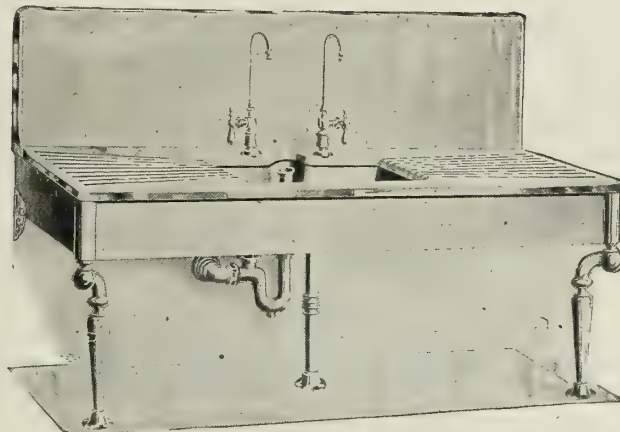
USUAL DIMENSIONS			
Total length of sink	Width of top	Height of back	Size of each oval sink
7 ft.	22 ins.	18 ins.	14 x 20 ins.
8 ft.	22 ins.	18 ins.	14 x 20 ins.
9 ft.	24 ins.	18 ins.	16 x 24 ins.



A-510 GERMAN SILVER OR COPPER RECESSED PANTRY SINKS

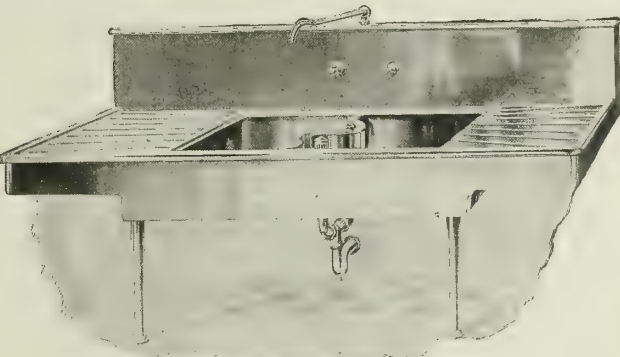
With standing overflows, and German silver or copper top with grooved drainboards. Made with either Italian marble, German silver or copper back ends and apron  
Usual dimensions for a combination sink in this style as follows:

DIMENSIONS			
Total length of sink	Width of top	Height of marble backs	Size of each sink
7 ft.	24 ins.	18 ins.	14 x 20 ins.
8 ft.	26 ins.	18 ins.	16 x 24 ins.
9 ft.	26 ins.	18 ins.	16 x 24 ins.



A-511 GERMAN SILVER OR COPPER RECESSED PANTRY SINK STANDING OVERFLOW

Countersunk marble top with drainboards in one piece; marble back and 8-in. aprons on front and ends. Can furnish this outfit complete as shown  
Full specifications and prices on request



A-512 GERMAN SILVER OR PLANISHED COPPER DOUBLE PANTRY SINK

With "S" dividing partition and right and left hand drainboard with back and apron; white metal combination compression supply valve with swinging nozzle, white metal legs, standing wastes, etc.

Usual Dimensions: Length, about 6 ft. 6 ins. over all; width from front to back, 27 ins.; height of back, 12 ins.; depth inside, 7 ins.; width of roll rim, 2 ins.  
Also furnished with right or left hand end or both, where sink goes in a recess

# RIVERSIDE BOILER WORKS, INC.

Manufacturers of Range Boilers and Steel Tanks

CAMBRIDGE, MASS.

PACIFIC COAST OFFICE, 461 Market Street, SAN FRANCISCO, CAL.  
WESTERN SALES OFFICE, 1616 Merchants Bank Building, INDIANAPOLIS, IND.  
EASTERN SALES OFFICE, 613 Broad Street Bank Building, TRENTON, N. J.

## Products.

RANGE BOILERS; STEEL SINKS.

BLACK and GALVANIZED TANKS of every description: EXPANSION TANKS; HOT WATER STORAGE TANKS.

Pneumatic Water Supply Tanks; Barbers' Boilers; Special Tanks of different shapes for Water, Oil and other purposes. Air and Gasoline Tanks; Ship and Pressure Tanks.

## "Riverside" Range Boilers.

This company makes a specialty of galvanized steel kitchen range boilers, a large production being annually distributed throughout the United States and foreign countries and standing up to working pressures of 150 lbs. per sq. in.

CONSTRUCTION—"Riverside" kitchen range boilers, for different water pressures, are made of various thicknesses of steel according to table below.

These boilers are single riveted, after which the longitudinal seam is brazed, this process effecting an absolutely tight and leakless joint which will not open up under alternate contraction and expansion.



Boilers are finally thoroughly pickled and then galvanized inside and outside, by the "hot-dip" process, giving them a heavy coat of zinc, thus insuring water free from rust, and long life to the boiler.

Expansion tanks, pressure boilers and other pressure tanks are made according to the same thorough construction.

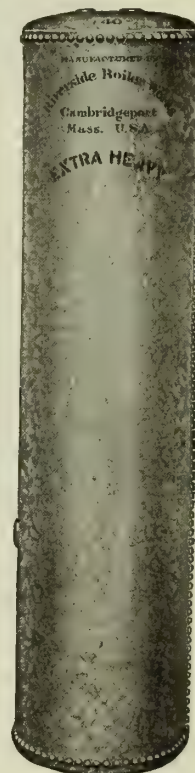
## "Riverside" Massachusetts Regulation Range Boilers.

The State of Massachusetts requires that boilers conform to the Massachusetts Law, and shall be full capacity and 200 lbs. test, not to be used for a working pressure greater than 42½% of the test pressure. Two classes of boilers are made for Massachusetts, as follows:

"Riverside Mass." Extra Heavy Range Boilers, 200 lbs. test, 85 lbs. working pressure.

"Riverside Mass." Double Extra Heavy "Kop-steel" Range Boilers, 300 lbs. test, 127½ lbs. working pressure.

In specifying boilers for the State of Massachusetts specify as above.



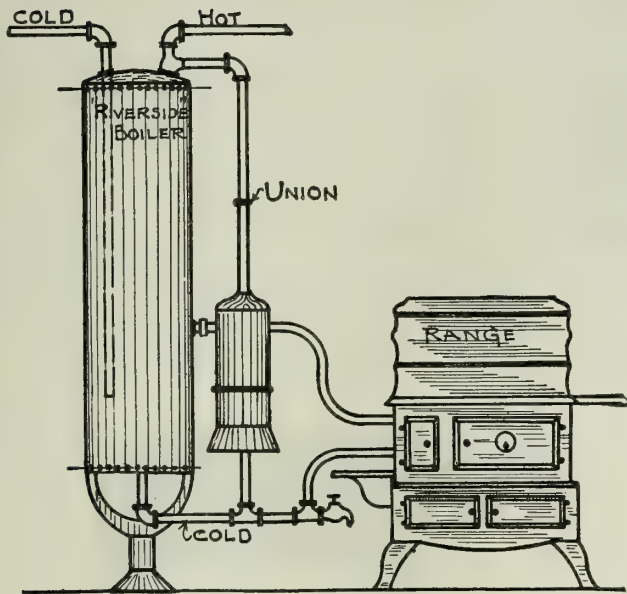
SPECIFICATIONS FOR "RIVERSIDE" GALVANIZED STEEL RANGE BOILERS, U. S. STANDARD GAGES

Capacity, gals.	Dimensions, ft. by ins.	**"Riverside" standard boiler guaranteed for 85 lbs. working pressure			**"Riverside" extra heavy boiler guaranteed for 150 lbs. working pressure			**"Riverside Kopsteel" boiler, double extra heavy guaranteed for six years at 150 lbs. working pressure		
		Shell	Head	Bottom	Shell	Head	Bottom	Shell	Head	Bottom
12	3 x10	14	11	11	12	11	11	11	11	11
18	3 x12	14	11	11	12	11	11	11	11	11
21	3½ x12	14	11	11	12	11	11	11	11	11
24	4 x12	14	11	11	12	11	11	11	11	11
24	3 x14	14	10	10	12	10	10	11	11	11
27	4½ x12	14	11	11	12	11	11	11	11	11
28	3½ x14	14	10	10	12	10	10	11	11	11
30	5 x12	14	11	11	11	11	11	10	7	7
32	4 x14	14	10	10	12	10	10	10	7	7
36	4½ x14	14	10	10	12	10	10	10	7	7
40	5 x14	14	10	10	11	10	10	10	7	7
42	4 x16	13	10	7	12	10	3	10	7	3
47	4½ x16	13	10	7	12	10	3	10	7	3
52	5 x16	12	10	7	11	10	3	10	7	7
53	4 x18	12	10	7	11	10	3			
66	5 x18	12	10	7	11	10	3	7	7	3
82	5 x20	12	10	7	11	10	3	7	7	3
100	5 x22	12	10	7	11	10	3	7	7	3
120	6 x24	12	10	7	11	10	3	7	7	3
144	5 x24	11	10	7	10	10	3			
168	7 x24	11	10	7	10	10	3			
192	8 x24	11	10	7	10	10	3			

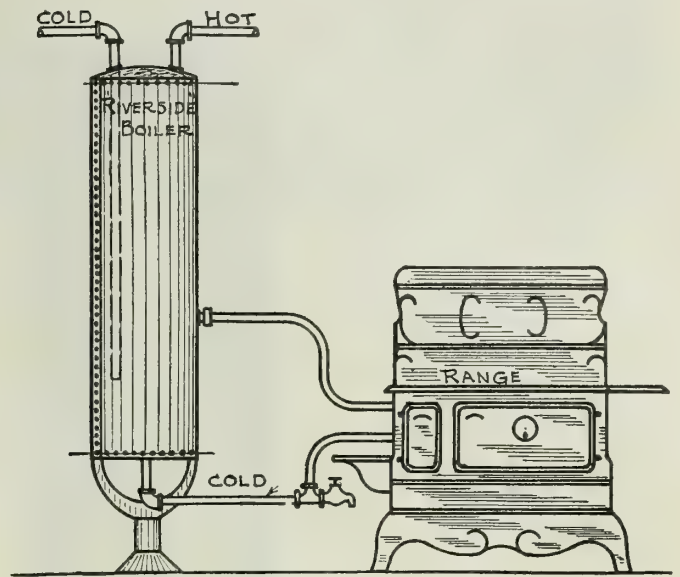
\*Boilers are stenciled as indicated in the heading. Gages are guaranteed as in this table.

"RIVERSIDE"  
EXTRA HEAVY  
RANGE BOILER  
150 lbs. working  
pressure

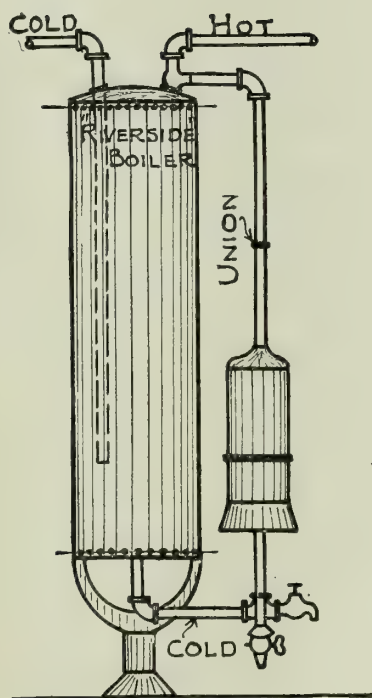




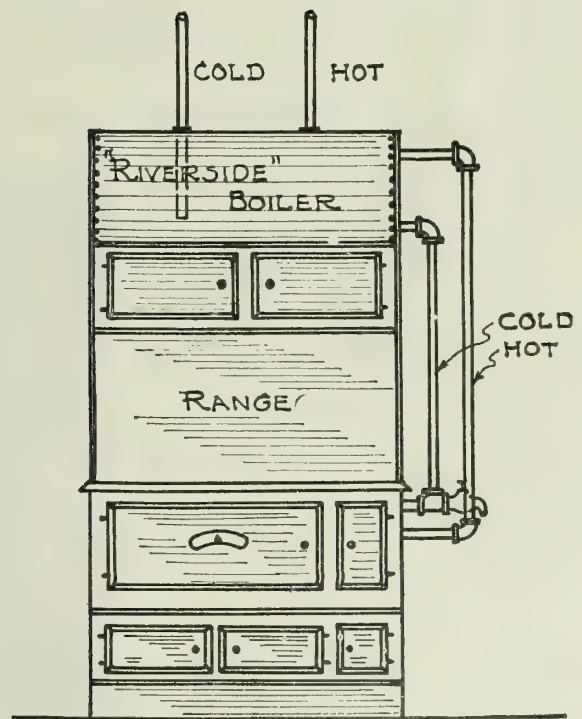
COMBINATION QUICK HEATING CONNECTION



USUAL HEATING CONNECTION



TYPICAL GAS WATER HEATER CONNECTION



QUICK SUPPLY TO FIXTURES

### Importance of Specifying Range Boilers According to Gages.

Architects and engineers will protect their reputation and satisfy their clients by specifying "Riverside" range boilers, and putting in specifications the thickness of shells, heads and bottoms for various pressures.

Specifying a range boiler without this data in the past has led to the substitution of cheaper products.

Each "Riverside" boiler bears a stencil identifying it as Standard, Extra Heavy or Double Extra Heavy, and stating the guaranteed working pressure.

EXPANSION TANK SIZES

Capacity, gals.	Dimensions, ins.	List price, galvanized or plain
5	10x16	\$6.00
8	10x20	7.50
10	12x20	8.00
15	12x30	9.00
20	14x30	12.50
24	14x36	13.00
26	16x30	14.00
32	16x36	15.00
42	16x48	16.50
66	18x60	31.00
82	20x60	37.00
100	22x60	51.00
120	24x60	58.00



"RIVERSIDE" EXPANSION TANK

### Typical Specifications for "Riverside" Range Boilers.

Referring to table of gages and working pressures, specify as follows:

Range boiler shall be guaranteed for .....lbs. working pressure. It shall not only be riveted but also brazed. It shall be galvanized inside and out with a heavy coat of pure "virgin" spelter. Boiler shall be made of heavy blue annealed steel of at least 55,000 lbs. tensile strength. (In case of "Kopsteel" say, "55,000 Kopsteel.")

Identification mark: "Riverside" Standard, Extra Heavy or Double Extra Heavy "Kopsteel" guaranteed for .....lbs. working pressure. In specifying "Riverside Kopsteel" boilers add, "boiler shall be guaranteed for 6 years."

### "Riverside" Coil Boilers.

"Riverside" boilers in all sizes either horizontal or vertical may be furnished with coils of brass, copper or galvanized steel and iron. In ordering, state steam pressure, and sufficient coil will be furnished to do the work properly.



"RIVERSIDE" VERTICAL COIL BOILER

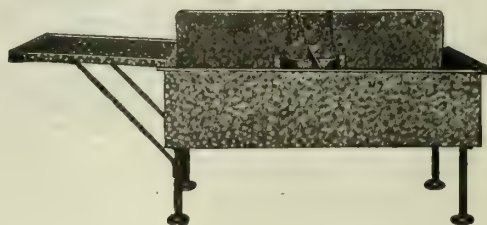
### "Riverside Kopsteel" Boilers.

These boilers are guaranteed for 6 years from date of installation and bear a stencil to this effect. They are made of special rust resisting, copper bearing steel and are made of double extra heavy thickness of material.

While they are good for 200 lbs. working pressure, it is *not* recommended that any range boiler be put on more than 150 lbs. working pressure; and if pressure is over 150 lbs., a pressure reducing valve should be used.

### "Riverside" Steel Sinks.

"Riverside" steel sinks are made from specially selected copper steel, and are designed for use in hospitals, hotels, restaurants, laundries, and other places where something better than a cast iron sink is required.



GALVANIZED STEEL SINK

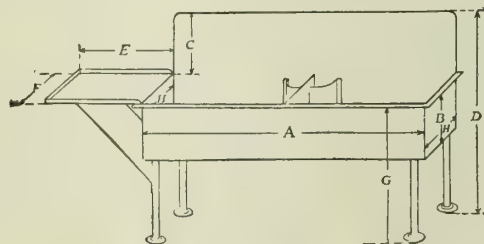
With draining shelf, partition, swill guards, No. 7 gage stock. 1¼-in. iron pipe legs

Made to order in most any thickness of light steel plate. No. 14 gage, No. 10 gage and No. 7 gage stock in different sizes are most commonly used.

All sinks are carefully welded throughout by the oxy-acetylene method, which process of manufacture insures a sink easily cleaned because of its seamless construction, there being no pockets in which debris might lodge.

The "Riverside" sink is regularly furnished with or without one partition, one or two wastes (1½ or 2 ins. in diameter), a back 10, 12 or 14 ins. high, and 1¼-in. iron pipe legs drilled to receive lag screws.

Additional partitions, draining shelves, swill guards, extra holes, tapping, etc., will be furnished at net extra prices.



"RIVERSIDE" STEEL SINK

When ordering, send dimensions for A to H inclusive, stating gage of stock, number of partitions, swill guards, draining shelves, wastes, etc.

Net prices on all sinks, either black or galvanized, will be furnished on receipt of inquiry.



**"Riverside" Storage Tanks.**

These tanks are furnished in accordance with specifications below and are tapped as per illustration accompanying, which is suitable for either vertical or horizontal installation.

They are made for the following working pressures:

Tanks for 125 lbs. test, guaranteed for 75 lbs. working pressure.

Tanks for 150 lbs. test, guaranteed for 100 lbs. working pressure.

Tanks to conform to the Massachusetts law, 200 lbs. test, 85 lbs. working pressure.

**"RIVERSIDE" STORAGE TANK****"RIVERSIDE" STORAGE AND AIR TANK SPECIFICATIONS**

STORAGE TANKS FOR HOT WATER, FUEL OIL, GASOLINE, ETC.				AIR TANKS		
Gallons capacity	Dimensions in inches diameter by length	75 lbs. Water Pressure	100 lbs. Water Pressure	125 lbs. Water Pressure or less	126 lbs. Water Pressure up to 200 lbs.	List price
		Gage shell	Gage shell	Gage shell	Gage shell	
5	9x 16	14	12	11	11	\$6.00
6	10x 16	14	12	11	11	6.50
7	10x 20	14	12	11	11	7.00
8	12x 16	14	12	11	11	7.50
9	12x 18	14	12	11	11	8.00
10	12x 20	14	12	11	11	8.25
11	12x 22	14	12	11	11	8.50
12	12x 24	14	12	11	11	8.75
15	12x 30	14	12	11	11	9.00
18	12x 36	14	12	11	11	9.50
20	14x 30	14	12	11	11	12.50
21	12x 42	14	12	11	11	15.50
24	12x 48	14	12	11	11	15.75
27	12x 54	14	12	11	11	18.50
28	14x 42	14	12	11	11	20.25
30	12x 60	14	11	11	7	19.00
32	14x 48	14	12	11	11	21.00
36	14x 54	14	12	11	11	21.50
40	14x 60	14	11	11	7	24.00
42	16x 48	13	12	11	11	26.00
47	16x 54	13	12	11	11	30.00
52	16x 60	12	11	7	7	31.00
53	18x 48	12	11	7	7	31.50
66	18x 60	12	11	7	7	38.00
82	20x 60	12	11	7	7	45.50
100	22x 60	12	11	7	7	63.50
120	24x 60	12	11	7	7	72.50
144	24x 72	11	10	7	7	103.00
168	24x 84	11	10	7	7	120.00
192	24x 96	11	10	7	7	132.00
235	24x120	7	7	7	7	152.00

Above tanks furnished galvanized only, with riveted and brazed seams.

Above tanks furnished black or galvanized with all welded seams.

		Gage shell	Approximate weight, lbs.	Gage shell	Approximate weight, lbs., 100 lbs. water pressure only	
86	30x 30	7	300	7	300	58.00
105	30x 36	7	365	7	365	64.00
139	30x 48	7	430	7	430	76.00
175	30x 60	7	495	7	495	85.00
209	30x 72	7	558	7	558	94.00
245	30x 84	7	640	7	640	102.00
281	30x 96	7	690	7	690	104.00
314	30x108	7	770	7	770	108.00
347	30x120	7	819	7	819	116.00
383	30x132	7	910	7	910	127.00
418	30x144	7	933	7	933	130.00

Above tanks furnished black or galvanized.

300	36x 72	7	699	7	699	112.00
399	36x 96	7	872	7	872	126.00
499	36x120	7	1018	7	1018	142.00
599	36x144	3	1264	3	1264	156.00
699	36x168	3	1330	3	1330	175.00
547	42x 96	3	1375	3	1375	170.00
684	42x120	3	1818	3	1818	178.00
822	42x144	3	1960	3	1960	196.00
950	42x168	3	2200	3	2200	218.00
1093	42x192	3	2480	3	2480	236.00
950	48x120	3	2060	3	2060	240.00
1074	48x144	3	2320	3	2320	250.00
1235	48x168	3	2610	3	2610	274.00
1425	48x192	3	2900	3	2900	304.00
1615	48x216	3	3600	3	3600	352.00
1786	48x240	3	3950	3	3950	393.00
2147	48x288	3	4650	3	4650	438.00

Above tanks have double riveted longitudinal seam and single-riveted girth seam.

Above tanks furnished in black only.

All seams welded.

DIMENSIONS—First figures shown are inside diameters. Second figures show lengths over all.

GALVANIZING—Tanks are galvanized inside and out by the "hot-dip" process.

HEADS—Regularly furnished with 1 convex and 1 concave. Welded tanks can be made up with both heads convex or concave, if desired.

Tanks listed can be made up from sheets regularly carried in stock. Tappings placed in any location desired. Manholes and handholes are extra and furnished on request. Net prices f.o.b. Boston will be quoted promptly on receipt of inquiry.

NOTE—Quotations on square and rectangular storage tanks or any tanks of special dimensions on receipt of inquiry.

# JOHN TRAGESER STEAM COPPER WORKS

Manufacturers of Range Boilers, Sinks and Drainboards

TELEPHONE:  
CHELSEA 8140

447-457 West 26th Street  
NEW YORK, N. Y.

## Products.

COPPER and GALVANIZED RANGE BOILERS; STEEL STORAGE TANKS with Steam Coils; PANTRY SINKS and DRAINBOARDS in Copper, German Silver, and White Metal.

### "Graves" Range Boiler.

The "Graves" range boiler (Fig. 1) is handmade of heavy copper bearing steel, galvanized inside and outside, and enameled painted outside.

Packed and boxed for shipping. Will stand 300 lbs. pressure and is warranted for 6 years. Every boiler bears a brass plate with this guarantee.

### CAPACITIES, DIMENSIONS AND PRICES "GRAVES" GALVANIZED RANGE BOILERS

Capacity, gals.	Height, ins.	Diameter, ins.	Price
30	60	12	\$29.00
40	60	14	34.00
52	60	16	41.00
66	60	18	48.00
82	60	20	55.50
100	60	22	73.50

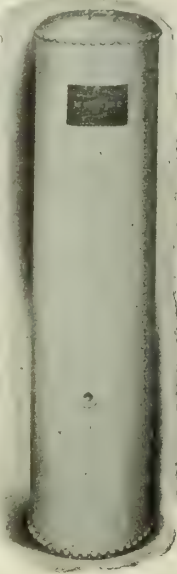


FIG. 1. "GRAVES" RANGE BOILER

### Steel Storage Tanks with Steam Coils.

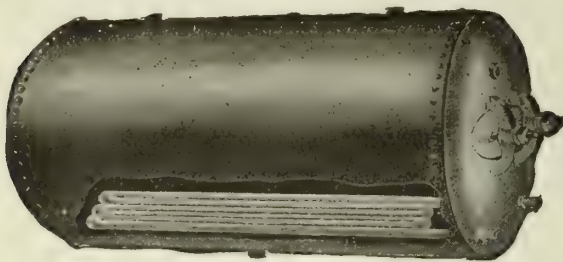


FIG. 2. STORAGE TANK WITH STEAM COIL

### DATA, BLACK TANKS WITH BRASS OR COPPER COILS

Capacity, gals.	Size, ins.	4 Lengths 1-in. pipe	4 Lengths 1 1/4-in. pipe	4 Lengths 1 1/2-in. pipe
120	24 x 60	\$ 92.00	\$100.00	\$113.00
145	24 x 72	104.00	116.50	129.00
170	24 x 84	116.00	131.00	146.00
190	24 x 96	125.00	142.50	160.00
		6 Lengths 1-in. pipe	6 Lengths 1 1/4-in. pipe	6 Lengths 1 1/2-in. pipe
180	30 x 60	\$116.00	\$131.00	\$146.00
220	30 x 72	130.00	149.00	168.00
250	30 x 84	152.00	181.50	197.00
300	30 x 96	170.50	196.50	223.00
265	36 x 60	.....	154.00	169.00
315	36 x 72	.....	172.00	191.00
360	36 x 84	.....	195.00	217.50
425	36 x 96	.....	220.00	247.00
504	42 x 84	.....	240.00	255.00
572	42 x 96	.....	255.00	275.00
644	42 x 108	.....	275.00	295.00

### CAPACITIES, DIMENSIONS AND PRICES COPPER RANGE BOILERS

Capacity, gals.	Height, ins.	Diam., ins.	Price, 200-lb. test	Price, 250-lb. test
30	60	12	\$30.00	\$35.00
35	60	13	35.00	40.00
40	60	14	40.00	45.00
50	60	16	50.00	60.00
60	60	18	60.00	70.00
80	60	20	80.00	90.00
100	62	22	100.00	110.00

The 250-lb. test boiler is guaranteed to stand a working pressure of 150 lbs., and against collapse.

### Pantry Sinks.

A white metal pantry sink with drainboard (Fig. 3), and apron. Can be made in any length, and to suit requirements as to any special design needed.

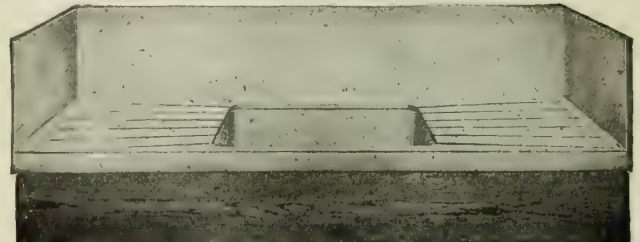


FIG. 3. "WEST END" PANTRY SINK AND DRAINBOARD

Size outside, ins.	22 x 48	24 x 48	22 x 60	24 x 60	24 x 72
German silver.....	\$100	\$105	\$135	\$110	\$120
White metal.....	130	135	135	140	150

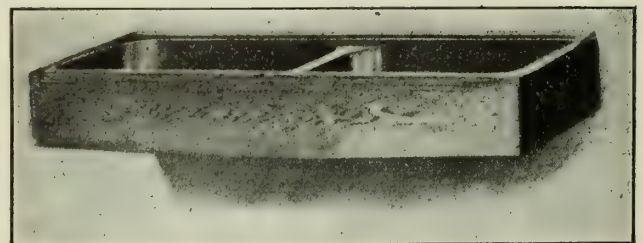


FIG. 4. BUTLER'S DOUBLE PANTRY SINK  
With partition incased in plain box

Size inside, ins.	40 x 18	44 x 22	48 x 16	48 x 24	60 x 20	60 x 24
Tinned and planished copper.....	\$36	\$38	\$38	\$40	\$50	\$55
German silver.....	62	68	72	78	82	90
White metal.....	75	80	85	95	110	120

Nickelplated standing waste extra.

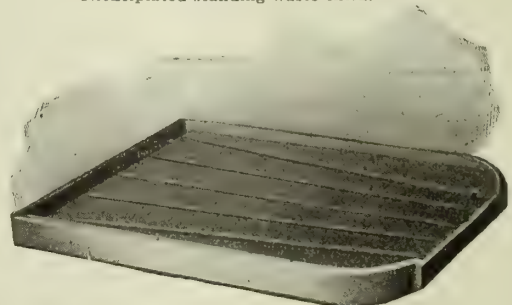


FIG. 5. "MANHATTAN" DRAINBOARD  
Covered with white metal

### SIZES AND PRICES WITH BRACKETS

Size, ins.	18 x 24	18 x 30	20 x 24	20 x 36	22 x 24	22 x 30
Price.....	\$12.00	\$12.50	\$13.50	\$15.50	\$14.00	\$15.00

Telescopic supports extra.



# ALBERGER HEATER COMPANY

BUFFALO, N. Y.

## Products.

ALBERGER MULTIHEAD HEATERS: Domestic Service Heaters, Feed Water Heaters, Forced Circulation Hot Water Heaters, Laundry Heaters, Oil Heaters.

Condensers, Wort Coolers, Air Coolers, Oil Coolers and Heat Interchangers.

## General Description.

Popular requirements of hot water heaters are not merely an adequate supply of hot water, but an adequate supply of hot water at *minimum cost* for repairs and cleaning. The closed heater of the water tube type has long been recognized as the most efficient type for delivering the highest rate of heat transmission, but internal troubles such as scale, corrosion, split tubes, leaky joints and heads, expansion strains, etc., have made it impossible to obtain maximum efficiency from closed heaters.

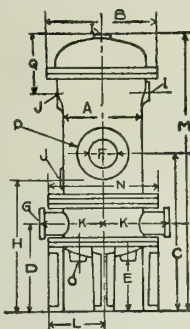
The Alberger multihead heater is recognized as the ideal heater—the closed heater without the usual closed heater troubles.

## Construction.

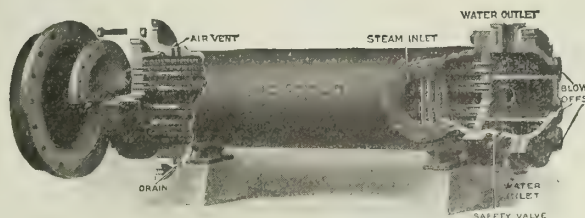
Shell, tube heads, water channel and the steam and water heads are made of special grade cast iron, selected for the purpose. Steel and charcoal iron are not used, as they are subject to rapid corrosion, unlike cast iron in this respect.

Tubes are of pure copper, and last indefinitely. Brass tubes are subject to segregation of materials with resultant splitting under temperature changes when drawn. Copper is free from this objection.

All water and steam connections are on body of shell, thus it is unnecessary to break these connections to secure access to heating surface. Tubes are straight, and any one may be removed or replaced without disturbing any other. Tubes are small, because small tubes transmit a much greater quantity of heat per square foot of heating surface than large tubes, also, there is shown an increase of over 50% in the amount of heat transmitted through corrugated tubes over plain tubes of same size. A further advantage of spirally corrugated tubes lies in the fact that water, passing through tubes, does so with a rotating motion, which produces a scouring effect, with the result that a heater with small spirally corrugated tubes will keep itself free from scale, while a heater with plain tubes using the same water will become filled with scale and require frequent cleaning. This company has adopted, as a standard, the 3/4-in. spirally corrugated tube, although other forms of



DETAIL OF HOT WATER HEATER



HORIZONTAL TYPE OF HOT WATER HEATER

heating surface can be furnished where particular conditions demand it.

## Expansion.

The method used in Alberger multihead heaters to accommodate unequal expansion is not only effective, but is also entirely free from objectionable features entailed by other designs on the market. The Alberger heater stands alone in its freedom from tube troubles.

## Capacities.

Alberger heaters are made in capacities from 200 to 200,000 gals. per hour; and while all sizes are not in stock, the design is such that standard parts are carried in stock, so that prompt deliveries can be made on practically all sizes.

Alberger heaters are made in 1-, 2-, 4- or 8-pass, either horizontal or vertical types, as requirements demand.

DIMENSIONS OF HOT WATER HEATERS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Weight, lbs.
A	9	12 1/2	15 3/4	X	X	2 1 1/2	8 1/4	1 1/2	1	X	4 1/2	34 3/8	12 1/2	X	7	6	300	
B	11 1/2	20 1/2	30	15 3/8	8	4 1/2	23	1	1	10	10	52 1/4	15	1	8	11	650	
C	11 1/2	20 1/2	30	15 3/8	8	5 3/8	23	1	1	10	10	70 1/4	15	1	8	11	750	
D	13 1/2	23 1/2	35 1/4	16 1/8	8	6 3/8	23 1/4	1	1	11	12	7 1/8	18	1	9	12	1,050	
E	13 1/2	23 1/2	35 1/4	16 1/8	8	6 3/8	23 1/4	1	1	11	12	8 1/2	18	1	9	12	1,150	
F	15 1/2	26	40 1/2	16 3/8	8	6 4	24	1	1 1/2	12	13 1/2	8 1/2	20	1 1/4	10 1/2	13	1,550	
G	15 1/2	26	40 1/2	16 3/8	8	6 4	24	1	1 1/2	12	13 1/2	9 1/4	20	1 1/4	10 1/2	13	1,650	
H	17 1/2	29	40 3/4	16 3/8	8	8 4	24 1/4	1	1 1/2	13 3/4	14 1/2	9 1/4	22	1 1/4	12	14	1,900	
I	20 1/2	32 1/2	50 3/8	19 3/4	9	10 4	30 1/8	1	2	15 1/2	16 1/4	10 1/4	26	1 1/4	13 1/2	15 1/2	2,650	
J	22 1/2	34 1/2	54	19	9	10 4	30	1	2	17	18	10 1/4	28	1 1/4	14 1/2	16 1/2	4,100	
K	22 1/2	34 1/2	54	19	9	10 4	30	1	2	17	18	11 1/2	28	1 1/4	14 1/2	16 1/2	4,400	
L	26	40 1/4	59 1/4	20 3/4	9 1/2	12 6	33 3/4	2	2 1/2	19	21	103 3/8	33	2	17	18	4,700	
M	26	40 1/4	59 1/4	20 3/4	9 1/2	12 6	33 3/4	2	2 1/2	19	21	115 1/2	33	2	17	18	4,900	
N	30	44	60 1/4	22 1/4	9 1/2	12 6	35 1/2	2	3	21 3/4	22 1/2	105 3/8	36 1/2	2	18 1/2	19 1/2	6,600	
O	30	44	60 1/4	22 1/4	9 1/2	12 6	35 1/2	2	3	21 3/4	22 1/2	117 1/2	36 1/2	2	18 1/2	19 1/2	6,900	
P	31 1/2	46 3/4	64 1/4	24 1/4	10	14 8	39 1/2	2	3	22 1/2	24	110 3/8	38 1/2	2 1/2	20	22	7,200	
Q	31 1/2	46 3/4	64 1/4	24 1/4	10	14 8	39 1/2	2	3	22 1/2	24	122 1/2	38 1/2	2 1/2	20	22	7,500	
R	35 1/2	52	68	27 1/8	10	14 8	45	2 1/2	3	25	27 1/2	117 1/8	43	2 1/2	22	25 1/2	10,000	
S	35 1/2	52	68	27 1/8	10	14 8	45	2 1/2	3	25	27 1/2	128 3/4	43	2 1/2	22	25 1/2	11,000	

NOTE.—M—E = Horizontal length. Water flanges = H.P. Openings above 2 1/2" are flanged. Steam flanges = L.P.

CAPACITIES COVERING HEATERS OPERATING UPON STEAM AT ATMOSPHERIC PRESSURE OF 212° FAHR.

G.p.h.	Temp.	50 to 120	50 to 130	50 to 140	50 to 150	50 to 160	50 to 170	50 to 180	50 to 190	50 to 200	G.p.h.	50 to 120	50 to 130	50 to 140	50 to 150	50 to 160	50 to 170	50 to 180	50 to 190	50 to 200
200 Heater.	A.1	A.1	A.2	A.3	A.5	A.6	A.9	A.12	B.5	1,750	B.10	C.5	C.7	C.10	D.2	D.5	E.7	F.3	G.4	
Lbs. st.	125	140	155	170	185	210	220	240	260	1,070	1,070	1,220	1,375	1,530	1,680	1,830	1,980	2,120	2,290	
300 Heater.	A.2	A.4	A.5	A.8	A.10	A.12	B.4	B.6	C.4	2,000	C.4	C.7	C.10	D.1	D.4	E.5	E.8	F.4	G.5	
Lbs. st.	185	210	235	260	285	310	335	360	385	1,225	1,225	1,400	1,560	1,750	1,900	2,100	2,250	2,425	2,600	
400 Heater.	A.3	A.5	A.6	A.9	A.11	B.4	B.8	B.9	C.8	2,500	C.8	A.12	A.2	D.4	E.6	E.7	F.3	F.9	I.1	
Lbs. st.	230	280	310	350	380	420	460	485	520	1,525	1,525	1,750	1,960	2,200	2,400	2,600	2,825	3,025	3,250	
500 Heater.	A.5	A.7	A.11	A.13	B.6	B.8	C.4	C.6	C.10	3,000	C.10	A.14	A.4	D.6	E.8	E.8	F.2	F.7	G.5	I.8
Lbs. st.	310	350	395	435	475	525	570	600	650	1,825	1,825	2,075	2,350	2,600	2,850	3,125	3,400	3,650	3,900	
600 Heater.	A.7	A.10	A.12	B.6	B.8	C.3	C.6	C.8	C.11	4,000	C.15	A.14	A.6	E.6	F.2	F.6	G.2	G.5	I.7	J.2
Lbs. st.	370	415	465	525	575	625	680	730	780	2,300	2,300	2,780	3,100	3,475	3,800	4,175	4,600	4,850	5,200	
750 Heater.	A.10	A.12	B.6	B.8	C.1	C.4	C.8	E.1	E.4	5,000	D.6	A.9	E.13	A.1	G.3	H.3	I.6	I.13	J.10	
Lbs. st.	460	520	580	650	720	780	850	900	975	3,050	3,050	3,500	3,900	4,350	4,800	5,200	5,650	6,075	6,500	
1,000 Heater.	A.13	B.6	B.8	B.11	C.7	C.8	C.11	E.3	E.7	6,000	D.7	A.12	A.9	F.9	A.11	H.3	I.4	I.11	J.7	L.3
Lbs. st.	610	700	785	875	950	1,050	1,125	1,225	1,300	3,625	3,625	4,150	4,700	5,200	5,725	6,250	6,800	7,300	7,800	
1,250 Heater.	B.7	B.9	C.4	C.7	C.8	C.11	D.3	E.5	F.2	7,500	E.11	A.14	A.8	F.10	A.1	I.3	I.4	I.12	J.3	L.1
Lbs. st.	775	880	990	1,090	1,195	1,300	1,405	1,510	1,615	4,550	4,550	5,250	5,900	6,500	7,200	7,800	8,450	9,100	9,750	
1,500 Heater.	B.8	B.16	C.5	C.8	C.11	D.3	D.6	E.8	F.5	10,000	F.9	A.12	A.7	A.11	J.1	J.8	L.1	L.4	O.1	
Lbs. st.	915	1,040	1,170	1,300	1,450	1,575	1,700	1,850	1,915	6,100	6,100	7,000	7,850	8,700	9,550	10,400	11,300	12,200	13,000	

NOTE.—Heater = size required. Lbs. st. = No. of pounds of steam required. Steam at 212°.

# THE NATIONAL PIPE BENDING CO.

Manufacturers of Power Plant Equipment

156 to 168 River Street

81 to 131 Lloyd Street

NEW HAVEN, CONN.

BRANCH OFFICES AND AGENCIES

BOSTON, MASS., W. G. RUGGLES COMPANY, 10 High Street

NEW YORK, N. Y., STEVENS BROS., 149 Broadway

## Products.

STORAGE HEATERS; FEED WATER HEATERS (closed and open); SERVICE HEATERS; STORAGE TANKS.

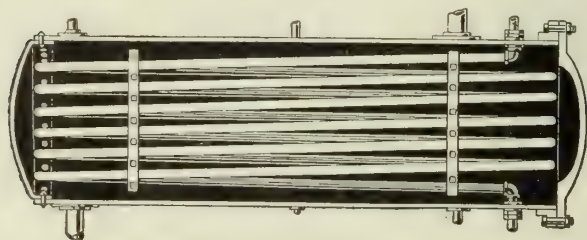
Direct Contact Heaters: Oil Separators; Coils and Bends of Iron, Brass and Copper.

## Co-operative Service.

THE NATIONAL PIPE BENDING CO. offers architects the results obtained from years of experience building and designing water heaters, storage heaters and tanks. The company's book, showing a large number of combinations and arrangements, should be in the hands of every architect. It is in blue print form.

## National Storage Heater.

For supplying a large quantity of hot water for washing in mills and factories, hospitals and hotels, the



NATIONAL STORAGE HEATER

National storage heater can always be depended upon. It uses exhaust steam, thereby saving coal, or live steam if there is not enough exhaust.

The coil is of seamless brass or copper tubing in a horizontal cast or wrought iron shell, which may be hung from the ceiling or carried on cradles.

**SIZES** — Standard sizes are of 100-, 200-, 300-, 500- and 1,000-gal. capacities.

## National Feed Water Heater.

Consists of many coils of seamless brass or copper through which the water passes. The exhaust steam surrounds



NATIONAL FEED WATER HEATER

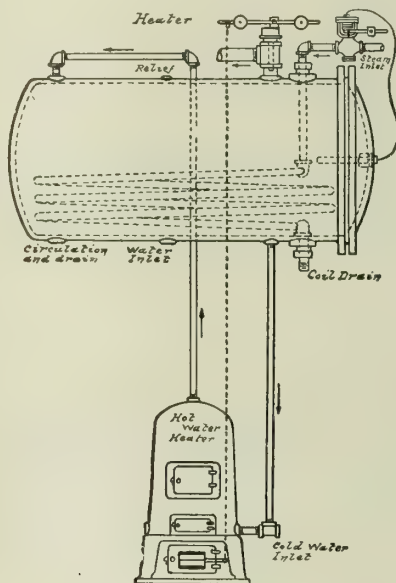
the coils. Brass and copper have no effect on the water, which is pure and clean, and free from rust.

## National Storage Heater and Auxiliary Fuel Burning Heater.

For public buildings, office buildings, dormitories, etc.

Coils for live steam for winter service; fuel burning heater for summer when heating or power boiler is shut down.

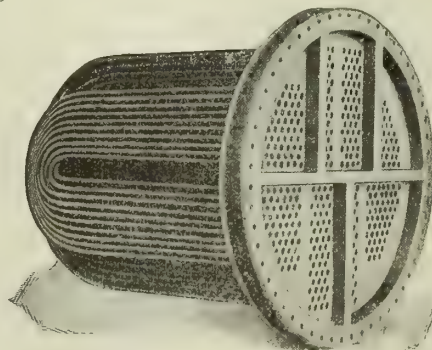
Regulator for live steam and damper control for stove.



PLAN NO. 6. NATIONAL STORAGE HEATER AND AUXILIARY FUEL BURNING HEATER

## National U-bend Heater.

For great capacity in small space. The U-bend form of tubes gives enormous surface; and the baffles on the header compel the water to make several passes, raising the temperature to that of the exhaust steam surrounding the tubes.



NATIONAL U-BEND HEATER COILS



### National Vertical Exhaust Steam Heater and Live Steam Booster.

For use with large wooden storage tank already installed in such industries as laundries, bleacheries and dye houses.

Live steam admitted automatically to heater, as required; but no steam is wasted, for none is used unless temperature falls.

### Combination National U-bend Heater and Cast Iron Storage Tank.

In units for any heating and storage requirements, and for use with live or exhaust steam.

Piping can be arranged to cut out storage tank and water delivered direct from heater.

Arrangement shows horizontal heater for use when headroom will not permit vertical heater. With sufficient headroom vertical heater may be substituted for horizontal.

### Combination National Storage Heater for Exhaust Steam and Live Steam Booster.

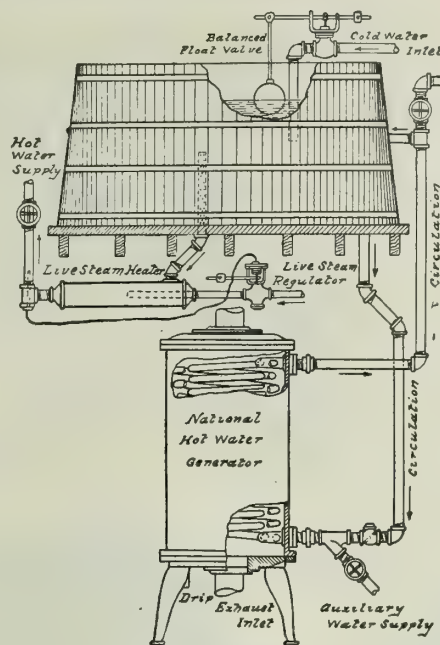
For laundries, bleacheries, dye houses, and other industries requiring large volumes of hot water. This arrangement gives a dependable supply, for when there is not enough exhaust steam, live steam can be used to raise the temperature of the water.

Thermostat automatically regulates use of live steam.

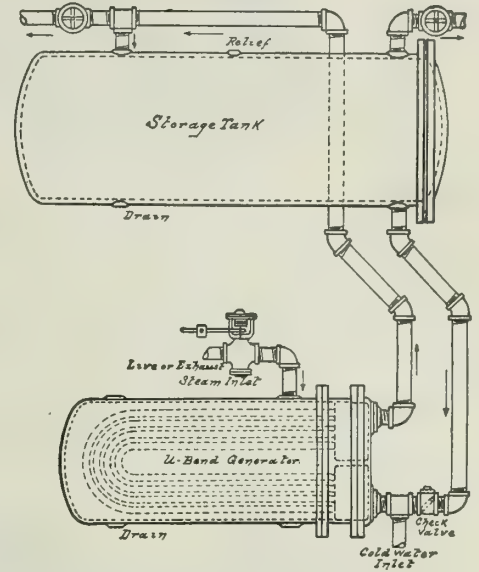
### National Combination Exhaust and Live Steam Heaters and Storage Tank.

Piping so arranged that either heater, or both, can be used with storage tank, or a heater used without the tank.

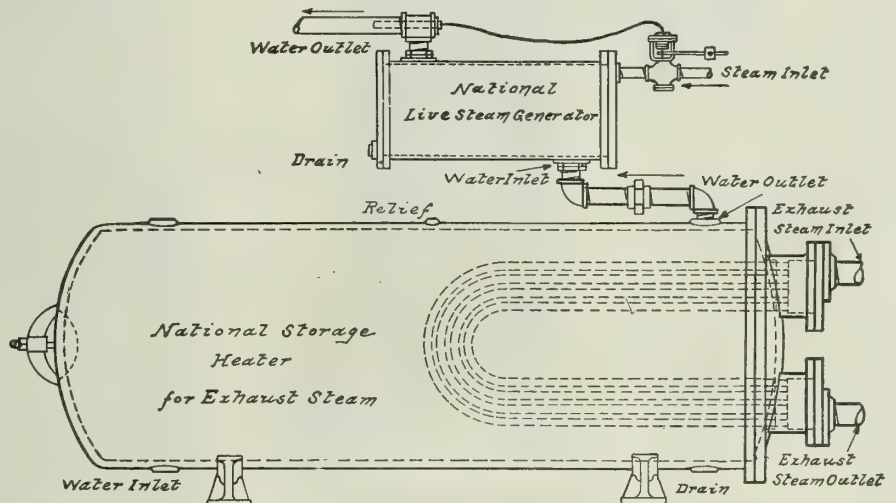
Particularly well adapted when a large volume of water is wanted intermittently, or when part of the exhaust steam is used for other purposes.



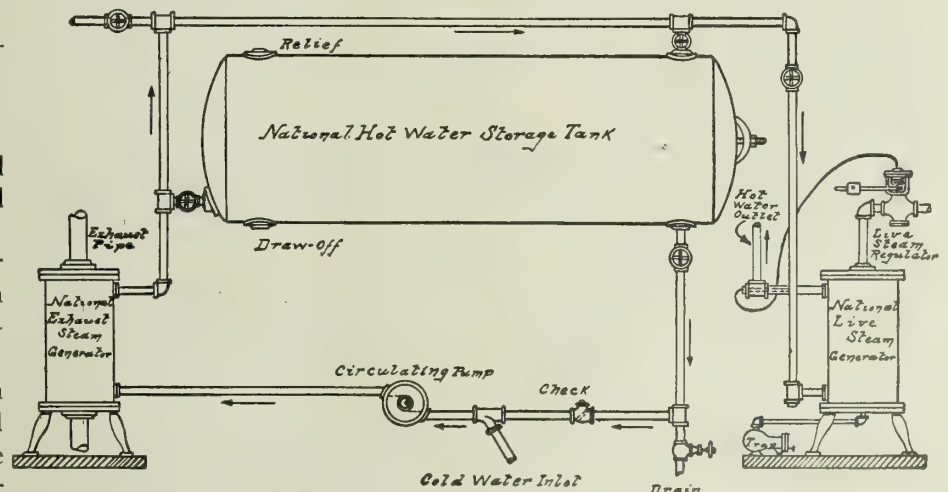
PLAN NO. 4. NATIONAL VERTICAL EXHAUST STEAM HEATER AND LIVE STEAM BOOSTER



PLAN NO. 3. COMBINATION NATIONAL U-BEND HEATER AND CAST IRON STORAGE TANK



PLAN NO. 5. COMBINATION NATIONAL STORAGE HEATER FOR EXHAUST STEAM AND LIVE STEAM BOOSTER



PLAN NO. 1. NATIONAL COMBINATION EXHAUST AND LIVE STEAM HEATERS AND STORAGE TANK

# THE WHITLOCK COIL PIPE COMPANY

## Feed Water and Hot Water Service Heaters

### HARTFORD, CONN.

#### Products.

Engineers, and manufacturers of FEED WATER HEATERS; HOT WATER SERVICE HEATERS.

Pipe Bends, Flanged Piping, Coils and Bends of Iron, Steel, Copper and Brass Pipe and Tubing, etc.

#### American Standard Feed Water Heater.

The American standard feed water heater has achieved a wide reputation. For 30 years it has been the "Standard" by which all other closed feed water heaters have been judged. Heating surface consists of coils of seamless copper tubing.

Type "A" American standard feed water heater is shown in Fig. 1. Full particulars in Bulletin No. 13.

#### Whitlock-American Hot Water Service Heaters.

Steam-actuated service heaters may be divided into two classes: storage and instantaneous. In each of these classes several different types, adapted to different requirements, are offered.

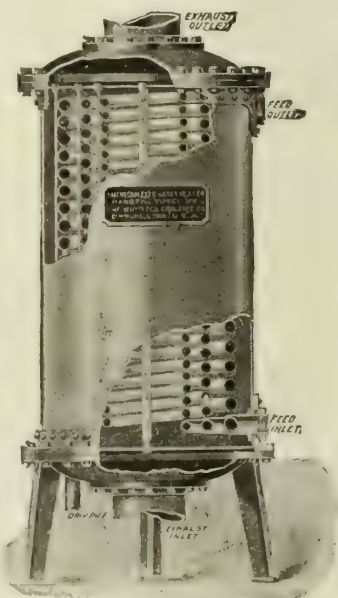


FIG. 1. AMERICAN STANDARD FEED WATER HEATER



mechanically, not being subject to "season cracks" sometimes developing in brass tubing.

Shells ordinarily made extra heavy and of the best grade of boiler steel. Shells of cast iron, or shells coated inside with rust-proof white enamel, can be furnished, when so ordered.

All castings are extra heavy and of the best grade of gray iron.

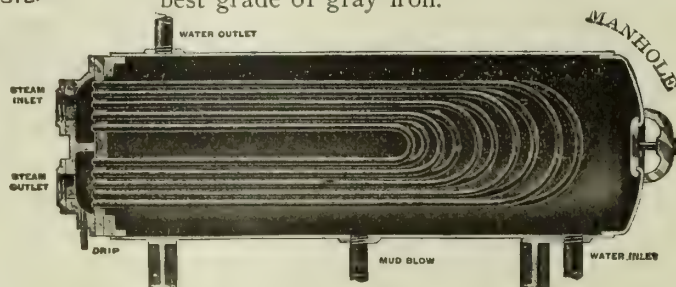


FIG. 2. TYPE "J" STORAGE HEATER

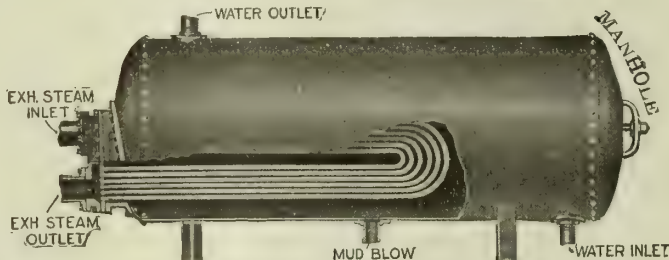


FIG. 3. TYPE "K" STORAGE HEATER

#### DIMENSIONS TYPES "K" AND "J" STORAGE HEATERS

Type	Shell			Size of connections		Gallons		Weight, lbs.	Steam connections		Cradles	
	Diameter	Length	Thickness	Head thickness	Water	Steam	1 filling	Per hour	Center to center	Floor to lower center	Length	Width
No. 1—TYPE "K" STORAGE HEATERS												
J	18	60	1/4	3/8	2	2	65	150	900	9	13 1/2	20 1/2
J	18	72	1/4	3/8	2	2	80	200	970	9	13 1/2	20 1/2
K	24	60	1/4	3/8	2	2	118	250	930	6 1/2	10 3/4	21 3/4
K	24	72	1/4	3/8	2	2	141	300	1010	6 1/2	10 3/4	21 3/4
K	24	84	1/4	3/8	2	2	164	350	1090	6 1/2	10 3/4	21 3/4
K	30	60	1/4	3/8	3	3	185	400	1115	6 1/2	11 3/4	24 1/2
K	30	72	1/4	3/8	3	3	220	500	1310	8	12 1/2	24 1/2
K	30	84	1/4	3/8	3	3	255	550	1420	8	12 1/2	24 1/2
K	30	96	1/4	3/8	3	3	290	600	1530	8	12 1/2	24 1/2
K	36	84	1/4	1/2	3	4	365	750	2130	10	16 1/4	20 4
K	36	96	1/4	1/2	3	4	395	800	2270	10	16 1/4	20 4
K	36	108	1/4	1/2	3	4	475	900	2440	10	16 1/4	20 4
K	36	120	1/4	1/2	3	4	525	1000	2735	10	17 3/4	20 4
K	42	96	1/4	1/2	4	4	575	1250	2800	10	17 1/2	26 4
K	42	120	1/4	1/2	4	5	720	1500	3315	12	18	26 4
K	42	144	1/4	1/2	4	5	860	1750	3680	12	18	26 4
K	42	168	1/4	1/2	4	6	1000	2000	4080	12	18	26 4
No. 2—TYPE "J" STORAGE HEATERS												
J	18	60	1/4	3/8	2	2	65	300	930	9	13 1/2	20 1/2
J	18	72	1/4	3/8	2	2	80	400	1010	9	13 1/2	20 1/2
J	24	60	1/4	3/8	2	2	118	500	1050	12	12	21 3/4
J	24	72	1/4	3/8	2	3	141	600	1120	12	12	21 3/4
J	24	84	1/4	3/8	2	3	164	700	1180	12	12	21 3/4
J	30	60	1/4	3/8	3	4	185	800	1890	15	14 1/2	24 1/2
J	30	72	1/4	3/8	3	4	220	1000	2000	15	14 1/2	24 1/2
J	30	84	1/4	3/8	3	4	255	1100	2110	15	14 1/2	24 1/2
J	30	96	1/4	3/8	3	4	290	1200	2220	15	14 1/2	24 1/2
J	36	84	1/4	1/2	3	5	365	1500	2850	18	19 1/4	20 4
J	36	96	1/4	1/2	3	5	395	1700	2970	18	19 1/4	20 4
J	36	108	1/4	1/2	3	5	475	1800	3100	18	19 1/4	20 4
J	36	120	1/4	1/2	3	6	525	2000	3220	18	19 1/4	20 4
J	42	96	1/4	1/2	4	6	575	2500	4030	21	20 1/2	26 4
J	42	120	1/4	1/2	4	6	720	3000	4800	21	20 1/2	26 4
J	42	144	1/4	1/2	4	8	860	4000	5750	21	20 1/2	26 4
J	42	168	1/4	1/2	4	8	1000	5000	6700	21	20 1/2	26 4

NOTE—All dimensions are in inches. Manhole 11 x 15 ins. Cradles furnished free, when required. Companion flanges furnished for steam connections when connections are for 3-in. pipe or larger. Capacities based on heating water from 40° to 180° Fahr., using steam at atmospheric pressure.



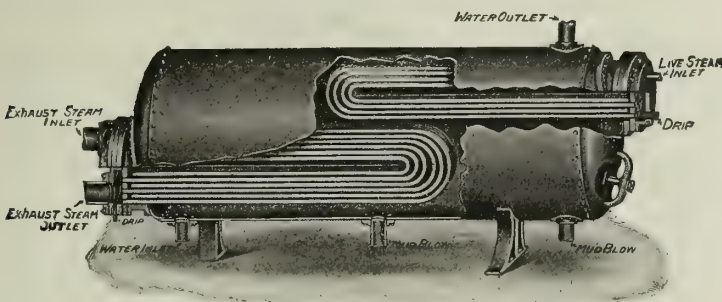


FIG. 4. TYPE "K" STORAGE HEATER  
Combination live and exhaust steam pattern

TESTS—All Whitlock-American heaters are tested under hydrostatic pressure before leaving the shop and made absolutely tight.

Instantaneous Heaters.

The copper coil type is similar in construction to the Type "AC" feed water heaters.

The water in these heaters comes into contact with nothing but copper and bronze, so that there is no chance for corrosion; and they are specially suited for heating salt water or any other liquid which would corrode iron or steel (Fig. 5). Dimensions of standard sizes are given in table. Full particulars in Bulletin No. 24.

The Type "R" instantaneous heater is of the Berryman or U-bend pattern. The heating surface consists of a number of "U-bends" of seamless copper tubing mounted in parallel (the ends of the bends being expanded into a heavy tube sheet), and communicating with a cast iron head containing the inlet



FIG. 5. TYPE "AC" INSTANTANEOUS COPPER COIL HEATER

DIMENSIONS AND WEIGHTS OF INSTANTANEOUS COPPER COIL HEATERS

Generator	Gals. per hour	Weight, lbs.	Total length	Length shell	Diam. flange	Diam. body	Center to center water connection	Length legs	Steam inlet	Water connection	Size of drip for condensation
			A	B	C	D	E	F	G	H	I
0	50	41	15	13	9	7	8		1 1/2	1	1 1/2
1	100	50	19	17	9	7	12		2	1	1 1/2
2	150	85	17	15	12	9 1/2	9		2 1/2	1 1/4	1 1/2
3	200	124	21	18	12	9 1/2	12		3	1 1/4	1 1/2
4	250	234	23	19	18	15	13	12	3 1/2	1 1/4	3/4
5	300	270	25	21	18	15	15	12	3 1/2	1 1/4	3/4
6	400	390	30	26	18	15	20	12	3 1/2	1 1/4	3/4
7	500	450	36	32	18	15	26	12	4	1 1/4	3/4
8	600	500	38	33	20	17	26	12	5	1 1/2	1
9	800	540	33	28	20	17	24	12	5	1 1/2	1
10	1000	630	38	33	20	17	26	12	5	1 1/2	1
11	1250	810	38 1/2	33 1/2	24	20	26	12	6	2	1 1/4
12	1500	890	44 1/2	39 1/2	24	20	32	12	6	2	1 1/4
13	2000	1250	54 1/2	49 1/2	24	20	42	15	8	2	1 1/4
14	2500	1450	56	50	27	24	42	15	8	2 1/2	1 1/4
15	3000	1600	69	63	27	24	55	15	8	2 1/2	1 1/4
16	4000	1750	63	57	27	24	47	15	10	3	1 1/2
17	5000	1900	76	70	27	24	60	15	10	3	1 1/2

NOTE—All dimensions are in inches. Heating capacity based on heating water from 40° to 180° Fahr., using steam at atmospheric pressure. Conversion tables sent on request.

and outlet water connections (Fig. 6). Full particulars in Bulletin No. 25.

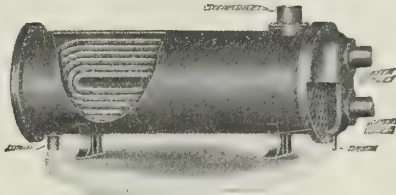


FIG. 6. WHITLOCK-AMERICAN TYPE "R" BERRYMAN PATTERN INSTANTANEOUS HEATER

The Type "ST" instantaneous heaters are of the straight tube floating head pattern.

They are used wherever the water contains such quantities of mud or scale-forming materials as to necessitate the occasional cleaning of the tubes. Cleaning may be easily accomplished in this type of heater, by removing the front and rear heads and running a tube cleaner or brush through the tubes. This can be done without breaking any pipe connections. Full particulars in Bulletin No. 26.

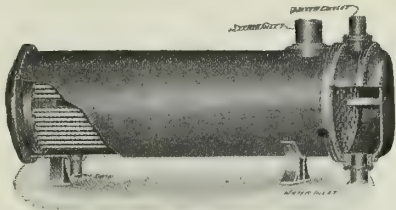


FIG. 7. WHITLOCK-AMERICAN TYPE "ST" STRAIGHT TUBE FLOATING HEAD PATTERN INSTANTANEOUS HEATER

Whitlock Junior Water Heater.

Where a small service heater is required, this company offers the Whitlock Junior storage heater which is built in units from 1.6 gals. storage capacity, upwards. This type is particularly suitable for residences, factory offices and other places where the demand for hot water is small. Uses low or high pressure steam. A typical arrangement is shown in Fig. 8. Full particulars in Bulletin No. 19, sent on request.

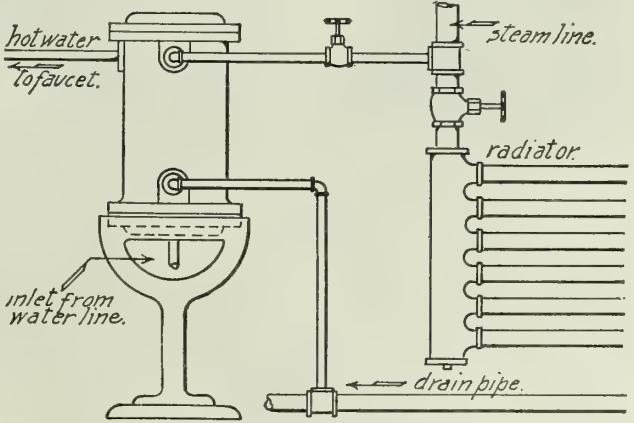


FIG. 8. WHITLOCK JUNIOR WATER HEATER  
Showing method of attaching

Catalogues and Bulletins.

Descriptive bulletins are issued giving complete data with regard to the types of heaters mentioned, including tables of dimensions, diagrams of typical installations, price lists, etc. A set of these bulletins will be mailed to any architect or engineer on request.

Another series of bulletins giving tables and engineering data pertaining to hot water problems is issued and will be sent on request.

## Installation Diagrams and Layouts.

This company has developed a number of installation diagrams for piping layouts showing some of the more important types of installations in which Whitlock heaters are used, a few of which are shown on this page.

A complete set will be sent to architects or consulting engineers on request.

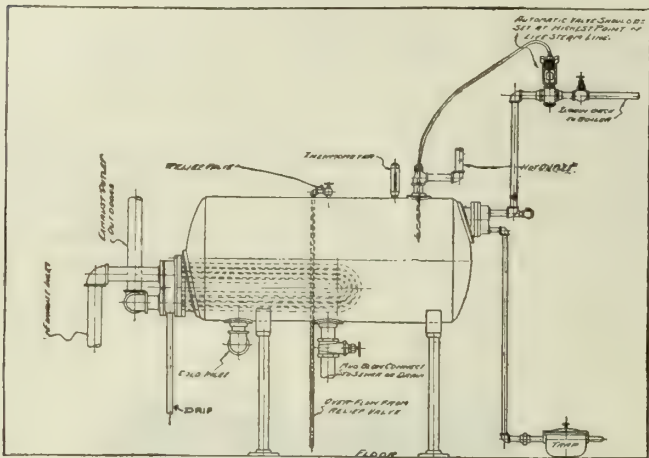


FIG. 113. WHITLOCK AMERICAN TYPE "K" STORAGE HEATER  
INSTALLED FOR LAUNDRY SERVICE

Particularly adapted for laundry service on account of the varying draft of hot water and the fact that the steam condensing power of the heat must be constant in order to thoroughly utilize the exhaust steam from engine.

Diagram shows piping for the auxiliary live steam heating section. Supply of steam to this section is automatically controlled as shown

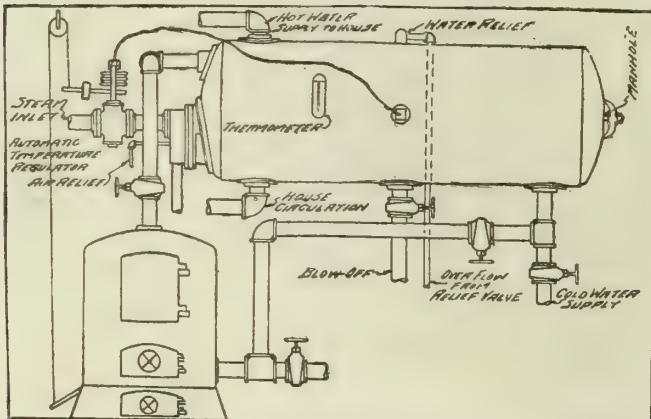
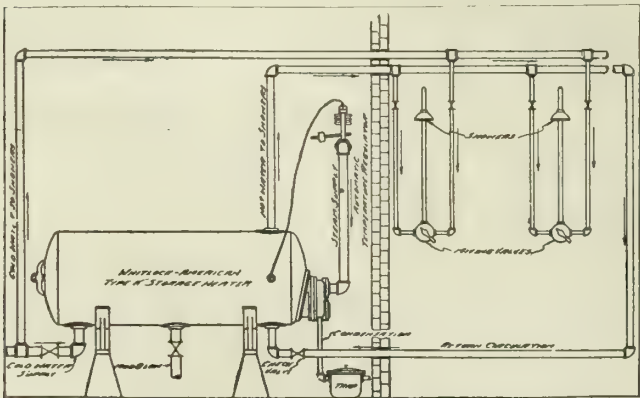


FIG. 160A. WHITLOCK AMERICAN TYPE "K" STORAGE  
HEATER WORKING IN CONNECTION WITH A COAL  
BURNING AUXILIARY HEATER

In this type of installation steam is supplied to the Type "K" heater from the main heating boilers during the heating season; and at times when no steam is carried on the main heating boilers, the auxiliary coal burning heater is fired.



**FIG. 174. WHITLOCK AMERICAN TYPE "K" STORAGE HEATER INSTALLED TO HEAT WATER FOR SHOWER SERVICE IN Y. M. C. A.'S OR GYMNASIUMS**

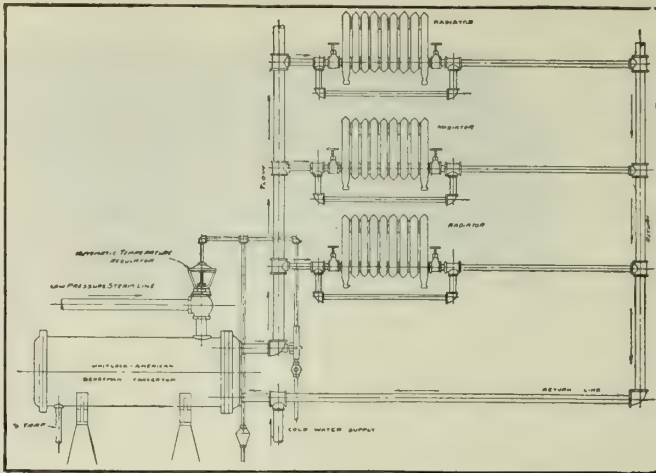


FIG. 145. WHITLOCK AMERICAN TYPE "R" CONVERTOR  
SUPPLYING HOT WATER TO A HOT WATER HEATING  
SYSTEM OPERATING BY GRAVITY CIRCULATOR

This system has a number of advantages over direct steam heating which are too numerous to mention here.

Bulletins on the subject sent on request

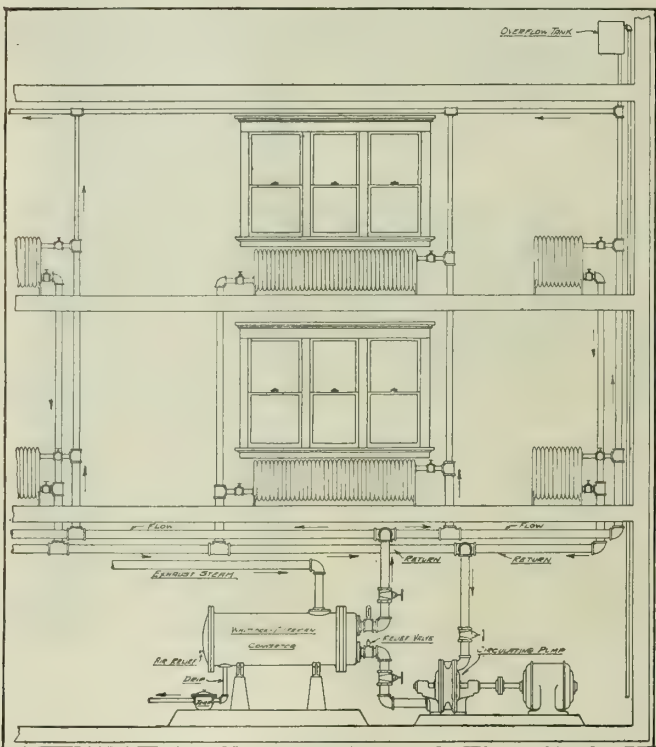
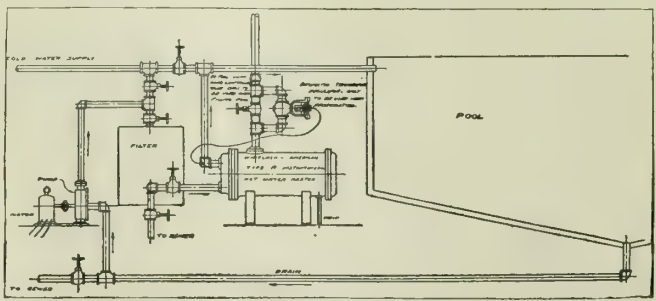


FIG. 208. WHITLOCK AMERICAN TYPE "R" CONVERTOR  
SUPPLYING HOT WATER TO A HOT WATER HEATING  
SYSTEM OPERATING BY FORCED CIRCULATION

This system has a number of advantages over direct steam heating which are too numerous to mention here.

Bulletins on the subject sent on request



**FIG. 207. WHITLOCK AMERICAN TYPE "R" INSTANTANEOUS HEATER CONNECTED TO HEAT A SWIMMING POOL BY THE RE-CIRCULATION METHOD**



GRAND CROSSING BOILER WORKS

Manufacturers of Combined Water Heaters and Garbage Burners

1244 East 73rd Street  
CHICAGO, ILL.

Product.

“DUBE” COMBINED WATER HEATER and GARBAGE BURNER.

“Dube” Combined Water Heater and Garbage Burner.  
SCOPE OF USE—Especially designed for heating water and burning garbage in residences, apartments, hotels, restaurants, hospitals, etc.

CONSTRUCTION—The “Dube” combined water heater and garbage burner is made of heavy steel boiler plate, carefully riveted and braced, and tested to 100 lbs. hydrostatic pressure.

The garbage grate is made of the very best boiler tubing, which is securely fastened by being expanded into openings of the inner shell. The garbage grate thus forms a part of the heating surface, and there is a constant circulation of water through the tubes, which greatly increases the efficiency of the heater and prevents the tubes from being injured by the heat.

In the outer shell opposite the ends of each tube are clean-out plugs, which may be removed and the tubes thoroughly cleaned of any sediment or scale that might accumulate in them.

Clean-outs are also provided at each corner end for removing any sediment in the water jacket.

The garbage chamber and fire pot are wide and deep, with large and convenient doors.

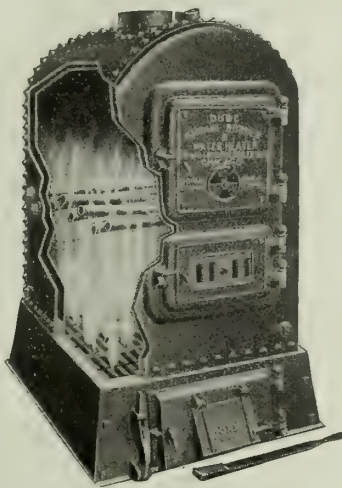
The base is furnished with sectional rocking boiler grates, which readily break up all clinkers, so that any kind of soft coal can be successfully used.

The staggered arrangement of the tubes, as illustrated, provides additional circulation.

There is no by-pass for the heated gases or for the draft from fire door to escape to the smoke pipe without coming in contact with the garbage and creating combustion. Therefore the garbage is thoroughly burned and a great saving of coal is made.



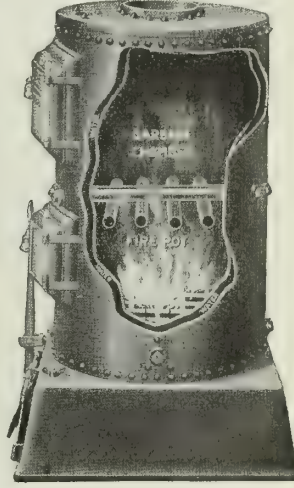
Type A



Type B



Type C



Type D

“DUBE” COMBINED WATER HEATERS AND GARBAGE BURNERS

DATA, “DUBE” COMBINED WATER HEATERS AND GARBAGE BURNERS

Catalogue No.	Capacity, gals. per hour, per 50° rise	Height over all, ins.	Floor space, ins.	Dimensions of heater, ins.	Dimensions of lower grates, ins.	Dimensions of coal grates, ins.	Diameter smoke pipe, ins.	Size of flow and return connections, ins.	Dimensions garbage door, ins.	Dimensions fire door, ins.	Approx. shipping weight, lbs.	List price
TYPE A												
4	200	56	22 (diam.)	17½x36	12	.....	8	1½	7x8	7x8	550	\$128.00
5	300	63	25 (diam.)	20½x42	16	.....	8	1½	7x8	7x8	850	154.00
6	400	63	29½ (diam.)	25x42	20	.....	8	2	7x8	7x8	950	216.00
TYPE B												
A1	800	60½	36x36	30x30	.....	25x25	10	2	16x16	10x16	1800	274.00
1	1000	60½	36x42	30x36	.....	25x31	10	2	16x16	10x16	2000	312.00
A2	1200	60½	42x42	36x36	.....	31x31	10	2½	16x16	10x16	2300	348.00
2	1400	60½	42x48	36x42	.....	31x37	10	3	16x16	10x16	2500	368.00
A3	1600	60½	48x48	42x42	.....	37x37	12	3½	16x16	10x16	2700	400.00
3	1800	60½	48x54	42x48	.....	37x43	12	3½	16x16	10x16	3000	432.00
TYPE C												
7	500	54½	30x30	24x24	.....	19x20	9	2	16x16	10x16	1300	200.00
8	600	54½	30x36	24x32	.....	19x26	9	2	16x16	10x16	1450	235.00
9	700	54½	30x42	24x36	.....	19x32	9	2	16x16	10x16	1820	260.00
TYPE D												
10	800	62	38x38	30½x48	25	.....	10	2	12x16	9x16	1400	288.00
12	1000	62	44x44	36½x48	31	.....	10	3	12x16	9x16	1800	336.00

# KERNER INCINERATOR COMPANY

596 Lapham Street  
MILWAUKEE, WIS.

AGENCIES IN ALL PRINCIPAL CITIES

## Product.

The KERNERATOR: a Sanitary Equipment for the destruction, by burning, without cost, of garbage and waste in residences, apartment buildings and hospitals.

## Description.

It consists of hopper doors (see illustrations) located in the regular chimney on the different floors, and a brick enlargement of the chimney in the basement into which is built a special arrangement of grates.

The Kernerator combines the three recognized desirable features: First, destroying refuse where it originates; second, destroying by burning; third, burning without cost.

The incinerator is constructed in accordance with detailed working drawings which are furnished with the parts. The drawings are clear and the construction so simple that the mason has no difficulty in building it.

## Five Distinctive Features of the Kernerator.

FIRST—It is built of brick and not of iron. Hence, there is no replacement of parts.

The grates are of extra heavy construction and do not come into direct contact with the flames.

SECOND—It does not cost one penny to operate. The waste deposited is the only fuel required.

Experience has demonstrated that the heat from the burning of the dry combustible waste that accumulates in the home is amply sufficient to dry out and eventually consume the garbage.

THIRD—The Kernerator handles all waste—not only garbage, but tin cans, broken crockery, bottles—in fact everything but liquids.

FOURTH—It occupies no space in the kitchen.

Although the material is deposited from the kitchen or some point convenient to the kitchen, the incinerator itself is in the basement where space is not so valuable.

FIFTH—There is practically no odor during burnings.

The by-pass grate is so arranged that the fire is always on top of the material to be burned. As the seat of the fire approaches the garbage, all offensive gases liberated by the heat must pass up through the flames and so be deodorized.

## Built in the Chimney.

The same flue that is used for ranges, laundry stoves or house heaters can be used for the incinerator.

Over 80% of the installations in operation use a flue common to other heating devices in the building.

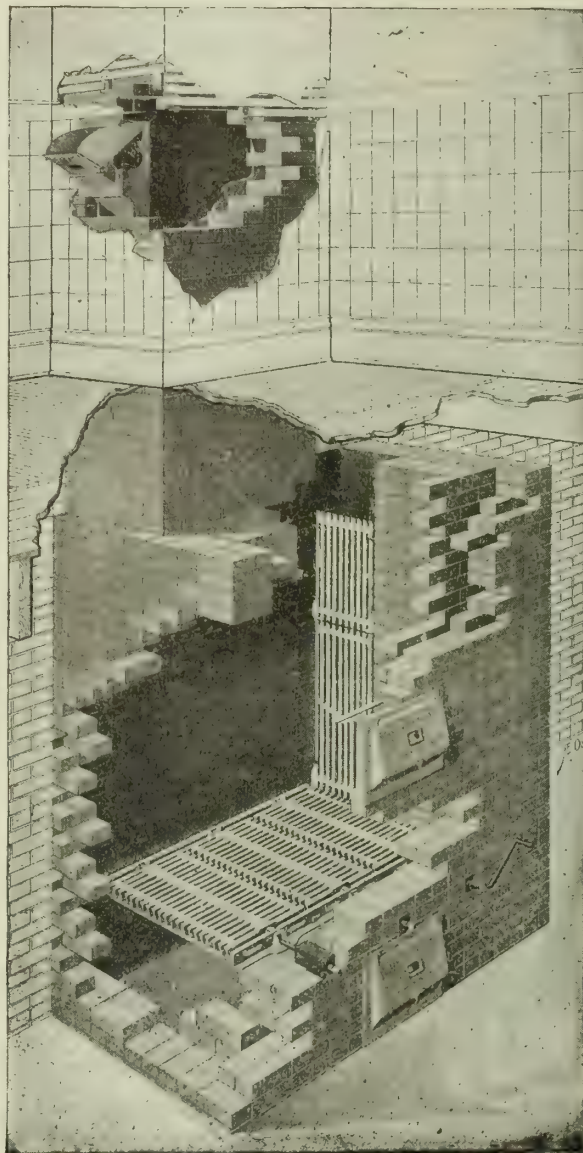
## Guarantee.

The following guarantee has gone with every Kernerator sold within the past seven years:

"Should the purchaser at anytime within six months from date of installation according to plans and specifications, and after a reasonable and fair trial use of the



HOPPER DOOR



MODEL OF KERNERATOR FOR LARGE APARTMENT HOUSE  
Residence size is very much smaller

incinerator in accordance with directions, find this method not strictly sanitary and in every way satisfactory, and not care to make further use of the incinerator, he may notify the company and return the metal parts, and the company will within 15 days after receipt of said parts refund to the purchaser all money paid to the company therefor, together with transportation charges."

There never has been an outfit returned.

## Users.

Kernerators have been in successful operation for many years and are in daily use by thousands of families. Upon application we shall be pleased to refer to users in almost any of the larger cities in the United States.



E. C. STEARNS & CO.

Manufacturers of Garbage Incinerators

SYRACUSE, N. Y.

**Products.**  
GARBAGE AND WASTE INCINERATORS.

**Construction and Operation.**

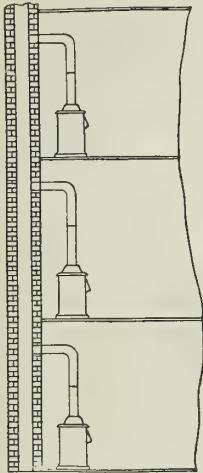
The Incinerite is the pioneer refuse receptacle and destructor for domestic and other uses. Stores all forms of garbage and refuse; no rehandling. Connected to a flue, it is sanitary and odorless. All waste destroyed and device sterilized by each burning. Natural, artificial or gasoline gas for fuel. Scientifically constructed of iron and steel. Double gas burners protect against clogging. Dumping grates with interchangeable parts. Economical to operate.

**The Wall Type.**

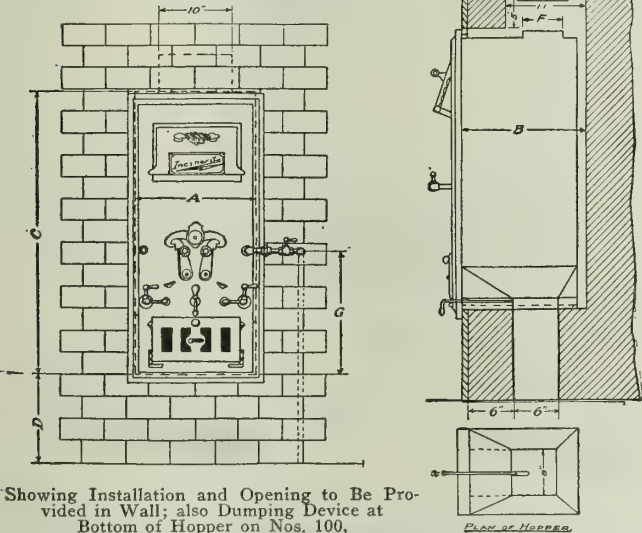
This is the type usually specified by architects for new buildings. May be connected with the kitchen range flue without in any way decreasing the efficiency of the flue. Sets within the chimney brace with only its face exposed, taking up no floor space whatever, or beside the chimney when several Incinerites are connected to the same chimney.

**Inside-dumping Wall Type.**

This is a special type that does away with the need of taking the



SEVERAL INCINERITES ON ONE CHIMNEY  
In this case extend flue pipes as high as possible before connecting to chimney



Showing Installation and Opening to Be Provided in Wall; also Dumping Device at Bottom of Hopper on Nos. 100, 200 and 300

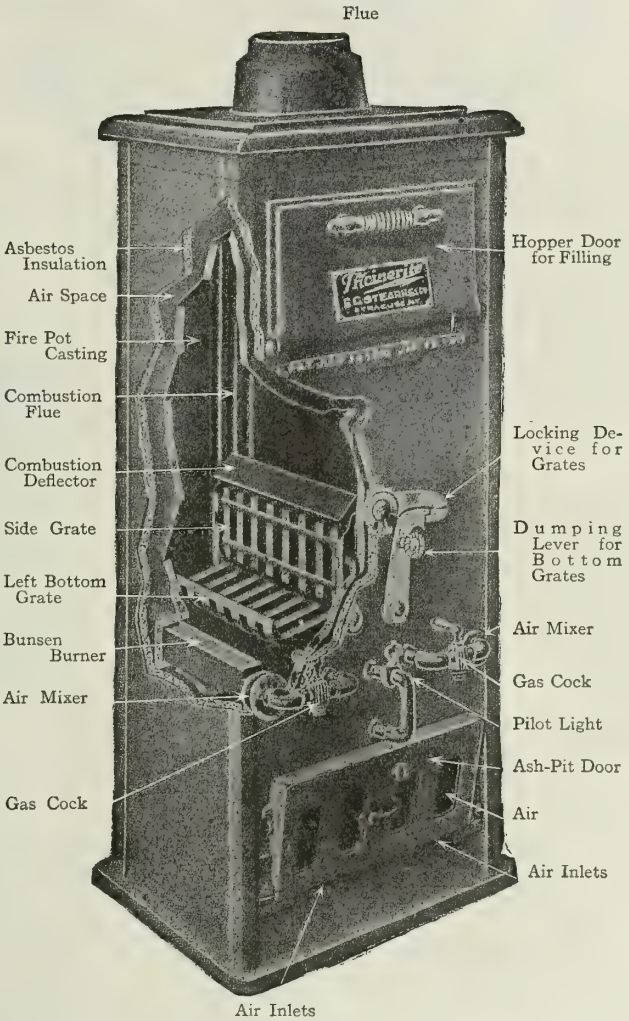
WALL TYPE INCINERITE  
(3 sizes)

No.	A ins.	B ins.	C ins.	D ins.	E ins.	F ins.	G ins.	Weight, lbs.	Capacity	List price
101	14	14	32	18	6	5	14	325	1 1/2 bu.	\$65.00
100	14	14	32	18	6	5	14	325	1 1/2 bu.	75.00
102	17	16	37	12	10 3/4	6	14	500	1 bu.	75.00
200	17	16	37	12	10 3/4	6	14	500	1 bu.	85.00
103	21 1/2	20	50 1/2	6	13	7	17	880	1 1/2 bbl.	135.00
300	21 1/2	20	50 1/2	6	13	7	17	880	1 1/2 bbl.	155.00

ashes out into the kitchen. Further particulars furnished on request.

**The Portable Type.**

Adapted for use anywhere. Preferably installed in the kitchen, near the kitchen range. The modern ideal method of handling garbage in residences, country estates, apartment buildings, clubs and restaurants. Indispensable for hospitals, asylums, sanitariums, school buildings, banks, telephone exchanges and institutions. Write for further particulars, discounts, etc.



PORTABLE TYPE INCINERITE  
(4 sizes)

No.	Width, ins.	Depth, ins.	Height, ins.	Weight, lbs.	Capacity	List price
1	15	15	30	325	1 1/2 bu.	\$65.00
2	18	18	40	500	1 bu.	75.00
3	22	23	52	900	1 1/2 bbl.	135.00
4	26	25	59	1400	1 bbl.	185.00

**Special Incinerators.**

Special furnaces designed and built to operate with any fuel. Send data to E. C. STEARNS & Co., Syracuse, N. Y., and proposals will be submitted. Special service to architects.

# H. W. JOHNS-MANVILLE CO.

## Underground System of Pipe Insulation

EXECUTIVE OFFICES  
296 Madison Avenue  
NEW YORK, N. Y.

AKRON  
ALBANY  
ATLANTA  
BALTIMORE  
BIRMINGHAM  
BOSTON  
BUFFALO  
CHICAGO  
CINCINNATI

CLEVELAND  
COLUMBUS  
DALLAS  
DAYTON  
DENVER  
DES MOINES  
DETROIT  
DULUTH  
EL PASO

GRAND RAPIDS  
GREAT FALLS  
HAVANA, CUBA  
HOUGHTON  
HOUSTON  
INDIANAPOLIS  
KANSAS CITY  
LOS ANGELES  
LOUISVILLE

MEMPHIS  
MILWAUKEE  
MINNEAPOLIS  
NASHVILLE  
NEWARK  
NEW ORLEANS  
OMAHA  
PHILADELPHIA  
PITTSBURGH

PORTLAND  
ROCHESTER  
SACRAMENTO  
ST. LOUIS  
ST. PAUL  
SALT LAKE CITY  
SAN DIEGO  
SAN FRANCISCO  
SEATTLE

STOCKTON  
SYRACUSE  
TACOMA  
TOLEDO  
TULSA  
WASHINGTON  
WILKES-BARRE  
YOUNGSTOWN

### THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

TORONTO  
LONDON, CAN.

MONTREAL  
HAMILTON

WINNIPEG

VANCOUVER  
ONTARIO

#### Products.

JOHNS-MANVILLE UNDERGROUND SYSTEM OF PIPE INSULATION—CONDUITS, UNIONS, ROLL FRAMES, etc.

For Acoustical Service and Waterproofing Materials, see page 36; for Asphalt Mastic Flooring, see page 331; for Roofing Materials, see pages 402-05; for Asbestos Shingles, see pages 386-87; for Radiator and Steam Traps, see page 930; for Pipe and Boiler Insulation, see pages 1076-77.

#### Important Features of an Underground System.

The underground method of distribution of steam and hot water is the most desirable, convenient and economical, provided the system installed meets three important qualifications:

- (1) It must be equal to or greater in efficiency than that attained with properly insulated pipes running indoors.
- (2) Its insulating value must not depreciate any more rapidly than the pipe itself.
- (3) Cost per year, based on its saving of heat and its great durability, must be less than cost of the others.

#### Underground System of Pipe Insulation.

The Johns-Manville underground system of pipe insulation provides a permanent, efficient and economical means of placing underground, and insulating, pipes conveying steam or hot water.

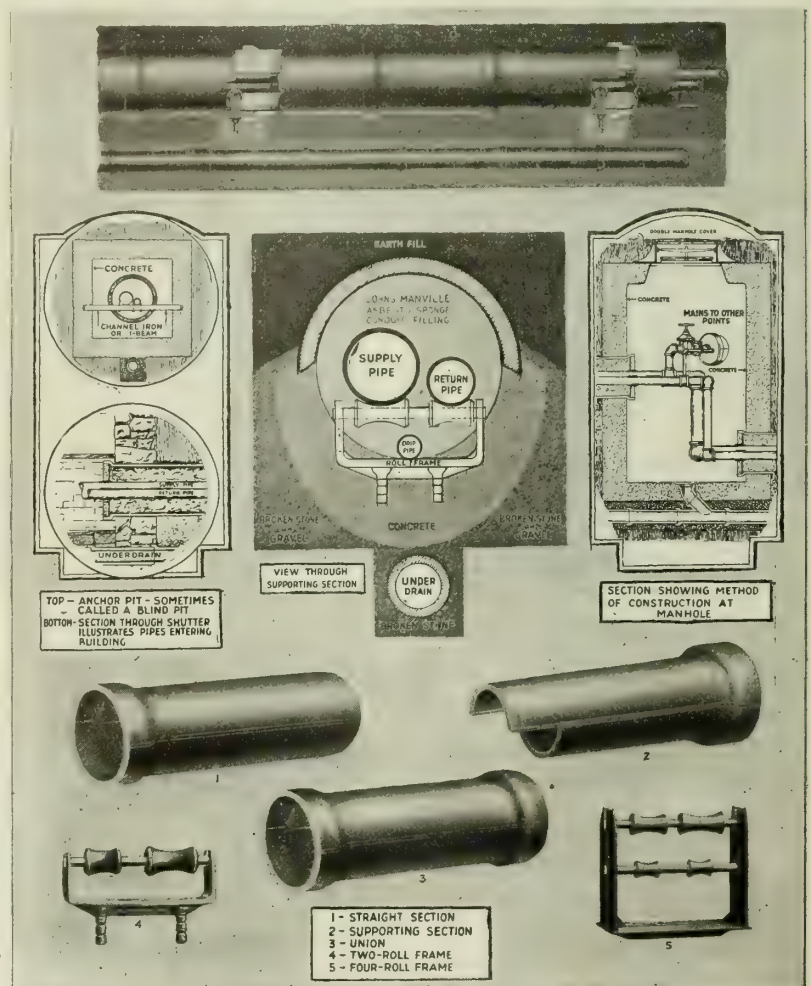
The system comprises not only the integral parts in the illustration, but the proper selection and arrangement of these parts and the installation or supervision of installation of them by Johns-Manville engineers.

The efficiency of the Johns-Manville system is at least 90% when installed according to our specifications, and by us or under our supervision.



This high efficiency is maintained for a long period of time on account of the character of the materials that are used in the construction of the system.

For complete specifications or description, consult nearest branch.



DETAILS AND COMPONENT PARTS OF THE JOHNS-MANVILLE SYSTEM FOR INSULATING PIPES THAT RUN UNDERGROUND



# TYLER UNDERGROUND HEATING SYSTEM

PITTSBURGH, PA.

## Products.

Manufacturers and designers of UNDERGROUND HEATING SYSTEMS, including Casing; Piping; Ball Bearing Pipe Supports, for ditch or tunnel floor; Wall Brackets to hold one, two, three, or four pipes, for tunnel or powerhouse work; Expansion Joints and Anchors for tunnel or ditch construction.

Water Weighing Machines for powerhouse work; Condensation Meters, that work either on gravity or vacuum systems; Hot Water Meters for measuring quantity water, and also temperature water; and Steam Traps.

## Tyler Underground Heating System.

In designing the Tyler underground heating system the makers went farther than the consideration of first cost, making it secondary to permanency, durability, and efficiency.

Insulation, expansion, and proper anchorage have been provided for, as well as numerous other features, which will prove extremely interesting to any one considering the installation of a system of this kind.

## Advantages.

**PROPER INSULATION**—Tyler ditch construction is so thoroughly insulated that heat loss is almost negligible; in fact, if the pipe is buried but 18 ins. it will not melt snow on the ground surface.

**PIPE EXPANSION**—The construction of Tyler expansion joints allows the pipe to expand and travel freely and without leakage of steam.

**ANCHORS**—Anchors are designed so that full sized outlets may be taken out of top or sides. Drip pocket outlet is provided.

**PIPE MAY BE ROTATED**—After the pipe is connected, it may be rotated so as to distribute the corroding effects of the condensation water. This feature adds from 30 to 40 years to the life of the pipe.

For further description see SWEET'S ENGINEERING CATALOGUE, 1916 Edition, pages 498-500.

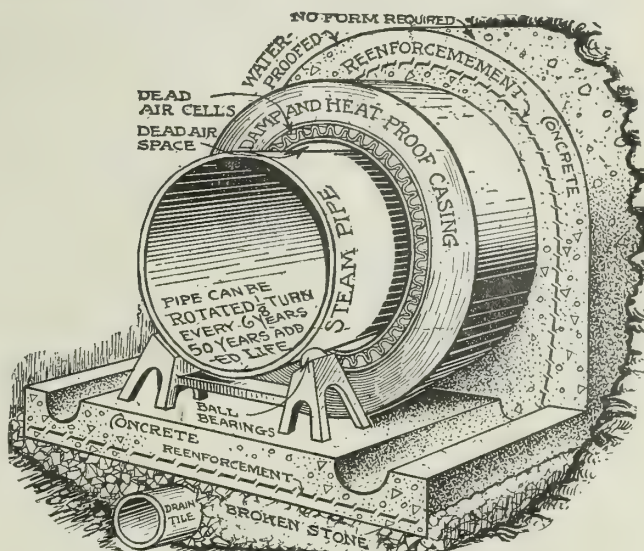
## Specifications.

All underground steam mains and returns shall be set up and carried through a ditch construction, as follows: A clear ditch shall be prepared, a drain tile laid in bottom and covered with broken stone. On this as a bed, a reinforced concrete base shall be laid, and pipe rests placed on same 12 ft. apart. The pipe shall be put in position, connected up, and anchored approximately every 150 ft., alternately, with anchors and expansion joints. Pipe shall then be cased in such a manner as to leave a space between pipe and casing, and casing covered with cinder concrete. Fittings shall be placed in properly reinforced manholes, the expansion joint being made accessible by a double lidded manhole, with gasket on inner lid. Where pipe enters expansion joint and anchor manholes, or enters the walls of building, space between casing and pipe is closed by a special collar.

Anchors and expansion joints shall be of such ample proportions and of such construction—without baffle plates or other obstructions—that steam shall have a free passage through them, and it shall be possible to take off full sized outlets from top and sides. They shall be provided with drip pockets in bottom. Expansion joints shall be equipped with brass follower, traveling at least 4 ins. in a bored guide, a portion of the follower running through a large stuffing box containing 6 packing rings. It shall be possible—after the pipe is connected up—to easily rotate it every 5 or 6 years, and thus distribute corroding effects of condensation water.

Pipe rests to be metal stands containing antifriction ball bearings carrying the pipe. These stands to be of such height that pipe is held up out of contact with the surrounding casing, and of dimensions appropriate to size of pipe carried.

The casing shall be a hard casing—such as made by the



SINGLE PIPE DITCH CONSTRUCTION

Designed also for two or more pipe

TYLER UNDERGROUND HEATING SYSTEM of Pittsburgh, Pa., and of such a size that it clears the pipe couplings. This casing is to be treated with a dampproofing and fireproofing process.

In tunnels, or interiors of buildings, pipe shall be covered by a special air cell casing, coming in direct contact with pipe. Pipe shall be supported by brackets specially constructed to securely hold in place pipe rests (as above described), and place the pipe in such a position as to leave all bolts accessible.

After underground conduit has been completed, exterior surface shall be waterproofed—when it will be ready for back filling.

## Expansion Joints, Anchors, etc.

This company manufactures all accessories to the heating system, including expansion joints, anchors, ball bearing pipe supports, wall brackets, etc. They are all made along scientific principles and possess the same dependability which is characteristic of all Tyler products.

## Guarantee.

The guarantee which goes with all Tyler products is so broad that only the manufacturer of high grade material could afford to give it.

## Co-operative Service.

Architects and engineers confronted with the problem of designing an underground heating system are earnestly invited to correspond with this company, who will co-operate with them fully in submitting sketches of layouts and estimates.

## References.

A few of the many installations of this system are given below:

Charles L. Pillsbury Co., State Engineers of Minnesota  
Canadian Locomotive Works  
Pennsylvania Railroad Co.  
Atlantic Coast Line Railroad Co.  
New Union Depot at Kansas City, Mo.  
New State Capitol, Jefferson City, Mo.  
Harold M. Bush, M.E., Columbus, Ohio  
The Tome School for Boys, Port Deposit, Md.  
New York Central Railroad Co.  
American Locomotive Works, Schenectady, N. Y.  
The State Agricultural College, Morris, Minn.  
Jones & Laughlin Steel Co., Pittsburgh, Pa.  
Lake Shore Railroad Co.



# AMERICAN DISTRICT STEAM COMPANY

## Manufacturers of Steam Heating Specialties

GENERAL OFFICES AND WORKS  
NORTH TONAWANDA, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., 280 Madison Avenue CHICAGO, ILL., First National Bank Building SEATTLE, WASH., Hoge Building

### Products.

"ADSCO" SPECIALTIES and MATERIALS for use with the "ADSCO" SYSTEM of ATMOSPHERIC STEAM HEATING in connection with central station distribution or individual boiler supply: Graduated Radiator Valves; Union Elbows; "Perfection" Reducing Valves; Receivers; Water and Mercury Gauges; Damper Regulators; Relief Valves.

### The "Adsko" System.

This method of heating by steam is primarily a two-pipe gravity system, with an operating pressure but a few ounces above atmosphere. The source of steam supply may be from either a central station or an individual boiler.

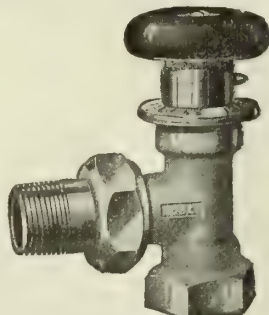
The area of the supply pipes is made liberal, because what is dispensed with in pressure must be compensated for in volume. In like manner, the return pipes are of sufficient size to accommodate easily the discharge of air and condensation from the radiators. The former finds a vent to the atmosphere through an open pipe connection leading from return piping at the boiler to the outside of the building; while the latter is returned to the boiler by gravity.

With a positive and efficient means of controlling the steam pressure in the supply mains, and with an accurately calibrated fractional supply valve on each radiator, having a steam flow capacity corresponding to the condensing power of that particular radiator, a heating equipment is provided that is so elastic in operation as to accommodate any weather condition. This naturally makes for the greatest economy, by the elimination of waste or overheating.

**ADVANTAGES**—The simple and easy manner of controlling heat in each radiator is most desirable. Valve, being placed at top of radiator, is in a very convenient position for operator to handle. Air vents on radiators are entirely unnecessary, thus doing away with a most objectionable feature. Steam circulates throughout the system quickly and without noise.

### "Adsko" Graduated Radiator Valve.

A valve of this type makes possible the absolute control by operator of volume of steam admitted to each radiator. Every "Adsko" valve is accurately calibrated at the factory, to supply a definite amount of direct radiation with a pressure of 5 ozs. This amount is plainly stamped on each valve, which must be connected to a radiator having a corresponding number of square feet of heating surface. Made in three types: handwheel, leverhandle and lockshield.

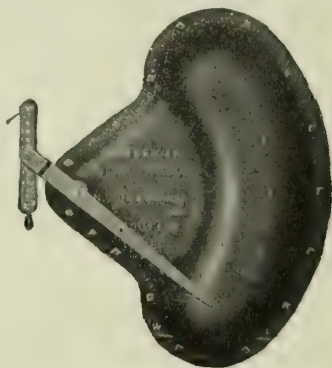


"ADSCO" GRADUATED RADIATOR VALVE

### "Adsko" Damper Regulator.

This device provides a thoroughly reliable means of control for the individual heating boiler. The motive power of the regulator is furnished by the rise and fall of a weighted float, riding on a water line that fluctuates with the variation of the boiler pressure, which is indicated in ounces by the pointer on the outside of the case. Positive action is combined with sensitive control.

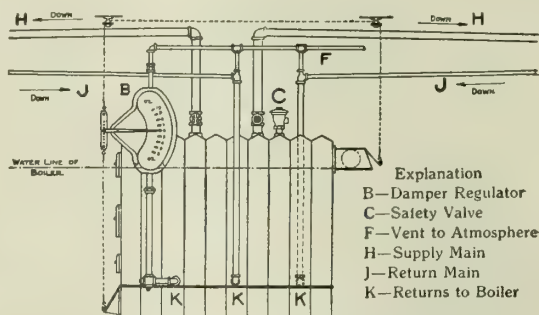
In conjunction with the "Adsko" damper regulator, an "Adsko" relief valve is installed, that is regularly set to release at approximately 15 ozs. boiler pressure, although adjustment can easily be made to carry any lower pressure desired.



"ADSCO" DAMPER REGULATOR

### Simplicity.

The "Adsko" system constitutes the most simple method of piping, of the supply and return variety, for the distribution of steam throughout a building for heating purposes. It is free from complications of every description, and its distinguishing feature is the small number of special devices required. The fewer of these used, the less become the opportunities for trouble. It is this simplicity which has gained the popular favor enjoyed, and to it is due the wonderful success that has been experienced.



Note—Use one or more connections to boiler as required  
PIPING AT BOILER, "ADSCO" SYSTEM

### Equipment.

"Adsko" specialties have been designed especially for the "Adsko" system, and are necessary for complete equipment and satisfactory operation. The AMERICAN DISTRICT STEAM COMPANY does not contract to install heating systems of this kind, but under its patents the various "Adsko" specialties are manufactured and sold by the company without royalty or license charges.



# THERMOGRADE VALVE COMPANY

Modulating and Vacuum System of Steam Circulation and Heating Specialties  
WATERTOWN, MASS.

## Products.

THERMO CONTROL VALVES; THERMO RETURN VALVES; COENCO STEAM TRAPS; BELVAC THERMOFIERS; VAN AUKEN ALTERNATING RECEIVERS.

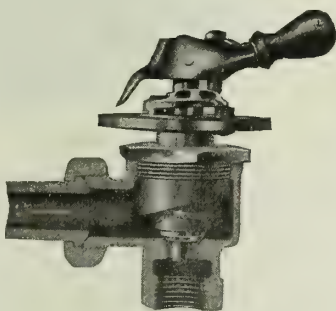
Pressure Regulating Valves, Accumulators, Oil Separators, Oil Traps, Back Pressure Valves, Automatic Receiving Tanks and Pump Governors, Electric Boiler Feed Pumps and Receivers, Vacuum Pump Governors, Settling Chambers, Lift Fittings, Strainer Fittings, Coil Hangers, Water Seal Automatic Air Valves, Air Eliminators.

## The Van Auken and Thermograde Steam Specialties.

The Van Auken and Thermograde steam specialties manufactured by the Consolidated Engineering Co., are widely known throughout America and have been used for many years in every type of building where strictly high grade steam specialties are desired. Their freedom from numerous parts resulting in greatest durability, and their accuracy under operation have established the distinguishing features of the entire line.

## Thermo Control Valve.

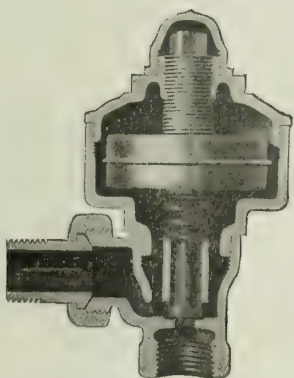
The Thermo control valve, of strictly modern design, is a quick opening radiator valve of the fractional type which controls accurately the amount of steam admitted to the radiator. The inconvenience of varying weather conditions is wholly eliminated where this valve is used, as one-quarter, one-half, three-quarters, or the radiator's full quota of heat may be utilized at will. The Thermo control valve is used in connection with either the Thermo return valve or Belvac Thermofier.



THERMO CONTROL VALVE

## Thermo Return Valve.

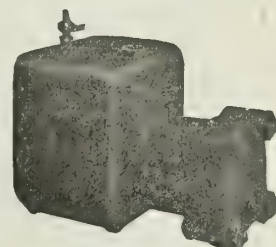
The best materials are used in the manufacture of the Thermo return valves, selected with due regard for long wear. This, with its quick and sensitive action during operation, establishes it as a return valve of great merit. This quality valve has always been singularly free from mechanical trouble, and it will handle all water of condensation with less steam loss and greater accuracy than any other type.



THERMO RETURN VALVE

## Coenco Steam Trap.

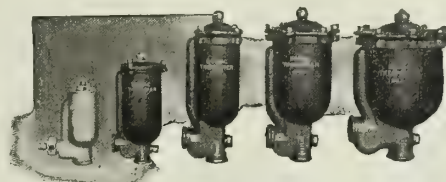
The Coenco steam trap of the float type is designed for either high or low pressure service. It is perfectly balanced, of large overload capacity and convenient to connect. There is no better trap made for the efficient draining of blast coils and vento sections.



COENCO STEAM TRAP

## The Belvac Thermofier.

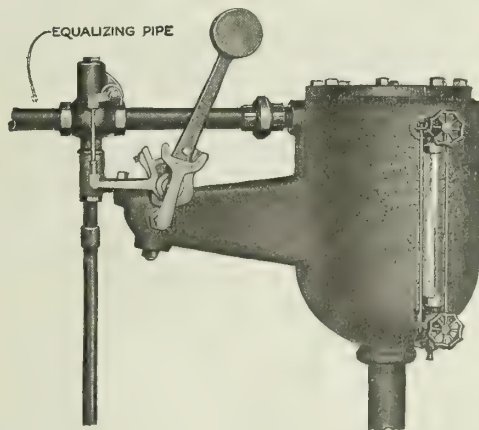
The Belvac Thermofier is a return trap of the float type of greatest simplicity of construction. Used in connection with our vacuum pump, it will permit the removal of all air and water from radiation and coils while acting as a check against the flow of steam into the return.



THE BELVAC THERMOFIER

## Van Auken Alternating Receiver.

The Van Auken alternating receiver is used on low pressure gravity installations where 30 ins. can not be obtained between lowest point of dry return main and the water line of the boiler. The alternating receiver is connected to the return main near the boiler. Should the boiler pressure increase, the water of condensation rises in the receiver, the pressures in the boiler and the receiver are equalized and the water flows back to the boiler by gravity without collecting in the return mains or risers, whether the boiler pressure be 2 lbs. or 10 lbs.



VAN AUKEN ALTERNATING RECEIVER

# THE BISHOP-BABCOCK-BECKER CO.

Vacuum Heating and Temperature Regulation Systems and Heating Specialties

GENERAL OFFICES AND FACTORIES  
CLEVELAND, OHIO

## BRANCHES

NEW YORK, N. Y., 376-80 Lafayette Street  
CHICAGO, ILL., 1229-31 South Michigan Avenue  
ST. LOUIS, MO., 210-12 South Broadway  
ST. PAUL, MINN., 338-40 Minnesota Street  
ATLANTA, GA., 60 West Mitchell Street  
PHILADELPHIA, PA., 330 North 15th Street

BOSTON, MASS., 130 High Street

DALLAS, TEX., 915 Elm Street  
SAN FRANCISCO, CAL., 950 Mission Street  
CINCINNATI, OHIO, 1026 Central Avenue  
MILWAUKEE, WIS., 229 Cedar Street  
DENVER, COLO., 1724 Lawrence Street  
PITTSBURGH, PA., 412 Third Avenue

## Products.

Complete Equipment and Apparatus used in connection with AIR LINE and RETURN LINE VACUUM and VACU-VAPOR SYSTEMS OF STEAM CIRCULATION; SYSTEMS OF TEMPERATURE REGULATION; RELIABLE ELECTRIC and HYDRAULIC VACUUM PUMPS; AUTOMATIC ELECTRIC SWITCH and VACUUM CONTROLLERS; VACU-TRAPS, THERMOSTATIC VALVES; VACU-STAT, AIR VALVES; VACU-GRADUATE PACKLESS VALVES; MARCK THERM STEAM TRAPS; AMERICAN "UTILSTAT," a Temperature Controller.

American Electric, Hydraulic and Belted Air Compressors; Vacu-Vapor Vent Valves; Vacu-Check Valves; Houghton Therm Valves and Float Traps; Steam, Water and Air Pressure Reducing Valves; Water Seal Automatic Air Valves; Pressure Regulating Air Valves; Back Pressure Valves; Vacuum Pump Control Valves; Dirt and Scale Arresters; Pump Governors.

Automatic Temperature Regulation Specialties: Room Thermostat, Duct and Hot Water Thermostat, Perforated Tube Thermostat, Hygrostats, Metal Diaphragm Radiator and Coil Valves, Thermostatic Push Buttons, Humidifiers.

## Policy of Co-operative Service.

The men at the head of our Heating and Engineering Department are thoroughly trained and competent, and will gladly co-operate with architects and consulting engineers in the preparation of plans and specifications, either for entirely new installations or for the adaptation of systems already installed to meet the requirements of our system. Of equal importance, and with full recognition of obligation and moral responsibility to patrons, all agreements as to prompt care and attention both of old and new installations are fulfilled impartially. Simplicity and durability in the construction of our specialties make this policy possible.

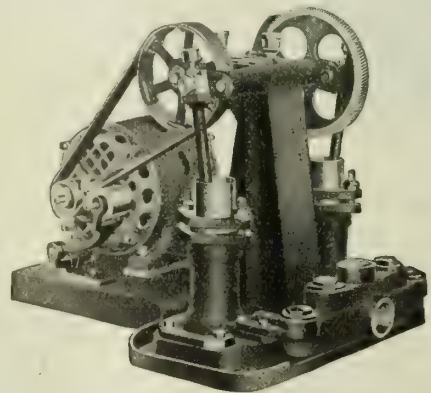
## Three Types of Reliable Heating Equipment.

**RETURN LINE VACUUM HEATING EQUIPMENT**—The Reliable return line vacuum heating equipment is adaptable for two-pipe low pressure steam heating plants of any size, vacuum being created and maintained by a Reliable electric or steam vacuum pump, which carries off all water of condensation and air from the system. A simple automatic electric switch and vacuum controller of most durable construction completes the equipment of the electric vacuum pump.

**VACU-VAPOR HEATING**—The Reliable vacu-vapor heating equipment is applicable to two-pipe low pressure steam heating plants. Its distinctive feature of great merit, wherein it differs from other vapor systems, is its

immediate utilization of any or all vacuum automatically created through steam condensation in radiators, this equipment removing air only.

**AIR LINE VACUUM HEATING SYSTEMS**—The Reliable air line vacuum heating equipment is adaptable either to one-pipe low pressure steam or two-pipe systems. Vacuum being created and maintained by either a Reliable electric or hydraulic vacuum pump, which removes the air only.



RELIABLE ELECTRIC RETURN LINE VACUUM PUMP NO. 122

## Reliable Electric Vacuum Pumps.

Owing to the oversized capacity of the Reliable electric vacuum pumps all water of condensation and air is immediately withdrawn from the heating system and a predetermined vacuum quickly created and easily maintained. The vacuum held in the expansion tank and return piping so assists the pump in keeping the system free from condensation and air that frequent pump operation is unknown.

If the system is tight a Reliable vacuum pump operates no more than one-third of the time, hence the operating expense, which is extremely low, is reduced to its minimum. The automatic electric switch and vacuum controller is very simple, all parts being durable and free from operating troubles. This being included with all Reliable electric vacuum pumps insures utmost economy of operation.

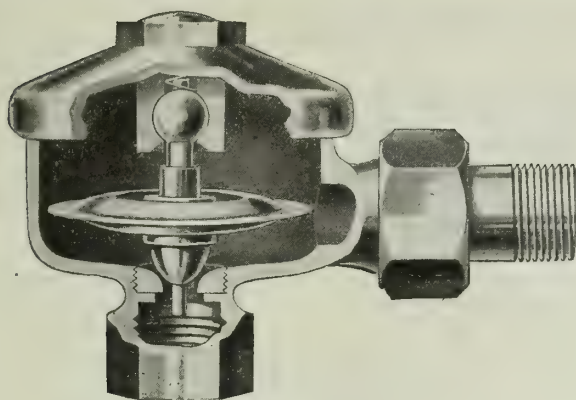
## Vacu-Traps.

Vacu-Traps are constructed of heavy bronze; are thermostatic valves, supersensitive in operation, which automatically free a heating system from air and drain the radiation and coils of all condensation without escape or loss of steam.

Detailed information as to valve capacities or any general information promptly forwarded on request.

Sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$  and  $1\frac{1}{2}$  ins.





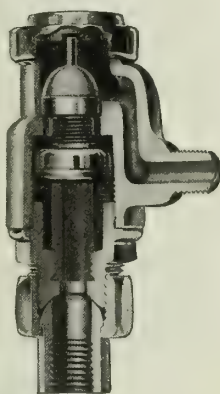
VACU-TRAP

### Vacu-Graduate Packless Valve.

The Vacu-Graduate packless valve with "Art" lever handle is a quick opening, self-cleaning graduating radiator valve of the latest design which controls accurately the amount of steam admitted to radiators or coils. This type of valve provides for varying weather conditions, as in cold or mild weather the radiators and coils can be either fully or partially heated. Sizes,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$  and  $1\frac{1}{2}$  ins.

### The VacUstat.

A thermostatic valve which automatically keeps the radiators, pipes and boilers free from air and prevents any escape or loss of steam. Built along entirely different lines and of far superior construction than other types of air valves. The air valve to specify and to use where "something better is desired."



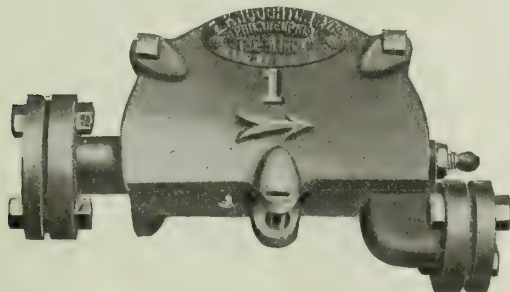
VACUSTAT

### The Marck Therm Steam Trap.

The Marck therm steam trap is designed especially for use on the discharge end of low pressure steam using apparatus. It automatically permits the passage of all water of condensation and prevents the escape of steam. Its application as a means of economy and efficiency in operation is universal.

Among its uses is the draining of radiators and coils on heating systems, cooking apparatus in hotels, restaurants, etc.; draining of heating and drying apparatus in textile mills, cotton mills, woolen mills, brick plants, lumber driers, greenhouses, breweries, candy and soap factories, etc.

Because of its absolute dependability there are many instances where it has proved profitable to substitute the Marck therm steam trap for other makes already installed.



MARCK THERM STEAM TRAP

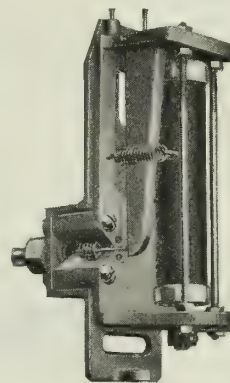
### The American System of Automatic Temperature Regulation.

The American system of automatic temperature regulation is designed primarily for automatically controlling heating plants of any type. Equally successful results are obtained, however, through its application in any of the manifold uses of heat where uniform temperature is necessary in the various processes of manufacture. The American thermostat operates a valve or damper from a wide open to a tightly closed position on temperature changes of  $1^\circ$  under all barometric conditions.

The American thermostat is of simple construction and has fewer working parts than any thermostat on the market and when properly installed will remain in constant and efficient operation for years with absolutely no repairs. The thermostatic element is a hard rubber tube, hard rubber having the highest coefficient of expansion of any material known to the art. A hollow tube of rubber will always keep its shape. Soft rubber diaphragms, which quickly become porous, vulcanize and crack, causing complete breakdown of the thermostat and consequent expensive repairs, are not used.

Two types of the American thermostat are manufactured—Intermediate and Positive actions—both of which are operated pneumatically or by compressed air using an electric, hydraulic or belted type of air compressor.

We make the best intermediate acting thermostat extant, its operation maintaining a fixed position of either a diaphragm radiator valve or damper. (Note—With other types the operation is gradual but not intermediate.) Our Intermediate action permits of greater accuracy and closer control. The Positive thermostat quickly and positively opens a diaphragm valve or damper. Its action is gentle, thus avoiding the consequent shock or strain to the diaphragm which always results from snap action.



Sectional View.



Cover

AMERICAN THERMOSTAT

### The American "Utilostat."

The American "Utilostat" is so designed that it may be utilized for automatically controlling the temperature of boilers, hot and cold water tanks, drinking water systems, pasteurizers, ovens, cookers, kettles, annealing ovens, glue pots, lead pots, dry kilns, hot air drying processes, refrigeration plants, etc.

Its simplicity in construction and operation make durability and dependability certain. Its delicacy of operation in quick but slight temperature changes, not only insures great saving of fuel, but reduces to the minimum the great waste of product existing when these processes are not under automatic control.

The "Utilostat" may be operated by either compressed air or water.

A special department is maintained for correctly solving these particular problems in the control of air, gases or fluids.



# C. A. DUNHAM COMPANY

Manufacturers of Specialties for the Dunham System of Heating

1710 Fisher Building

CHICAGO, ILL.

FACTORIES: MARSHALLTOWN, IOWA; TORONTO, ONT., CAN.

DIVISION OFFICES

NEW YORK, N. Y., 503-21 East 40th Street Building  
CHICAGO, ILL., 1710 Fisher Building

BRANCH OFFICES

DAVENPORT, IOWA, 210 Security Building  
MINNEAPOLIS, MINN., 405 Metropolitan Building  
INDIANAPOLIS, IND., 512 Board of Trade Building  
LOUISVILLE, KY., 1020 Starks Building  
KANSAS CITY, MO., 401 Lathrop Building  
CLEVELAND, OHIO, 917 Garfield Building  
BOSTON, MASS., 201 Devonshire Street  
DETROIT, MICH., 406 Marquette Building  
DALLAS, TEX., 1612 Southwestern Life Insurance Building  
ST. LOUIS, MO., 1208 Fullerton Building  
SEATTLE, WASH., 933 Henry Building  
ALBANY, N. Y., 322 Arkay Building  
LOS ANGELES, CAL., 1310 South Hill Street

EL PASO, TEX., 123 San Francisco Street

CANADIAN PLANT: C. A. DUNHAM CO., LTD., TORONTO, ONT.

BRANCH OFFICES

TORONTO, ONT., 701 Canadian Pacific Ry. Building  
WINNIPEG, MAN., 405 Tribune Building  
OTTAWA, ONT., 214 Booth Building

CINCINNATI, OHIO, 1301 Union Trust Building  
DES MOINES, IOWA, 511 Hubbell Building  
PORTLAND, ORE., 410 Board of Trade Building  
SPOKANE, WASH., 713 Realty Building  
SALT LAKE CITY, UTAH, 211 Scott Building  
ROCHESTER, N. Y., 629 Mercantile Building  
MILWAUKEE, WIS., 442 East Water Street  
DENVER, COLO., 406-7 Tabor Opera House Block  
WASHINGTON, D. C., Room 801, 710 14th Street, N. W.  
PITTSBURGH, PA., 5086-7 Jenkins Arcade Building  
PHILADELPHIA, PA., 710 Witherspoon Building  
CHEYENNE, WYO., 630 Citizens National Bank  
BIRMINGHAM, ALA., 2109 Third Avenue

VANCOUVER, B. C., 1050 Hamilton Street  
MONTREAL, QUE., 11 St. Sacramento Street  
HALIFAX, N. S., McCurdy Building

## Products.

Specialties for use in connection with the DUNHAM SYSTEM of HEATING, known according to its several adaptable forms as follows: the DUNHAM HOME HEATING SYSTEM, the DUNHAM RETURN SYSTEM, and the DUNHAM VACUUM SYSTEM—All two-pipe systems; and the DUNHAM AIR LINE SYSTEM.

These Specialties are: The Dunham Radiator Trap; Dunham Packless Inlet Valve; Dunham Air Eliminator; Dunham Pressurestat; Dunham Thermostat; Dunham Damper Motor; Dunham Return Trap; Dunham Blast Trap; Dunham Medium Pressure Trap; Dunham Pressure Reducing Valve; Dunham Oil Separator; Dunham Strainer; Dunham Air Vent; Dunham Vacuum Pump Governor; Dunham Air Line Valve; Dunham-Thompson Air Line Vacuum Pump.

## The Dunham System.

It is three-fold:  
Organization;  
Service;  
Product.



THE COMPANY—The Company, and the organization within it, is strong, the largest engaged exclusively in the manufacture of heating specialties and systems.

SERVICE—This is the Company's strong point. With 36 Branch and Division Offices throughout the United States and Canada, and two complete factories, 100% efficiency service can be rendered. Our Service Departments, with their trained engineers, are at all times ready to co-operate with consulting engineers, architects, and contractors, to furnish special details and information instructive as to the best way of installing and using the Dunham products.

THE DUNHAM PRODUCTS—They are the leaders of their kind, made of the highest grades of suitable materials, by especially trained workmen, in clean, sanitary, well ventilated buildings. Each article will be briefly described.

## Dunham Radiator Traps.

The simplicity of the Dunham Radiator Trap is very

apparent. It comprises a body, a cover, and thermostatic disc which is secured in the cover. There are no loose parts, no sliding contacts, nothing to gum up, and no guide or pin to obstruct the valve opening. There is a flat valve and seat with liberal valve opening. The position and design of the valve is such that it is self-cleaning. The action of the disc is positive, and the valve seats squarely, like a globe valve, the tightest of all types of valves, and one presenting little opportunity for uneven wear. The body is standardized, also the cover and disc, thus giving the further advantages of interchangeable parts.

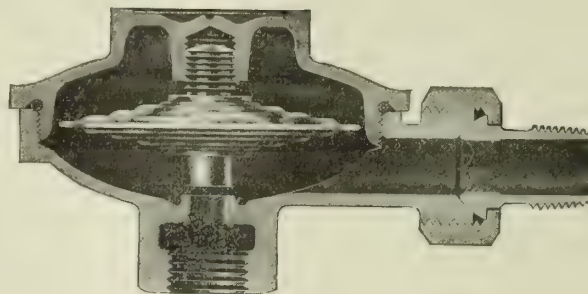


FIG. 1. DUNHAM RADIATOR TRAP

The function of the Dunham Radiator Trap is to conserve heat, and thus fuel, by keeping radiation and piping at the point of maximum efficiency. To do this the working part of the trap, the Dunham Thermostatic Disc, must be and always is fully exposed to the actual conditions within the radiator, and it therefore responds instantly to any change taking place therein, automatically releasing air and water of condensation and closing to prevent waste of unused steam. It not only saves steam but clears the space which should be occupied by steam from air and water—enemies of high efficiency.

This trap was the first of its kind to be a commercial success, and it has maintained its leadership through fifteen years of service. It has therefore stood the test of time. It is made in five sizes, and for steam pressures not to exceed 10 lbs. gage.



Nos. 1 and 2 traps are for use principally on radiators; No. 3 for large radiators, for pipe coils, and dripping piping; Nos. 4 and 5 for large pipe coils, and dripping steam mains. To determine trap capacity for pipe coils reduce actual surface of coil to equivalent square feet of direct cast iron radiation, the unit in which all traps are rated, by multiplying by  $1\frac{1}{4}$ .

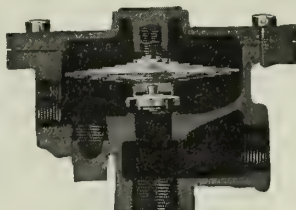


FIG. 2. DUNHAM NO. 4 AND NO. 5 TRAP

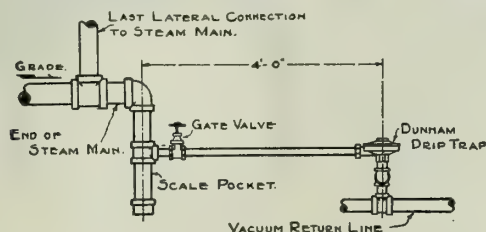


FIG. 3. METHOD OF DRAINING END OF STEAM MAIN IN DUNHAM VACUUM SYSTEM

TABLE A—DUNHAM RADIATOR TRAPS

Size	Pipe connection, in.	Capacity in sq. ft. direct radiation
No. 1	$\frac{1}{2}$	100
No. 2	$\frac{1}{2}$	350
No. 3	$\frac{3}{4}$	450
No. 4	$\frac{3}{4}$	1000
No. 5	1	2000

Nos. 1, 2, and 3 traps made in angle, straightway, right-hand, and left-hand pattern—all made in brass and bronze; Nos. 4 and 5 in angle and straightway pattern only and made of iron.

### Dunham Blast Trap.

In design and appearance the Dunham Blast Trap is essentially the same as the Nos. 4 and 5 radiator traps, illustrated above. It is designed only for draining blast heating coils. In selecting capacities be sure and reduce blast coil radiation to equivalent direct radiation by multiplying the actual surface of coil by a factor ranging from 6 to 10, depending upon temperature, velocity and volume of air blown over coils.

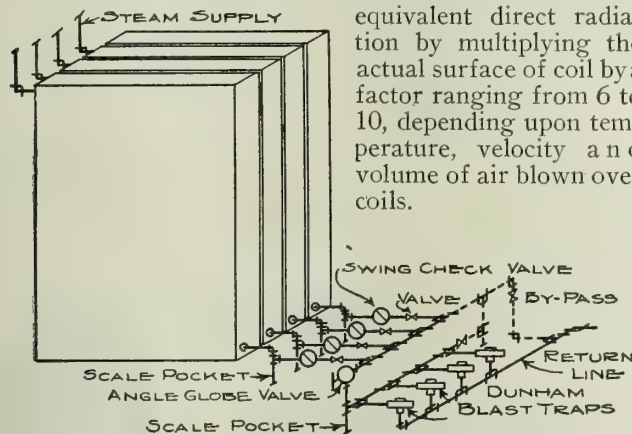


FIG. 4. METHOD OF APPLYING DUNHAM BLAST TRAPS

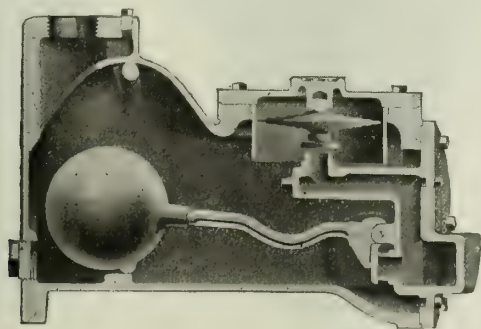


FIG. 5. DUNHAM NO. 6 BLAST TRAP

Dunham No. 6 Trap is intended for handling large quantities of condensation, and is especially adapted for blast coil work. It combines the Dunham thermostatic principle with the float; it has a double valve and large connections.

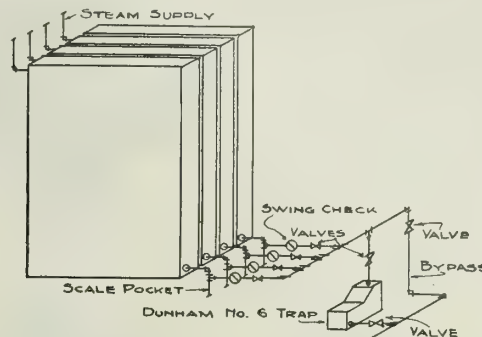


FIG. 6. METHOD OF APPLYING DUNHAM NO. 6 BLAST TRAP

TABLE B—DUNHAM BLAST TRAPS

Size	Pipe connection, ins.	Capacity in sq. ft. direct radiation	Weight, lbs.
* $\frac{3}{4}$ in.	$\frac{3}{4}$	1500	12 $\frac{1}{2}$
*1 in.	1	3000	21
No. 6	2	10000	75

\*Made in angle and straightway patterns.  
Made only for pressures up to 10 lbs.

### Dunham Air Line Valve.

Principle of operation is identical, and design similar, to the Dunham Radiator Trap. Its efficiency is high, and service in connection with air line systems invaluable. Can be furnished with either  $\frac{1}{8}$ -in. or  $\frac{1}{4}$ -in. radiator connection. Air piping is required in connection with its use.

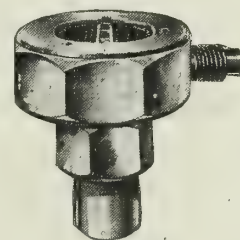


FIG. 7. DUNHAM AIR LINE VALVE

### Dunham Return Trap.

The Dunham Return Trap is used to separate the air and water discharged into the dry return piping by the Dunham Radiator Traps, to release the air, and to automatically return the water to the boiler without regard to the pressure carried in boiler or system.

It is a simple, positive acting device, with large valve areas, designed especially for high efficiencies at low heating pressures. Its working parts are protected from dust and dirt, and yet are easily accessible without removing any piping connections.

### Dunham Packless Inlet Valve.

This is a bona fide packless inlet valve and not one dependent upon springs and packing rings. The Dunham disc makes this possible. It has a low bonnet and stem and unusual lines, making it attractive in appearance. The valve can be opened or closed in seven-eighths of a turn. It is made only in the angle pattern for use in a top radiator connection. Sizes  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 and  $1\frac{1}{4}$  ins.

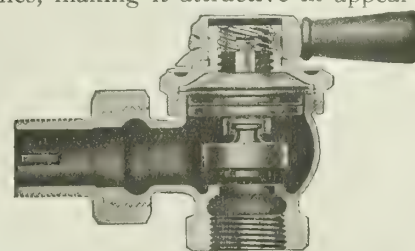


FIG. 8. DUNHAM PACKLESS INLET VALVE

**Dunham Medium Pressure Traps, "D" Style.**

These embody the principle so successfully used in the Dunham Radiator Trap, and are just as simple and satisfactory. They are used almost exclusively in hospitals and kitchens for dripping sterilizers and steam cooking apparatus, where steam is used at a pressure not less than 10 lbs. or more than 40 lbs. gage.

TABLE C—DUNHAM MEDIUM PRESSURE TRAPS, "D" STYLE

Size	Capacity, lbs. of water per hour	Weight, lbs.
$\frac{1}{2}$ in.	100	4
$\frac{3}{4}$ in.	200	15
1 in.	400	25

Always state operating pressure when ordering.

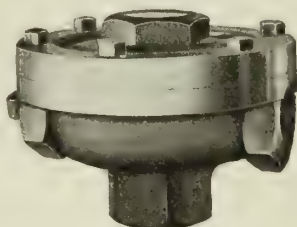


FIG. 9. DUNHAM "D" STYLE MEDIUM PRESSURE TRAP

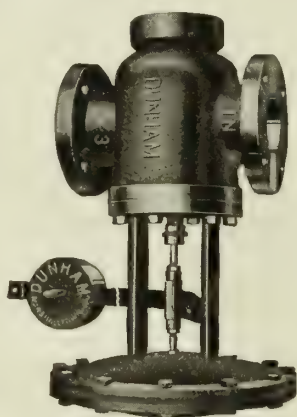


FIG. 10. DUNHAM PRESSURE REDUCING VALVE, STRAIGHT PATTERN

**Dunham Pressure Reducing Valves.**

This product is so well known and universally accepted that no comment is needed. These valves are made only in standard weight for a pressure range of 125 lbs. down on high side, to 10 lbs. and atmosphere on low side, in straight and expanded outlet patterns.

**Dunham Vacuum Pump Governor.**

The function of this governor is to control the steam to a steam driven vacuum pump to operate same so as to maintain a certain vacuum in the suction piping. It is used in maintaining a predetermined amount of vacuum in the return piping of a vacuum heating system. Made in all pipe sizes from  $\frac{1}{2}$  in. to 2 ins., inclusive.

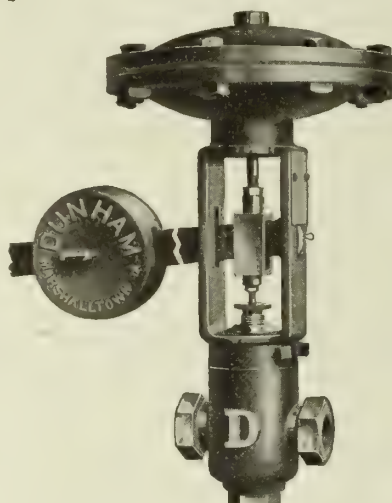


FIG. 11. DUNHAM VACUUM PUMP GOVERNOR

**Dunham Pressurestat.**

This is a simple instrument operated by pressures, similar to a pressure gage, and used always in combination with a Dunham Damper Motor by which it operates the drafts of a steam boiler so as to keep up a slight steam pressure, and prevent the pressure going above that required for the best operation of the system.

It is one of our special efficiency devices used in connection with the Dunham Home Heating System, and usually in conjunction with a thermostat. It is not for the purpose of indicating the pressure in the boiler.

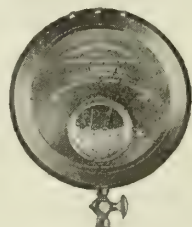


FIG. 12. DUNHAM PRESSURESTAT

**Dunham Damper Motor.**

This, too, is a standard article needing no description. Its function is to operate the boiler dampers when put into action by either the pressurestat or thermostat. It is furnished in three styles dependent upon the motor force: a spring motor; an alternating current motor with transformer operated from lighting circuit; and a direct current motor operated by dry cell batteries.

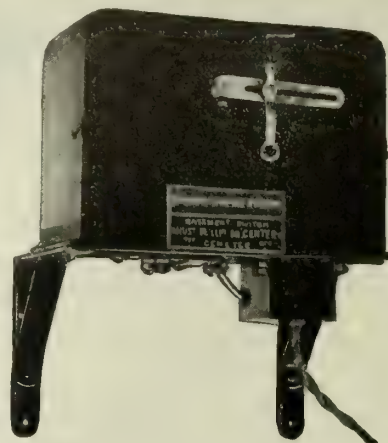


FIG. 13. DUNHAM DAMPER MOTOR

**Dunham Thermostat.**

In home heating, a Dunham Thermostat, to control the temperature of the home, and a Dunham Pressurestat to maintain the steam pressure, present an unexcelled combination for efficient operation.

The thermostat is equipped with a clock which automatically sets it for a lower temperature at night, and raises it to the day temperature in the early morning, thus opening the draft. It may be set for any desired temperature for the day and night, and to throw open the drafts at whatever hour desired in the morning. The thermostat can only be used in single homes; that is, it is not applicable in apartments or double houses unless each apartment or house has its own independent boiler and heating system.

Thermostats without clock attachments also furnished.



FIG. 14. DUNHAM THERMOSTAT

**Dunham Air Eliminator.**

This is used in connection with the Dunham Home Heating System for venting the air from the system. Capacity for 2,000 sq. ft. radiation.

**Dunham Air Vent.**

This device is for the purpose of venting air from water that is under



FIG. 15. DUNHAM AIR ELIMINATOR

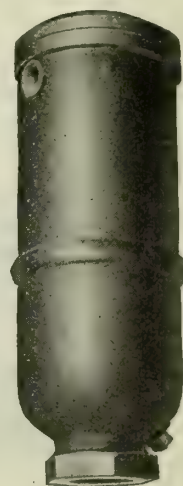


FIG. 16. DUNHAM AIR VENT



pressure. It is particularly adapted to heating work where the vacuum pump is discharging water of condensation directly back to the boiler. Capacity for 5,000 sq. ft. of radiation.

### Dunham Separators.

The Dunham Separators made for oil separator or steam separator service are very efficient for their respective duties. Where exhaust steam is used for heating purposes the heating efficiency of the steam is materially increased by the use of a good oil separator. Dry steam, too, is a more effective heating medium than moist steam. Dunham separators for either service are made in all sizes from 1½ to 10 ins., in horizontal pattern only, with flanged ends.

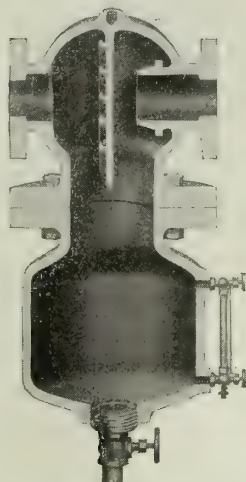


FIG. 17. DUNHAM STEAM AND OIL SEPARATOR

### Dunham Strainers.

A strainer is a necessity in protecting the vacuum pump from dirt and scale which otherwise might get into it and cause considerable damage. The Dunham Strainer with its large brass screen baskets for catching and holding the dirt, and easily accessible for cleaning, at once commends itself for this purpose. It is made in all sizes from 2 to 6 ins.; the 2-, 2½-, and 3-in. sizes, with either screw or flanged ends; larger sizes flanged ends only.

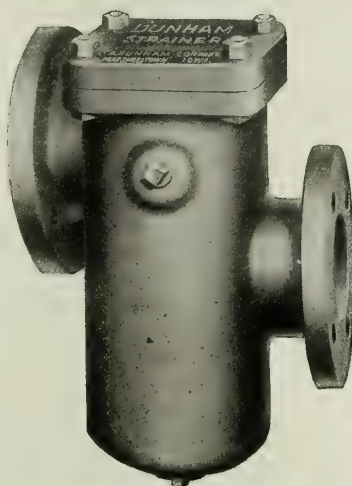


FIG. 18. DUNHAM STRAINER

### Using the Dunham Products.

The Dunham System of Heating may be further described in its several adaptable forms to peculiar conditions by the following subnames:

The Dunham Home Heating System, as its name implies, for the home or small building.

The Dunham Return System, for the medium size building, the apartment house, the small school, factory, and church, also for changing over and increasing the efficiency of old one-pipe and two-pipe gravity steam jobs. The Dunham Vacuum System for still larger buildings of all types, for groups of buildings, factories, schools, colleges, hospitals, and

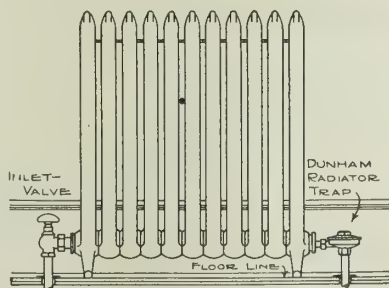


FIG. 19. BOTTOM SUPPLY CONNECTION TO RADIATOR

for municipal or central heating plants.

Each of these several designs are complete two-pipe systems, the great efficiency of which is made possible by the use of the Dunham Radiator Trap, which is installed at the discharge or return outlet of each radiator or pipe coil, where it stands guard against the waste of steam and constantly relieves the radiation of the enemies of heating efficiency, air and water.

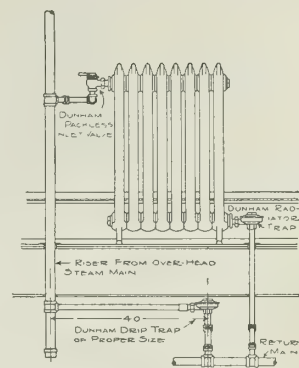


FIG. 20. METHOD OF DRAINING BOTTOM OF STEAM RISER IN AN OVER-HEAD SYSTEM

### The Dunham Home Heating System.

No system could be more simple in arrangement and design, or more easy or efficient in operation. Steam at a pressure not exceeding 8 oz. is used; it leaves the boiler and passes through liberal sized, though not large, steam piping and through Dunham Packless Inlet Valves to each radiator, where it is retained by the Dunham Radiator Trap until it has given off its heat, when, as water, it passes through the trap together with the air (no sputtering, leaky, "abominable" air valves are used on the radiators) and back to the boiler through the return piping, the air being freed through the Dunham Air Eliminator, and the water returning back into the boiler without the use of any mechanical device.

The end of each steam main is vented through a Dunham Air Line Valve into the return piping and is dripped through a wet drip line directly back to the boiler. All radiators used shall be of hot water pattern with top inlet and bottom outlet connections.

The high efficiency of operation is obtainable because of the opportunities for effective steam distribution, and this is assisted by the Dunham electric thermostatic control used exclusively with this design. The Dunham Pressurestat controls the boiler pressure and

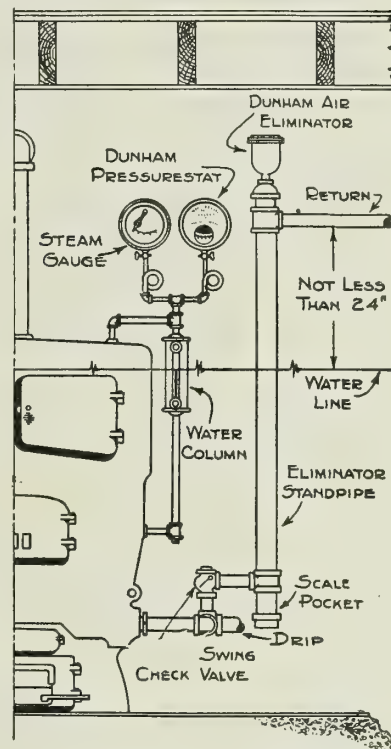


FIG. 21. RETURN CONNECTION AT BOILER, DUNHAM HOME HEATING SYSTEM

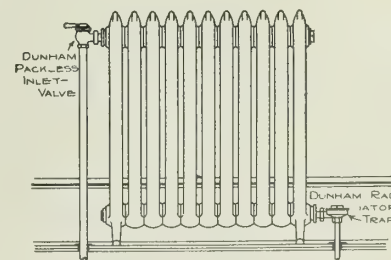


FIG. 22. TOP SUPPLY CONNECTION TO RADIATOR

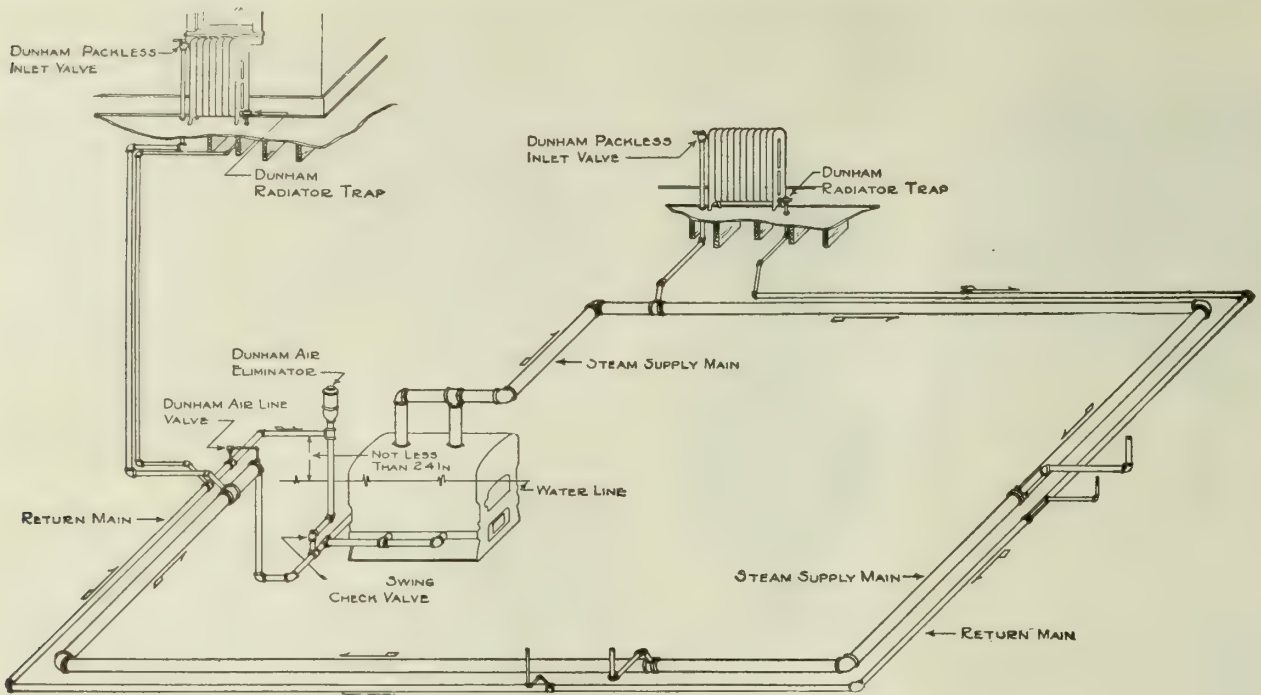


FIG. 23. TYPICAL PIPING PLAN, DUNHAM HOME HEATING SYSTEM

works in conjunction with the thermostat which maintains a uniform heat in the home. These two devices work together in operating the damper motor, which in turn operates the draft damper and check damper of the boiler.

**PIPE SIZES AND RADIATOR CONNECTIONS**—The following is a schedule of pipe, riser, and radiator connection sizes for use with the Dunham Home Heating System:

PIPE SIZES AND RADIATOR CONNECTIONS  
PIPE SIZES (IN INCHES)

Sq. ft. radiation	Steam main	Return main	Steam main drip
Up to 320	2	1	1 1/4
600	2 1/2	1 1/4	1 1/4
1100	3	1 1/4	1 1/2
1600	3 1/2	1 1/2	1 1/2
2300	4	1 1/2	2

Run steam main full size its entire length, basing the size of the main upon the total radiation.

RISER SIZES (IN INCHES)

Sq. ft. radiation	Steam		Return	
	Vert. pipe	Horiz. pipe to main	Vert. pipe	Horiz. pipe to main
40	3/4	1	3/4	3/4
100	1	1 1/4	3/4	3/4
180	1 1/4	1 1/2	3/4	3/4
300	1 1/2	2	3/4	3/4

RADIATOR CONNECTIONS (IN INCHES)

Sq. ft. radiation	Inlet valve	Vert. supply pipe	Horiz. pipe to riser	Trap	Vert. return pipe	Horiz. pipe to riser
40	1/2	1/2	3/4	No. 1	1/2	3/4
100	3/4	3/4	1	No. 1	1/2	3/4
180	1	1	1 1/4	No. 2	1/2	3/4

**HOW TO SPECIFY**—Specify the Dunham Home Heating System using Dunham Packless Inlet Valves and Dunham Radiator Traps in supply and return connection to and from each radiator, Dunham Air Eliminator to release the air, and Dunham Pressurestat, Thermostat, and Damper Motor complete to control dampers; each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. DUNHAM COMPANY.

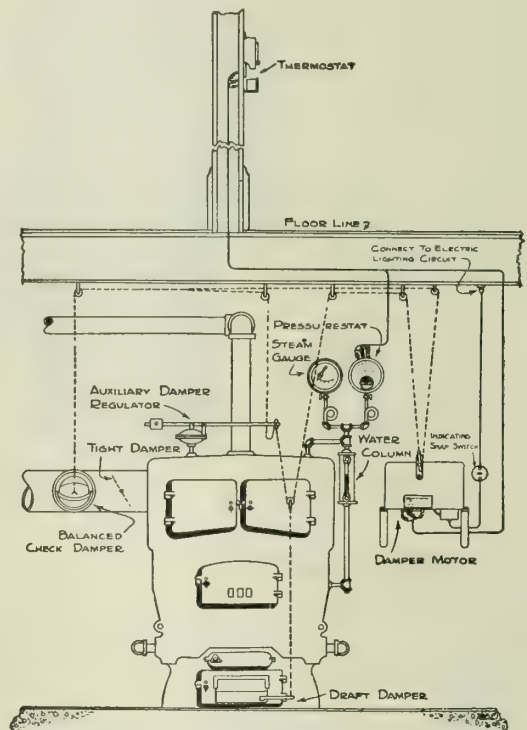


FIG. 24. METHOD OF INSTALLING DAMPER CONTROLS, DUNHAM HOME HEATING SYSTEM

### The Dunham Return System.

This system also comprises the simplicity in arrangement and design now so well known in the Dunham Home Heating System, and it is accompanied by the same opportunity for maximum efficiency. It differs from the system already described in that it makes use of the Dunham Return Trap in place of the air eliminator, which introduces the added feature of a positive automatic return of water to the boiler when it is desired to raise the steam pressure.

The feature of a positive return under varying steam pressures makes this Dunham System particularly



adaptable to apartment houses, small hotels and medium sized commercial buildings, schools and churches. Above all, however, this system makes possible the modernizing of old one-pipe and two-pipe gravity flow systems, materially increasing their efficiency by the introduction of the Dunham Radiator Trap at each radiator, insuring a positive circulation without loss of steam, and permitting the removal of all sputtering, leaking air valves which are such trouble makers in these old heating jobs. During these days when conservation of fuel is of such great importance, this system presents the greatest opportunity for the most efficient and effective use of steam for heating purposes, and therefore will be a fuel saver.

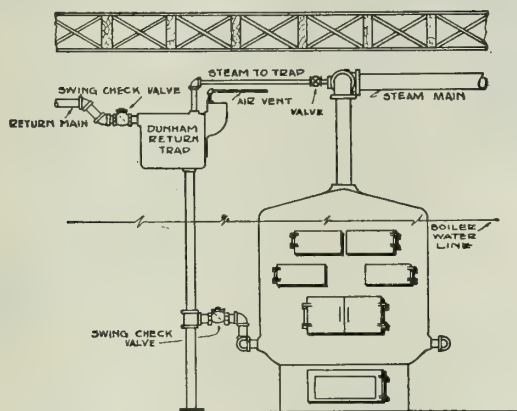


FIG. 25. METHOD OF INSTALLING DUNHAM RETURN TRAP

**HOW TO SPECIFY**—Specify the Dunham Return System using Dunham Packless Inlet Valves (except in old jobs where inlet connections are at bottom of radiators) and Dunham Radiator Traps in supply and return connections to and from each radiator, and Dunham Return Trap for releasing air and returning water to the boiler; each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. DUNHAM COMPANY.

### The Dunham Vacuum System.

For fifteen years the Dunham Vacuum System has been a leader and it still stands at the front, easily maintaining its position because of the remarkable success as well as the high efficiency of the Dunham Radiator Trap and allied Dunham specialties.

Simplicity again is the leading note of Dunham design. There is the system of steam mains and piping to supply all radiation, and the return piping to carry away the air and water of condensation. Steam may be supplied direct from boiler plant, or through reducing valve where boiler pressure is too high (over 10 lbs. gage) for direct service, or exhaust steam may be used supplemented by live steam through a reducing valve.

The returns all converge and grade to the suction inlet of a vacuum pump which may be either steam or motor driven, automatically controlled, and which may also act as a boiler feed pump. Where exhaust steam is used or where boiler pressure exceeds 20 lbs., the discharge from the vacuum pump should go to a freely vented automatic receiver of a boiler feed pump, the vacuum pump not being used directly to feed the boiler.

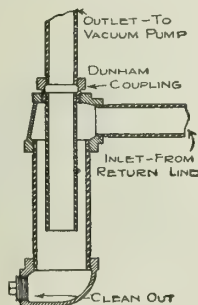


FIG. 26. CONSTRUCTION OF LIFT IN A VACUUM RETURN LINE

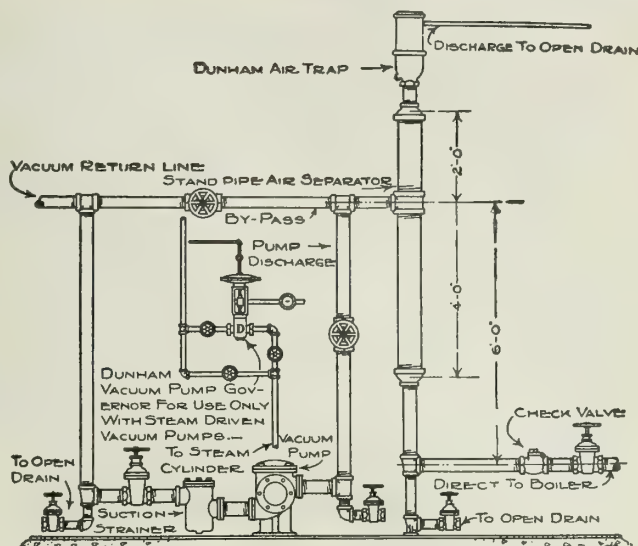


FIG. 27. METHOD OF DISCHARGING DIRECT FROM VACUUM PUMP INTO BOILER

**HOW TO SPECIFY**—Specify the Dunham Vacuum System using Dunham Packless Inlet Valves and Dunham Radiator Traps in the supply and return connection to and from each radiator (use hot water type radiation, preferably), Dunham Nos. 3, 4, or 5 Traps for dripping mains, Dunham Blast and No. 6 Traps for all blast coils, Dunham Pressure Reducing Valve for reducing steam pressure, or automatically supplementing exhaust steam, Dunham Oil Separator for removing oil and making exhaust steam suitable for efficient heating, Dunham Strainer for keeping dirt and scale from vacuum pump, Dunham Vacuum Pump Governor for automatically starting and stopping the steam driven vacuum pump to maintain desired amount of vacuum in return piping, and Dunham Air Vent for releasing air from the system; each and all to be installed in accordance with instructions and standard detail drawings to be supplied by the C. A. DUNHAM COMPANY.

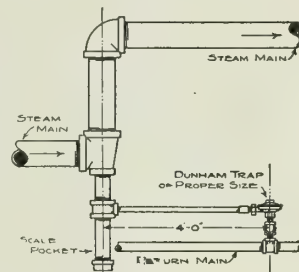


FIG. 28. METHOD OF DRIP-ING RISE IN STEAM MAIN, DUNHAM VACUUM SYSTEM

### Dunham Air Line System.

This is a one-pipe steam system, using a Dunham Air Line Valve on each radiator in place of the usual sputtering air valve, with a system of air line piping which may discharge the air by gravity, or be attached to a Dunham-Thompson air line vacuum pump. This system is particularly adaptable in making old one-pipe heating systems more efficient. It is easily and cheaply installed, and insures the quick removal of air from the radiators.

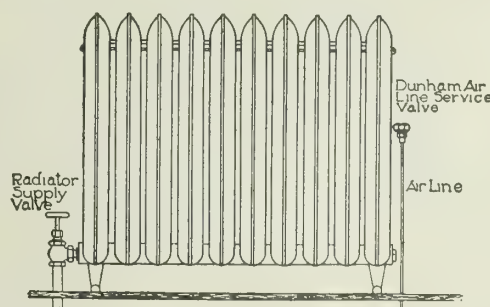


FIG. 29. TYPICAL RADIATOR CONNECTIONS, DUNHAM AIR LINE SYSTEM

# EDDY ENGINEERING CO.

## Automatic Vacuum Steam Heating Equipment

ALPENA, MICH.

### Products.

EDDY SYSTEM AUTOMATIC VACUUM STEAM HEATING.

### Experience.

The Eddy system has been well tested during 15 years of actual use, undoubtedly proving its efficiency in the highest degree.

### Adaptability.

This system of automatic vacuum steam heating is now giving most satisfactory service throughout the United States and Canada, in all kinds of buildings where low pressure steam or vapor can be used for heating purposes.

### Eddy Automatic Vacuum System for Steam or Vapor Heating.

The Eddy equipment is designed to vent low pressure steam heating plants in the ordinary firing of the boiler, creating and maintaining a vacuum (more than 20 ins.) in steam boiler, radiators and mains, thus permitting instant circulation of heat. Vacuum in boiler allows boiling at less than 212° Fahr. and immediately facilitates the transmission of steam to radiators, resulting in even heating and an *appreciable saving of fuel—one-third less than for ordinary steam and water heating.*

### The Equipment.

(1) One retarder for each radiator (any size) and others for steam mains at certain distances according to directions, to permit air to escape from boiler, radiators and mains to air pipe, but to retard escape of steam and to prevent return of air; (2) main air pipe, with risers and branches to radiators on all floors; (3) a combination receiver with an exhausting and vacuum valve (latter screwed vertically into top of vacuum) which receives and vents air from extreme end of main air pipe; (4) a return water valve which receives in its trap any condensation water that may be in main air pipe, transmitting same to return end of steam main above water line in boiler; also, (5) vacuum gage, and a few other minor accessories (Fig. 1).

**RETARDER**—Eddy retarders, made of brass and tin, are funnel shaped inside (Fig. 1), with a minute opening at the inlet end. There are no movable parts, simply a minute opening of proper size for correct venting of radiators. The male end of retarder to be connected to radiator or steam main; outlet or ground union to be connected to branch air pipe (Fig. 2). Size of minute opening must not be enlarged. All retarders must be in position to drain with the  $\frac{1}{4}$ -in. outlet looking down or sidewise; never up.

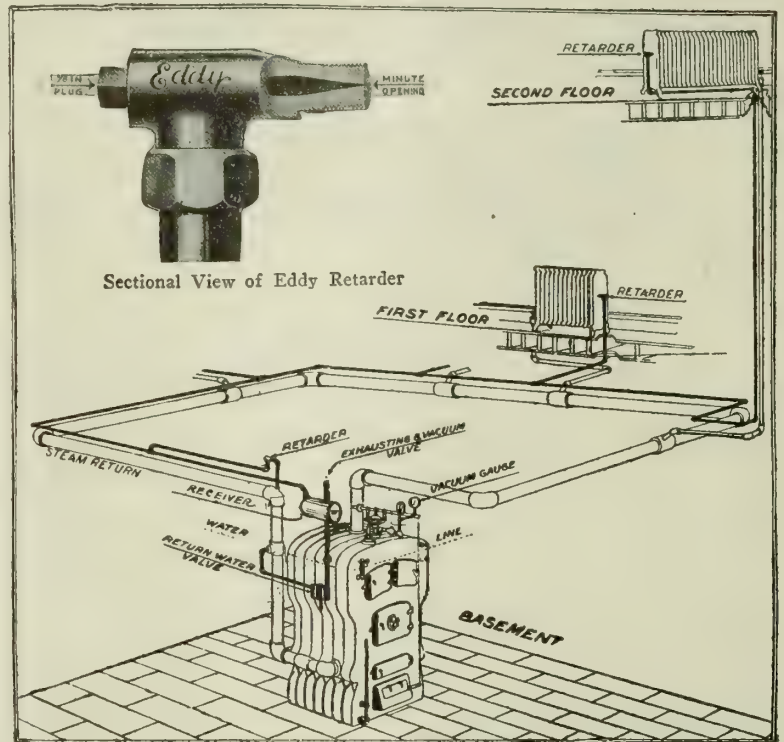
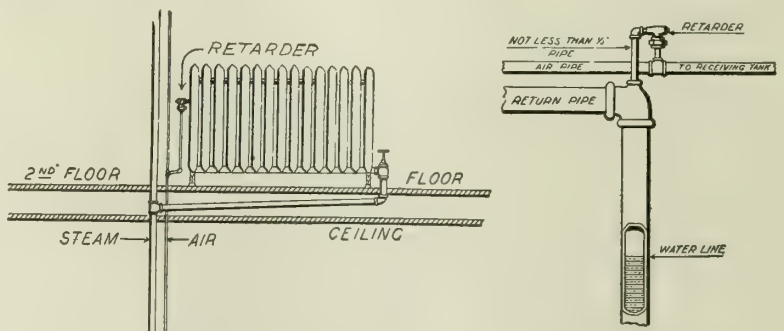


FIG. 1. DIAGRAM SHOWING INSTALLATION OF EDDY VACUUM SYSTEM  
Dark lines represent air piping and connections

**Location of Retarder**—On each radiator, irrespective of the amount of radiation provided for, also on steam mains; but no retarder to be placed so there will be less than 10 ft. of pipe between it and the receiver hereinafter described. All retarders to be located throughout the system *above* the main air pipe; all branches from retarders must drip *down* to main air pipe; therefore, when venting indirect, wall or ceiling radiators located below main air pipe, a branch pipe must be extended from bottom of radiator to a point *above* main air pipe where the retarder will be connected by another *downward* pipe to the main air pipe.

In this manner the return end of the steam main must be vented, as shown in Fig. 2.



Showing Connection to Radiator When Risers Continue above First Floor      Position When Venting Return of Steam Main

FIG. 2. LOCATION OF EDDY RETARDERS



**COMBINATION RECEIVER, EXHAUSTING and VACUUM VALVE**—The receiver and exhausting valve are situated in boiler room so that bottom of receiver will be above water line in boiler and the valve in a strictly vertical position in top of receiver (Fig. 1). The receiver takes all air and condensation water from main air pipe; the air is exhausted out of the system by the exhaust and vacuum valve and the condensation water, if any, passes down to return water valve. No air can return through this valve (Figs. 1 and 3).

Parts 1, 2 and 3 (Fig. 3) are enclosed in a brass body. Part 1 allows air to escape under the slightest pressure and positively prevents the return of air through this valve. Part 2 is a double seat, under which part 3 rises and prevents escape of accumulated water of condensation, resulting from continuous steam pressure.

**RETURN WATER VALVE**—Must be located so it will be always "trapped," that is, full of water. The outlet to boiler must be connected above boiler water line so that a siphon-like effect may be obtained automatically; this connection can be made to return end of steam main (Figs. 1 and 4), or this valve can be connected to a "T" in an equalizing pipe from an opening on top of boiler to one below the water line.

This valve (Fig. 4) is iron body, made strong and capable of resisting any pressure at which pop valves for heating plants are adjusted. It permits water of condensation to pass freely from receiver to boiler, but no steam or water can pass in an opposite way.

**AIR PIPING**—Main air piping and connections must be installed as suggested in Fig. 1 and as follows: The piping should be of wrought or galvanized iron, and must drain toward receiver in all cases, to insure free venting. Use a reliable level for this purpose. All joints to be made tight; plug or cap all openings and test piping with city water pressure, or, fill piping with water and use a suitable force pump; raise at least 25 lbs. pressure as a test for leaks, before connecting air piping to heating plant.

**Sizes of Main Air Pipe**— $\frac{1}{2}$  in. up to 50 retarders; if there be more than 50 retarders,  $\frac{3}{4}$  in. All branches to be at least  $\frac{3}{8}$  in., and to be reduced to  $\frac{1}{4}$  in. for connecting to retarder.

**FITTINGS**—Use galvanized beaded fittings throughout the air piping. Use reducing tees, elbows and couplings. Do not use bushings for reducing.

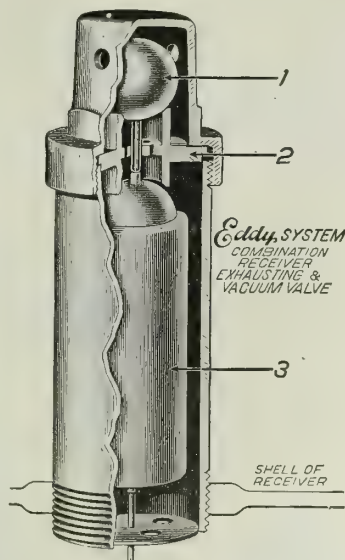


FIG. 3. COMBINATION RECEIVER, EXHAUSTING AND VACUUM VALVE

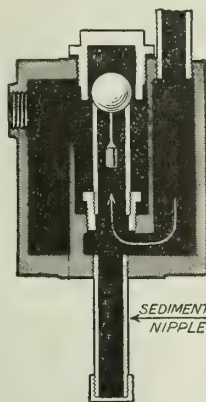


FIG. 4. RETURN WATER VALVE

### Advantages of the Eddy Vacuum Equipment.

The principal advantages are: (1) Perfect venting of all the radiators; (2) a quick heating service; (3) simplicity of operation; (4) minimum attention required; (5) uniform heating; (6) fuel economy—one-third saved.

### Cleaning the Heating System.

Failure to blow off boiler several times results in an accumulation of oil and other impurities, making it difficult to generate steam even with a hot fire in the combustion chamber. To remove oil and other impurities from piping, radiators and boiler, blow off boiler several times—first with steam pressure (about 10 lbs.) used for testing, again after several days and at frequent intervals thereafter; allow all water to be blown out each time.

**CLEANING AIR PIPING**—Continue steam pressure long enough to locate leaks, if any, in air connections to radiators, etc. Also, while making steam for testing and blowing off boiler, unscrew cap on sediment nipple at bottom of return water valve and continue steam pressure until condensation drips from this valve; allow this to drip for some time, as it removes oil, etc., from air piping; repeat this operation when again blowing off boiler.

When connecting the Eddy system to an old steam plant, clean air piping in same manner—the object being to prevent any oil from coming in contact with rubber ball in return water valve.

### Cost.

The Eddy system adds but little to the cost of an ordinary steam heating plant and the total expense compares favorably with the outlay incurred in respect of any system of hot water, steam or vapor plant of equal capacity for warming.

### Guarantee.

The EDDY ENGINEERING Co. will furnish new material at its own expense to replace any part of the equipment found to be defective; but no responsibility is assumed, however, for defects in the heating plant or for faulty installation of the Eddy system, contrary to plain printed instructions as to the proper attachment thereof.

### Specification.

The architect's specifications, regarding that part applying to the Eddy system, can simply read as follows: "The heating plant to include the Eddy System Automatic Vacuum Steam Heating, manufactured by the EDDY ENGINEERING Co., Alpena, Mich., and to be installed according to instructions furnished."

### Installation and Co-operation.

Complete instructions for installation of the Eddy system, including the operation of same, as well as for firing and cleaning steam heating plants, accompany each shipment of the vacuum equipment. The company will otherwise co-operate with purchasers of this system by extending to them the benefit of a long and practical experience in vacuum heating.

The engineering department of the company will gladly co-operate with architects in the preparation of piping plans, etc.

### References.

List of satisfied users of the Eddy system will be mailed on application.

# WILLIAM S. HAINES & COMPANY

Manufacturers of Steam Heating Specialties

Twelfth and Buttonwood Streets  
PHILADELPHIA, PA.

## Products.

HAINES VACUUM HEATING SYSTEMS and AUTOMATIC VAPOR SYSTEMS, consisting of Haines Automatic Valves and Traps, Automatic Air Traps, Graduated Supply Valves, Suction Strainers, Safety Valves, Vacuum Pump Governors, Damper Regulators, Low Pressure Gauges, and all Specialties used in the systems.

## Vacuum Systems of Steam Heating.

We believe that the architect and engineer are sufficiently familiar with the principle, operation and general piping arrangement of this system to make it unnecessary to detail them here. It is generally conceded that a vacuum system of steam heating, properly installed and equipped, is the most efficient and economical heating system that can be used in connection with large buildings of any description.

Vacuum systems of heating, however, have not always proved successful, due not to any fault in the principle of the system, but almost entirely to poorly constructed automatic valves; in fact, the automatic valve is so important a feature that, regardless of all other perfections, any system of vacuum heating would be a failure without an equipment of positive and reliable automatic valves.

## Haines Automatic Valves and Traps.

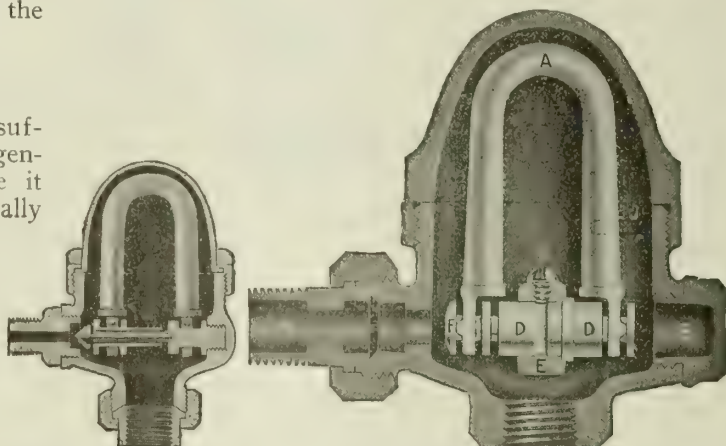
This company is the sole manufacturer of the Haines automatic valves and traps (four illustrated herewith), in all of which the operating power consists of the Haines specially designed thermostatic tube. This member is not new or untried, as the company has been using it in connection with its automatic valves and traps for 18 years, and during this entire period the principle of the thermostatic tube has not been changed a particle.

**CONSTRUCTION**—The Haines automatic valves and traps are all constructed on one principle, with some slight difference in design to meet different conditions. In all cases the operating power consists of a specially designed Haines thermostatic tube mounted vertically on a horizontal valve motion. The thermostatic tube has forked or bifurcated ends made to fit a groove in the valve head at one end and a groove in the guide stem at the opposite end. The guide stem is set permanent, so that the movement or travel of the tube is confined to the opposite end in such a way as to automatically open and close the valve. To eliminate friction and remove any possible chance of the valve sticking, the hole in the valve stem is round, whereas the end of the guide stem on which it is mounted is square, which assures a free and perfect movement.

The valve mechanism in all the Haines automatic valves and traps is mounted horizontally. This permits scale and foreign matter to drop clear of the valve and seat at each operation; and as the construction of the thermostatic tube is such as permits a long range of

movement, the chances of the valve fouling with scale or foreign matter is reduced to a minimum.

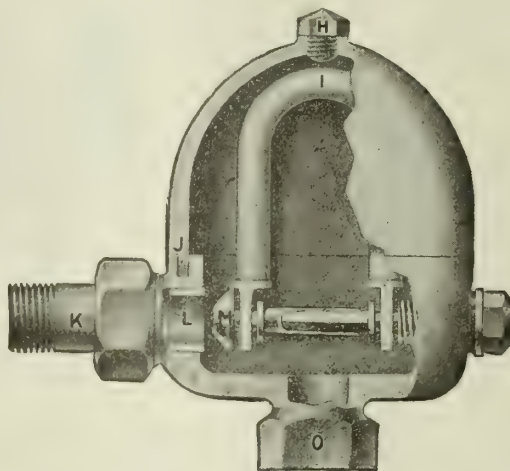
**GUARANTEE**—The Haines automatic valves, when used in connection with vacuum or vapor heating systems, are guaranteed absolutely for a period of 5 years;



HAINES AUTOMATIC  
AIR LINE VALVE

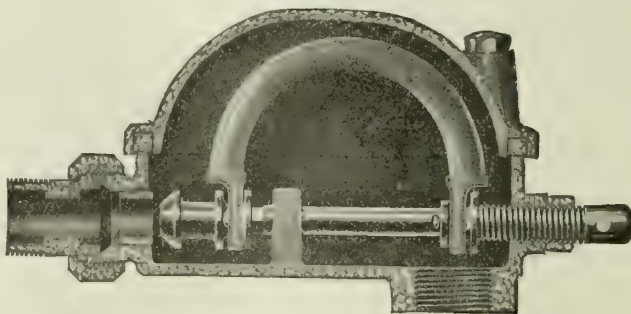
HAINES VENTO TRAP

Recommended for use with cast iron radiation with low pressure steam. Not exceeding 10 lbs.



HAINES 1911 TYPE TRAP

Recommended for coil work and drip points with low pressure heating. Controls very large valve area



HAINES BLAST COIL TRAP

In addition to all classes of blast coil work, it can be used with any class of work employing from 1 to 100 lbs. pressure



that is, should any of the valves become defective through usage during said period, all such will be replaced with new ones free of cost.

### Haines Vapor Vacuum Heating System.

This system as a whole is absolutely automatic, noiseless, effective and economical. On the detailed diagram herewith the installation and operation of this system is clearly shown.

### Piping Arrangement.

The steam supply main is started at the highest possible point from the boiler, and should be run throughout the building in the most direct course, grading down from the boiler to the drip points. All drip points in the main supply line are connected to a common wet return line, which is carried back and connected to the boiler below the water line. The dry return pipe which carries condensation and air from the radiators is started from the highest point at the extreme end of runs, graded back to the boiler, then dropped and connected to the boiler below the water line. No air valves are used on the radiators, as the air from all radiators is discharged into the dry return line and eliminated through the automatic air trap.

### Automatic Air Trap.

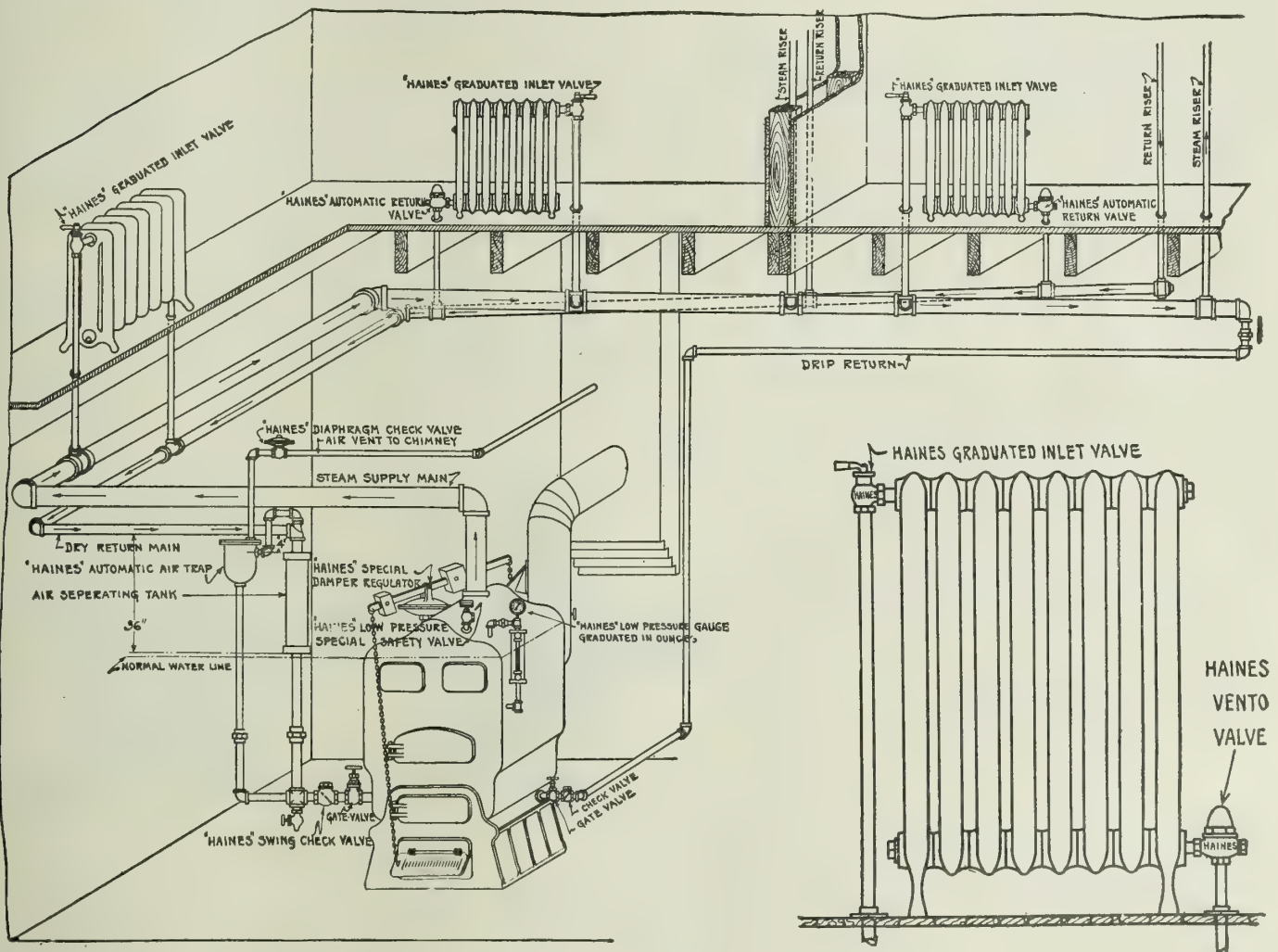
To eliminate air from the system an outlet is provided at the high point of the dry return line at the boiler and connected to the Haines automatic air trap, said air trap being provided with a vent to the atmosphere. Under normal working conditions the air trap performs no functions in connection with the operation of the system; it is simply an emergency break, or a safeguard to balance the system in the event of excessive pressures being created in the boiler.

### Vento Automatic Valve.

The return end of each radiator is controlled by a Haines vento valve which automatically discharges the water of condensation and air from the radiator without permitting a particle of steam to escape to the return line.

### Graduated Supply Valve.

The amount of steam or vapor admitted to all radiators is controlled by the Haines graduated supply valves. These valves, for the sake of accessibility and to permit easy regulation of the amount of heat desired, should preferably be connected at the top of each radiator.



HAINES VACUUM HEATING SYSTEM

HAINES VALVES INSTALLED ON RADIATOR

# HOFFMAN SPECIALTY CO.

Manufacturers of Venting Devices

MAIN OFFICE  
130 North Wells Street  
CHICAGO, ILL.

EASTERN OFFICE, NEW YORK, N. Y., 512 Fifth Avenue  
WESTERN OFFICE, LOS ANGELES, CAL., 215 West 7th Street

## Products.

SIPHON AIR VALVES; SIPHON AIR AND VACUUM VALVES; RETURN LINE VALVES; "AIR LINE" VALVES; "QUICK VENT" AIR VALVES; "QUICK VENT FLOAT" AIR VALVES; "QUICK VENT FLOAT" AIR AND VACUUM VALVES; VAPOR VALVES.



air which collects in a hot radiator is as freely vented as cold air. The sensitivity of the valve in distinguishing between live steam and heated air insures full efficiency of the radiator whenever steam is maintained in the boiler.

## Guarantee.

All Hoffman valves are unqualifiedly guaranteed for 5 years.

## Hoffman Valves.

The design and construction of Hoffman valves are the result of thirty years' experience in the heating business. We have devoted the last 15 years to the perfecting of dependable venting devices for low pressure steam heating systems, and through radical departures in valve design have been able to produce them. These devices are absolutely non-adjustable, and perform automatically the functions for which they are designed. They are also foolproof, because the absence of screw tips makes it impossible for the user to tamper with them or to attempt to adjust them.

**TESTS**—All Hoffman valves are shipped ready to be put in place. They are thoroughly tested and accurately adjusted before they leave the factory.

**RELIABILITY**—The practical test of service in thousands of heating plants throughout the country has furnished the best proof that these valves are reliable.

**MATERIALS**—Every Hoffman valve pin is made of german silver, which is tougher than any other metal that is used for valve pins. The diaphragms are made of phosphor bronze, the toughest metal known. All other parts are made entirely of brass. All valves are nickelplated.

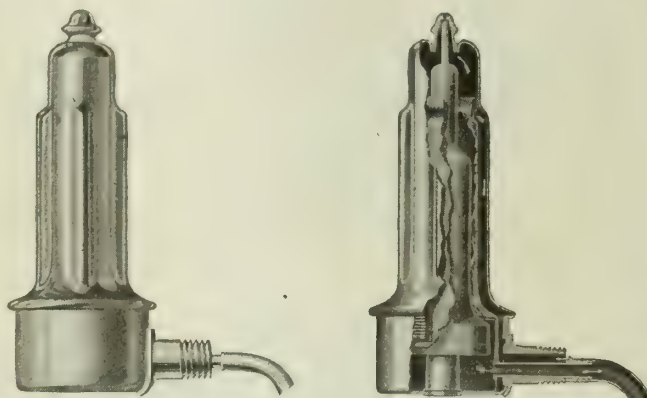
## The No. 1. Hoffman Siphon Air Valve.

**ADAPTABILITY**—This valve is designed for use on gravity systems of steam heating.

**CONSTRUCTION AND OPERATION**—The mechanical construction is shown in the sectional view on this page. The float shown in this illustration is a sealed metal chamber with a flexible bottom. It contains a volatile or heat-sensitive fluid that vaporizes at 190° Fahr. and thus generates in the chamber a pressure that deflects the flexible bottom and closes the valve port by raising the float valve against its seat. Any temperature above 190° instantly closes the valve port, but any below 190° causes the fluid to condense and the valve port to open. This action of the valve means that the heated

Another function of the float is to take care of any sudden charge of water within the radiator. The valve closes instantly against water leakage whenever water reaches it. When water in radiator drops away from valve, the siphon automatically discharges the water in the valve into the radiator without leakage, because the necessary replacing air flows into the valve through separate distinct channels as the water discharges.

The arrows in the sectional view show the direction of the flow of water through the siphon and the direction of the flow of air into the valve. Note that air entering the valve can not pass through the water in the float chamber, but must enter through channels provided for it. Note also that the outlets from these channels are above the water line in the float chamber and that, therefore, when the valve port opens, even though there is water in the valve, the air passes out through the valve port, perfectly dry. There is not the slightest spit. The valve closes tight without the slightest leakage as often as water comes against it, but opens instantly without the slightest leakage whenever water leaves it.



Exterior View      Sectional View  
NO. 1 HOFFMAN SIPHON AIR VALVE

**ADVANTAGES**—(1) The No. 1 Hoffman siphon air valve distinguishes perfectly and effectively between steam and air and between water and air. (2) Its air channels are separate from those provided for water. (3) It closes tight against steam or water, but freely vents all air from the radiator, whether the air is hot or cold.



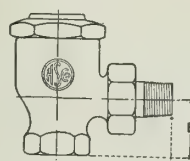
### The No. 8 Hoffman Return Line Valve.

**ADAPTABILITY**—This valve is for use on vapor, vapor vacuum, modulating and vacuum heating systems.

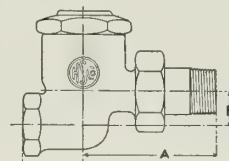
**DESCRIPTION**—The No. 8 Hoffman return line valve is automatic and non-adjustable. The sectional illustration below clearly shows that radical departure has been made in its mechanical design. The first, last, and only function of a thermostatic return line valve is to positively distinguish between steam, air and water, freely permitting the passage of air and water which may come to it, but stopping steam. In order to insure a free, unobstructed passage of air and water through the valve, it seems reasonable to contend that the valve movement or travel should be sufficient to provide a full opening of the port or passage through the valve when water or air comes to it. The Hoffman return line valve has a quarter of an inch travel of its port valve, which means a wide open unobstructed passage when the flood of condensation reaches the valve; thus minimizing the question of dirt lodging therein and interfering with its proper operation.

In order to get this movement thermostatically and at the same time preserve three vital essentials in a thermostatic return line valve, i. e., efficiency, durability and non-adjustability, three small thermostatic chambers (they are only 1 in. in diameter) with a phosphor bronze flexible diaphragm top and bottom of each chamber, making six diaphragms in all, are assembled in a cage. The three chambers are joined together in the center and are made practically into one thermostatic chamber, by having an opening through the center connections between the chambers. These chambers are then suspended from the top of the cage, the valve pin being rigidly attached to the bottom diaphragm. This method of construction insures not only that the thermostatic travel or movement of the chambers will be the total collective movement of the separate diaphragms, but also that the movement will be absolutely vertical; and the valve pin, being also guided by the bottom of the cage, insures the valve pin properly seating. The flat phosphor bronze spring shown on the top of the cage tends not only to hold the cage or container in its place, but also to relieve by spring tension any surplus thermostatic movement due to excess temperature.

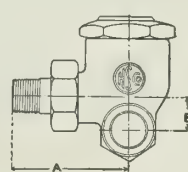
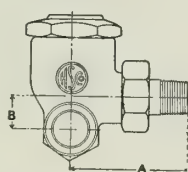
wide pressure range of operation, the No. 8 Hoffman is, therefore, not only the latest return line valve on the market, but is without a question the "very last word" in such valves.



No. 8 ANGLE



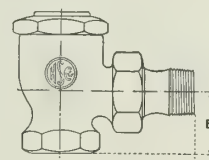
NO. 8 STRAIGHTWAY



NO. 8 RIGHT AND LEFT OFFSET

DATA, NOS. 8 AND 9 HOFFMAN RETURN LINE VALVES

Style	Size, ins.	Maximum capacity, sq. ft.	Dimensions, ins.		
			A	B	C
No. 8 angle.....	1/2	200	2 23/32	1	1 3/8
No. 8 straightway.....	1/2	200	2 23/32	1	1 3/8
No. 8 offset.....	1/2	200	2 23/32	1	1 3/8
No. 9 angle.....	3/4	600	3 1/2	1	1 3/8



NO. 9 ANGLE

**ADVANTAGES**—(1) The Hoffman return line valve is absolutely noiseless and positively distinguishes steam, air and water from one another. (2) It freely passes air and water, but prevents the passage of steam. (3) The valve is non-adjustable. (4) The thermostat parts are interchangeable and may be shifted from one valve to another without affecting the proper operation of the valve. (5) The valve operates at various pressures without adjustment; and because gas is the motive force, instead of a liquid, the valve is not harmed in any way, even at a temperature of 300° Fahrenheit.

**SIZES**—No. 8 Hoffman return line valves are made in 1/2-in. and 3/4-in. sizes only. The 1/2-in. valve is made in angle, straightway and right- or left-hand offset patterns. All 1/2-in. valves are designated as No. 8, because the 1/2-in. angle is the standard. When straightway or offset patterns are wanted, they should be specified. The 3/4-in. valve is designated as No. 9 and is made in the angle pattern only.

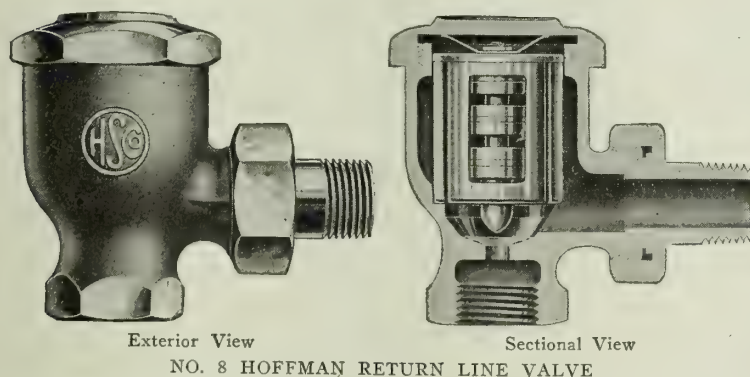
The standard port of all No. 8 (1/2-in.) valve has a 1/4-in. diameter. The standard port of the No. 9 (3/4-in.) valve has a 3/8-in. diameter.

**CAPACITIES**—The capacity of any return valve or trap is determined by the temperature and the pressure of the water at the valve. The capacity of the No. 8 (1/2-in.) valve is 200 sq. ft. of cast iron radiator surface. The capacity of the No. 9 (3/4-in.) valve is 600 sq. ft. of cast iron radiator surface.

To determine valve capacity for blast coils the condensing power of the coils should be calculated as four to six times greater than that of radiator cast iron service. The minimum outside temperature determines which factor should be used.

### The No. 2 Hoffman Siphon Air and Vacuum Valve.

**ADAPTABILITY**—This valve is designed for use on gravity vacuum systems.



Exterior View

Sectional View

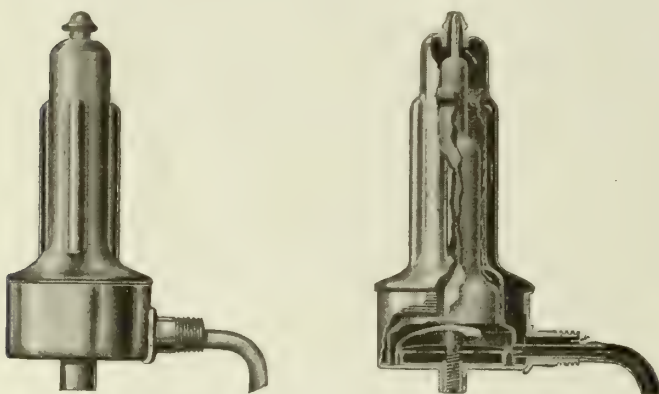
NO. 8 HOFFMAN RETURN LINE VALVE

The No. 8 Hoffman return line valve is absolutely non-adjustable. The thermostatic units are interchangeable, and may be shifted from one valve body to another without affecting the proper operation of the valve. The valve positively distinguishes between steam, water and air; freely passing the air and water, but stopping steam within a pressure range of 13 ins. of vacuum to 50 lbs. plus pressure. Because of its

**DESCRIPTION**—When a pressure of 6 oz. or more reaches this valve, it acts exactly as the No. 1 Hoffman siphon air valve does. The description of that valve is a description of all of this one except one thing—its vacuum feature.

The function of any air valve is to vent the air from the radiator when steam enters it, and then to close when steam fills it. The ordinary air valve, however, when steam pressure goes off and the steam in the radiator begins to cool and condense, opens and allows the air to return into the radiator. Since fuel is consumed to produce the pressure necessary to push the air from the radiator, it is a matter of common sense to keep it out after it has been expelled. The Hoffman siphon air and vacuum valve freely vents air from the radiator at a pressure of more than 6 oz., and automatically closes to prevent the emission of steam or water. *It also closes automatically to prevent the ingress of air through it into the radiator when the pressure goes off.*

**CONSTRUCTION AND OPERATION**—The sectional view shows that the outlet is normally closed, and that the float pin is held tight against its seat by the upward pressure of a small bronze diaphragm in the bottom of the valve. The port in the *bottom* of the valve leads to this diaphragm chamber and is always open, so that any pressure within the valve tends to deflect the diaphragm, the upward tension of which is so adjusted that only 6 oz. of pressure will deflect it. As the float follows the diaphragm downward the valve port in the *top* of the valve opens. Temperature has nothing to do with this function of the valve; pressure opens it, and lack of pressure closes it.



Exterior View  
Sectional View  
NO. 2 HOFFMAN SIPHON AIR AND VACUUM VALVE

**ADVANTAGES**—(1) The No. 2 Hoffman siphon air and vacuum valve, when cold, is normally closed, but opens as soon as a pressure of more than 6 oz. reaches it. (2) If water comes against it, it closes and prevents water leakage through the valve. (3) As soon as the water that has caused it to close drops away, it opens without spitting. (4) It closes instantly if steam reaches it. (5) If pressure goes off, the valve instantly and automatically closes against the ingress of air into the radiator through the valve. (6) It vents all air that is in the radiator, and does not let any air enter it. (7) It is absolutely automatic in all its functions.

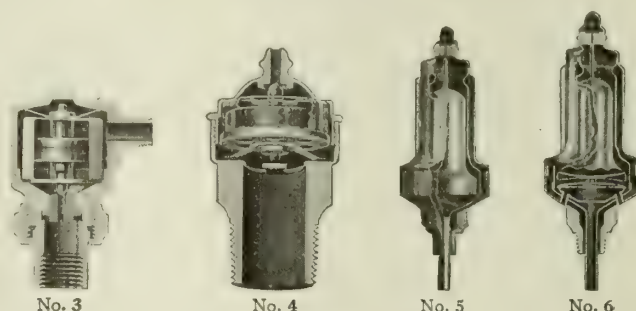
### Other Types of Valves.

**No. 3 HOFFMAN "AIR LINE" VALVE**—Designed for drip line or vacuum air line service. It vents *all* air, but automatically closes against steam. It has a  $\frac{1}{8}$ -in. male thread and a  $\frac{1}{4}$ -in. female thread.

**No. 4 HOFFMAN JUNIOR "QUICK VENT" AIR VALVE**—Designed for quick vent service *where water is not a factor*. The vent port has a  $\frac{1}{8}$ -in. diameter. This valve closes tight against steam emission, but *does not close against water*. It is threaded  $\frac{1}{4}$  in. and  $\frac{3}{4}$  in.

**No. 5 HOFFMAN "QUICK VENT FLOAT" AIR VALVE**—For quick vent service where it is desired to prevent the emission of either steam or water through the valve. This valve has  $\frac{1}{16}$ -in. vent port and is threaded  $\frac{3}{8}$  in.

**No. 6 HOFFMAN "QUICK VENT FLOAT" AIR AND VACUUM VALVE**—For quick vent service where it is desired to control or prevent the emission of either steam or water through the valve, and also to prevent the return of air to the stack or the line to which the valve is connected. It vents all air that comes to it. This valve has a  $\frac{1}{16}$ -in. vent port and is threaded  $\frac{3}{8}$  in. The vent port can be made of  $\frac{3}{16}$ -in. diameter when the pressure is not more than 3 lbs.



OTHER HOFFMAN VALVES

### The No. 10 Hoffman Vapor Valve.

**ADAPTABILITY**—This valve meets absolutely the demand for a large port automatic air valve in connection with vapor heating.

**DESCRIPTION**—The valve is made entirely of metal; is automatic, non-adjustable and thermostatic.

Diameter of air port is  $\frac{3}{4}$  in. and this is maintained through the valve. Hence there can be no back pressure in the air line due to restricted air port in connection with venting appliance.

The valve is equipped with large buoyant float which instantly closes the valve port in the possibility of water reaching the valve.

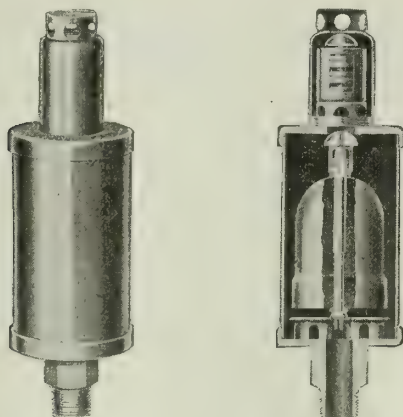
In the No. 10 Hoffman Vapor Valve is remedied the defect heretofore common to large port air valves in that the float, once raised to its seat by a flood of water, would remain there after the water receded. The cause of this is the force known as velocity head due to pressure. As long as pressure is maintained such a valve remains closed and there can be no further air relief from the system until there is a marked reduction in the pressure. This defect is fully and successfully remedied by equipping the float with a double port valve, the larger valve closing the  $\frac{3}{4}$ -in. port in the valve proper and the smaller valve closing the  $\frac{3}{16}$ -in. port which passes through the center of the  $\frac{3}{4}$ -in. valve. The  $\frac{3}{16}$ -in. port is normally always closed, the  $\frac{3}{4}$ -in. valve resting on top of the  $\frac{3}{16}$ -in. valve.

The thermostatic member of the valve surmounting the float chamber consists of three chambers, each chamber having on its top and bottom a special spring bronze flexible diaphragm so arranged that the collective thermostatic movement of the six diaphragms is im-



parted to the valve pin attached to the upper diaphragm. Sufficient movement is thus insured so that when steam reaches the valve the port is closed, thus preventing passage of steam through the valve.

The three thermostatic members are joined together in the center and are made theoretically into one thermostatic chamber but having an opening through the center connection between the chambers.



Exterior View      Sectional View  
NO. 10 HOFFMAN VAPOR VALVE

**OPERATION**—The valve when cold is always open for free passage of air; but as soon as steam reaches valve, the volatile fluid in the thermostatic chamber vaporizes, generating sufficient pressure to distend the flexible diaphragm on top and bottom of these chambers, thus pushing the valve pin to its seat, which closes the valve port tight to the passage of steam.

When water comes to the No. 10 Hoffman vapor valve, the float rises and closes the  $\frac{3}{4}$ -in. port, and the  $\frac{3}{16}$ -in. port being already closed, both float ports are closed by this float action against passage of water through valve. When water drops from valve, the float follows with receding water, instantly opening  $\frac{3}{16}$ -in. port, thus relieving air. Under pressure conditions, if not exceeding 1 lb., this relief permits the  $\frac{3}{4}$ -in. valve to drop and thereby restores valve to normal service conditions, i. e., the  $\frac{3}{4}$ -in. port again being open through the valve. In case pressure is over 1 lb. and does not exceed 5 lbs., the  $\frac{3}{16}$ -in. valve is operative and  $\frac{3}{16}$ -in. port is fully open, and due to higher pressure causing greater air velocity, this size port is ample to freely vent the system.

The No. 10 Hoffman Vapor Valve distinguishes positively between air, steam and water, freely venting the air no matter whether hot or cold, but instantly closing against passage of steam. It also closes tight against water leakage when water comes against the valve, but opens wide for free passage of air at pressures less than 1 lb. and opens its  $\frac{3}{16}$ -in. port the minute water drops away from it at pressures of 5 lbs. or less.

### Wide Distribution of Hoffman Valves.

Every jobber of steam heating and plumbing supplies in the United States and Canada is a Hoffman representative; and carries in stock most of the various patterns of Hoffman valves.

### Specification Information.

The information that follows is furnished by the HOFFMAN SPECIALTY CO. to guide architects in specifying Hoffman automatic vent and return line valves for various kinds of steam heating systems.

### Specification Data for Low Pressure One-pipe Gravity Steam Jobs (Open System).

**AUTOMATIC AIR VALVES**—Heating contractor to operate heating apparatus several days, using old automatics or pet cocks. At the beginning of test, prime boiler with 5 gals. of vinegar through safety valve opening. During this preliminary test, boiler should be blown off not less than 3 times under 10-lb. pressure. At the completion of this test, furnish and connect to each radiator in building one No. 1 Hoffman Siphon Air Valve. (This use of vinegar cuts or neutralizes oil and grease in system, preventing boiler from foaming; and by giving the Hoffman air valve a clean job, assures long and uninterrupted service on its part.)

**"QUICK VENT" VALVES**—Each return main, before it enters the boiler, must be equipped with one No. 4 Hoffman Junior "Quick Vent" Air Valve, in order to relieve the basement piping of all air.

*Note for Architects*—Should return main exceed 3 ins., it is strongly recommended that one No. 5 Hoffman "Quick Vent Float" Air Valve be used instead of No. 4 Hoffman Junior "Quick Vent" Valve.

### Specification Data for Vapor, Vapor Vacuum, Modulating and Vacuum Jobs.

**RETURN LINE VALVES**—Heating contractor to furnish and connect to each radiator in building one  $\frac{1}{2}$ -in. No. 8 Hoffman Return Line Valve for radiators of 200 sq. ft. or less. Where pipe coils exceed 200 sq. ft. of radiation, and where drips are employed to carry condensation from mains, one  $\frac{3}{4}$ -in. No. 9 Hoffman Return Line Valve to be used. Offset and straight-way valves to be installed wherever specified by architect. Before system is accepted as complete by architect, heating contractor must remove thermostats and operate system for at least 3 weeks without using interior part of valves. This insures an absolutely clean system. After this is done, thermostats must be replaced, and final test must be made in presence of architect or architect's representative.

*Note for Architect*—For vapor heating it is recommended that either the No. 5 Hoffman "Quick Vent Float" Air Valve or the No. 10 Hoffman Vapor Valve be used in connection with the Hoffman Return Line Valves, except on systems having over 1,000 sq. ft. of radiation, when the No. 10 Hoffman Vapor Valve should be used. Where vapor vacuum, vacuum or modulating systems are contemplated, specify No. 6 Hoffman "Quick Vent Float" Air and Vacuum Valve with  $\frac{1}{8}$ -in. port. One valve will accommodate approximately all air system up to 1,200 sq. ft. of radiation. For larger installations use one or more additional valves.

These quick vent and vapor valves are designed to vent all air from entire system without the use of any other venting devices.

### Specification Data for Low Pressure One-pipe Combination Pressure and Vacuum Steam Jobs (Closed System).

**AIR AND VACUUM VALVES**—Heating contractor to operate heating apparatus several days, using old automatics or pet cocks. At the beginning of test, prime boiler with 5 gals. of vinegar through safety valve opening. During this preliminary test, boiler should be blown off not less than three times under 10-lb. pressure. At the completion of this test, furnish and connect to each radiator in building one No. 2 Hoffman Siphon Air and Vacuum Valve. (This use of vinegar cuts or neutralizes oil and grease in system, preventing boiler from foaming; and by giving the Hoffman air and vacuum valve a clean job, assures long and uninterrupted service on its part.)

**"QUICK VENT" AIR AND VACUUM VALVES**—Each return main, before it enters boiler, to be equipped with one No. 6 Hoffman "Quick Vent Float" Air and Vacuum Valve to relieve basement piping of all air and insure a perfect and even distribution of vapor and steam throughout entire system.

*Note for Architects*—It is advisable to use packless radiator valves with this method of heating. They are not necessary, however, if the ordinary radiator valves are thoroughly packed. In order to get full and efficient service from the use of these valves, it is necessary that the system as a whole be made as near airtight as possible. This the heating contractor must see to. It is recommended that a compound pressure and vacuum gage be used to ascertain amount of vacuum on system.

# H. W. JOHNS-MANVILLE CO.

## Radiator and Steam Traps

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910

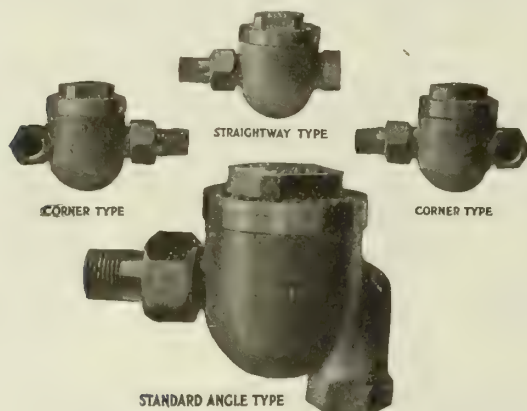
### Products.

JOHNS-MANVILLE RADIATOR and STEAM TRAPS for heating systems, power plant and general steam work.

For Acoustical Service and Waterproofing Materials, see page 36; for Asphalt Mastic Flooring, see page 331; for Roofing Material, see pages 402-05; for Asbestos Shingles, see pages 386-87; for Underground System of Pipe Insulation, see page 910; for Pipe and Boiler Insulation, see pages 1076-77.

### Johns-Manville Radiator Trap.

This device permits the free discharge of air and water from the radiator without loss of steam, whether system operates by gravity or vacuum. The action is direct; that is, it operates by water flowing to it from radiator rather than by the temperature of steam. This principle of operation accounts for the fact that capacity of the trap does not vary with variation of pressure and temperature. Made in bronze or bronze with plain nickel finish, and is very attractive in appearance.



TYPES OF JOHNS-MANVILLE RADIATOR TRAP

DIMENSIONS AND CAPACITIES, RADIATOR TRAP

Type	Pipe size, ins.	Pressure, range, lbs.	Lbs. water per hour	Sq. ft. radiation surface	Linear ft. 1-in. pipe
Standard Angle.	$\frac{1}{2}$ and $\frac{3}{4}$	0 to 10	80	250 or less	750
Straightway ...	$\frac{1}{2}$ and $\frac{3}{4}$	0 to 10	80	250 or less	750
Corner R or L.	$\frac{1}{2}$ only	0 to 10	80	250 or less	750

**PRINCIPLE OF OPERATION**—The principle of operation is the same for all types and models. There is just one moving part, a ball, which rises when water flows into the chamber and is held against the discharge bushing by an unbalanced pressure.

After water level reaches a point slightly above discharge orifice, the buoyant force of the water rolls the ball up and exposes a part or all of the discharge orifice, allowing free escape of water and air.

Should water discontinue to flow into trap, the ball settles back on the discharge orifice, and, with the water seal that is maintained, prevents steam leakage. The operation of trap is continuous, as it discharges as the water is received.



**ADVANTAGES**—The following qualities make this trap superior for all heating systems:

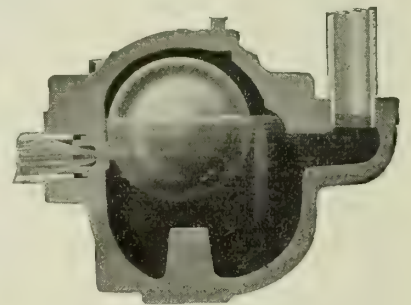
**Simplicity**—Nothing to get out of order, wear out or require replacement or repairs. **Nothing to adjust and therefore no need of tampering with any part of trap.** **Noiseless**—Nothing to vibrate, as ball is at all times surrounded by a cushion of water, steam and air. **No Steam Leakage**—A thin constant water seal prevents steam leakage. **Non-air Binding**—Free discharge of air as well as water permits rapid heating of radiator.

**CAPACITY**—This trap will take care of direct radiation up to 250 sq. ft. and any pressure up to 10 lbs. with either gravity or vacuum return line.

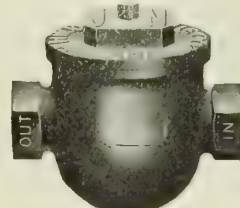
### Johns-Manville Steam Trap.

This trap is made for power plants and general use in sizes with connection from  $\frac{3}{4}$  in. to 2 ins., inclusive, and is similar in construction and principle to the Johns-Manville radiator traps.

The Johns-Manville Junior steam trap (suitable for pressures up to 100 lbs.) is especially adapted for cooking utensils, coffee urns, plate warmers, sterilizers, kettles, and various types of small machinery heated by steam where condensation does not exceed 250 lbs. per hour.

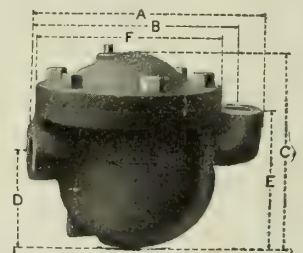


JOHNS-MANVILLE STEAM TRAP DISCHARGING



JOHNS - MANVILLE JUNIOR STEAM TRAP

Made with  $\frac{1}{2}$ -in. connections for higher pressure than radiator trap and has larger capacity. Body of cast bronze steam metal



DIMENSION DIAGRAM

DIMENSIONS AND CAPACITIES, JUNIOR MODELS

Trap bushing	Pipe size, ins.	Pressure range, lbs.	Lbs. water per hour	Sq. ft. radiation surface	Lin. ft. 1-in pipe
Low pressure....	$\frac{1}{2}$	1 to 10	250	750	2200
Medium pressure....	$\frac{1}{2}$	10 to 30	250	750	2200
High pressure....	$\frac{1}{2}$	30 to 100	250	750	2200

JOHNS-MANVILLE STEAM TRAP, CAST IRON (ANY PRESSURE)

No.	Pipe size, ins.	Lbs. water per hour	Sq. ft. radiation surface	Lin. ft. 1-in. pipe	A ins.	B ins.	C ins.	D ins.	E ins.	F ins.	Weight, lbs.
2	$\frac{3}{4}$	700	2000	6000	7 $\frac{3}{4}$	6 $\frac{3}{4}$	5 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5 $\frac{3}{4}$	14
3	1	1000	3000	9000	9 $\frac{3}{4}$	8 $\frac{3}{4}$	7 $\frac{3}{4}$	4	5 $\frac{1}{2}$	7 $\frac{1}{4}$	28
4	1 $\frac{1}{4}$	1700	5000	15000	12	10 $\frac{1}{2}$	9 $\frac{1}{4}$	4 $\frac{3}{4}$	6 $\frac{1}{2}$	9	44
5	1 $\frac{1}{2}$	3500	10000	30000	12 $\frac{1}{2}$	12	5 $\frac{3}{4}$	7 $\frac{1}{4}$	12		90
6	2	6000	18000	54000	13 $\frac{3}{4}$	Inlet Horiz. 13 $\frac{1}{2}$	6 $\frac{1}{4}$	7 $\frac{3}{4}$	13 $\frac{3}{4}$		130

\*To center.



# SARCO COMPANY, INC.

## Radiator Traps and Temperature Regulators

Woolworth Building  
NEW YORK, N. Y.

### BRANCH OFFICES

BUFFALO, Ellicott Square  
PHILADELPHIA, Drexel Building  
CHICAGO, Monadnock Block

DETROIT, New Telegraph Building  
MONTREAL, PEACOCK BROS.  
LYONS, FRANCE, RICHARDSON FRERES

REPRESENTATIVES IN ALL PRINCIPAL CITIES

### Products.

SARCO RADIATOR TRAPS for vapor, vacuum or low pressure heating systems; SARCO TEMPERATURE REGULATORS for liquids or air.

Sarco Steam Traps, for low and high pressure.

### Sarco Radiator Trap.

Designed for systems of heating, operating on vapor or vacuum; can be attached to return end of radiators or coils, at any angle; will operate in any position, and adapts itself to any location of return piping, thus eliminating extra cost of special fittings, or *special traps* having elbows cast integral with bodies and opening in different directions.

**CONSTRUCTION**—Few working parts; none to get out of order. In the body of the trap is a cartridge containing an easily expansible fluid which operates an inner corrugated tube, on lower end of which is attached a piston carrying the valve head. Contact between valve head and seat is a circular line, *not a surface*. No dirt can lodge at seat, to cause leakage. No levers, gauges, packing, stuffing boxes, etc.

**OPERATION**—After a simple adjustment, the spirally corrugated tube is automatically operated by the liquid expanding and contracting. When water collects, the operating liquid contracts, valve opens, and condensation is expelled into return line; then, entry of steam causes operating liquid to expand, and to force piston down, closing valve.

**ADVANTAGES**—Noiseless operation; self-cleaning; no air binding; no waterhammer; no freezing, because no water seals; no moving parts to corrode; no leakage of steam; can be set at any angle.

### Sarco Temperature Regulators.

For maintaining a constant temperature of liquids and atmosphere. Substantially constructed on same thermostatic principle as the radiator trap Sarco (above described), and steam traps Sarco (not illustrated or described, about which write for full particulars).

**OPERATION**—Slight increase in temperature of surrounding liquid or atmosphere expands operating fluid, producing a powerful hydraulic pressure tending to close valve; a decrease in temperature contracts fluid, and gradually opens valve.

Sarco regulators operate steam, water or gas valves.

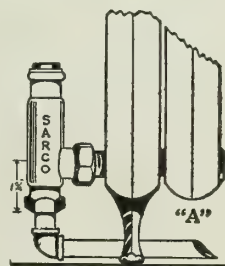
**USES**—They are being widely adopted and are suitable for public institutions, schools, hotels, breweries, packing houses, canning factories, bottle works, paper mills, gas condensers and producers, ammonia stills, etc.



Full View

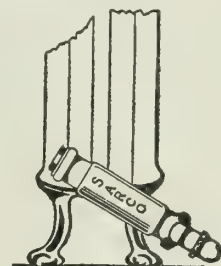


Trap and Cartridge Shown in Section  
THE RADIATOR TRAP SARCO



TRAP ATTACHED TO  
RADIATOR

Specially adapted for use where piping is above floor, on cement floors or where radiator has short legs



TRAP CONNECTED  
TO RADIATOR AT  
AN ANGLE

Works perfectly at any degree of angle

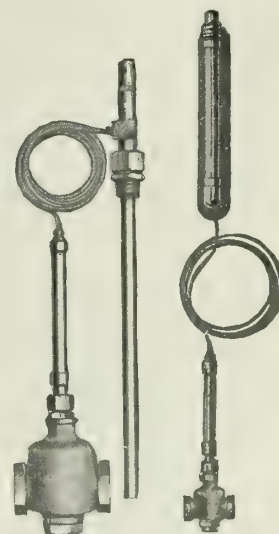
### DATA, RADIATOR TRAP SARCO

Size, ins.	Over all length, ins.	Center inlet to outlet, ins.	Center of valve to face inlet, ins.	Price
3/8	5 1/4	1 3/4	2 1/4	\$5.50
1/2	5 1/4	1 3/4	2 1/4	6.00
3/4	5 1/4	1 3/4	2 1/2	9.00

Apply for discounts.

### SARCO TYPE TR-21 REGULATOR, FOR LIQUIDS

Size, ins.	Weight, lbs.	Face to face of valve, ins.	Price
1/2	8	2 3/4	\$75.00
3/4	8	3 3/4	80.00
1	9	3 1/2	85.00
1 1/4	13	4 1/2	90.00
1 1/2	22	5	95.00
2	28	6	100.00
2 1/2	37	7 1/4	115.00
3	51	8 3/4	135.00
4	81	13 3/4	185.00
5	132	15 3/4	250.00
6	158	18	300.00



Type TR-21, for Tanks, etc.  
Type RR-7, for Rooms  
SARCO TEMPERATURE REGULATORS

### SARCO TYPE RR-7 REGULATOR, FOR ATMOSPHERE

Size of valve, ins.	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Price.....	\$40.00	45.00	50.00	60.00	70.00	90.00	110.00	130.00	170.00

# WARREN WEBSTER & COMPANY

The Webster Modulation and Vacuum Systems of Steam Heating; Feed Water Heaters and Heater-Meters; Steam and Oil Separators; Steam Specialties

ESTABLISHED 1888  
INCORPORATED 1895

MAIN OFFICE AND WORKS  
CAMDEN, N. J.

OFFICES AND REPRESENTATIVES  
IN THE PRINCIPAL CITIES

## Products.

We manufacture SPECIAL WEBSTER APPLIANCES for use in connection with THE WEBSTER VACUUM SYSTEM OF STEAM HEATING and THE WEBSTER MODULATION SYSTEM; THE WEBSTER FEED WATER HEATERS and HEATER-METERS; WEBSTER STEAM and OIL SEPARATORS.

## The Webster Modulation System.

The Webster Modulation System of Steam Heating insures the positive circulation and complete condensation of low pressure steam in a noiseless, 2-pipe system; the flexible control and close regulation of temperature; and the automatic removal of water and air. Send for complete catalogue M-35 for more details.

**ADVANTAGES**—The phlegmatic action of hot water systems and the lack of control of ordinary steam systems, which must be either "all on" or "all off," are entirely eliminated in the Webster Modulation System. A temperature of 80° need not be endured in order to avoid one of 50°. Open the Webster Modulation Valve for the amount of heat desired, and the system does the rest. There are no air valves opening into rooms and emitting ill smelling air, steam, or hot water; there is entire freedom from water hammer and from air binding.

**OPERATION**—Steam at low pressure is admitted to each radiator, the amount being controlled by a self-indicating Webster Modulation Valve.

By this one valve, located within easy reach at the top of each radiator (hot water type preferred), the effective area of the heating surface can be quickly changed and the temperature of the room perfectly modulated.

The Webster Sylphon Trap, which requires no adjustment, automatically ejects water and air from the radiator without permitting the escape of steam.

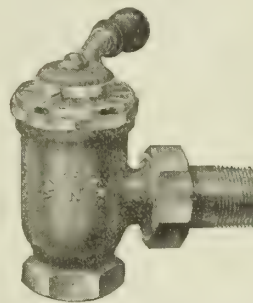
The instant steam is admitted to a radiator, the air is forced to the bottom of same and passes into the return main through a Webster Sylphon Trap, shown herewith in the No. 5 type.

The air is finally discharged into the atmosphere,

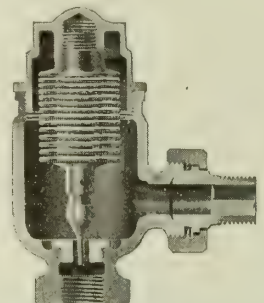
while the water of condensation is returned to the boiler by means of a Webster Modulation Vent Trap in the simpler systems, and by other methods of returning condensation to boilers in large or complex systems.

In the low pressure gravity modulation system, a Webster Damper Regulator, especially designed for this service, closely regulates the boiler draft according to the amount of steam pressure required.

The peculiar features of this system make possible the use of smaller piping than in ordinary hot water or steam systems. Less radiation may be used than with hot water heating.



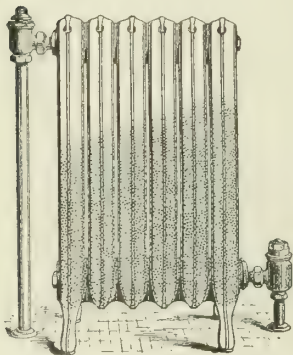
THE WEBSTER  
MODULATION VALVE  
Exterior view



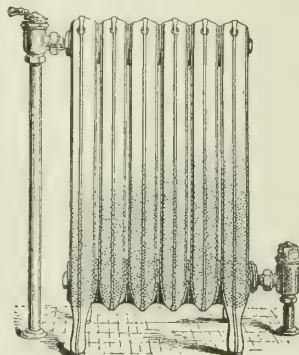
THE WEBSTER  
SYLPHON TRAP NO. 5  
Sectional view

**APPLICATION**—The same results can be obtained in small and medium sized buildings with the Webster Modulation System as with the Webster Vacuum System, without expensive accessories or a vacuum pump requiring relatively high steam pressure. It can be successfully installed and economically operated in any size building up to the point where the length of the runs makes it cheaper to "pull" by a vacuum pump than to "push" by increased initial pressure. When this limit is reached, the Webster Vacuum System becomes economically effective. The Webster Modulation System is so simple, that it is easily understood and operated by the average janitor or householder.

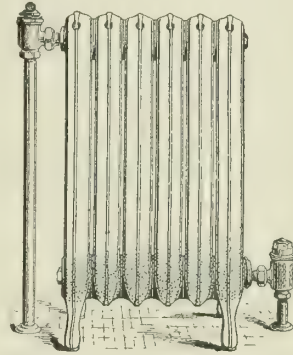
It should be remembered, however, that it is desirable and indeed imperative for certain large buildings or



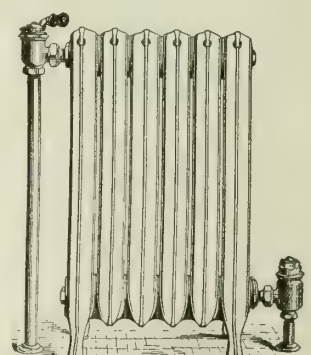
Showing Steam in Radiator  
When Webster Modulation Valve  
is About  $\frac{1}{4}$  Open



Showing Steam in Radiator  
When Webster Modulation Valve  
is About  $\frac{1}{2}$  Open



Showing Steam in Radiator  
When Webster Modulation Valve  
is About  $\frac{3}{4}$  Open



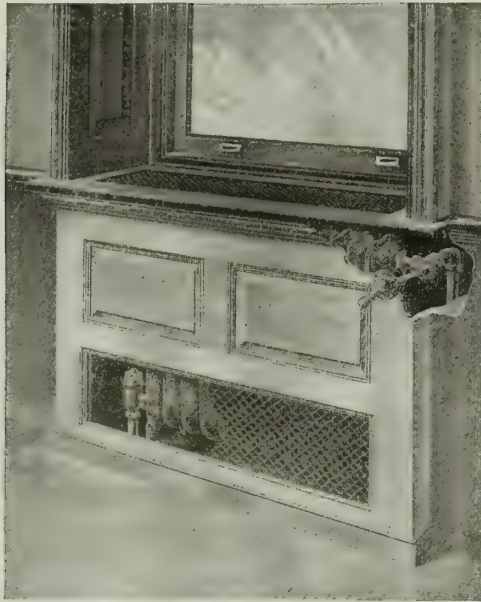
Showing Steam in Radiator  
When Webster Modulation Valve  
is Full Open

APPLICATION OF THE WEBSTER MODULATION FEATURE



groups of buildings to use the Webster Vacuum System features in connection with the Webster Modulation System.

**THE WEBSTER MODULATION FEATURES**—The Webster modulation feature is applicable to vacuum systems, to gravity "open return line" systems and to systems equipped with automatic return water apparatus; and where applied results in marked increase in economy and in comfort.



THE WEBSTER MODULATION VALVE WITH EXTENDED STEM  
Showing application to radiator behind grill. The Webster Syphon Trap on return end of radiator automatically removes air and water of condensation

### The Webster Vacuum System.

The Webster Vacuum System is applicable to nearly all classes of buildings, but is particularly adapted to the large building or group of buildings. While it is used principally in connection with exhaust steam plants, it is used also on live steam installations and assures perfect steam distribution, with maximum radiator efficiency, through mains over 1,000 ft. long. With this system little or no back pressure is placed on the engines, no air valves are required, and by means of Webster methods and appliances, the condensation is saved, pumped, and used for boiler feed purposes.

For central plants heating scattered buildings, the Webster Vacuum System with Hy-Lo apparatus is used. This arrangement "balances the vacuum," securing uniform distribution of steam in the several buildings. Any predetermined degree of vacuum can be maintained automatically in each building or subdivision of an extensive group.

We make several types of water and air relief traps for allowing air and water removal from radiators, coils, blast sections, etc. Experience has taught us that no one type of trap is adaptable to every condition.

When a Webster System is contracted for, we furnish such Webster appliances as are necessary to secure the best results.

**THE WEBSTER SYLPHON TRAP**—This trap, shown on the preceding page, contains a most flexible thermostatic member of the all-metal bellows construction, and has great lift off the seat, permitting dirt that would lodge in most traps to pass through the port. Tested and adjusted at the factory, it needs no adjustment after it is installed. It is good for widely varying pressures,

permitting all air and water to pass into the return, while tight against steam leakage.

A copy of our new Vacuum System Catalogue V-35, sent upon request.

**THE WEBSTER NUMBER SEVEN TRAP**—This is another of our return line traps and has a double metal diaphragm thermostatic member. While it does not contain the refinements found in the Webster Syphon Trap it is superior in many respects to any other trap on the market intended for the same purpose.

**THE WEBSTER WATER SEAL TRAP**—This trap is of the float or differential type and has great water capacity. When properly applied and operated, permits the removal of air and water from factory coils, blast sections and other heavy drainage points.

There are conditions where one of our other types of traps is preferable, however, and we prefer to have the selection of the trap to be used left to our engineers.

### Engineering Service.

Our engineering department, with an experience of 30 years in this field of engineering, is maintained for the purpose of consulting and co-operating with engineers, architects, contractors, steam fitters and owners, concerning the installation and operation of Webster Systems of Steam Heating and the Webster Appliances, exactly suited to buildings of any size, for any use, and grouped in any number. The unsatisfactory operation of many old heating systems has been overcome by the Webster method of securing proper circulation and flexible control. We are not contractors, but we give general supervision to every Webster installation.

This service is a part of every Webster System contract and is available through our network of branch offices in the principal cities of the United States and Canada. We also have representatives in foreign countries.

### Guarantee.

Every Webster System, when operated as we direct, is guaranteed as to proper circulation of steam and freedom from water hammer and air binding. All Webster Appliances are guaranteed as to workmanship and material.

### The Webster Feed Water Heaters.

For a building having its own power plant, the Webster Feed Water Heater is a coal saver. It works practically automatically, taking exhaust steam from the engine as its heating medium, bringing up to a high temperature the water to be used in the boiler.

**ADVANTAGES**—By utilizing the latent heat in the steam exhausted from the engine, a source of heat is used which costs nothing for fuel. The operation of this heater reduces the amount of work which the boiler has to perform, and decreases fuel consumption in the same ratio (14% to 17%). This reduction is the work of heating all the water passed through the system from the temperature of the main, to the temperature at which the water enters the boiler.

The Webster Feed Water Heater of the open type, as shown on following page, combines the functions of heater, oil separator and receiver for returns from the heating system. It thus makes a separate tank unnecessary. It may be so arranged as to operate automatically by means of a float, thus controlling either the discharge of hot water from the heater into the boiler, or the entry of cold water from the main into the heater.



By separating oil and other impurities from the water, the Webster Feed Water Heater keeps these substances from entering the boiler, thereby keeping cleaner boiler surfaces, and preventing the formation of deposits in the boiler tubes, with resultant loss of heating efficiency. The "vacuum" construction of this heater decreases back pressure on the engine, thus obtaining economies in steam consumption otherwise impossible in a non-condensing plant.

With cast iron shell and copper trays, this heater has the maximum of durability. The use of copper makes its heating efficiency the very highest which can be obtained.

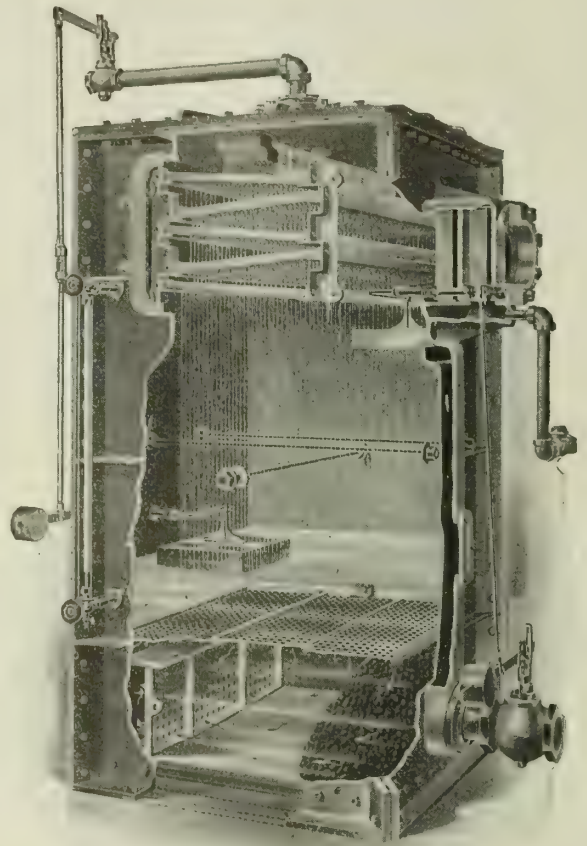
The Webster Feed Water Heater is used extensively in hotels, factories and other buildings having their own power generating stations, as well as in electric light, power, railway, gas, water and other plants.

The "preference cut-out type" of the Webster Feed Water Heater is especially designed for use in connection with any kind of heating or drying system which may be operated at, above or below atmospheric pressure.

This special type includes an extra large oil separator for purifying from oil all of the available exhaust steam used in the heating or drying system as well as in the heater. A simple cut-out valve is provided for cutting the heater "out of service" for inspection or for cleaning without affecting the flow of the exhaust to the heating system.

For detailed information, write for catalogue F-35.  
Write for information on Webster Heater-Meters.

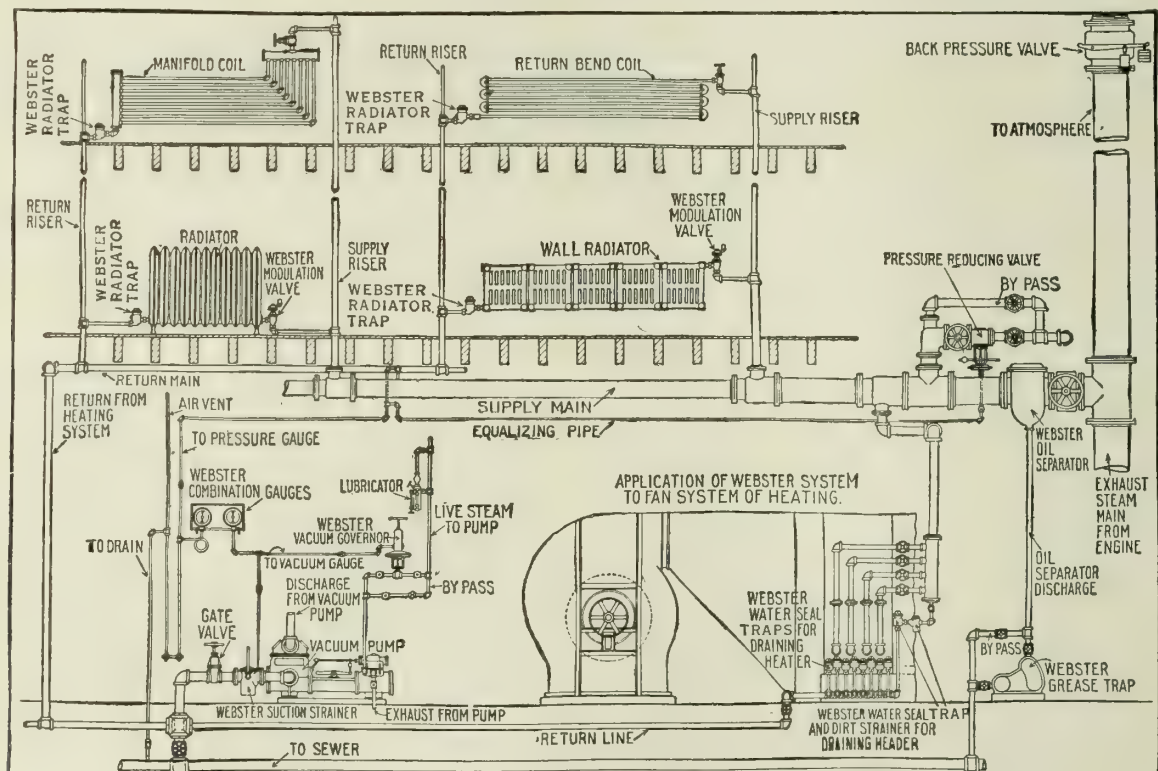
Ask for catalogue S-35, giving complete information regarding Webster Steam and Oil Separators.



THE WEBSTER OPEN FEED WATER HEATER, CLASS "EB"  
Interior view, showing principles of operation

### Webster Steam and Oil Separators.

The Webster Separators comprise a complete line of apparatus for separating water and oil from steam, air or other gases or vapors. They are designed for installation in either horizontal or vertical pipe, or for angular flow, for all pressures. Manufactured of cast iron, steel or special materials.



GENERAL ARRANGEMENT OF THE WEBSTER VACUUM SYSTEM OF STEAM HEATING



# THE BEATON & CORBIN MFG. CO.

## Manufacturers of Floor and Ceiling Plates

### SOUTHINGTON, CONN.

#### GENERAL REPRESENTATIVE, CHARLES G. BODLEY

#### REPRESENTATIVES

NEW YORK, N. Y., MONTE F. JACOBS, 19 Liberty Street  
CHICAGO, ILL., H. LUDWIG, 30 West Lake Street

PACIFIC COAST, C. ERWIN GILCHRIST, San Francisco, Cal.  
CANADIAN, W. H. CUNNINGHAM, Toronto, Ont.

### Products.

B. & C. FLOOR and CEILING PLATES; ADJUSTO FLOOR SLEEVES; AUTOMATIC AIR VALVES.

### B. & C. Floor and Ceiling Plates.

Made of gray iron, cold rolled steel, sheet and cast brass. They are the most practical plates made; can be put on after the work is



finished, and can be secured permanently in position.

### Finishes.

B. & C. plates are furnished in black, nickelplate and brass. Nickelplated plates are all coppered before nickeling.

For details of finish, see list price below.

### LIST PRICE OF FLOOR AND CEILING PLATES

Nos. 1, 2 AND 7

Size, ins.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Black	\$ .15	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30	\$ .50	\$ .65	
N. P.	.26	.27	.28	.32	.35	.38	.45	.65	.80	
C. B.	1.00	1.00	1.20	1.30	1.60	1.80	2.00	2.50	3.00	

Nos. 3 AND 6

Size, ins.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Black	\$ .14	\$ .15	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30	\$ .50	\$ .65
N. P.	.25	.26	.27	.28	.32	.35	.38	.45	.65	.80
C. B.	1.00	1.00	1.00	1.20	1.30	1.60	1.80	2.00	2.50	3.00

Size, ins.	3 1/2	4	4 1/2	5	6	7	8	9	10	
Black	\$ .80	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00	\$2.25	\$2.50	\$2.75	
N. P.	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	
C. B.	4.00	5.00	6.00	7.00	9.00	10.00	12.00	14.00	16.00	

No. 4

Size, ins.	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Black	\$ .10	\$ .10	\$ .13	\$ .15	\$ .16	\$ .20								
N. P.	.20	.20	.23	.26	.28	.30								
P. or N. P. B.	.80	.80	1.00	1.10	1.10	1.45								

No. 5

Black	\$ .12	\$ .12	\$ .15	\$ .18	\$ .20	\$ .24								
N. P.	.22	.22	.25	.28	.30	.33								
P. or N. P. B.	.95	.95	1.10	1.15	1.25	1.50								

No. 8

N. P. Iron	\$ .28	\$ .30	\$ .32	\$ .35	\$ .40	\$ .45	\$ .50							
P. or N. P. B.	1.10	1.20	1.30	1.40	1.80	2.00	2.20							

No. 9

Black	\$ .15	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30	\$ .50	\$ .65					
N. P.	.26	.27	.28	.32	.35	.38	.45	.65	.80					
S. B.	.60	.62	.65	.72	.80	.85	1.00	1.50	1.80					

No. 10

Black	\$ .15	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30	\$ .50	\$ .65	\$ .80	\$1.00			
N. P.	.26	.27	.28	.32	.35	.38	.45	.65	.80	1.00	1.25			
S. B.	.60	.62	.65	.72	.80	.85	1.00	1.50	1.80	2.25	2.75			

No. 12

Black	\$ .32	\$ .34	\$ .40	\$ .44										
N. P.	.54	.56	.64	.70										
S. B.	1.24	1.30	1.44	1.60										

Nos. 13 AND 15

Black	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30								
N. P.	.27	.28	.32	.35	.38	.45								
S. B.	.62	.65	.72	.80	.85	1.00								

Nos. 16 AND 17

Black	\$ .08	\$ .09	\$ .10	\$ .11	\$ .12	\$ .13								
N. P.	.12	.13	.14	.15	.16	.17								
P. or N. P. B.	.17	.18	.20	.23	.25	.30								

No. 40

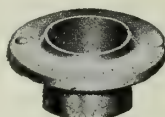
Black	\$ .16	\$ .17	\$ .20	\$ .22	\$ .25	\$ .30	\$ .50	\$ .65	\$ .80	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00
N. P.	.27	.28	.32	.35	.38	.45	.65	.80	1.00	1.25	1.50	1.75	2.00	
C. B.	1.00	1.20	1.30	1.60	1.80	2.00	2.50	3.00	4.00	5.00	6.00	7.00	9.00	

Discounts upon application.

N. P.—Nickelplated; C. B.—Cast Brass; S. B.—Sheet Brass; P. or N. P. B.—Polished or Nickelplated Brass.



No. 1. HINGED CEILING PLATE WITH COLLAR



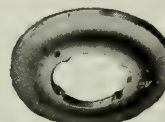
No. 2. HINGED FLOOR PLATE WITH COLLAR



No. 3. COMBINATION FLOOR AND CEILING PLATE WITH SET SCREW AND SNAP LOCK CATCH



No. 4. SOLID CAST IRON FLOOR PLATE



No. 5. SOLID CEILING PLATE WITH SET SCREW  
May be used both at floor and ceiling



No. 6. FLOOR PLATE  
Especially adapted for radiator plate



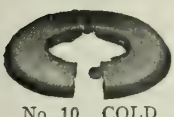
No. 7. COMBINATION FLOOR AND CEILING PLATE



No. 8. PLUMBERS' PLATE



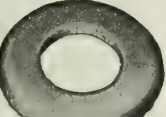
No. 9. SNAPLOCK COLD ROLLED STEEL, HINGED FLOOR AND CEILING PLATE



No. 10. COLD ROLLED STEEL COMBINATION FLOOR AND CEILING PLATE



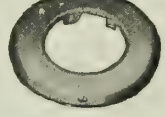
No. 12. DOUBLE COMBINATION FLOOR AND CEILING PLATE  
For twin connections where single plates can not be used



No. 13. COLD ROLLED STEEL COMBINATION FLOOR AND CEILING PLATE WITH SET SCREW



No. 15. COLD ROLLED STEEL COMBINATION PLATE WITH NARROW FLANGE  
Especially adapted for twin connection work

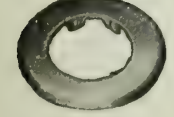


No. 16. COLD ROLLED STEEL SOLID CEILING PLATE  
Narrow flange. Especially adapted for twin connection work



ADJUSTO SLEEVES AND PLATE

No. 1, adjustable from 10 to 16 ins.; No. 2, from 14 to 24 ins.; also in shorter lengths. Made of galvanized iron. Plates in sizes from 1/2 in. to 2 ins.



No. 17. COLD ROLLED STEEL SOLID FLOOR PLATE  
Narrow flange for twin connections



No. 40. COMBINATION 2-PIECE FLOOR AND CEILING PLATE

### No. 1 Automatic Air Valve.

Made from the best brass, with cast brass base, screwed and soldered on, and equipped with high grade carbon. All valves are tested before leaving the factory and are guaranteed.



No. 1. AUTOMATIC AIR VALVE

# HUMIRAD COMPANY, INC.

## Manufacturers of Air Conditioning Apparatus

15-17 East 40th Street  
NEW YORK, N. Y.

### Products.

HUMIRADS (Patented) for Air Moistening and Air Conditioning.

### Adaptability.

For furnishing humidity (evaporated vapor), in proper determined degrees, to the dry, heated, indoor atmosphere of residences, schools, industrial plants, hospitals and other places where steam or hot water boilers have been installed for heating purposes, including vapor heat.

### The Humirad.

An air moistener, made of iron, which comprises a receptacle for holding water (see illustrations), with a heating member therein having end chambers and connecting conduits that heat and evaporate the water, diffusing the created vapor into surrounding interior atmosphere.

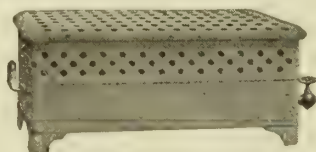


FIG. 1. THE HUMIRAD  
Exterior view of Type 1

TWO TYPES—(1) A receptacle having 2 end heating chambers with connecting conduits, and with perforated top (Figs. 1 and 2). (2) A receptacle with heating chambers, etc., as in Figs. 1 and 2 and with additional radiator top, to increase heating area and evaporating capacity (Fig. 3).

HEAT AND WATER CONNECTIONS FOR BOTH TYPES—Heating member is connected with main heat supply pipe (steam, vapor or hot water) in same manner as a radiator; receptacle is provided with an automatic water feed connected with main water supply pipe; valves on both pipes may be closed during non-operation of Humirad (spring, summer or at any time); or valve of water supply may be shut off and heat supply valve left open, to give off heat like a radiator, without moisture, as desired.

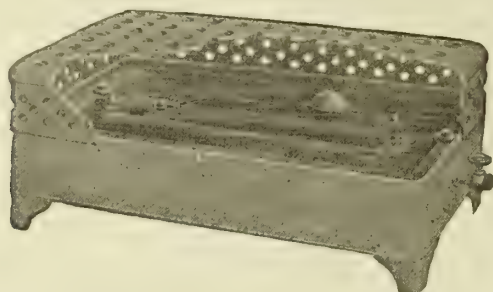


FIG. 2. THE HUMIRAD (PATENTED)  
Showing inner construction of Type 1

LOCATION OF HUMIRAD—In casing of indirect stack in cellar; or suspended from ceiling in cellar, vapor to come up under radiator on first floor; or in same room containing radiator, Humirad being either exposed or enclosed within a casing with grille top (to let out vapor).

### Humidity.

Outdoor atmosphere absorbs and contains vapor of water—humidity—in increasing quantities as the temperature rises; the vapor is supplied by rain and by absorption from bodies of water, etc., giving the natural, healthful and comfortable air in which we breathe. *Nature holds and diffuses heat in the atmosphere by means of humidity; aqueous vapor holds at night the heat given off by the sun in daytime;* dry air, on the contrary, does not hold heat, as evidenced by warm days and cold nights over sandy deserts—heat escapes in dry air anywhere, requiring more fuel; so, in confined, dry-heated rooms, schools, plants, etc., humidity is an absolute necessity not only to retain heat but also to improve the general health and comfort of the inmates by use of nature's saturated air.

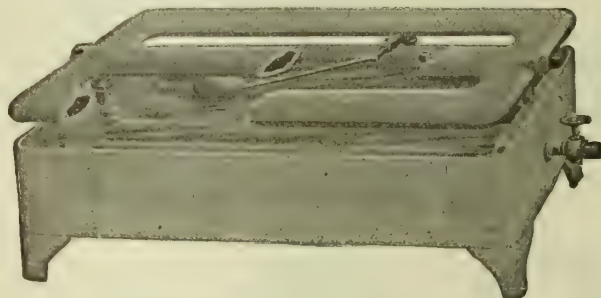


FIG. 3. THE HUMIRAD (PATENTED)  
Showing inner construction and radiator top.  
Each Humirad (both types) maintains 45% humidity for a small building. Size of each: 19½ ins. long; 8½ ins. wide; 12 ins. high. Capacity of each: 3½ gals. of water evaporated into atmosphere during daytime and evening

INJURIOUS EFFECTS OF DRY AIR OR LOW HUMIDITY IN HEATED HOUSES—(a) It affects the skin; mucous membranes of the mouth, throat, lungs and nose; moist surfaces of eye and ear; thus reducing resistance to infection by the bacteria of tuberculosis, bronchitis, catarrh and pneumonia. (b) Increase of dust in air, carrying bacteria, etc. (c) Irritation of nervous system, producing nervous tension in healthy persons. (d) Dry air attacks, dries out and shrinks house woodwork, trim and furniture, musical instruments, house plants, etc.

### Economy and Health.

The use of a Humirad accomplishes the following beneficial results: (1) Large amount of coal saved. (2) Health improved. (3) Comfort assured. (4) No fine dust, carrying germs. (5) Catarrh, pneumonia, bronchitis, etc., guarded against. (6) Furniture and woodwork in house protected. (7) A Humirad can be efficiently used with steam, vapor or hot water heating.

### Price.

Steam pattern, \$40.00. Hot water and vapor pattern, \$50.00. Both prices f. o. b. New York.

### References.

School laws, providing for humidity, are now enacted in nearly every State in the Union. Names of individual users sent on request.



# THE FULTON COMPANY

Manufacturers of Automatic Temperature Controlling Radiator Covers

KNOXVILLE, TENN.

NEW YORK OFFICE: 141 Broadway  
AGENTS IN ALL PRINCIPAL CITIES

## Products.

A combined RADIATOR COVER and AUTOMATIC ROOM TEMPERATURE CONTROL, known as THE JA-NAR.

Also other Sylphon Devices for automatic thermostatic control, for diaphragm-operated and packless valves and other purposes.

## Description and Purpose.

The Ja-Nar is a heat insulated, cabinetlike radiator cover containing a complete automatic, heat controlling mechanism. It is made of furniture steel, finished in baked enamel to imitate woods of different kinds, and can be placed over any radiator that stands on the floor.

Its two-fold purpose is, to conceal the radiator with a handsome cabinet to match the furniture or trim, and to maintain a uniform room temperature.

## Principle and Operation.

The Ja-Nar is automatically operated and controlled by the Sylphon thermostat or regitherm—a patented device favorably known for years to all heating engineers (Fig. 1). A dial under the lid of The Ja-Nar is set at the desired temperature, and regulates the action of the Sylphon. The cut-away illustration (Fig. 2) shows the position of the radiator when covered by The Ja-Nar. The rear view, back removed (Fig. 3), shows position of Sylphon regitherm in its heat insulated compartment, also the louvers which it controls, and which in turn, by opening and closing, allow the heat to escape, or shut it off.

Air enters the cover at the floor, rises and passes around the radiator sections and goes out heated through the louvers located in the front behind the grill.

The circulation of the air at room temperature enters the side grill (shown in the end views on following page), passes over the Sylphon regitherm and causes it to

*The Ja-Nar*

*Sylphon*

TRADE-MARKS

open or close the louvers, thereby keeping the temperature of the room uniform—at the degree indicated by the dial.

## Advantages.

The installation of Ja-Nars makes it possible to automatically maintain different fixed temperatures in different rooms.

The Ja-Nar requires no supplementary devices, pumps or connections. It can be used in rooms where temperature regulation is desired without affecting any other part of the heating system. It can be used on any radiator, old or new, with either steam, vapor or hot water system.

The Ja-Nar improves the appearance of any room and hides the unsightly radiator. It is noiseless in operation.

The Ja-Nar does away with charred dust which arises from an exposed radiator and discolors walls and soils hangings.

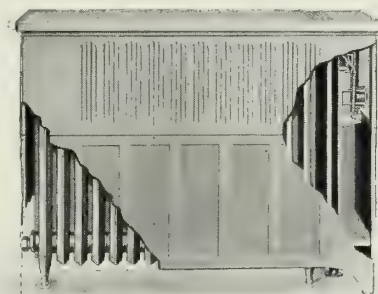


FIG. 2. CUT-AWAY VIEW OF JA-NAR PLACED OVER RADIATOR

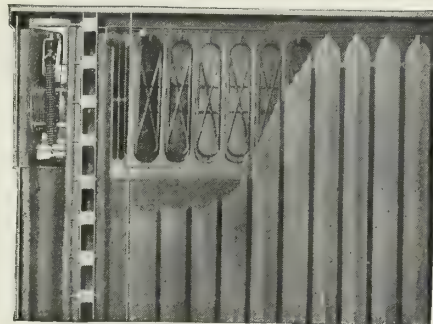


FIG. 3. JA-NAR FROM REAR, BACK REMOVED, RADIATOR CUT AWAY  
Showing louvers, the levers which operate them and the Sylphon thermostat in its separate chamber

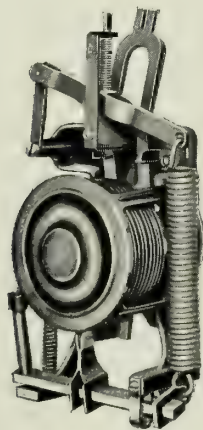
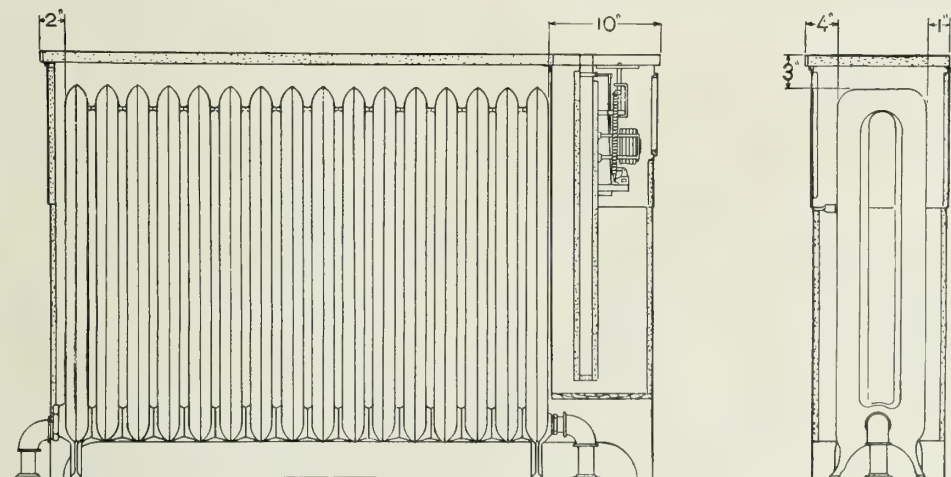


FIG. 1. THE SYLPHON THERMOSTAT



DIMENSION DIAGRAM SHOWING CLEARANCES REQUIRED FOR INSTALLING JA-NAR

NOTE—End containing Sylphon regitherm must not be placed against wall or partition



THE JA-NAR (MAHOGANY FINISH)



End View (Right)



THE JA-NAR (ENAMEL FINISH)



End View (Right)



End View (Left)



THE JA-NAR (ENGLISH OAK FINISH)

### Finishes.

Hard baked enamel. Hard to scratch and easily cleaned, being unaffected by soap, water or oil.

Standard finishes, mahogany, English oak, walnut, and white or tinted enamel.

Special finishes at slight extra cost.

### Installation.

The Ja-Nar is self-contained. No pipes required; no clockwork, batteries, wires, air piping, motors. No tearing out of floors, walls, etc. It is simply placed over the radiator.

It is not applicable to radiators of wall, ventilating or indirect cast iron base type.

### Catalogue and Price List.

A complete catalogue, beautifully illustrated and printed in colors, together with price list and measurement blank, will be sent free on request.

#### PRICE LIST

RADIATOR			
Length over all, inches.	Height, inches.		
	20 22 23	26 32	38 45
12 to 17	\$36	\$38	\$42
18 to 23	38	40	44
24 to 29	40	42	46
30 to 35	42	44	48
36 to 47	44	46	52
48 to 59	46	48	56
60 to 71	48	50	60
72 to 83	52	54	64
84 to 96	56	58	68

### How to Specify.

All radiators indicated on plans shall be fitted with The Ja-Nar, a combination heat control and radiator cover as manufactured by THE FULTON COMPANY of Knoxville, Tenn.

Each Ja-Nar shall be finished as indicated for each room..... (give finish in mahogany, walnut, English oak, or white or colored enamel, or special finish, as desired, for each Ja-Nar in each room).

The size of each Ja-Nar shall be as indicated..... (See dimension diagram on preceding page. Valves should be entirely open when measured.)



# MOLINE HEAT

Heating and Ventilating Engineers

MOLINE, ILL.

## Products.

THE MOLINE SYSTEM of HEATING and VENTILATION, for school buildings, etc.

## Description.

The Moline system of heating and ventilation consists of two direct connected, motor driven fans mounted above an especially designed steam or hot water radiator. Radiator, fans and also a water pan are contained in a neat appearing enclosure which can be finished to match the surrounding decorations.

The air is taken directly from the outside (or from the room), is passed over a heated radiator and water pan, and blown at high velocity toward the ceiling, where the air is immediately diffused to all parts of the room.

## Advantages.

This unit is especially adaptable for the ventilation of public school buildings on account of its many advantages as follows:

**INDIVIDUAL CONTROL**—Each schoolroom has its own ventilating unit installed directly in the room. By means of an electric rheostat control, the unit can be adjusted to deliver only the requisite amount of air for the number of pupils enrolled. The operation can be discontinued when a room is not in use without affecting the ventilation of any other room.

**THE MOLINE UNIT VERSUS DUCT SYSTEMS**—In this unit no long supply ducts which collect dust and dirt are required. The air is taken directly into the machine, is cleaned, humidified and delivered directly into the room. There are no ducts to convey the air supply, with a consequent saving of building space and lower cost of building construction. No power is required to drive air through an entire system to ventilate one room. Space in basement required ordinarily for a duct



THE UNIT SHOWING AUTOMATIC TEMPERATURE CONTROL

system is available for other purposes, or, if desired, building can be built with basement other than that required for the steam boiler.

## Adaptability.

In addition to the ventilation of schools the unit is especially adaptable for the ventilation of hospitals, churches, theaters, offices and all buildings requiring positive ventilation.

**FOR OLD BUILDINGS**—This unit can be readily adapted to any existing direct heating system, the only requirements being suitable steam or hot water and electrical connections.

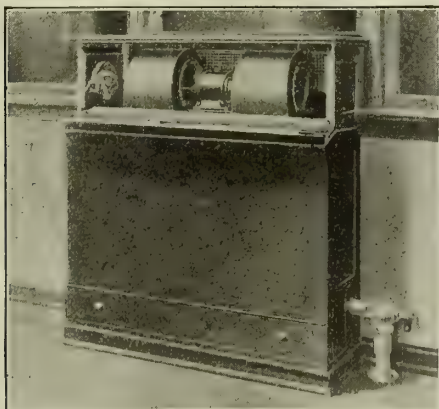
## How Furnished.

The unit is furnished complete in every particular and ready to install.

In ordering, complete information should be furnished, stating the cubical contents and the number of occupants of the room to be ventilated.

## Services.

Correspondence relating to ventilating problems is solicited. Complete data in answer to any inquiries received will be submitted.



UNIT SHOWING BLOWER COMPARTMENT OPEN



INSTALLATION OF FOUR HEATING AND VENTILATING UNITS  
IN ACADEMIC SCHOOL ROOM  
This room seats 175 pupils

# ATLAS VALVE COMPANY

## Automatic Pressure and Temperature Regulating Devices

MAIN OFFICE AND FACTORY

282-286 South Street  
NEWARK, N. J.

SALES OFFICES, NEW YORK, N. Y., 90 West Street

### Products.

PRESSURE REDUCING and REGULATING VALVES; PUMP GOVERNOR and FAN ENGINE REGULATORS; FLOAT VALVES.

"VICTOR" HOT WATER TANK REGULATORS; DAMPER REGULATORS; DIAPHRAGM VALVES.

Hot Water Draft Regulators, Industrial Temperature Regulators, Thermostats and Humidity Regulators.

### Operation of Type A Valves.

The regulator is one of that type known as auxiliary-operated, that is, the opening of the main valve is controlled by an auxiliary or secondary valve. Normally, the main valve is held closed by a spring of just sufficient strength to overcome the weight of the clapper (main valve), and the auxiliary valve is always "open" until closed by pressure on the diaphragm overcoming the power of the adjusting spring. When steam is admitted it passes through the port on the inlet side of regulator into the auxiliary valve chamber and thence to top of controlling piston, which, being of larger area than the main valve, forces the latter open and permits steam to pass to outlet or low pressure side of regulator.

### "Atlas" Pressure Reducing Valve, Type A.

This valve works on the same principle as shown in the sectional cut. A reduction from 250 lbs. to atmospheric pressure or into a vacuum can be made with a variation not exceeding 1 lb. on the delivery side. The initial pressure, however, can vary to within 10 lbs.

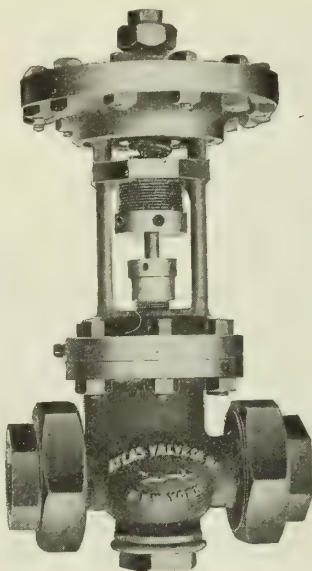
To install, run a 1/4-in. pipe from top of valve to the point where the low pressure is needed.

DATA, TYPE A PRESSURE REDUCING VALVES

Size, ins.	Face-to-face length, ins.	Diameter of flanges, ins.	Shipping weight, lbs.
1 1/2	6 1/4	Screwed	23
2	6 1/4	"	23
2 1/2	7	"	28
3	7 1/4	"	31
3 1/2	7 3/8	"	35
4	9 1/4	"	46
4 1/2	10	7 1/2	100
5	10	8 1/4	121
5 1/2	11	9	150
6	12 1/2	10	185
	12 1/2	10 1/2	195
	15	11	250
	17	12 1/2	325

1/2 to 2 ins. inclusive, all-bronze—extra heavy union connections.  
2 1/2 ins. and over, iron body—bronze mounted—extra heavy flanged. All flanges shipped blank, when so ordered will be drilled extra heavy standard without charge.

For superheated steam, furnished with steel bodies and renewable seats. All valves guaranteed for 250 lbs. pressure.



TYPE A "ATLAS" PRESSURE REDUCING VALVE

### "Atlas" Pump Governor, Type A.

A sectional view of this governor is shown. It is guaranteed for all classes of service, and is especially recommended for elevator pumps and for high discharge pressures.

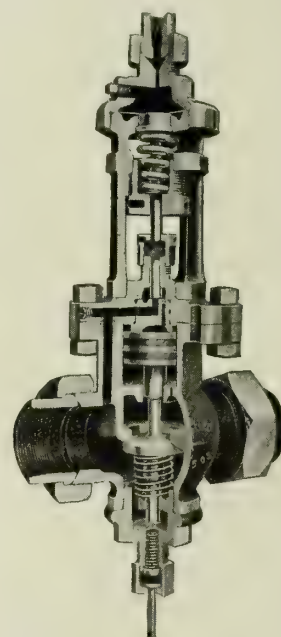
For boiler feed pumps the same valve is used, but a special top is furnished to guard against pump pulsations and prevent hammering on the diaphragm.

The only pump governor that has a limit screw to control the speed of the pump and prevent racing. All diaphragms made of phosphor bronze.

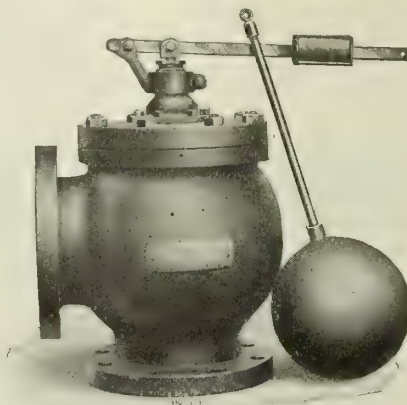
### "Atlas" Float Valve, Auxiliary Operated.

A float valve that is guaranteed not to hammer or chatter and to maintain a uniform water level in the tank.

Water enters at a point marked inlet, passes under seat and into tank. When tank is full, float closes the auxiliary valve and the water collecting on top of piston closes the valve. Upon the float dropping, the water is relieved from top of piston by auxiliary valve opening and the pressure under the seat opens the valve, allowing water to pass into tank.



SECTIONAL VIEW, TYPE A, "ATLAS" PUMP GOVERNOR OR FAN ENGINE REGULATOR



"ATLAS" FLOAT VALVE

Size, ins.	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Globe, face to face, screwed	3 3/8	3 3/8	4 1/4	4 7/8	5 3/4	7 3/4	9 3/8	12	13 1/4	16
Globe, face to face, flanged	3 3/8	4	4 3/8	4 7/8	6	7 1/2	9 1/4	11 3/4	13 1/8	16
Angle, center to face, screwed	1 1/2	1 3/4	2 1/8	2 1/4	2 7/8	3 3/4	4 1/8	6	6 5/8	8
Angle, center to face, flanged	2 3/8	2 5/8	2 3/4	3 1/8	3 3/4	4 1/2	4 3/4	5 7/8	6 1/2	8



**"Victor" Hot Water Regulator.**

Designed for automatic control of the temperature of hot water, using water pressure for a motive power.

The operation is due to the expansion and contraction of the expanding tube, affecting the supply and discharge of the water pressure to the diaphragm heat controlling medium.

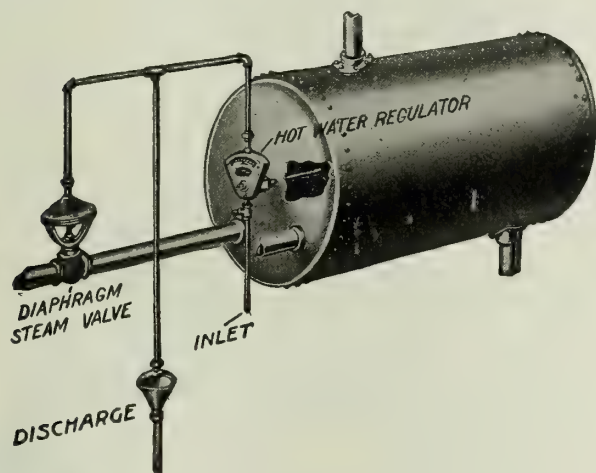
The "Victor" Regulator is unlimited in its use. It is effective for all industrial purposes, dry room regulation, pasteurizers, etc. Can be adjusted to maintain any temperature and will operate valves of any size.

This regulator will eliminate the annoyance of scalding water from lavatory and bathroom fixtures, and will insure a constant supply of hot water at the correct temperature.

The "Victor" hot water regulator is constructed entirely of metal and is indestructible.



"VICTOR" HOT WATER REGULATOR



APPLICATION OF "VICTOR" REGULATOR TO HOT WATER TANK

**Application of "Victor" Regulator to Hot Water Tank.**

When the water in the tank reaches the temperature for which the regulator is adjusted, the expansion tube expands and opens valve inside of the regulator casing. This allows the water pressure which enters the regulator at bottom connection to pass through the upper connection and on to the diaphragm steam valve. It then inflates the diaphragm and pushes the valve seat down, thereby shutting off the steam.

As soon as the water in the tank cools, the expansion tube contracts, shutting off the water pressure to the upper connection. The water pressure which is then on the diaphragm of the steam valve is relieved through the discharge, allowing the spiral spring, which is around the stem, to open the valve.

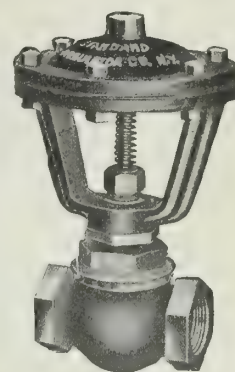
**Diaphragm Steam Valve.**

Illustration herewith shows the brass body diaphragm steam valve used in connection with the "Victor" hot water regulator. Brass bodies furnished up to and including 2 ins. Over 2 ins. they are made with iron bodies. They are of the high lift pattern having full steam area. The bonnets have large gland stuffing boxes which can be tightened without removing the diaphragm top, on account of the open construction of the spider.

Instead of solid metal clappers they contain disk holders made of brass with removable Jenkins Bros. composition disks.

Will operate in any position and are thoroughly tested before leaving the factory.

Diagram in opposite column shows the application of the diaphragm steam valve in conjunction with the hot water tank regulator.



DIAPHRAGM STEAM VALVE

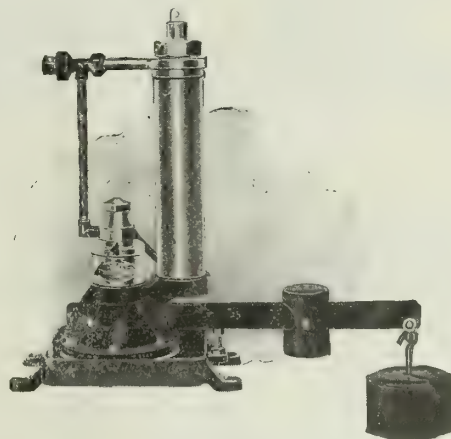
**"Victor" Hydraulic Damper Regulator.**

May be applied to low pressure heating boiler or to power boiler.

The high pressure damper regulator will operate the heaviest dampers on the slightest variation of pressure, without use of counterweights or diaphragms.

The low pressure damper regulator is especially effective on drafts of low pressure boilers carrying less than 1 lb. pressure and will operate drafts on less than 1/2-lb. variation in steam pressure.

This device is operated by the variation of the steam pressure, using water pressure for a motive power. When steam pressure is sufficient to raise the weighted lever, the pilot valve controlling the supply and discharge of the water is opened, admitting water pressure into bottom of motor cylinder. This in turn operates the piston stem, and hydraulic force is exerted in the usual manner to open and close the damper.



"VICTOR" HYDRAULIC DAMPER REGULATOR

ESTABLISHED 1885

**JOHNSON SERVICE COMPANY**

Manufacturers of Heat Regulating Apparatus

MAIN OFFICE AND FACTORY

MILWAUKEE, WIS.

## BRANCHES

BOSTON, MASS., 35 Hartford Street  
 BUFFALO, N. Y., 108 Erie County Bank Building  
 CHICAGO, ILL., 177 North Dearborn Street  
 CINCINNATI, OHIO, 405 Gwynne Building  
 CLEVELAND, OHIO, 719 St. Clair Avenue, North East  
 DENVER, COLO., 205 Temple Court Building  
 DETROIT, MICH., 20 Montcalm Street, West  
 KANSAS CITY, MO., 411 East 10th Street  
 INDIANAPOLIS, IND., 614 Majestic Building  
 MINNEAPOLIS, MINN., 308 Third Avenue, South

NEW YORK, N. Y., 118 East 28th Street  
 PHILADELPHIA, PA., 1521 Sansom Street  
 PITTSBURGH, PA., Century Building  
 PORTLAND, ORE., 800 Chamber of Commerce Building  
 ST. LOUIS, MO., 106 North 10th Street  
 SAN FRANCISCO, CAL., 314 Rialto Building  
 SEATTLE, WASH., 1104 White Building  
 LOS ANGELES, CAL., 541 Citizens National Bank Building

## CANADIAN REPRESENTATIVE

JOHNSON TEMPERATURE REGULATING COMPANY OF CANADA, LIMITED

## OFFICES

CALGARY, ALTA., 605 Second Street, West  
 MONTREAL, QUE., 18 Cathcart Street

TORONTO, ONT., 118 Adelaide Street, West  
 WINNIPEG, MAN., 805 Alverston Avenue  
 VANCOUVER, B. C., 1160 Seymour Street

**Products.**

HEAT REGULATION SYSTEMS.  
 THERMOSTATS.  
 HUMIDOSTATS.

**Johnson Positive Acting Thermostat.**

This type of thermostat should be used to control the temperature of rooms heated by direct radiation.

It is operated by compressed air supplied by a small air compressor in the basement and carried through pipes concealed in the wall.

It automatically opens and closes the diaphragm valve on the radiator when the temperature of the room falls below or rises above the degree at which the thermostat is set.

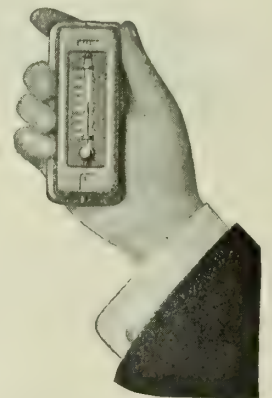


POSITIVE THERMOSTAT  
Showing inside mechanism

It is the only thermostat on the market provided with positive snap-action for closing and opening the radiator valve quickly, positively and fully, which is necessary with steam valves.

While small enough to be held in palm of the hand, it is very sensitive and powerful in its action on the radiator valve. It is equally adaptable to steam or hot water heating.

**INDICATOR and CUT-OFF—**  
 It is the only thermostat having an indicator which shows at a glance whether the thermostat has the heat turned on or off. A cut-off is provided for shutting the heat off permanently when desired.



THERMOSTAT HELD IN HAND

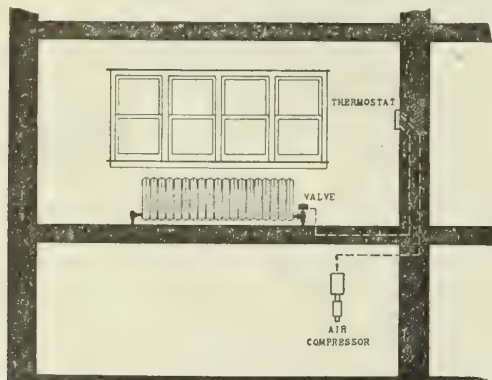
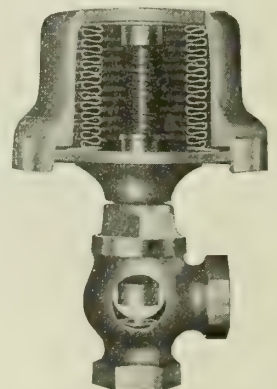


DIAGRAM SHOWING INSTALLATION OF POSITIVE ACTING THERMOSTAT AND CONNECTION TO VALVE

**"Sylphon" Radiator Valves.**

To get the very best in automatic temperature control specify the indestructible Johnson "Sylphon" seamless metal diaphragm radiator valves for steam or hot water heat. These valves are especially adaptable to radiators located in wall boxes as these valves, unlike rubber diaphragm valves, are unaffected by the heat in the wall box.

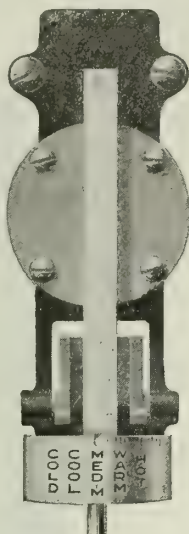


"SYLPHON" METAL DIA-  
PHHRAGM RADIATOR  
VALVE



**Johnson Graduated Acting Thermostat.**

Specify this type for controlling the temperature of rooms heated by steam hot blast or hot air furnaces. It is pneumatically operated as described on preceding page and controls a mixing damper located at the plenum chamber. The damper, which is furnished, together with thermostat, etc., is operated by a diaphragm damper motor connected with the thermostat in such a way that the damper blades will automatically assume the correct intermediate position necessary to deliver the right mixture of hot and tempered air to the room and to maintain a constant and proper temperature therein.



JOHNSON GRADUATED ACTING THERMOSTAT

Any of the branch offices of the company will be glad to demonstrate by model or actual installations the operation of Johnson thermostats without obligation on the part of architects, owners or contractors.

An exclusive feature with Johnson thermostats is the small indicator at top of the cover, showing at a glance whether the heat is turned on or off.

The thermostat is set to the desired temperature by either open or locked dial shown at bottom; and a cut-off provided to shut heat off permanently, especially desirable on bedroom and hotel thermostats.

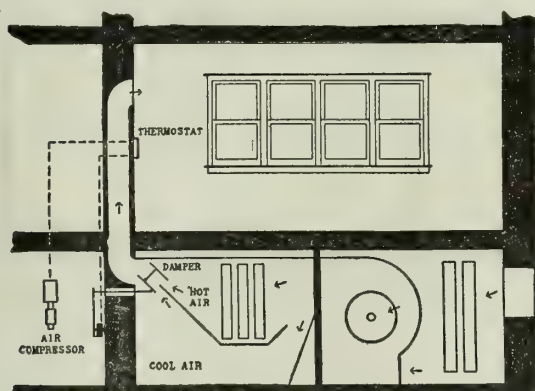


DIAGRAM SHOWING GRADUATED ACTING CONTROL FOR STEAM HOT BLAST SYSTEM

**Thermostat Covers.**

The covers which conceal the thermostat proper are small, inconspicuous and very neat in design and workmanship.

There are two distinct styles; one called the R type and one called the P type.

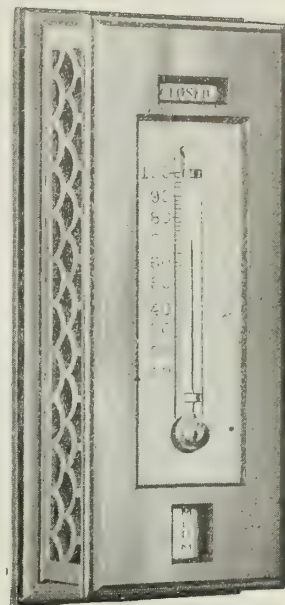
The R type is a die-casting, very beautifully designed and used generally in residences and other handsomely decorated buildings.

The P type is a pressed metal cover, very finely finished but not as ornamental and artistic as the R cover, and used more generally in schools, office buildings, hospitals and places where simple and neat design is

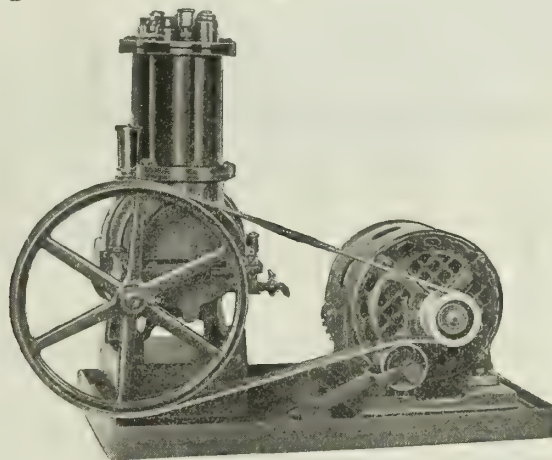
desired rather than artistic and ornamental.

The R and P covers are made with many variations, such as with and without the indicator, with and without the accessible adjustment and with and without lock screws.

Thermostat covers for schoolhouses are usually finished in black, either japanned or so-called bower barff, but for other buildings it is customary to electroplate them, and they can be furnished in any desired plating finish, or if desired, as sometimes for hospitals, with enamel finish of any color.

MODEL R. I. COVER  
4 3/4" x 2" x 1 1/8" deep**Air Compressors for Operation of the Thermostats.**

Electric, hydraulic, steam or belt driven air compressors in all sizes are furnished and installed by this company to supply the small amount of compressed air necessary to operate Johnson thermostats. They are entirely automatic in operation and require only occasional oiling.



ELECTRIC AIR COMPRESSOR FOR OPERATING JOHNSON THERMOSTATS

**Insertion Duct Thermostat.**

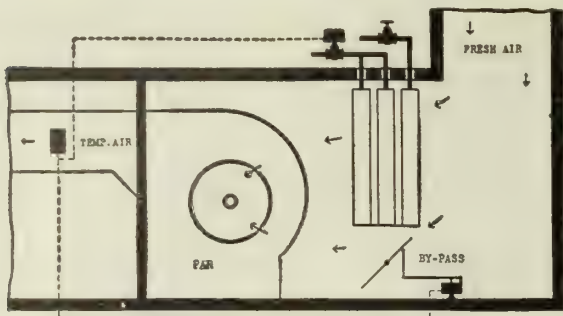
Controls the temperature of tempered air for heating or ventilation. It is inserted into tempered air duct and controls either valves on tempering coils, by-pass damper under coils, or both, as shown on following page.

**POSITIVE ACTING TYPE—**  
Used for controlling valves or valve and by-pass damper.

**GRADUATED ACTING TYPE—**  
Used on single or mixing dampers.

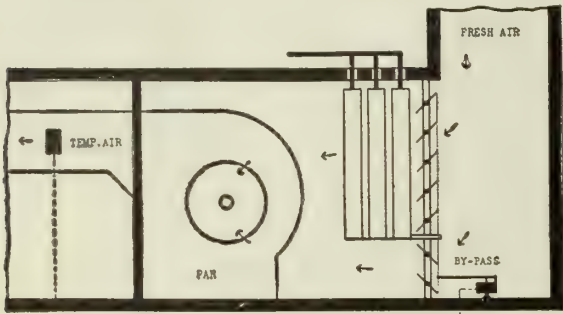


INSERTION THERMOSTAT



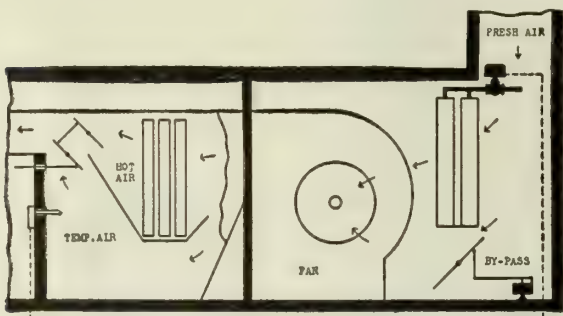
TEMPERED FAN VENTILATION NO. 1

The thermostat, located in the duct from the fan, controls by-pass damper under the tempering coils, or coils themselves, when there is no by-pass provided. Some engineers prefer to control both by thermostat. (See also multiple insertion thermostats)



TEMPERED FAN VENTILATION NO. 2

The insertion thermostat here controls louver mixing dampers placed before tempering coils. Thermostat operates dampers so proper proportion of air will pass through the tempering coils and by-pass, to produce a temperature of 65° to 68° Fahr. of ventilating air. Tempering coils not controlled. The graduated acting type thermostat is preferable for this purpose



HOT BLAST HEATING SYSTEM

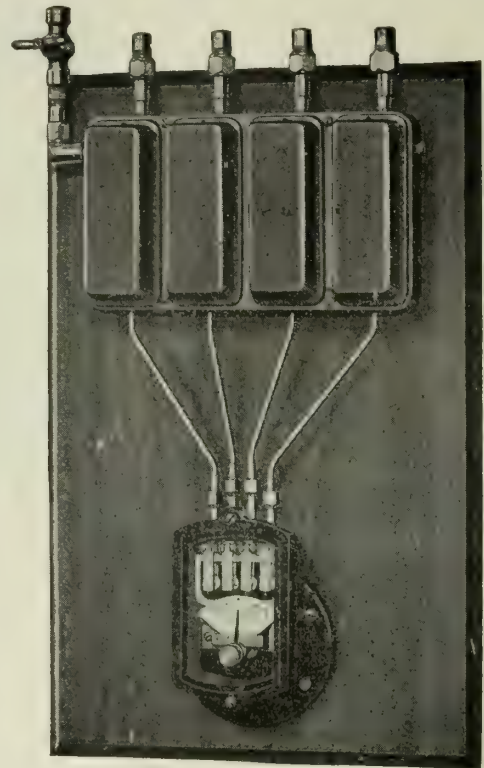
The thermostat, located in the tempered air plenum chamber, controls by-pass damper, or valves on steam coils, as the case may be. Sometimes both are controlled. Thermostat is usually set for 68° Fahr. When temperature falls, coil valves are opened and damper closed; and when temperature reaches 68° Fahr., coils are closed and by-pass damper opened

### Multiple Insertion Thermostat.

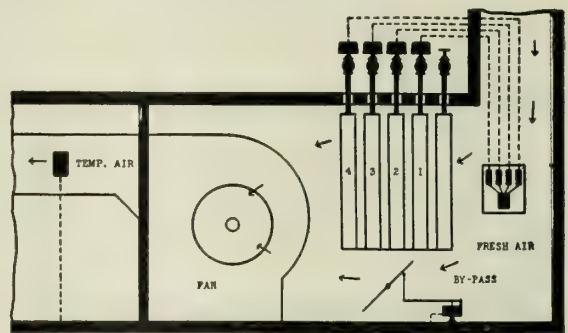
Similar to the insertion duct thermostat excepting that one multiple thermostat takes the place of a number of separate duct thermostats set for different temperatures. The 4-point multiple thermostat shown will operate 4 separate diaphragm valves at as many different temperatures. It has become very popular with heating engineers for the control of heating and tempering coils where it is desired to have these coils turn on at different temperatures. It is made to work with positive action when controlling valves; with graduated action when controlling dampers; or with both positive and graduated action when controlling valves and dampers.

The 4-point multiple thermostat has innumerable

and interesting applications which the branch office of the company will be glad to explain in detail.

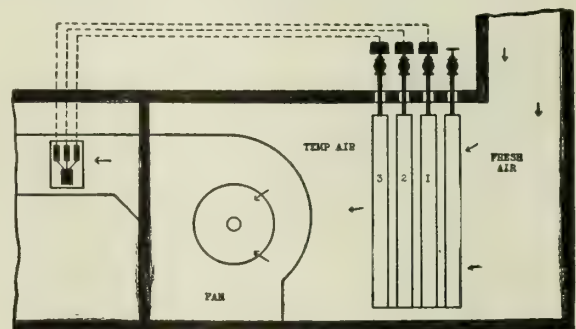


FOUR-POINT MULTIPLE THERMOSTAT



TEMPERED FAN VENTILATION (1)

The multiple thermostat located in the fresh air intake will turn on tempering coil No. 1 when outside temperature falls to 40°; section 2 at 30°; section 3 at 20°; section 4 at 10°. Thermostats are adjustable for any temperatures. A duct insertion thermostat controls temperature of the ventilating air by means of a by-pass damper which mixes cold air with warm to get desired temperature



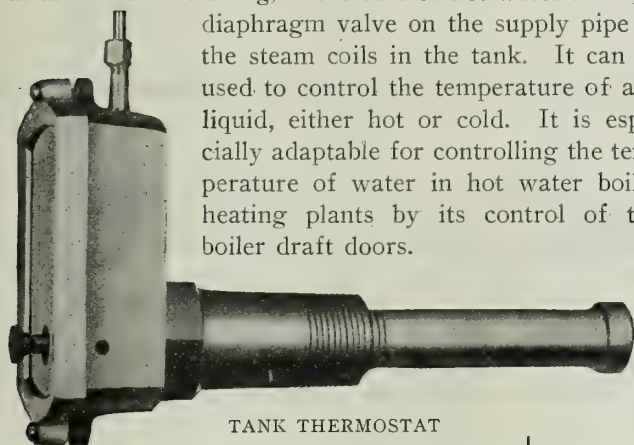
TEMPERED FAN VENTILATION (2)

The 3-point multiple thermostat here takes the place of the single insertion thermostat. There is no by-pass damper and the temperature of the ventilating air is regulated by coil control. For instance, section 1 opens at 68°; section 2 at 67°; section 3 at 66°. Thus, as the weather gets colder the thermostat has more radiation under control



**Tank Thermostat.**

Designed for insertion through 1-in. tapped hole in tank and controlling, in the case of hot water tanks, a diaphragm valve on the supply pipe to the steam coils in the tank. It can be used to control the temperature of any liquid, either hot or cold. It is especially adaptable for controlling the temperature of water in hot water boiler heating plants by its control of the boiler draft doors.



TANK THERMOSTAT

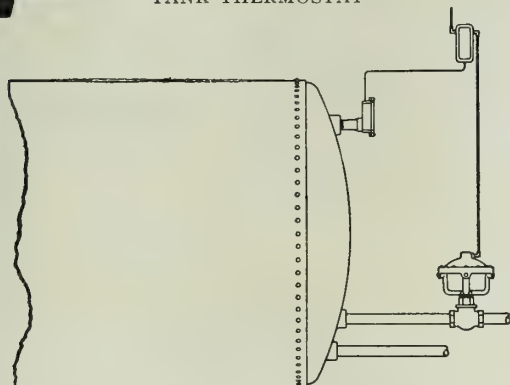


DIAGRAM SHOWING APPLICATION OF TANK THERMOSTAT

**Hydraulic Thermostat.**

A hydraulically operated type of thermostat for controlling the temperature of hot water tanks. It operates a diaphragm valve on the steam supply to the tank and is the only positive quick acting type of thermostat of its kind. It operates by city water pressure.

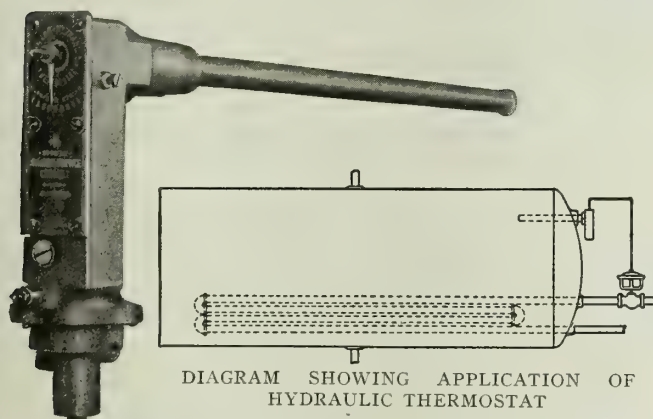


DIAGRAM SHOWING APPLICATION OF HYDRAULIC THERMOSTAT

HYDRAULIC THERMOSTAT

**Humidity Control.**

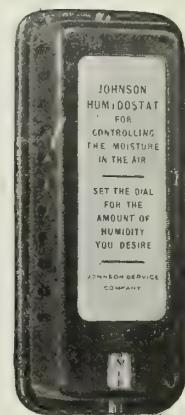
The supplying of moisture to the heated air in buildings and the automatic control of the percentage of moisture in this air are recognized by authorities to be as important as maintaining proper temperatures. Dry air parches the membranes of the body, causing irritation and tending to the development and prolongation

of skin diseases, colds, chills, etc. The average humidity in our heated buildings is far less than that of the Sahara desert.

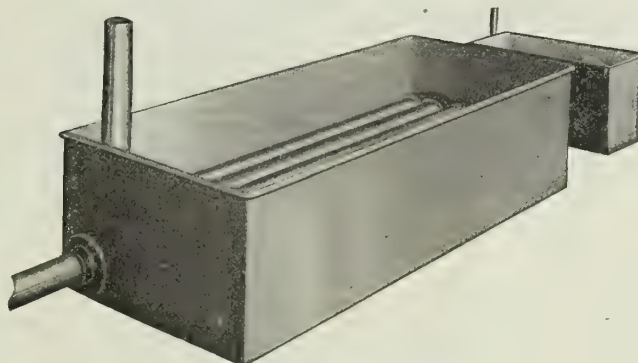
Humidity is indispensable for museums and fine residences to protect valuable pictures, furniture, wood carvings, etc. It is even more valuable for the protection of human life in our homes, schools, hospitals, etc. The company's literature gives facts and figures regarding air conditioning which architects and others can not afford to overlook. Proper humidity is fast becoming a popular demand.

**Humidostats and Humidifiers.**

The humidostat automatically controls the supply of moisture delivered to the air by a humidifier and maintains a constant percentage of relative humidity. It operates a diaphragm valve on the steam coils in the pan humidifier. The pan is provided with float box to maintain constant water level and is located in the ventilating air duct leading throughout the building. Steam jet and water spray types of humidifiers are also furnished.



HUMIDOSTAT



COPPER PAN HUMIDIFIER

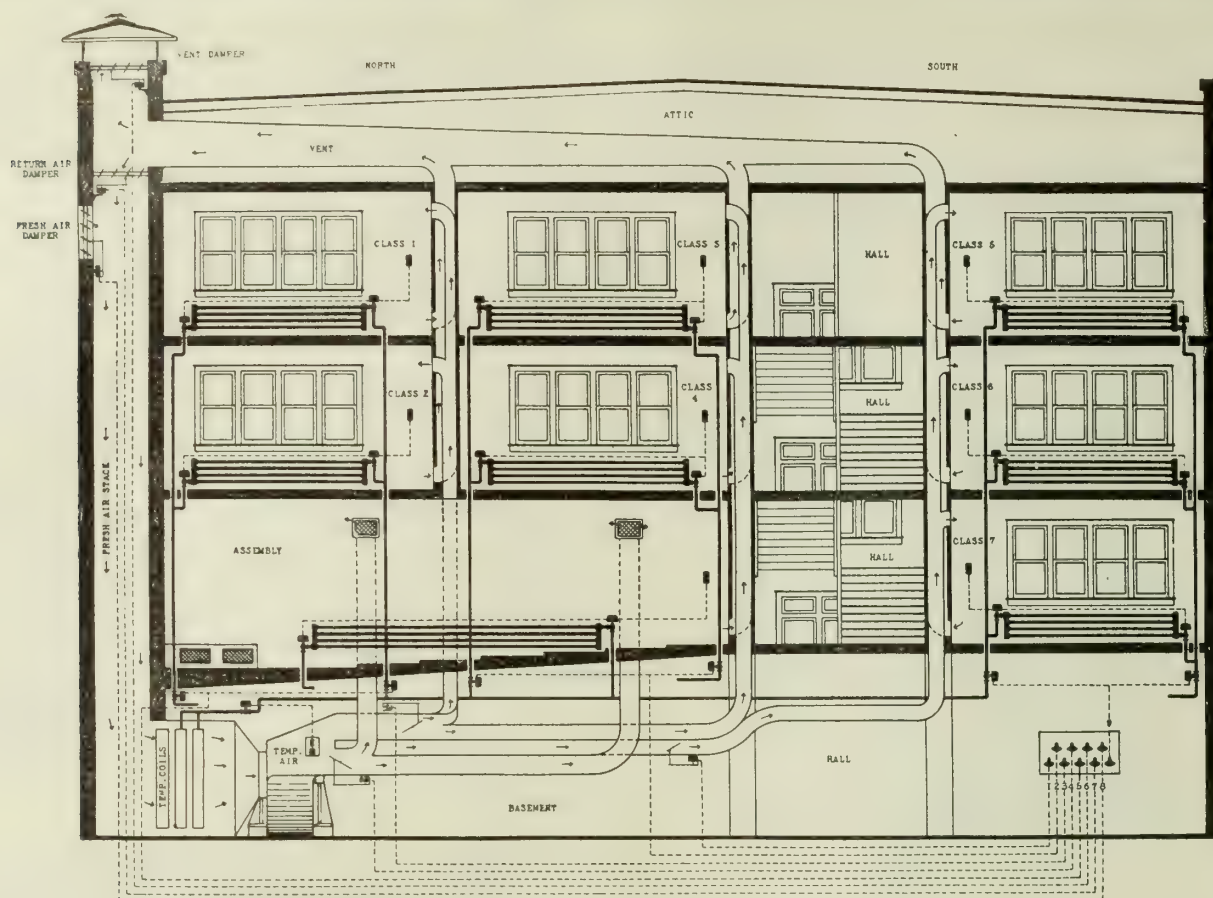
**Pneumatic Switch Control.**

Remote valve and damper control plays, by means of our pneumatic switches, a very important part in the economical operation of the modern heating plant, especially in schools. It saves the janitor's time for other duties, and makes it possible to accomplish results in the operation of the heating plant which can not be obtained in any other way. It makes it easy to operate the fresh air, return air and vent dampers with the corresponding assurance that these dampers will be economically operated as intended by the heating engineer.



PNEUMATIC SWITCH

The scope of this control is unlimited and the illustration herewith shows to what extent a modern school heating plant may be brought under the control of the engineer by means of a switchboard located in boiler room.



TYPICAL SWITCH CONTROL FOR SCHOOLS

Switches 1, 2, 3, 4, 5, 9 are for regulating distribution of heat to various parts of building. Necessary in modern schools where night classes, etc., make it desirable to shut heat off certain parts of building and save fuel. Switch 1 shuts off ventilating air from classrooms 5, 6, 7, and switch 9 shuts off steam from risers supplying radiation in these rooms. Switches 2, 3 and 5 shut heat and ventilation off classrooms 1, 2, 3, 4. Switch 4 controls ventilation of auditorium and radiation can be controlled the same way if desired. Switch 6 operates vent damper; switch 7 the return air damper; switch 8 the fresh air damper. Diagram shows rooms controlled by thermostats operating valves on radiators, and a duct insertion thermostat maintains uniform temperature of ventilating air by operating valve on tempering coil.

### How to Specify.

Furnish and install a complete system of automatic temperature regulation and humidity control, furnishing all necessary thermostats, valves, dampers, humidifiers, special devices, air compressors, piping and fittings, and labor of installing system, except setting valves and dampers in position—all in accordance with the following schedule and detailed specification:

**SCHEDULE**—State the rooms to be controlled and number of thermostats in each; the manner in which the tempered air, if there is any, is to be controlled; the manner in which the drafts of the boiler are to be controlled; and specify the manner of the control of any fresh air, vent or return air dampers, stating the location and number of switches.

**THERMOSTATS**—Specify Johnson Model Thermostat, size,  $4\frac{1}{2}$ " by 2" by 1"; and state whether it is to have residence or school cover, indicating device, positive shut-off, and whether it is to be positive or intermediate motion. Specify the number and kind of inserted thermostats.

**VALVES**—Specify Johnson Metal Diaphragm Syphon Valve, and state whether it is to be plain or nickelplated, with or without unions, adding that these valves will be placed in position by the heating contractor.

**AIR COMPRESSORS**—Specify kind of air compressor, steam, hydraulic, electric or power driven, requiring that the air compressor shall be of sufficient size to operate the system, with a factor of safety not less than 3, and requiring that it be provided with all necessary governing devices, fittings, gage, etc.

**HUMIDOSTATS**—Specify Johnson Humidostat and Humidifier, stating the kind of humidifier, whether perforated steam or copper evaporating pan.

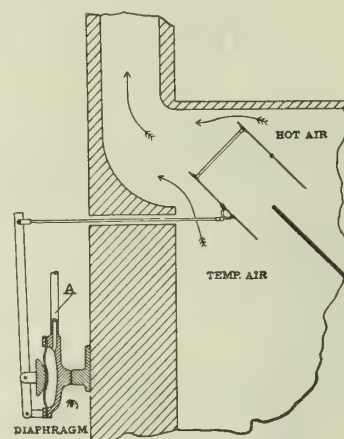
**DAMPERS**—Specify that dampers shall be made by the heat

regulating contractor, but installed by the galvanized iron contractor, and that dampers shall consist of wrought iron frames, sheet steel blades, strongly cleated, with brass bearings.

**GUARANTEE**—Require that system be complete in every respect, and that all necessary material and special fittings shall be furnished whether specifically mentioned or not. Require that entire system be guaranteed free from all original defects in material and workmanship, and that any parts proving defective or wearing out within 2 years from date of completion shall be replaced free of charge. Require that thermostats shall operate the valves or dampers to which they are attached, at a variation of not to exceed  $1^{\circ}$  above or below any given point.

### Contracting.

This company contracts to furnish and install in complete working order the Johnson System of Temperature Control, including thermostats, valves, piping, etc.



MIXING DAMPER CONTROL



# THE POWERS REGULATOR CO.

Manufacturers of Automatic Temperature Controlling Systems

GENERAL OFFICES AND FACTORY

2131 Mallers Building  
CHICAGO, ILL.

GENERAL EASTERN OFFICES

931 Architects Building  
NEW YORK, N. Y.

## BRANCHES

BOSTON, MASS., The Federal Street Building  
CINCINNATI, OHIO, Gerke Building  
DETROIT, MICH., Kerr Building  
CLEVELAND, OHIO, 8001 Whitehorn Avenue

SEATTLE, WASH., Alaska Building  
KANSAS CITY, MO., Reliance Building  
SALT LAKE CITY, UTAH, Walker Bank Building  
LOS ANGELES, CAL., 908 Hill Street

CANADIAN POWERS REGULATOR CO., LTD., TORONTO, CAN., WITH BRANCHES AT MONTREAL, WINNIPEG, AND CALGARY

## Products and Services.

AUTOMATIC TEMPERATURE CONTROLLING SYSTEMS, applying them, under the supervision of our own engineers, to the heating plants, new or old, in residences, offices, factories, schools, institutions, and to any other condition of artificial heating where uniform temperature is desired.

Heating systems, and the requirements for temperature control, vary widely in detail. Special study should be given each case, so that its particular requirements may be intelligently handled and all conditions that exist in the building may be considered. Much of the dissatisfaction experienced with some temperature regulating apparatus is due to the fact that the attempt has been made to force a ready-made inflexible system to meet special requirements, taking no account of the conditions peculiar to the heating plant or building treated.

To insure efficient study of each case, and proper application and adaptation of the Powers system to each, we maintain at each branch office a competent engineering and erecting force. Those at a distance from our main offices may therefore feel assured of receiving prompt and intelligent attention.

## Mechanical Appliances Used.

Powers thermostats are accurate in their working and will maintain their adjustment. They are of the vapor disk type, exclusive with Powers regulators, and the only type not thrown out of adjustment by extremes of temperature or long disuse. For 30 years this has been the standard of thermostatic control by which all other methods are measured. In design, Powers thermostats are second to none in beauty and perfection of finish; in size, as small as is consistent with the reliability



Residence Type

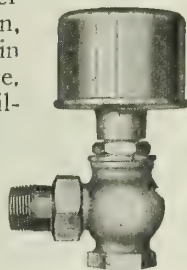


Heavy Duty Type

THERMOSTATS



DIAPHRAGM MOTOR



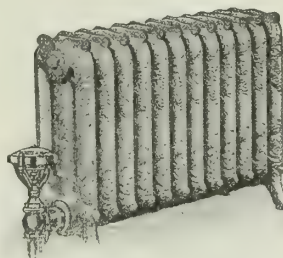
ALL-METAL RADIATOR VALVE

rugged in construction, dependable, and durable; built regardless of expense, wherever strength is needed for efficiency and long service.

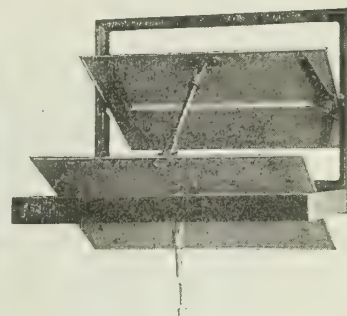
Motive power used in these systems is compressed air. We build our own air compressors, operated by steam, electricity, or water. Characterized by their reliability, noiseless operation, perfect control, and long life.



RADIATOR VALVE



VALVE ATTACHED TO RADIATOR



MIXING DAMPERS

## Installations.

Installations are invariably made by this company, its employees being specially educated in the work, and no expense is spared to maintain such a force at the highest degree of efficiency.

## Prices.

Our price covers the system installed complete, and price is only named after a careful study of the requirements, which we shall be glad to do for any contemplated installation. This company does not claim to be the lowest priced, but maintains that no other system will be found as economical in the long run. Customers are served with the sole aim of getting results for them; and experience shows that assurance of satisfactory service from a temperature controlling system is of much more importance than its first cost.

## Specifications.

An opportunity is solicited to submit to any architect or engineer a detailed specification, accompanied by a guaranteed price, to cover complete system of temperature control, installed, the price to hold if specification is used. This guarantees full protection to the client against advantage being taken of a close specification. This company will gladly collaborate with architect or engineer in preliminary plans. As specialists in temperature control, we have unusual facilities for solving problems in this particular field.

ity so necessary in such instruments; in operation, sure, with gradual or positive action, as conditions require.

Diaphragm radiator valves, diaphragm motors, mixing dampers and other equipment are especially



ESTABLISHED 1885

**MINNEAPOLIS HEAT REGULATOR CO.**

MINNEAPOLIS, MINN.

## FACTORY BRANCHES

BOSTON, MASS., 77 Summer Street  
 CHICAGO, ILL., 231 Insurance Exchange Building  
 CLEVELAND, OHIO, 1327 East 105th Street  
 DETROIT, MICH., 406 Marquette Building

ST. LOUIS, MO., 1412 Syndicate Trust Building  
 ST. PAUL, MINN., 140 Endicott Arcade  
 SPRINGFIELD, MASS., 216 East Worthington Street  
 SYRACUSE, N. Y., 218 East Washington Street

TORONTO, CAN., 27 Toronto Arcade

**Products and Services.**

MINNEAPOLIS HEAT REGULATORS, THERMOSTATS, MOTORS.

This company manufactures exclusively AUTOMATIC HEAT REGULATORS for warm air furnaces; steam, vacuum, vapor and hot water boilers; hot water tanks and heaters, gas and street steam service.

The co-operation of trained service salesmen is always available to show the best means and newest ideas for the successful handling of the "Minneapolis" line, and to insure the most efficient service from the regulators already in use.

**Minneapolis Heat Regulator.**

Made in various models as to style of both thermostats and motors. The application is simple. The thermostat (mechanical thermometer) is placed at an average temperature point in the living room, connected by concealed 3-wire cable through two ordinary dry cells to motor located in basement. The thermostat is adjustable on 1° or more temperature range, which operates the motor, causing it to open and close the dampers of heater on temperature change of 1° as registered in living room.

**WHAT IT DOES**—Keeps the house at an even temperature, saves coal, prevents destruction of property by fire, and prolongs the life of a heater by always closing the draft before the fire gains too much headway. Relieves the mind entirely of the care of the draft dampers, and the fear that at night, or during your absence for a few hours, there is danger to life or property through neglect of the heater. No heating plant can be efficient or complete without it. It is especially adapted for residences.

**ADVANTAGES**—The Minneapolis regulator has been on the market for 30 years, and is more widely used than any device of its character. Nothing to wear out. Many of them sold 25 and more years ago are still in use. No special dampers required. The device is practically noiseless in operation.

**No. 47 Thermostat.**

Has reliable 24-hour clock. This part of the device, located in living room, registers temperature the same as a thermometer. Adjustable throw allows pointer to be set at any desired temperature.

**No. 55 Duplex Thermostat.**

Equipped with reliable 8-day clock. At night, pointer automatically moves

back to night temperature, and in morning, at predetermined hour, is moved to day temperature. Adjustment of time "set" can be made almost instantly.

**No. 60 Thermostat.**

Equipped with very high grade timepiece, clock and alarm running 8 days with one winding. Clock has solid brass case, repeater alarm, jeweled balance, porcelain dial and bevel glass front. Adjustable throw allows pointer to be moved to any day temperature desired.

**No. 35 Heat Regulator.**

Lowest priced high grade gravity regulator made. Equipped with 1-day clock. Clock time attachment allows lower temperature at night and automatically turns indicator to 70° at any predetermined hour in the morning.

No. 35 gravity motor is furnished only with No. 35 heat regulator. Designed to be fastened to ceiling of basement. Small and compact, and enclosed in pressed steel case, black enamel finish (baked).

**No. 65 Thermostat.**

Temperature control for hot water tanks in apartment buildings, hospitals, hotels, etc. Operates perfectly on coal heaters, gas heaters, garbage burners or steam coils, or any combination of these. Saves fuel, prevents waste of water, keeps water at any desired temperature.

In connection with motor, controls valves, dampers, etc., for regulation of hot water, steam, bake ovens, vulcanizers, etc.

Regularly furnished with 2-in. extension, scale 50° to 250°; or with 4-in. extension, scale 0° to 400°. Longer extensions when desired.



NO. 47  
THERMOSTAT  
WITH TIME  
ATTACHMENT  
2x10½ ins.



NO. 55  
DUPLEX  
THERMOSTAT  
WITH 8-DAY  
CLOCK  
2½x10 ins.



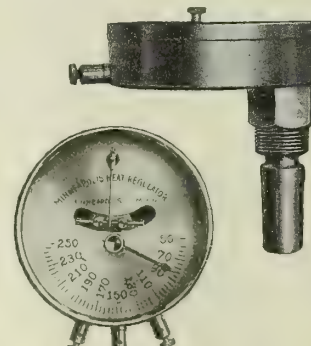
NO. 35 HEAT  
REGULATOR  
2½x8½ ins.



NO. 35 GRAVITY  
MOTOR



NO. 60  
THERMOSTAT  
WITH 8-DAY  
CLOCK  
2½x11½ ins.



NO. 65 THERMOSTAT



### Standard Spring Motor.

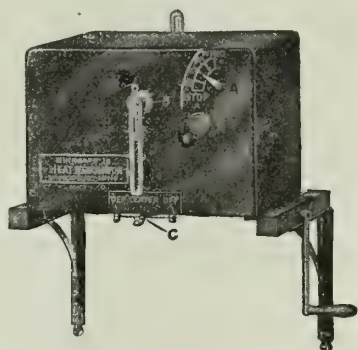
All parts of pressed steel and brass (no cast iron); bearings are lathe turned, running in brass bushings, finely adjusted and fitted. Requires winding about every week or 10 days in coldest weather.

All motors when run down, leave drafts closed.

**COVER**—Incased in solid, pressed steel cover, No. 22-gauge, finished in black enamel (baked). Cover is dustproof and moistureproof: cotton sleeving is used at shaft "B."

**WINDING INDEX**—Index finger with scale "A" travels as motor is wound and unwound. A glance shows condition with reference to winding.

**BASEMENT SWITCH**—By this means "C" motor can be operated in basement. Easily wound by means of crank key.



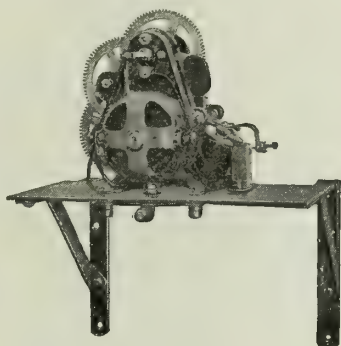
INCASED IN STEEL COVER

### Direct Current Motor.

Compact and neat. Has ample power for heaviest work required. Power furnished by 4 dry cells with capacity for more than full heating season. Aside from replenishing batteries and oiling machine once a year, it requires absolutely no attention.

Where alternating current is available, A. C. motor is recommended. Though slightly higher in first cost, it is cheaper in the long run, there being no battery renewal.

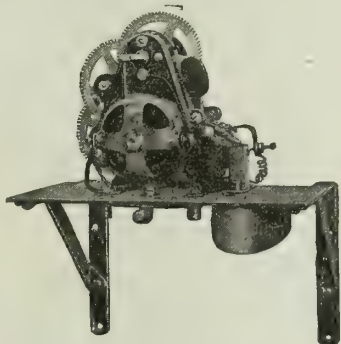
Equipped with basement switch.



DIRECT CURRENT MOTOR, WITH COVER REMOVED

### Alternating Current Motor.

Designed to operate directly from house lighting current. Operates with 110-volt, 60-cycle alternating current with small transformer mounted on bottom of case, reducing the voltage of current operating thermostat and magnet coils. With this system most satisfactory results are obtained, as the higher voltage is used for operating the motor and an extremely low voltage for the thermostat, which is much



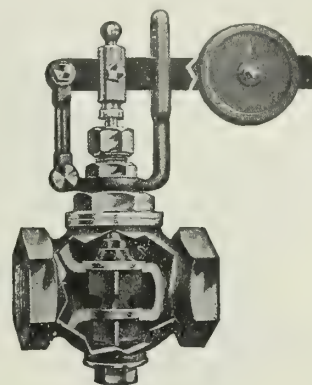
ALTERNATING CURRENT MOTOR, WITH COVER REMOVED

easier on the platinum contact points than the higher voltage necessary when complete device is operated by current furnished by transformer. This alternating current motor has been approved by the National Board of Fire Underwriters—a most important point.

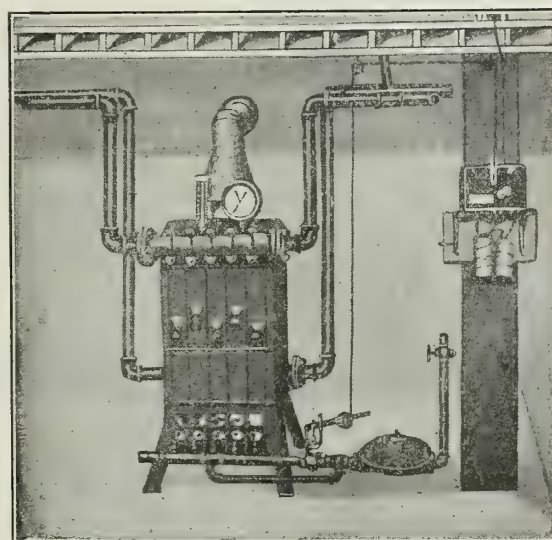
### Minneapolis Regulator Applied to Street Steam and Gas.

Minneapolis regulator is especially serviceable in controlling temperature of buildings heated by gas or street steam, because it governs the supply of gas or steam to heater and only admits enough to maintain the desired temperature. Can be connected to any heating plant (hot air, hot water or steam), whether it be a straight gas heater or a coal heater with gas burners in it.

Motor connected to gas valve (usually a balanced disk) by chain and pulley. By-pass and pilot light are installed in connection with it.



VALVE FOR STREET STEAM OR GAS



MINNEAPOLIS HEAT REGULATOR APPLIED TO GAS HEATER

#### LIST PRICES, THERMOSTATS AND MOTORS

No. 35 (with 1-day time) gravity motor only	Spring Motor	D. C. Motor	A. C. Motor
No. 40 (no time)	\$40.00	No. 40 D. C. \$50.00	No. 40 A. C. \$60.00
No. 47 (1-day time)	47.00	No. 47 D. C. 57.00	No. 47 A. C. 67.00
No. 55 (8-day duplex)	55.00	No. 55 D. C. 65.00	No. 55 A. C. 75.00
No. 60 (8-day time)	60.00	No. 60 D. C. 70.00	No. 60 A. C. 80.00
No. 65 (hot water or tank)	65.00	No. 65 D. C. 75.00	No. 65 A. C. 85.00

Shipping weight approximately 30 lbs. each.

Specify by number, and if electric, specify D. C. or A. C. A. C. motors are 110-volt, 60-cycle, and prices include transformers. Other windings at slight advance in price.

#### Specifications.

"Contractor shall furnish and properly connect to heating plant a Minneapolis heat regulator model [...] complete."

Model number is given above and the different combinations and styles of heat regulators are shown.

# THE POWERS REGULATOR CO.

Manufacturers of Temperature Controlling Devices

GENERAL OFFICES AND FACTORY  
2131 Mallers Building  
CHICAGO, ILL.

GENERAL EASTERN OFFICES  
931 Architects Building  
NEW YORK, N. Y.

FOR BRANCH OFFICES, see page 947

## Products.

APPLIANCES for the Automatic Regulation of Heating and Cooling Mediums and similar general purposes.

## Quality and Guaranty.

All Powers products are the result of years of research and experience in this one line of temperature control, and are covered by the Powers guaranty of perfect workmanship and efficiency.

## Variety and Adaptability.

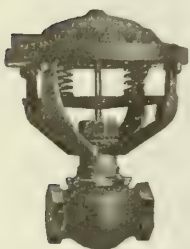
The specialties here shown are quite flexible in their adaptation to different temperature controlling requirements, and offer a variety designed to cover the field. New problems are welcomed, however, and correspondence invited.

## Tank Temperature Regulation.

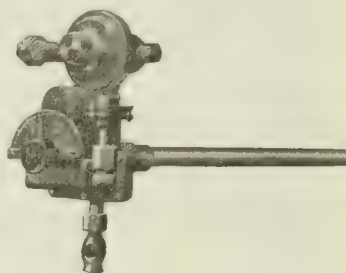
No. 10 REGULATOR—For controlling the temperature of water or other liquids, in tanks, etc.

Prevents overheating and consequent waste of fuel. Accurate, positive and reliable.

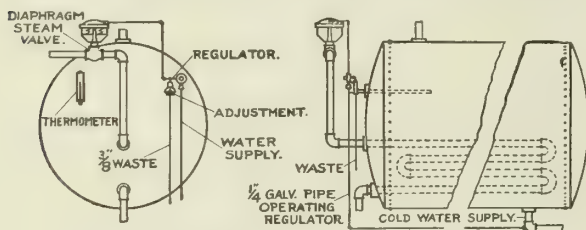
Of the well-known water operated type, and in its



DIAPHRAGM VALVE



NO. 10 REGULATOR  
Water operated



TYPICAL INSTALLATION OF NO. 10 REGULATOR

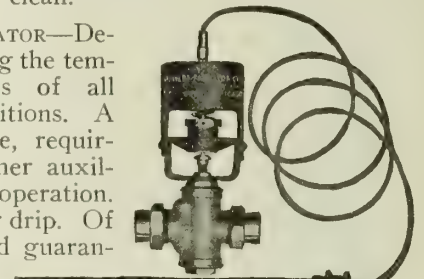
PRICES OF NO. 10 TANK REGULATOR, COMPLETE WITH VALVE

Size of valve, ins.	Price	Size of valve, ins.	Price
1	\$70.00	5	\$150.00
1 1/4	75.00	6	175.00
1 1/2	80.00	7	200.00
2	90.00	8	225.00
2 1/2	95.00	9	250.00
3	100.00	10	275.00
4	120.00	No. 10 Regulator requires 3/4-in. tank tapping	

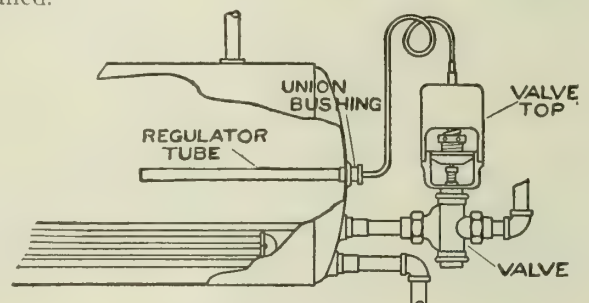
For independent heater control, regulating both steam valve and draft dampers, so that automatic control is obtained through either medium, add \$25.00. Liberal discount to the trade. For full details ask for Bulletin No. 116.

class has no superior; absolutely reliable where water supply is reasonably clean.

No. 11 REGULATOR—Designed for controlling the temperature of liquids of all kinds, under all conditions. A self-contained device, requiring no water or other auxiliary power for its operation. All-metal. No water drip. Of great durability, and guaranteed accurate and positive in action. Very easily installed.



NO. 11 REGULATOR  
With 1/4-in. valve



TYPICAL INSTALLATION OF NO. 11 REGULATOR

PRICES OF NO. 11 TEMPERATURE REGULATOR, COMPLETE WITH VALVE

Size of valve, ins.	Price	Size of valve, ins.	Price
1 1/2	\$60.00	3	\$100.00
3/4	65.00	3 1/2	110.00
1	70.00	4	120.00
1 1/4	75.00	5	175.00
1 1/2	80.00	6	200.00
2	90.00	8	250.00
2 1/2	95.00		

For all sizes up to 2 ins. inclusive, the regulator tube is 20 ins. long and requires a 1-in. tapping in tank. Sizes 2 1/2 to 4 ins. inclusive, 20-in. tube and 1 1/4-in. tapping. Sizes larger than 4 and to 8 ins. inclusive, 24-in. tube, 1 1/4-in. tapping. Valves up to and including 1 1/2 ins. have solid bronze bodies with union and tailpiece. Size 2-, 2 1/2-, and 3-in. valves have iron bodies, screwed ends. All sizes above 3 ins. have iron bodies flanged and drilled standard. Companion flanges will be furnished when desired, but are extra at the market price. Flexible connecting tube is 8 ft. long, in sizes up to 4 ins. inclusive; for larger sizes, tube is 10 ft. long, or longer if desired.

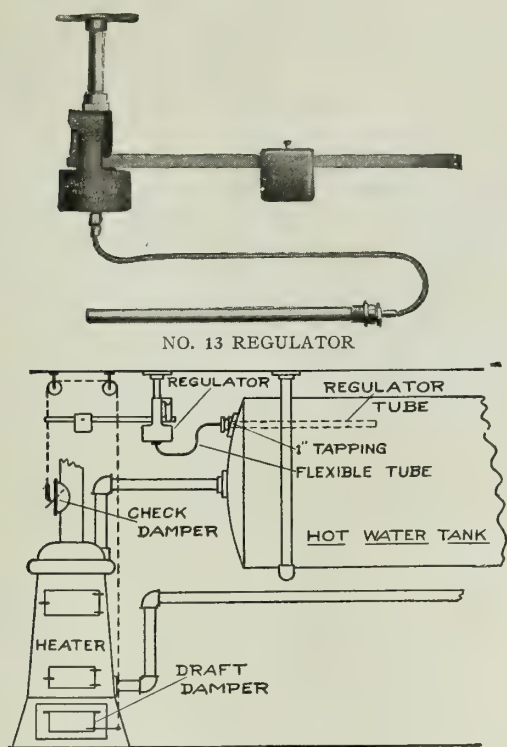
No. 12 REGULATOR—Same as No. 11, with lever instead of spring equipment. On request, it is furnished complete with chains and pulleys, for control of dampers of auxiliary coal burning tank heater, both heat sources being controlled with our regulator.

Prices—The same as for No. 11 throughout. Liberal discount to the trade. For more detailed information ask for Bulletin No. 129.

No. 13 REGULATOR—For hot water tank heaters and garbage burners. Self-contained unit, similar to No. 11, but has weight and lever instead of spring balance. It operates draft dampers as shown in illustration on the opposite page. Furnished for 140° Fahr. operation unless otherwise specified.

Prices—Complete, with 6-ft. flexible tube, chains, pulleys and check damper (give smoke pipe size), \$50.00. Liberal discount to the trade. For further details ask for Bulletin No. 136.





**GAS VALVE**—Where gas is burned in tank heaters and garbage burners, No. 13 regulator operates a Powers gas valve instead of dampers, as illustrated above.

The Powers gas valve is a frictionless, mercury seal valve, especially adapted to control gas for heating purposes. May be operated by the ordinary diaphragm lever of a steam boiler, or by any automatic regulator. Its peculiar and positive shut-off eliminates back-firing.



POWERS GAS VALVE

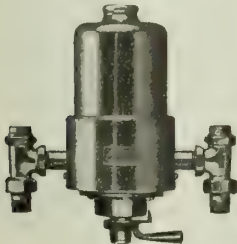
PRICE LIST, POWERS GAS VALVES

1 in.....	\$12.00	1½ ins.....	\$16.00	2½ ins.....	\$30.00
1¼ ins.....	14.00	2 ins.....	20.00	3 ins.....	40.00
		4 ins.....	\$60.00		

Liberal discount to the trade. For more detailed information ask for Bulletin No. 121.

Water Line Temperature Regulation.

**SHOWER BATH CONTROLLER**—This device furnishes absolute thermostatic control of the water supply to shower baths, either singly or in gangs. Entirely automatic in operation, and positively antiscald insurance. Will cut off hot water completely if cold water supply fails. Made in several sizes, to control from 1 shower to 50. Highly finished for



Types Nos. 1, 3 and 4  
Highly Finished in Nickel



Types Nos. 5, 6, 7 and 8  
Galvanized and Painted

SHOWER BATH CONTROLLERS

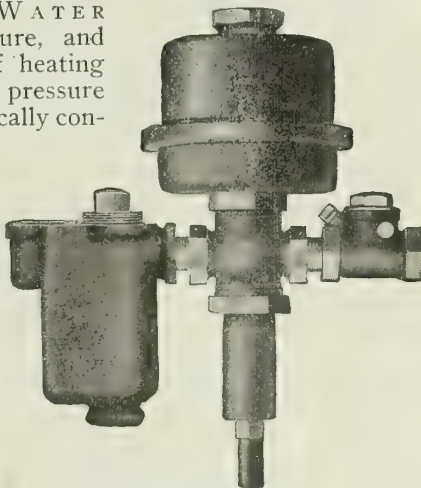
bathroom equipment. Larger sizes galvanized and painted to prevent rust. Furnished complete as illustrated, with unions, strainers, and check valves, ready to connect.

PRICE LIST, POWERS SHOWER BATH CONTROLLERS

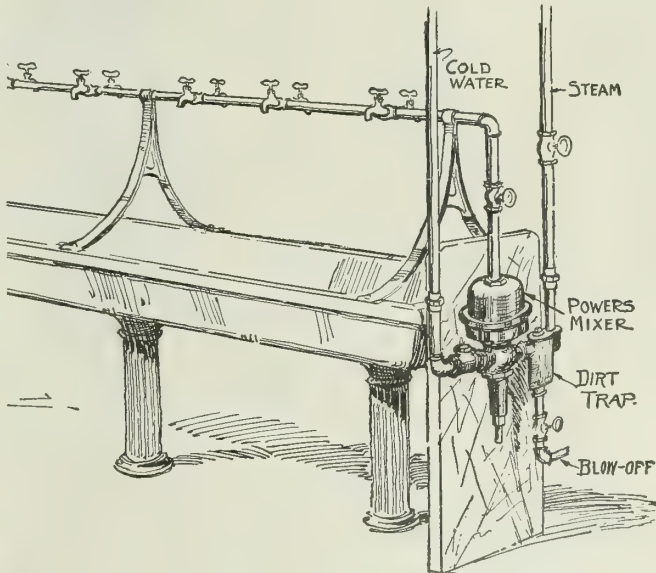
No.	Description	Pipe Sizes		Capacity, gals. per min.	Price
		Inlet, ins.	Outlet, ins.		
1	Nickelplated brass body, screwed connections	½	¾	Individual shower	\$100.00
3	Nickelplated brass body, screwed connections	¾	1	25	125.00
4	Nickelplated brass body, screwed connections	1	1¼	50	150.00
5	Galvanized iron bodies, painted, flanged connections	1¼	1½	80	175.00
6	Galvanized iron bodies, painted, flanged connections	1½	2	100	185.00
7	Galvanized iron bodies, painted, flanged connections	2	2½	200	200.00
8	Galvanized iron bodies, painted, flanged connections	2½	2½	250	225.00

Regularly furnished with maximum temperature adjustment of 110° Fahr. Higher adjustment furnished when specified. Always state purpose for which controller will be used. Liberal discount to the trade. For more detailed description ask for Bulletin No. 124.

**STEAM AND WATER MIXER**—A safe, sure, and accurate method of heating water with high pressure steam. Thermostatically controlled. Adapted to workmen's wash sinks, shower baths, etc., in factories, mines and other industrial plants, and to a great variety of purposes where a supply of warm or hot water is desired, at a specified temperature, at irregular intervals.



STEAM AND WATER MIXER



SHOWING INSTALLATION OF STEAM AND WATER MIXER IN WORKMEN'S SINKS

PRICE LIST, STEAM AND WATER MIXERS

No.	Fittings		Capacity, gals. per min.	Shipping weight, lbs.	Price
	Inlet, ins.	Outlet, ins.			
1	¾	1	25	50	\$100.00
2	1	1¼	50	60	150.00

Liberal discount to the trade. For more detailed information ask for Bulletin No. 137.

# AMERICAN PRESSWELD RADIATOR CORPORATION

DETROIT, MICH.

## BRANCH AGENCIES

NEW YORK, N. Y., J. F. SIEGEL, 101 Park Avenue  
CHICAGO, ILL., EDWARD P. LOMASNEY, 223 W. Erie Street  
KANSAS CITY, MO., P. WINSBOROUGH, 335 Lathrop Building  
SEATTLE, WASH., F. A. LACLERQ, 105 Cherry Street  
MINNEAPOLIS, MINN., J. G. ROELLER, 726 Fourth Street  
SALT LAKE CITY, UTAH, E. H. DOHERTY, 216 D. F. Walker Building

BUFFALO, N. Y., J. A. SULLIVAN, 28 Dewey Avenue  
PITTSBURGH, PA., H. P. CANNON, 538 Winebiddle Avenue  
ATLANTA, GA., GEO. B. FINDLAY, 304 Forsyth Building  
DES MOINES, IOWA, H. D. PHELPS, 2719 Moyer Street  
DETROIT, MICH., F. T. SCHREINER, 816 Ford Building  
OMAHA, NEBR., OMAHA SANITARY SUPPLY Co., 1412 Howard Street  
WASHINGTON, D. C., M. E. DANFORTH, Pope Building  
ST. LOUIS, MO., W. C. WINSBOROUGH, 1107 Syndicate Trust Building

## Product.

PRESSWELD SHEET METAL RADIATORS.

## Pressweld Radiation.

Pressweld radiation is the modern method of steam and water heating. It is designed to eliminate waste of space, weight, fuel and time.

Pressweld radiation is more sanitary, cleanly, efficient and durable than the old form of heat radiation from old type appliances.

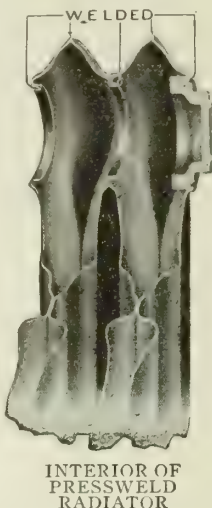
Pressweld radiation has been indorsed by leading engineers and architects as the most efficient and least expensive form of artificial heat for all purposes. An investigation of government data, filed by disinterested parties, will prove these claims to be facts.

These proofs, and full data pertaining to special equipment for any installation, will be sent to interested parties on request.

## The Pressweld Radiator.

The Pressweld radiator represents the highest development of this modern method of radiation, possessing certain special and exclusive features that place it far in advance of other sheet metal or cast iron radiators.

The Pressweld radiator is made up of uniform sections, each consisting of two plates, heavy gage special analysis radio alloy sheet metal made specially for this radiator, united by special welding process, making a perfect steam and watertight unit, same as the sheet metal itself. The sections are then welded together on the inside top and bottom. This method of joining the sections has proved to be superior in every respect to any method heretofore used in radiator construction.



## Distinctive Features of the Pressweld Radiator.

**DURABILITY**—Various tests and actual use have demonstrated that the Pressweld radiator, under ordinary conditions, will last indefinitely, without showing any appreciable mark of deterioration.

**ADAPTABILITY**—The Pressweld radiator is so constructed as to permit its use for either water, steam or vacuum heating systems, for gas and electric heaters, also for dryers, engine coolers, transformer oil coolers, brine coils, and for various types of refrigeration installation.

**EFFICIENCY**—The Pressweld radiator will heat and cool quickly, giving an accurate index of the condition of



TRADE-MARK

the fire, and will radiate more heat from a given surface than a cast iron radiator because of the thinness of the metal and the smoothness of the interior surface, permitting more rapid circulation. Wide air spaces allow about one-half more air to pass over the surface.

**FUEL ECONOMY**—A considerable saving of fuel is effected by the superior radiating qualities of the Pressweld radiator over the cast iron radiator and the quickness with which it responds to heat, having no excess metal.

**ADVANTAGE OF WEIGHT**—The Pressweld radiator is about one-fourth the weight of the cast iron radiator.

**ECONOMY OF SPACE**—The Pressweld radiator takes up much less space and has more heating surface than a cast iron radiator of equal rated capacity.

**INSTALLATIONS**—Owing to its light weight, the Pressweld radiator may be placed on the wall, leaving a free space below. Adjustable concealed wall brackets are arranged for this purpose when desired, without extra cost.

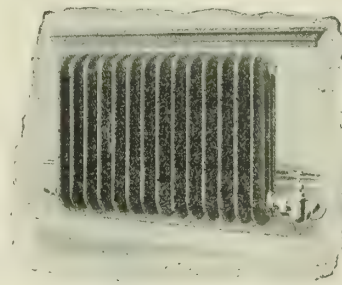
**NO DANGER OF FREEZING**—The peculiar design of the Pressweld radiator allows for expansion should water freeze in the radiator, while the same action in those of cast iron construction always results in cracking.

**TESTS**—Every Pressweld radiator receives three tests—the material test, the individual section or unit test, and the complete radiator test. These tests are far more severe than the finished product is ever called upon to undergo in actual use.

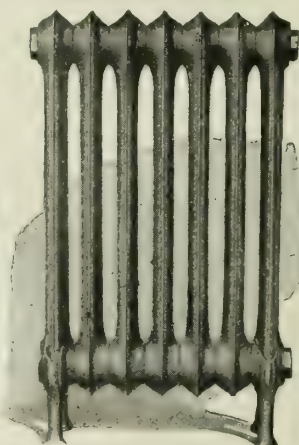
**PAINTING**—The Pressweld radiator is delivered with a smooth, even surface, finished with priming coat, all ready for the final painting on the job.

## Weights.

Pressed steel radiators crated for domestic shipment, weigh approximately 2¼ lbs. per sq. ft. of radiation. Boxed for foreign shipment they weigh about 3 lbs. per sq. ft. of radiation.

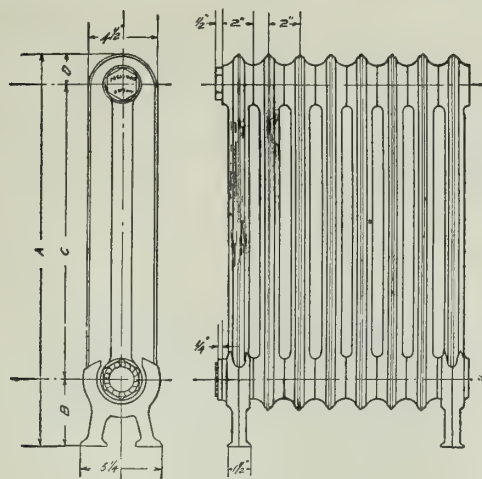


PRESSWELD RADIATOR ON WALL BRACKETS  
For steam or water

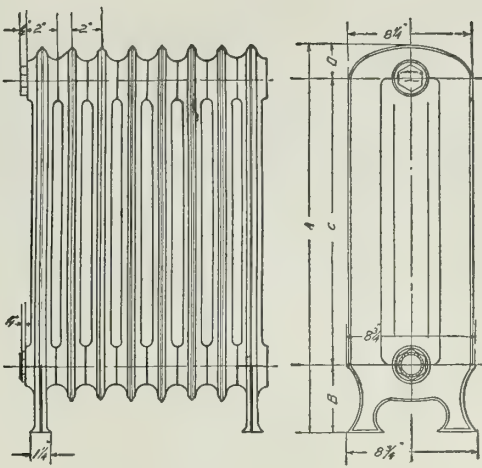


PRESSWELD FLOOR OR WALL RADIATOR  
Three-column





One-column



Three-column

PRESSWELD RADIATORS  
Dimensions (in inches)

Sizes	A	B	C	D
14	13 3/4	4 1/2	7 1/2	2
18	17 3/4	4 1/2	11 1/4	2
22	21 3/4	4 1/2	15 1/4	2
26	25 3/4	4 1/2	19 1/4	2
32	31 3/4	4 1/2	25 1/4	2
38	37 3/4	4 1/2	31 1/4	2

Size	A	B	C	D
18	18	4 1/2	11 1/4	2 1/4
22	22	4 1/2	15 1/4	2 1/4
26	26	4 1/2	19 1/4	2 1/4
32	32	4 1/2	25 1/4	2 1/4
38	38	4 1/2	31 1/4	2 1/4
45	45	4 1/2	38 1/4	2 1/4

SURFACE RATINGS PER SECTION IN SQUARE FEET

Size	14	18	22	26	32	38	45
1-col.	1	1 1/3	1 2/3	2	2 1/2	3	4
3-col.	1.55	2 1/4	3	3 3/4	4 1/2	5	6
4-col.	2 1/4	3	3 3/4	4 1/2	5	6	7

In estimating length of radiators, allow 2 ins. for each section and 1/2 in. for each bushing.  
All radiators are tapped 2 ins., and bushed as per list

Model Specifications.

All direct radiation to be Pressweld as manufactured by the AMERICAN PRESSWELD RADIATOR CORPORATION of Detroit, Mich.

Legs and Wall Brackets.

Either standard adjustable wall brackets, or legs to make the distance from floor to center of bottom tapping 4 1/2 or 6 ins., will be furnished for all radiators without extra charge.

Higher legs furnished on special order at extra charge. Legs for all models are shipped detached from radiators.

The following number of legs or brackets will be furnished for each radiator:

- From 4 to 20 sections—2 legs or 4 brackets
- From 21 to 40 sections—3 legs or 6 brackets
- From 41 to 50 sections—4 legs or 8 brackets
- From 61 to 80 sections—5 legs or 10 brackets

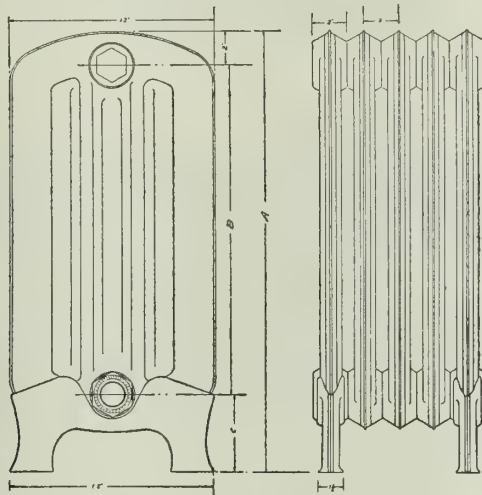
All legs, brackets and bushings boxed separately for shipment, except with very small orders, when they will be fastened to crates.

Guarantee.

This organization's goods are guaranteed to the extent of furnishing new radiators for any found defective in manufacture or material.

Some Users of Pressweld.

- U. S. Government:
  - Submarine chasers
  - Watervliet Arsenal
  - West Point Military Academy and other departments
- Maxwell Motor Car Co., Detroit, Mich., and Kansas City, Mo.
- Buhl Stamping Co., Detroit, Mich.
- Montgomery Ward & Co., Kansas City, Mo.
- Norwegian Hospital, Chicago, Ill.



FOUR-COLUMN PRESSWELD RADIATOR

Dimensions (in inches)

Sq. Ft. per sec.	Standard 4 1/2-in legs				3-in legs	
	Size	A	B	C	A	C
2 1/4	14	13 3/4	7 1/2	4 1/2	12 1/4	3
3	18	17 3/4	11 1/4	4 1/2	16 1/4	3
3 3/4	22	21 3/4	15 1/4	4 1/2	20 1/4	3
4 1/2	26	25 3/4	19 1/4	4 1/2	24 1/4	3

STANDARD TAPPING LIST

STEAM  
ONE-PIPE WORK

- Radiator containing 25 sq. ft. and under..... 1 in.
- Above 25, but not exceeding 60 sq. ft..... 1 1/4 ins.
- Above 60, but not exceeding 100 sq. ft..... 1 1/2 ins.
- Above 100 sq. ft..... 2 ins.

TWO-PIPE WORK

- Radiator containing 48 sq. ft. and under..... 1 by 3/4 in.
- Above 48, but not exceeding 96 sq. ft..... 1 1/4 by 1 in.
- Above 96 sq. ft..... 1 1/2 by 1 1/4 ins.

TAPPED FOR SUPPLY AND RETURN

WATER

- Radiator containing 40 sq. ft. and under..... 1 in.
- Above 40, but not exceeding 72 sq. ft..... 1 1/4 ins.
- Above 72 sq. ft..... 1 1/2 ins.

Vapor tapplings, top and bottom opposite ends, supply, 3/4 in.; return, 1/2 in.  
Four openings are placed in each radiator, one each at top and bottom, both ends, and tapped 2 ins.  
All air valve tapplings of direct radiators are regularly made 1/2 in.  
For each opening, reducing bushing of the size specified, or plugs, will be furnished.  
All openings tapped with right hand threads. Openings tapped with left hand threads will be furnished when specified

# THE SHARP ROTARY ASH RECEIVER CO., INC.

Manufacturers of Rotary Underground Ash and Garbage Receivers

BINGHAMTON, N. Y.

## Product.

The SHARP ROTARY ASH and GARBAGE RECEIVING SYSTEM, the modern method of ash disposal.

## Sharp Rotary Underground Ash and Garbage Receiver.

A most modern and sanitary way of caring for ashes, garbage and refuse. Has the hearty indorsement of architects, builders, health and fire commissioners and hundreds of satisfied users. It has become an economical necessity in the modern home, store, office and public building. Saves space in the basement. Insures pure, dustless air. Eliminates all danger of fire from hot ashes. Can be installed under any type of heater, at any time, in new or old buildings.

## Description.

It consists of a circular pit excavated in the cellar bottom and extending under the front of the heater about 12 ins. In this pit is assembled the complete equipment, as shown in Figs. 3 and 4, which consists of a metal form containing a series of specially constructed, closely nested, galvanized iron cans that revolve on a central perpendicular shaft, by means of a lever, bringing one numbered can at a time directly beneath the ash pit of the furnace. (Fig. 2.)

As each can is filled, the device is turned until the next number is opposite the arrow, when an empty can takes its place, and so on until all cans are filled.

The whole device is covered by stationary top plates level with the basement floor, provision being made to receive the ashes through an opening in the floor of the heater ash pit. One plate being removable permits the filled cans to be lifted out by block and tackle, furnished by the company, and fastened to the ceiling.

The only movable part of the system is the internal mechanism. The cover plates, being stationary, restore and preserve the continuity of the cellar bottom.

There are 2 styles made: the iron top and the cement top finish. The cement top finish permits of 2, 4 or 6 ins. of concrete on the surface (Fig. 5), extension plates being provided for any one of these thicknesses. This style is regularly furnished for 4 ins. of concrete, unless otherwise specified.

## Advantages.

The system increases efficiency of basement space by eliminating all ash cans and boxes. Sweepings from basement floor and waste material not easily burned may be allowed to drop into the cans by removing a plate that covers a small handhole in one of the top plates.

Part of the ashes falling directly into a can, during the process of shaking the furnace, prevents the accumulation of hot ashes and saves the grates.

Waste from the kitchen may also be deposited in the cans through the open space in the floor of the ash pit, all odors being drawn up through the

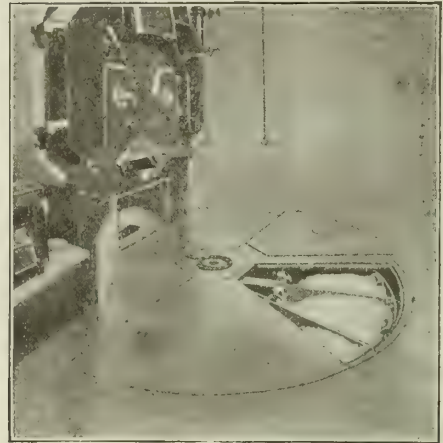


FIG. 1. IRON TOP FINISH  
Showing removable plate lifted off

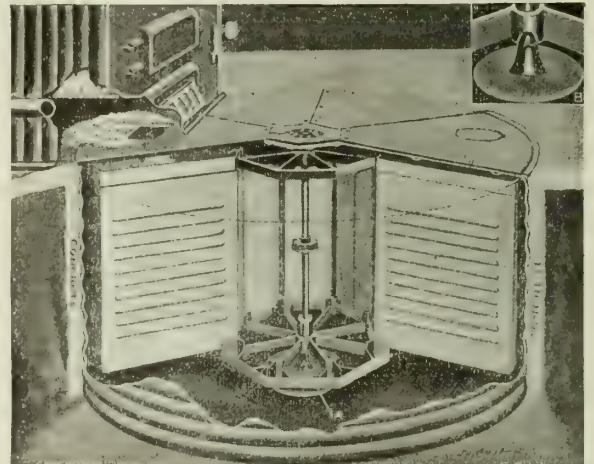


FIG. 2. SECTIONAL VIEW



FIG. 3. Inside View

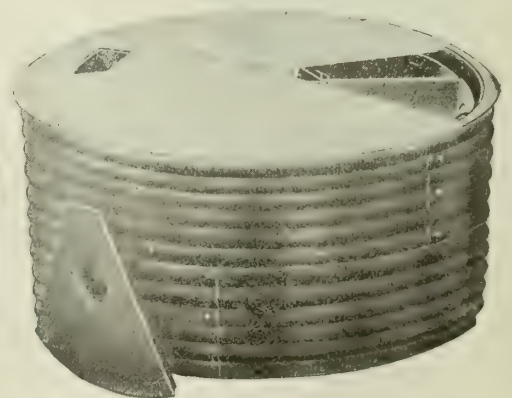


FIG. 4. Outside View

COMPLETE EQUIPMENT BEFORE INSTALLING



fire box of the heater, and passing out through chimney.

In many cases this would save the owner the expense of an incinerator. Another advantage is that by its use all waste matter may be separated, as is required in some municipalities.

The cover plates, when assembled, are airtight, preventing any possibility of drafts to the furnace or escape of dust. Fireproof itself, it also prevents the possibility of fires.

There is a saving of at least 90% of the labor connected with ash handling and disposal.

An ash chute from kitchen range can also be attached, if range is conveniently located.



FIG. 5. METHOD OF INSTALLING CEMENT TOP FINISH

SIZES AND PRICES								
Receiv- er No.	Cor- rugated steel cans	Cover plates	Capac- ity, bush- els	Diam- eter, ins.	Height, ins.	Height of can, ins.	Shipping weight, lbs.	Price
1	8	6	24	60	30	25	550	\$95
1A	8	6	24	60	34	25	500	85
2	12	6	33	72	30	25	750	120
2A	12	6	33	72	34	25	650	110
15	8	6	14	60	19	15	475	95
15A	8	6	14	60	23	15	400	85
5	5	1	6	44	20	16	300	45

Nos. 1A, 2A and 15A are made with extension castings for cement top. No. 15 is used where obstructions in soil require shallow receiver. Watertight tanks can be furnished for all sizes. Prices on request.

Installation.

The installation is simple, and a common laborer who understands mixing cement can easily follow directions sent for installation.

Brief Specification Form.

Furnish and install, in suitable sized pit in cellar of building, a Sharp Rotary Ash Receiver (made by THE SHARP ROTARY ASH RECEIVER CO., INC., Binghamton, N. Y.), in accordance with detailed directions furnished by manufacturer, this outfit to extend 12 ins. underneath ash pit of furnace (boiler) and to conform to following specifications:

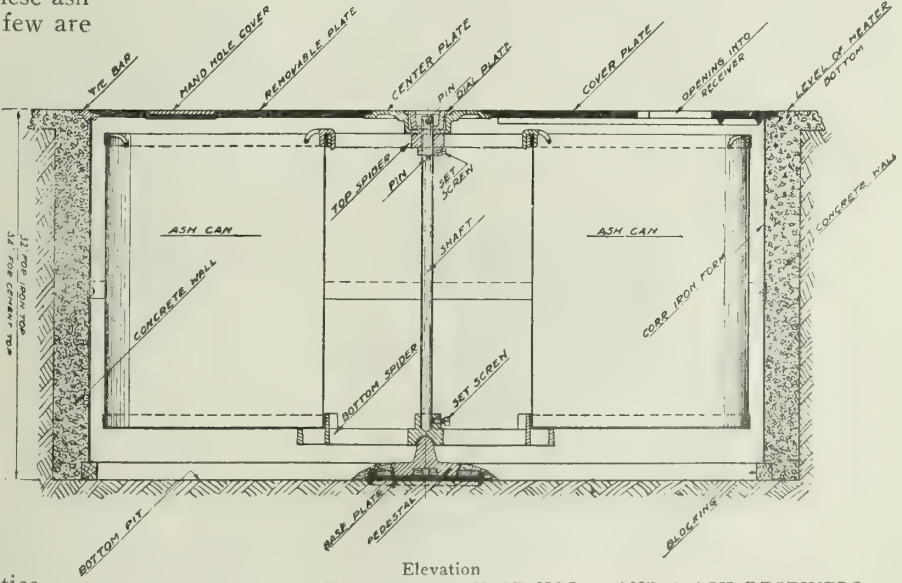
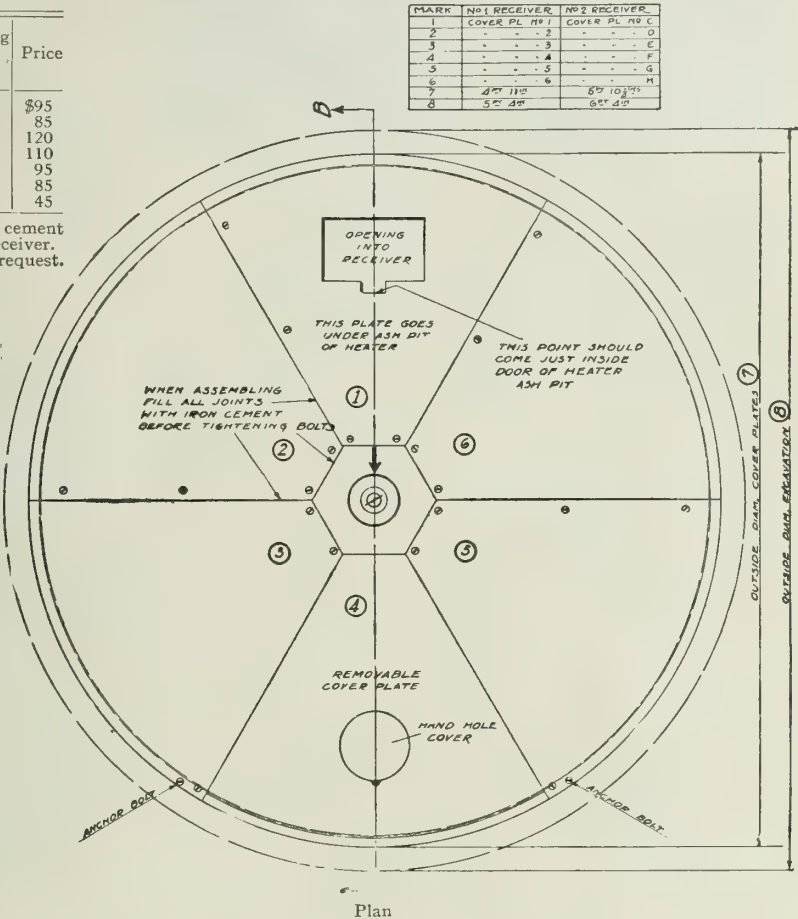
Receiver number	Capacity corrugated steel cans	Capacity, bushels	Height of receiver, ins.

References.

Hundreds of private homes, churches, schools, stores, etc., and well-known companies and municipalities are using these ash receivers. For lack of space, only a few are given:

Earl L. Ovington, Newton Centre, Mass.  
Geo. Ulrich, Hartford, Conn.  
F. B. Walker & Co., New Haven, Conn.  
Dr. W. E. Bliss, Meriden, Conn.  
John M. Coggeshall, North Scituate, R. I.  
Allison P. Clark, Montclair, N. J.  
Owen C. Becker, Oneonta, N. Y.  
E. G. Lavino, Philadelphia, Pa.  
F. H. Emery, Scranton, Pa.  
Geo. W. Babcock, Louisville, Ky.  
A. L. Mancourt, Detroit, Mich.  
H. L. Wilton, Grosse Ile, Mich.  
Geo. Huntington, Ann Arbor, Mich.  
H. F. McCormick, Lake Forest, Ill.  
J. A. Dick, Oak Park, Ill.  
Miles C. Riley, Madison, Wis.  
Public Library, Minneapolis, Minn.  
H. H. Bigelow, St. Paul, Minn.  
J. A. Bollinger, Cedar Rapids, Iowa  
James L. McAfee, Lincoln, Nebr.  
W. H. Tipton, Burlington, Colo.  
Harry Johnson, Johnson City, N. Y.  
Thos. B. Cray, Binghamton, N. Y.  
Lackawanna Railroad Co.

Receivers on display in various cities.



FIGS. 6 AND 7. PLAN AND ELEVATION OF NOS. 1 AND 2 ASH RECEIVERS

# HOLLAND FURNACE COMPANY

HOLLAND, MICH.

## Products.

FURNACES: HOLLAND and OTTAWA ALL CAST; the HOLLAND WINDOW CHUTE.

## Holland Furnaces.

**ADVANTAGES**—The Holland furnace will burn any and all grades of fuel, hard coal, soft coal, lignite or wood, without waste of gases, without internal explosions and without opening of joints.

It gives the maximum heat for the fuel consumed because it has the grate furnace, the radiation and the most perfect and natural way of burning the fuel.

**DESCRIPTION**—The special patented features are necessary common sense improvements. The castings are heavy and well made, and the fittings are the best that can be provided.

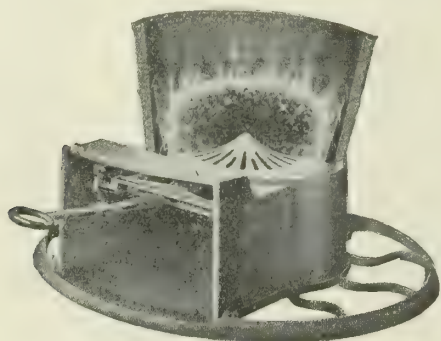
**THE GRATE AND ASH PIT**—The Holland grate, as illustrated herewith, is slightly cone shaped, which breaks up all clinkers and makes the fuel roll towards the wall of the fire pot, where air is mixed with the gas. This generates a much greater degree of heat than it is possible to obtain with the old duplex and flat grates, and clinkers that would form and be wasted in other furnaces are thereby consumed.

Resting on rollers, it is easily operated, and for convenience and simplicity it has no equal. Either the solid or open construction is furnished; both have the roller attachment, and either can be removed through door of ash pit.

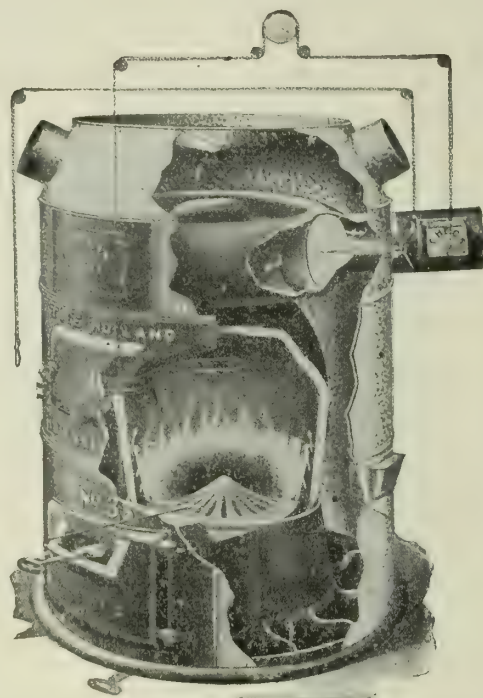
By lifting grate slightly and raising hooks on sides of ash pit, the grate can be lowered, giving an opening of 7 ins., and the holding bar locks back in position by simply raising grate with shaker or lifter.

The ash pit is large and roomy on the inside, and is provided with a very large door, which makes it convenient for the removal of ashes.

**PATENTED FIRE POT**—The Holland air admitting fire pot insures fuel economy, durability and cleanliness. Made in two heavy corrugated sections, with lower part provided with a large number of funnel shaped slots, it supplies the fuel with superheated air from all sides.



HOLLAND GRATE, ASH PIT AND PATENTED FIRE POT

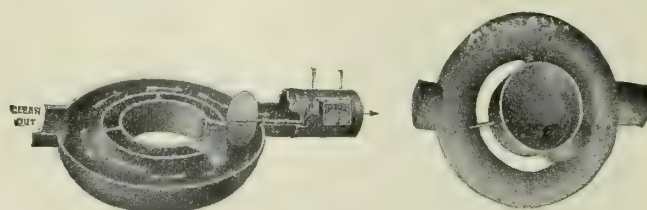


SECTIONAL VIEW OF HOLLAND FURNACE

This burns the fuel from the sides and over the top. The gases and soot are consumed, which means fuel saving in place of trouble and dirt.

**PATENTED RADIATOR**—The Holland radiator is cast in one piece, with no joints to be cemented or bolted together. It has three heating surfaces, and longest possible smoke travel, so produces the greatest amount of radiation, all heat being utilized.

The damper, operated from the outside of casing, makes all smoke travel the full circuit, when closed; or allows a direct draft, when open. It opens and closes by lifting and lowering the weight hanging in front of furnace. With this damper arrangement the smoke has to travel twice as far in the "Holland" as it does in other furnaces similarly constructed, and the heat is equal for all warm air pipes taken off.



PATENTED RADIATOR OF THE HOLLAND FURNACE

**COMBINATION HEATING**—For combination heating, cast iron water rings can be supplied to go between fire pot and feed section. Through recess in feed section water coil can be placed for combination heat purposes, by using a radiator or two, or the coil can be used for heating bath and kitchen water.



DATA. HOLLAND FURNACES

No.	Fire pot diam., ins.	Casing diam., ins.	Cast- ing height, ins.	Residence capacity, cu. ft.	One room capacity, cu. ft.	Weight, lbs.	Cast- ing, price list	Casing, price list
38	21	38	49	10,000	25,000	1,100	\$135.00	\$20.00
40	22	40	50	14,000	35,000	1,200	147.50	22.50
3-40	24	40	51	18,000	42,000	1,300	160.00	22.50
45	25	45	52	22,000	50,000	1,450	177.50	25.00
4-45	27	45	53	26,000	65,000	1,600	195.00	25.00
50	28	50	54	30,000	75,000	1,750	217.50	27.50

**All Cast Ottawa Furnace.**

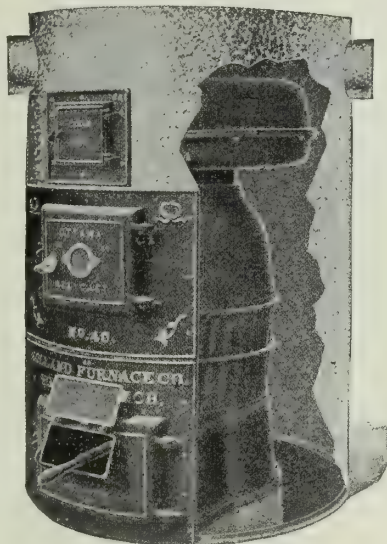
The demand by real estate dealers and builders, who build houses to sell, has made such a strong call for an ordinary all cast furnace which can be sold at a price consideration, that we have added the All Cast Ottawa to our line.

This furnace is heavy and well made; and while the radiator is cast in two pieces and bolted together, and the smoke travels only half as far as in the Holland, it is fully as good as other furnaces of similar construction that have not the patented "direct-indirect" damper feature of the Holland.

The fire pot is in two plain sections, with outside surfaces corrugated. The furnace is also provided with the cone grate.

The all cast Ottawa is an ideal heating plant for those who want an ordinary all cast furnace, to gain a saving in first cost.

A recess is provided in the feed section for the admittance of a water coil.



ALL CAST OTTAWA FURNACE

DATA, ALL CAST OTTAWA FURNACES

No.	Fire pot diam., ins.	Casing diam., ins.	Cast- ing height, ins.	Residence capacity, cu. ft.	One room capacity, cu. ft.	Weight, lbs.	Cast- ing, price list	Straight casing, price list
22-40	22	40	49	12,000	25,000	950	\$110.00	\$22.50
25-40	25	40	50	16,000	35,000	1,150	112.50	22.50

**Holland Service.**

Our customers do not merely buy a furnace—a heating plant. They buy experience, the ripeness of years of dealing with heating problems and difficulties. To be sure, we sell the best furnace we can manufacture; but the matter does not end there. We make a special feature, in our service, of knowing positively that every furnace we install will give satisfaction. Write us about your heating problems.

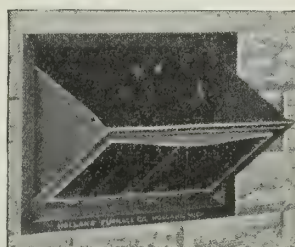
**Holland Window Chute.**

This burglarproof coal chute is also a fine appear-

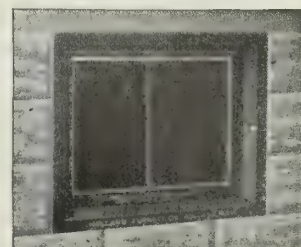
ing glass window, and is the easiest chute on the market for the mason or carpenter to set. It will not rust out, and is strong enough to support the wall above it without buckling.

Has no hinges or bolts on the outside, and locks automatically from the outside by merely closing it.

Can be opened only from the inside, and has no bolts, hooks or clips to get out of order.



Opened as Coal Chute

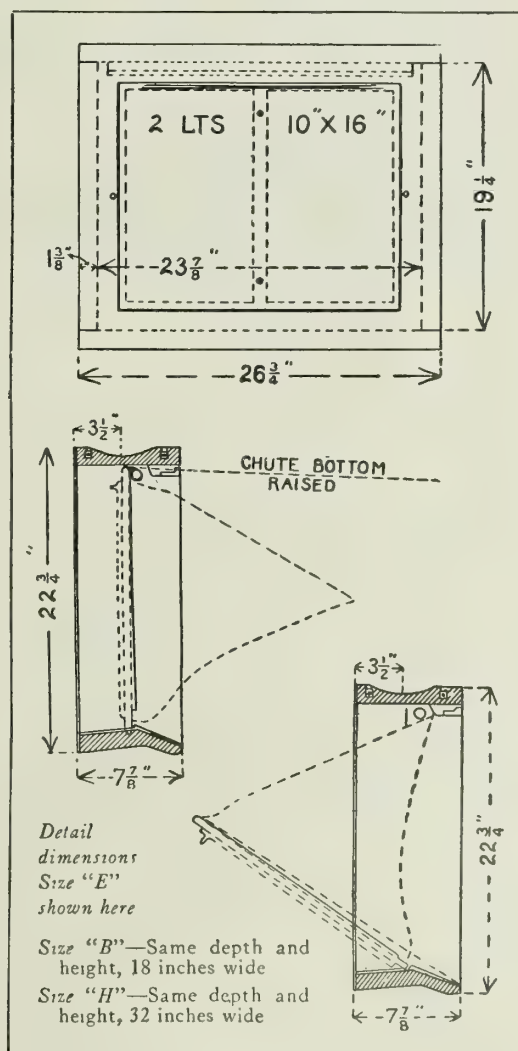


Window Closed

HOLLAND WINDOW CHUTE

DATA, HOLLAND WINDOW CHUTE

Size	Weight, lbs.	Wall width, ins.	Opening height, ins.	No. of lights	Size, ins.	Price
B	120	18	22 $\frac{3}{4}$	1	14 x 16	\$10.00
E	145	24	22 $\frac{3}{4}$	2	10 x 16	12.50
H	185	32	22 $\frac{3}{4}$	2	14 x 16	15.00



DETAILS OF HOLLAND WINDOW CHUTE

# KELSEY HEATING COMPANY

## Manufacturers of Warm Air Generators

MAIN OFFICE AND FACTORY

SYRACUSE, N. Y.

CABLE ADDRESS, "KELSEYCO"—Western Union Telegraphic Code Used

### BRANCHES

NEW YORK OFFICE, 103 Park Avenue Building  
Telephone, Murray Hill, 6591, 6592  
CHICAGO OFFICE, 217 Lake Street

DETROIT OFFICE, Builders' Exchange  
Telephone, Cherry 5040

BOSTON OFFICE, 405 P. O. Square Building

BROCKVILLE, CAN., CANADA FOUNDRIES AND FORGINGS, LTD.

DEALERS IN ALL PRINCIPAL CITIES

### Products.

KELSEY WARM AIR GENERATORS;  
GRAVITY and FAN BLAST WARM AIR  
SYSTEMS OF HEATING and VENTILATING;  
"CLIMAX" HOT WATER HEATER; KELSEY AUTOMATIC  
HUMIDIFIER.

### Kelsey Warm Air Generators.

**ADVANTAGES**—The claims for the efficiency, healthfulness and economy of the Kelsey warm air generator are based: (1) On its superior construction and method of warming and distributing air. (2) Its great heating surfaces and their weight. (3) The utilization of all the heat generated.

**METHODS OF WARMING AIR**—The Kelsey warm air generator warms fresh air by an improved method. Separate air currents pass up through the great battery of cast iron zigzag heat tubes which surround the fire and form the fire cylinder and combustion chamber.

As there are from 8 to 16 heat tubes in each generator and as each heat tube has 8 to 9 sq. ft. of heating surface, this means *great volumes of air properly, thoroughly and most economically warmed, and evenly distributed.*

**HEATING SURFACES AND WEIGHTS**—The "Kelsey" has *two or three times* as much weight and *heating surface* as the ordinary furnace with same size grate and fuel capacity. A comparison of the weights and heating surfaces with those of other furnaces will explain why the "Kelsey" is more durable, powerful and economical.

**UTILIZATION OF HEAT**—The heat tubes, being in direct contact with and overhanging the fire, are heated *on all four sides* by conduction, by radiation from the fire, and by the burning gases and products of combustion which pass down around their backs.

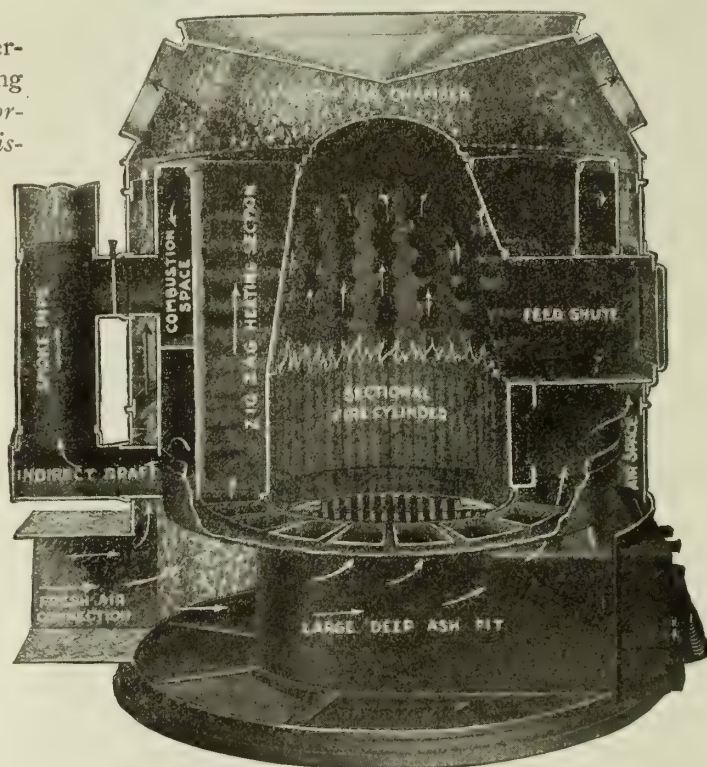
**DISTANT AND EXPOSED ROOMS POSITIVELY HEATED**—The separate currents of warm air are naturally forced out through the heat conducting pipes and into all the rooms of houses of ordinary size.

**THE KELSEY**  
WARM AIR GENERATOR  
TRADE-MARK

### *Kelsey Positive Cap Attachment*

—Exposed or distantly located rooms are heated by means of this attachment, placed over two or more of the heat tubes, forming a direct connection with the heat conducting pipe; the warm air which passes up through these particular heat tubes is forced through the heat pipe (which may be long or "against the wind") and into the room so connected.

**DURABILITY**—The Kelsey warm air generator has been in actual operation under the most severe conditions for the past 24 years and the letters of commendation that come to the company unsolicited, as well as the heaters that have been in use for years, will convince those interested that *the sectional construction allowing for expansion and contraction at 6-in. intervals around the circumference of the fire cylinder is the correct principle.*



KELSEY WARM AIR GENERATOR  
With the zigzag heat tube construction

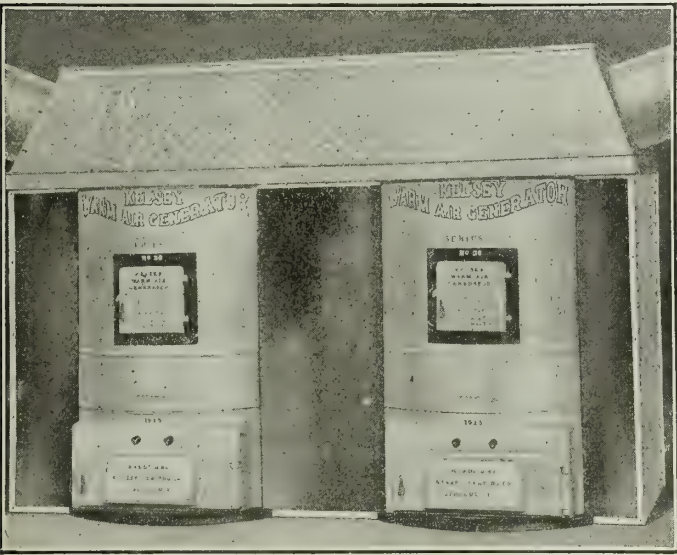


COMBINATION HOT WATER HEATER—With the “Climax” hot water heater a powerful combination heating system is insured, and is especially adapted for heating conservatories and for rooms where it may be difficult to extend the warm air pipes. This attachment is placed in fire chamber directly above fire.

WOOD BURNING CONSTRUCTION—Besides the regular style, with single feed door, the “Kelsey” is made with double feed door for admitting large chunks of wood and with cast iron front for brick set form.

BATTERY SYSTEM FOR LARGE BUILDINGS—A battery of two or more generators under one dome casing provides a most efficient system for heating and ventilating large residences, churches, schools, hospitals and public buildings.

This system supplies a variable amount of warm air as needed, without waste of fuel. One heater can be used in moderate weather.



BATTERY OF TWO KELSEY GENERATORS UNDER ONE DOME CASING

MECHANICAL SYSTEM FOR CHURCHES AND SCHOOLS—This means a forced circulation, by means of a fan or blower, of large quantities of air. The “Kelsey” is the only heater properly designed to heat air traveling

at a high velocity. “Kelsey” systems are meeting all requirements of the state laws for schools. The “Kelsey” will warm 4500 cu. ft. of air, traveling at a velocity of 1000 ft. per minute through 130° of temperature.

WATERFRONT—The “Kelsey” may be provided with a waterfront, under the feed chute, at an additional cost, for the heating of water in range boilers.

FUEL—The “Kelsey” uses anthracite coal; a good grade of bituminous, such as the “Pocahontas”; natural gas and wood.

A natural gas burner that allows either gas or coal to be used without changing the grates or any part of the heater can also be furnished.

Plans and Estimates.

Furnished for either the gravity or fan blast system, on receipt of blue prints and specifications of building.

Kelsey Automatic Humidifier.

Humidifying apparatus is necessary with every type of heating system; to supply this demand we have perfected an apparatus that furnishes, at limited expense for installation in old or new generators, sufficient moisture to protect the contents of the finest home and to give the air in the rooms the humidity needed for health and comfort.



KELSEY AUTOMATIC HUMIDIFIER

Showing it in warm air chamber and pipe connection to storage tank

References.

The “Kelsey” booklets, explaining both the gravity and mechanical systems or any apparatus that the company makes, together with list of references, will be sent on request.

SIZES, WEIGHTS AND CAPACITIES, KELSEY WARM AIR GENERATORS

GRATES			HEATING SURFACES		WEIGHTS	HEIGHT	BASE	HEATING CAPACITIES		
Size or number of generator	Diameter of grate and fire cylinder, ins.	Grate area, sq. ins.	Sq. ft. of heating surfaces	Sq. ft. of heating surfaces to each sq. ft. of grate surface	Weight of generators complete, lbs.	Height generator, cased complete, ins.	Diameter of floor space, ins.	House heating		Church heating
								Number of average sized pipes or rooms	Total area heating pipes supplied by each generator, cu. ins.	Estimated capacity in cu. ft. using 1-4 pipes
14	14	154	91	85	1008	61	38	3 to 4	280 to 350	8,000
16	16	201	114	82	1168	63	42	4 to 6	350 to 420	10,000 to 14,000
18	18	254	135	78	1635	68	46	6 to 8	450 to 500	16,000 to 20,000
21	21	346	146	61	2033	69	53	9 to 11	575 to 625	25,000 to 35,000
24	24	452	161	51	2300	69	56	10 to 13	675 to 750	35,000 to 45,000
27	27	572½	176	44	2600	72	60	12 to 15	850 to 925	50,000 to 60,000
30	30	707	211	43	3124	76	64	14 to 19	975 to 1,100	70,000 to 90,000

The capacities given for house and church heating are estimated averages under varying conditions, and are based on heating to 70° Fahr., with temperature outside registering at zero.  
All weights include refined sheet iron inside casings. Series A or B. With cast inside casings add about 300 lbs. for each heater.

# ABRAM COX STOVE CO.

Manufacturers of Boilers, Heaters and Ranges

American and Dauphin Streets

PHILADELPHIA, PA.

## Products.

"NOVELTY" STEAM and WATER BOILERS, TANK HEATERS, LAUNDRY STOVES, ALL-CAST WARM AIR HEATERS, STEEL DRUM WARM AIR HEATERS, PIPELESS WARM AIR HEATERS, COAL RANGES, COMBINATION COAL and GAS RANGES, SECTIONAL HOTEL RANGES, DOUBLE OVEN RANGES, etc., made in a wide variety of sizes and styles, suitable for all kinds of fuel.

## "Novelty" Steam and Water Boilers.

In the design of the "Novelty" boilers, both square and round types, the keynotes were simplicity of erection, economy of operation and durability.

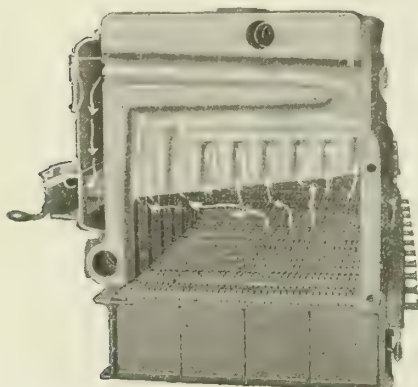
In the square type the design of the sections makes practically a water tube boiler. The free and unobstructed circulation of water reduces friction to a minimum. There are no unequal strains, and the steam boiler has a low, steady and reliable water line.

With "Novelty" arrangement of the flue surfaces, in both the round and square boilers, the combustion gases are so baffled in their course through the sections that a maximum number of heat units are extracted before they reach the smoke outlet.

THE IMPROVED NOVELTY GRATE—"Novelty" round and square hot water and steam boilers can now be equipped with this fine mesh grate. It is suitable for all sizes and grades of fuel—wood, hard or soft coal and coke.

Easy to operate. Can be shaken and dumped, giving complete control of fire.

GUARANTEE—Under proper installation and management "Novelty" boilers are guaranteed to carry the ratings with which they are accredited. New castings will be furnished for any found defective in manufacture.



SIDE VIEW SHOWING INTERMEDIATE SECTION, COMBUSTION CHAMBER, ETC., OF NO. 40-12 "NOVELTY" FIREBOX

"NOVELTY" SQUARE STEAM and WATER BOILERS—The square boiler is made in 4 grate sizes, as to depth from front to back, and the number of sections vary from 3 to 12.

Capacity: Steam, 550 to 9,000 sq. ft. water, 900 to 14,600 sq. ft. (See data.)



FLUE FRONT AND WATER FRONT REMOVED, SHOWING DIRECT AND FLUE HEATING SURFACE OF NO. 40-12 "NOVELTY" BOILER



NO. 40-12 "NOVELTY" STEAM BOILER

DATA, "NOVELTY" BOILERS WITH SQUARE FIREBOX

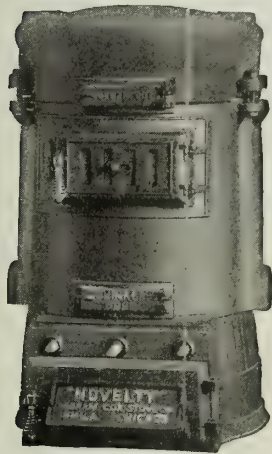
No.	Size of grate, ins.	Grate area, sq. ft.	Base dimensions (outside), ins.		Boiler dimensions (outside), ins.		Supply outlets, ins.	Return inlets, ins.	Smoke outlet, ins.	Ratings, sq. ft.		List price	
			Length	Width	Length	Width				Steam	Water	Steam	Water
20-3	20x 18 1/2	2.57	34	22	47	26	1-3 1/2	1-3 1/2	8	550	900	\$215.00	\$200.00
20-4	20x 27 3/8	3.83	34	32	47	36	2-3 1/2	2-3 1/2	10	825	1350	300.00	285.00
20-5	20x 36 1/4	5.11	34	42	47	46	2-3 1/2	2-3 1/2	12	1100	1800	385.00	370.00
20-6	20x 45 7/8	6.38	34	52	47	56	3-3 1/2	3-3 1/2	14	1400	2300	470.00	455.00
25-3	25x 18 1/2	3.21	39	22	52	26	1-3 1/2	1-3 1/2	8	700	1150	255.00	240.00
25-4	25x 27 3/8	4.80	39	32	52	36	2-3 1/2	2-3 1/2	10	1075	1775	355.00	340.00
25-5	25x 36 1/4	6.38	39	42	52	46	2-3 1/2	2-3 1/2	12	1450	2400	455.00	440.00
25-6	25x 45 7/8	7.96	39	52	52	56	3-3 1/2	3-3 1/2	14	1850	3100	555.00	540.00
25-7	25x 55	9.55	39	62	52	66	3-3 1/2	3-3 1/2	16	2250	3800	655.00	640.00
30-3	30x 18 1/2	3.85	44	22	57	26	1-3 1/2	1-3 1/2	8	875	1450	320.00	300.00
30-4	30x 27 3/8	5.76	44	32	57	36	2-3 1/2	2-3 1/2	10	1325	2200	435.00	415.00
30-5	30x 36 1/4	7.65	44	42	57	46	2-3 1/2	2-3 1/2	12	1775	3000	550.00	530.00
30-6	30x 45 7/8	9.56	44	52	57	56	3-3 1/2	3-3 1/2	14	2250	3800	665.00	645.00
30-7	30x 55	11.45	44	62	57	66	3-3 1/2	3-3 1/2	16	2750	4600	780.00	760.00
30-8	30x 64 1/2	13.36	44	72	57	76	4-3 1/2	4-3 1/2	18	3250	5400	895.00	875.00
40-3	40x 18 1/2	5.14	49	22	62	26	1-4	1-4	8	1300	2150	410.00	390.00
40-4	40x 27 3/8	7.68	49	32	62	36	2-4	2-4	10	2000	3300	580.00	560.00
40-5	40x 36 1/4	10.21	49	42	62	46	2-4	2-4	12	2700	4450	750.00	730.00
40-6	40x 45 7/8	12.75	49	52	62	56	3-4	3-4	14	3400	5600	920.00	900.00
40-7	40x 55	15.28	49	62	62	66	3-4	3-4	16	4100	6750	1090.00	1070.00
40-8	40x 64 1/2	17.81	49	72	62	76	4-4	4-4	18	5000	8200	1260.00	1240.00
40-9	40x 73 1/2	20.35	49	82	62	86	4-4	4-4	18	6000	9800	1430.00	1410.00
40-10	40x 82 3/8	22.88	49	92	62	96	5-4	5-4	18	7000	11400	1600.00	1580.00
40-11	40x 91 1/2	25.42	49	102	62	106	5-4	5-4	18	8000	13000	1770.00	1750.00
40-12	40x 100 3/8	27.88	49	112	62	116	5-4	5-4	18	9000	14600	1940.00	1920.00

Height from floor to inlets, all sizes, 16 ins. Height from floor to outlets, all sizes, 59 ins.  
Height of water line, all sizes, 53 ins.

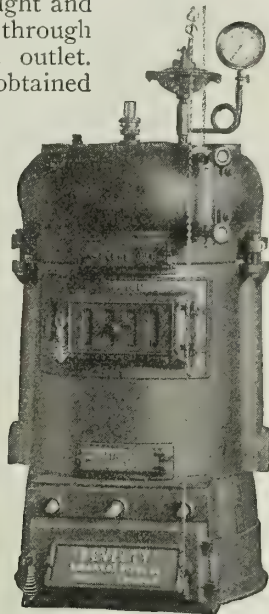


"NOVELTY" ROUND STEAM and WATER BOILERS—The "Novelty" is the only *round* boiler in which the products of combustion are carried first to the back, then to the front through the right and left hand flues, and then back through the center flue to the smoke outlet. Thus the same fire travel is obtained as in the square boiler.

All grates measure full size.



"NOVELTY" ROUND WATER BOILER



"NOVELTY" ROUND STEAM BOILER

### "Novelty" Laundry Stove and Tank Heaters.

The "Novelty" line of tank heaters and laundry stoves contains more distinctive features than any similar appliances made. The fire pots are deep, and, in the No. 10 tank heater and laundry stove, are lined with brick, thus insuring perfect combustion. This feature guarantees high efficiency with low fuel consumption. The ash pit is extra deep and the feed door large. The fire can be controlled perfectly by means of balanced draft and check doors.

By means of these appliances ample hot water can be had at all times at a cost of a few cents a day.

The laundry stove will also heat 8 irons on the side, and has a top which will take care of a large wash boiler. Being installed in the cellar, it will not add heat to the kitchen in summer, and will always keep the basement dry.



NO. 120 "NOVELTY" LAUNDRY STOVE



NO. 12 "NOVELTY" TANK HEATER



NO. 10 "NOVELTY" TANK HEATER

#### DATA, "NOVELTY" LAUNDRY STOVE AND TANK HEATERS

	No. 120 Laundry Stove	No. 12 Tank Heater	No. 10 Tank Heater
Diameter fire pot, ins. . . . .	12	12	10
Diameter smoke outlet, ins. . . . .	6	6	5
Height, floor to smoke outlet, ins. . . . .	33	32	32
Tappings, ins. . . . .	1 1/4 x 1 1/4	One 2-in. Two 2-in.	1 1/4 x 1 1/4
Tank capacity, gals. . . . .	40 to 80	200	30 to 60
Sq. ft. direct water radiation. . . . .	225	250	200
Shipping weight, lbs. . . . .	225	250	200
Height, floor to flow outlet, ins. . . . .	19 1/2	32	28
Height, floor to center of return, ins. . . . .	17 1/2	11 1/2	19
Deduct from height when set without legs, ins. . . . .	6	2	6
List price . . . . .	\$40.00	\$66.00	\$36.00

### "Novelty" Warm Air Heaters.

The "Novelty" line of warm air heaters embraces a wide variety of styles and sizes. They are all well proportioned as to grate and heating surfaces, making them most economical in operation.

The "Novelty" all-cast, "Novelty" steel drum and "Marvel Novelty" are equipped with straight fire pots, which materially increase their coal carrying capacity, and prevent the ashes from clinging to the sides, as they invariably do with a sloping fire pot. They are also equipped with triplex grates, the bars of which extend clear to the edge of the fire pot, making all parts of the grate surface movable, so that it can be readily and perfectly cleaned with the shaker, the use of a poker not being necessary as with most heaters.

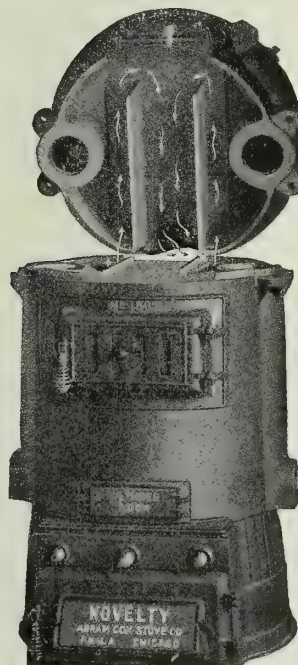
These heaters have all doors carefully ground and fitted, and can be easily regulated with the check draft in the rear. They are also provided with deep cup joints throughout, making them absolutely proof against dust and gas.

The modern "Novelty G" room heater has the same internal construction and dimensions as the "Novelty" all-cast furnace, and is adapted for installation in large rooms or halls which have no cellars.

The "Novelty" pipeless furnace is recommended for installation in churches, halls, bungalows or residences with open halls which will allow a free circulation of air.



"NOVELTY" ROUND BOILER WITH MAIN SECTION TILTED



"NOVELTY" ROUND BOILER WITH DOME SECTION TILTED

#### DATA, "NOVELTY" ROUND FIREBOX BOILERS

No.	Diam. of grate, ins.	Grate area, sq. ft.	Supply out-lets, ins.	Return in t., ins.	Height from floor to		Height of water line, ins.	Smoke out-let, ins.	Ratings, sq. ft.		List price	
					Inlet	Outlet			Steam	Water	Steam	Water
					ins.							
160	16	1.40	2-2	2-2	15	S-51 W-47	45	6	300	475	\$125.00	\$110.00
190	19	1.97	2-2½	2-2½	15	S-51 W-47	45	8	425	675	160.00	145.00
210	21	2.41	2-2½	2-2½	15	S-51 W-47	45	8	575	875	200.00	185.00
240	24	3.14	2-3	2-3	16	S-52 W-48	45	9	700	1150	260.00	245.00
270	27	3.98	2-3½	2-3½	16	S-52 W-48	45	9	1000	1500	330.00	315.00
300	30	4.91	2-4	2-4	16	S-52 W-48	45	10	1350	2000	410.00	395.00



**"Novelty" Formula for Measuring Building for Warm Air Heating.**

Find the cubic feet of space in room by multiplying the length by the width, and then multiplying this product by the height.

To the actual cubic feet of space in room add 75 cu. ft. for each sq. ft. of exposed glass surface, and 8 cu. ft. for each sq. ft. of exposed wall surface. For either a northern or western exposure add 10% to glass surface and 10% to wall surface in making the computation. For either a southern or eastern exposure deduct 10% from the exposed glass surface and 10% from the exposed wall surface. Count outside doors the same as glass surface; but where double doors or storm doors are provided, count such doors as exposed wall surface.

Add together the figures for all the rooms to be heated, and the total will be the equivalent cubic feet of space to be provided for by the furnace. Where this total does not agree with the exact capacity rating of any size of "Novelty" furnace, select the next larger size. For example, to heat a residence having 70,000 equivalent cubic feet of space, the No. 48-26 "Novelty" furnace would be installed (capacity 80,000), and not the No. 44-24 "Novelty" (capacity 66,000).

If the hall extends to upper floors, and no register is placed above the first floor, count in all the space on upper floor as well as on first floor in computing for the hall.

The foregoing computation is based on maintaining a temperature of 70° above zero in the building when the outside temperature is zero.

**NOTE**—In specifying size of the furnaces, the above formula will be found to serve the useful purpose of not only providing sufficient heat for the building, but of securing estimates on a comparative and equitable basis.

DATA, "NOVELTY" ALL-CAST WARM AIR HEATER

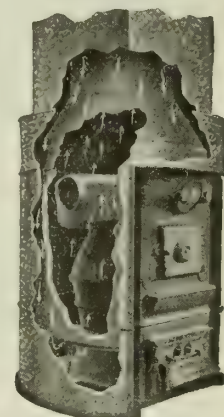
No.	Capacity in "equivalent cubic feet" on basis of maintaining temperature of 70° above zero in building when outside temperature is zero	Height of heater cased complete, ins.	Diam. of fire pot, ins.	Diam. of casings, ins.	Height to top of radiator, ins.	Diam. of smoke pipe, ins.	Size of cold air duct required, ins.	Weight of heater, less casings, lbs.
20-36 G	42,000	59	20	36	46	8	12x20	666
22-40 G	52,000	61	22	40	48	8	12x26	825
24-44 G	63,000	64	24	44	50 1/8	9	12x30	956
26-48 G	75,000	67	26	48	52 1/8	9	14x30	1105
30-56 G	106,000	72	30	56	56	9	14x38	1550

DATA, "MARVEL NOVELTY" STEEL DRUM WARM AIR HEATER

No.	Capacity in "equivalent cubic feet" on basis of maintaining temperature of 70° above zero in building when outside temperature is zero	Height of heater cased complete, ins.	Diam. of fire pot at grate, ins.	Diam. of casings, ins.	Height to top of drums, ins.	Diam. of smoke pipe, ins.
32-18 G	36,000	58	18	32	45	7
36-20 G	42,000	59 1/2	20	36	46 1/2	8
40-22 G	49,000	61	22	40	48	8
44-24 G	59,000	63	24	44	49 1/8	9
48-26 G	70,000	66	26	48	51 1/8	9
56-30 G	95,000	68	30	56	53 1/2	9

DATA, "NOVELTY" PIPELESS ALL-CAST WARM AIR HEATER

No.	Capacity in "equivalent cubic feet" on basis of maintaining temperature of 70° above zero in building when outside temperature is zero	Diam. of fire pot, ins.	Diam. of inner casings, ins.	Diam. of outside casings, ins.	Diam. of hot air outlet, ins.	Outside dimensions of register, ins.	Diam. of smoke pipe, ins.
20-44	38,000	20	36	44	18	24x27	8
22-48	47,000	22	40	48	22	30x30	8
24-52	57,000	24	44	52	24	30x36	9
26-56	68,000	26	48	56	26	35x35	9

**"NOVELTY" STEEL DRUM WARM AIR HEATER****"NOVELTY" ALL-CAST WARM AIR HEATER****"MARVEL NOVELTY" STEEL DRUM WARM AIR HEATER****MODERN "NOVELTY" ROOM HEATER****"NOVELTY" PIPELESS ALL-CAST HEATER  
Also made with steel radiator**

DATA, "NOVELTY" STEEL DRUM WARM AIR HEATER

No.	Capacity in "equivalent cubic feet" on basis of maintaining temperature of 70° above zero in building when outside temperature is zero	Height of heater cased complete, ins.	Diam. of fire pot, ins.	Diam. of casing, ins.	Height to top of drum, ins.	Diam. of smoke pipe, ins.
36-20 G	43,000	60	20	36	48	8
40-22 G	54,000	63	22	40	51	8
44-24 G	66,000	66	24	44	54	9
48-26 G	80,000	69	26	48	57	9
56-30 G	110,000	71	30	56	59	9

DATA, "NOVELTY" PIPELESS STEEL RADIATOR WARM AIR HEATER

No.	Capacity in "equivalent cubic feet" on basis of maintaining temperature of 70° above zero in building when outside temperature is zero	Diam. of fire pot, ins.	Diam. of casings, ins.	Diam. of outside casings, ins.	Diam. of hot air outlet, ins.	Dimensions of outside register, ins.	Diam. of smoke pipe, ins.
44-20	39,000	20	36	44	18	24x27	8
48-22	49,000	22	40	48	22	30x30	8
52-24	60,000	24	44	52	24	30x36	9
56-26	72,000	26	48	56	26	35x35	9

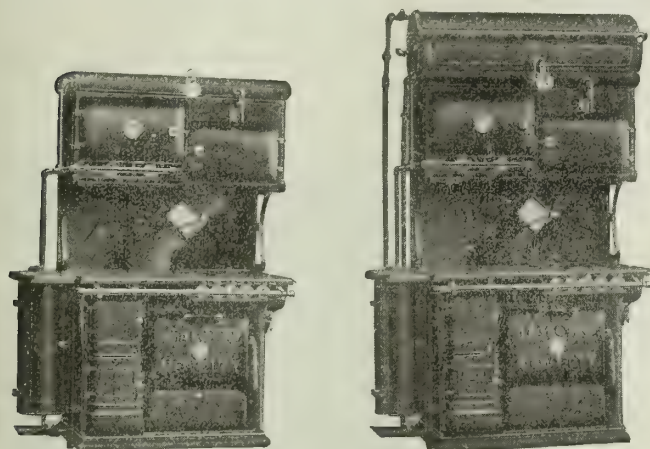


**"Yearound Novelty" Ranges.**

The "Yearound Novelty" range embodies in a most compact form all the facilities of a complete coal range for winter use, as well as a cabinet gas range and gas water heater for summer use, and the cost does not exceed that of the same articles if purchased separately. It is made in one size only, with coal oven either to the right or left of fire box, and has a number of exclusive features.

All gas parts of this range are standard according to the most rigid requirements of the largest gas companies. The gas water heater is the double copper coil type encased in two jackets.

The regular equipment includes gunmetal polished top, velvet back finish on the body, aluminized ovens, white enameled burner and broiler pans, porcelain gas valve handles, thermometers in both oven doors, and illuminating gas fixture. Duplex grate, spacious ash pan, low closet with drop door. Requires no blacking.



Without Horizontal Boiler but  
with Gas Water Heater

Complete for Coal and Gas

**"YEAROUND NOVELTY" RANGE****DATA**

18-in. coal baking oven.	Height to top of gas ovens, 67½ ins.
18-in. gas baking oven.	Height over all, including boiler, 79 ins.
16-in. gas broiling oven.	Capacity of horizontal boiler, 26 gals.
Four 8-in. cooking holes for coal.	Coal cooking top, 25½x20 ins.
5-burner gas cooking top.	Gas cooking top, 25½x21 ins.
2-burner gas baking oven.	Length of cooking top, less gas water heater, 41 ins.
Pilot lighter for gas oven.	Length over all, including gas water heater, 49 ins.
3-line burner in gas broiling oven.	Clearance between cooking top and bottom of gas ovens, 16 ins.
Ash chute opening, 7 ins. in diameter, with center of opening 9½ ins. from front, and 7 ins. from side.	
Height of main cooking top, 31½ ins.	

**"Junior Yearound Novelty" Range.**

The "Junior Yearound Novelty" range is of the same general construction as the "Yearound Novelty" range, but smaller and somewhat lower in price. Can be furnished in the same forms.

**"Suburban Novelty" Range.**

The "Suburban Novelty" has been termed the "heavy duty range."

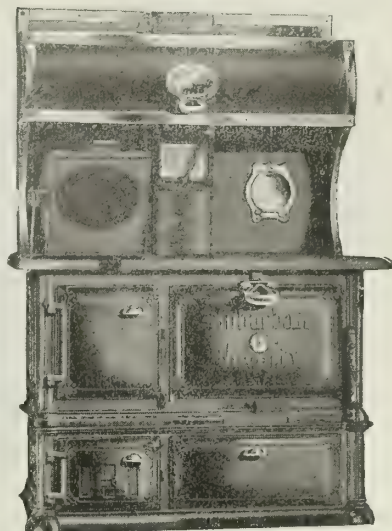
Hot water for bathing and for other domestic purposes is demanded in constantly increasing quantities in the modern household. Even the very best kitchen ranges of the ordinary types are deficient in power to meet the modern demand for hot water and for cooking and roasting at the same time.

The firebox of the "Suburban Novelty" is more than twice as large as that of the very best kitchen ranges of the regular types. It has ample power to supply hot water for 5 bathrooms and to meet all cooking requirements at one and the same time.

Three types of water fronts can be furnished; and as the water heating capacity of the "Suburban Novelty" is so great, a circulating boiler of less than 60 gals. capacity should not be used even with the smallest style.

The patent lift-up ratchet slip plate on the "Suburban Novelty" is a new feature. It is easy to operate and most convenient for broiling.

The grate is the 3-bar type, operated by a heavy shaker which attaches to a shank on the middle bar. Deep, spacious ash pan furnished with every range.



"SUBURBAN NOVELTY" RANGE  
With high closet

**DATA, "SUBURBAN NOVELTY" RANGE**

Firebox, 14 x 12 x 8½ ins.	Extreme height, including gas closet, 67 ins.
Oven, 20 x 20 x 12½ ins.	Extreme height, including high shelf, 54 ins.
Gas baking oven, 18 x 17 x 10 ins.	Size of top, 45 x 27 ins.
Gas broiling oven, 18 x 12 x 10 ins.	Width of gas end shelf over all, 15 ins.
Height of range to main top, 32 ins.	Diameter of smoke collar, 7 ins.
Extreme height, including high closet, 63½ ins.	

**"Novelty Kitchener" Range.**

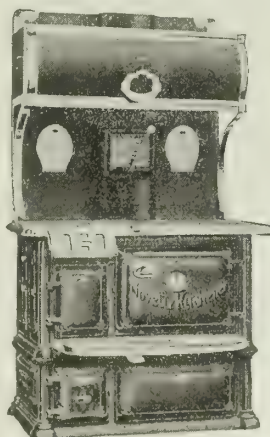
The "Novelty Kitchener" (800 Series) is plain and dignified, yet rich and beautiful in appearance; and is the range for strength, service and endurance.

A heavy, durable construction in two parts, body and base. Has a large firebox with improved duplex grate which, with properly constructed flues and oven, insures perfect results and economy of fuel. Made with either right or left hand oven.

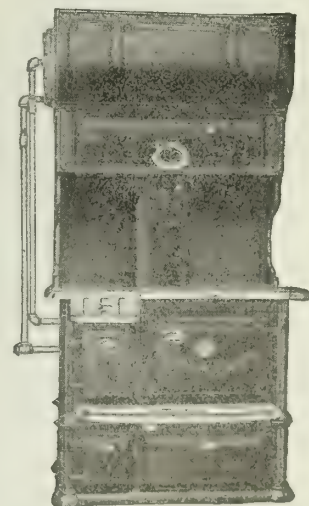
A waterfront of large capacity, constructed to supply an abundance of hot water, always furnished unless otherwise specified.

This popular line is furnished with swing oven door as well as drop oven door. The swing door type carries a nickel oven shelf that extends the full width of the range, adding greatly in its appearance.

A spacious ash pan furnished with every range.

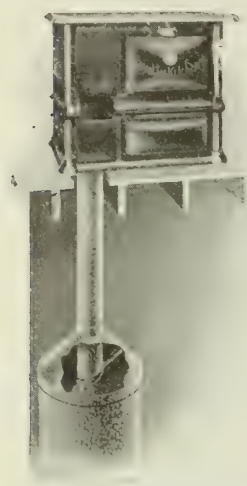


"NOVELTY KITCHENER" F  
OR G  
800 Series, with high closet



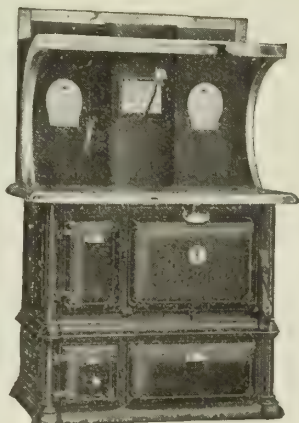
"NOVELTY KITCHENER" F  
OR G  
800 Series, with boiler closet for 12- or 14-in. boiler





"NOVELTY KITCHENER" A,  
WITH ASH CHUTE DAMPER  
AND ASH CAN

Entire equipment absolutely dust-  
proof. Ash can has sliding cover



"NOVELTY KITCHENER" A  
800 Series, with high shelf



"NOVELTY KITCHENER" HOTEL RANGE

An ideal kitchen appliance for hotels, large boarding houses, schools, restaurants and institutions. Furnishes hot water at all times for every kitchen use and for 4 or 5 bathrooms. Has base doors with low warming closets; can be supplied with ash chute when specified. 3-way waterfront always furnished in one section. Made with either right or left hand overs: has triplex and duplex grates

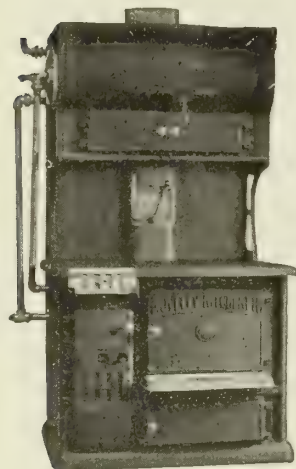
Height to cooking top, 32 ins.  
Height over all, 63½ ins.  
Size of cooking top, as shown in  
illustration, 90 x 27 ins.  
Two 20-in. ovens.

Six 9-in. covers.  
Four 8-in. covers.  
French slip plate, with quadruple  
reducing ring cover over fire.

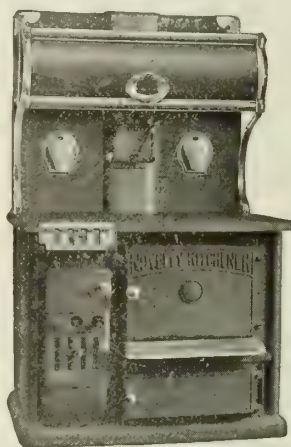
DATA, "NOVELTY KITCHENER" RANGES, 800 SERIES

	818A	820A	920A
Size of oven, ins.	18 x 18	20 x 20	20 x 20
Measurement of top, ins.	39 x 27	41½ x 28	41½ x 28
Size of smoke pipe, ins.	7	7	7
All ranges have 6 covers. Size, ins.	8	8	9

Style	Description	Total height, ins.
M	Body of range only	32
N	With splash plate	38
O	With No. 119 high shelf	54
P	With No. 7 high closet	63½
R	With boiler closet for 12- or 14-in. boiler	73½
S	With elevated gas oven	68
	With elevated gas oven, boiler shield and 12-in. boiler	77



"NOVELTY KITCHENER"  
100 Series, with boiler closet for 10-  
and 12-in. boiler. Also made  
with rack for boiler



"NOVELTY KITCHENER"  
100 Series, with high closet

DATA, "NOVELTY KITCHENER" RANGES, 100 SERIES

	No. 147	No. 148
Size of ovens, ins.	16 x 16	18 x 18
Measurement of top, ins.	24 x 33	26 x 36
Size of smoke pipe, ins.	6½	6½
Size of hot air pipe, ins.	5	5
All ranges have 6 covers. Size, ins.	7	8

Style	Description	Height, ins.
A	Body of range only	29
B	With splash plate	34
C	With steel high shelf	50
E	With high closet, including smoke pipe and check	61
G	With boiler rack for 10- or 12-in. boiler	55½
H	With boiler closet for 10- or 12-in. boiler	66
J	With elevated gas oven and gas end shelf	66
K	With elevated gas oven and gas end shelf and boiler bracket	75

### Double Oven Ranges.

The "Regal Novelty" has the largest cooking top; while the "French Novelty" and "Home Novelty" are the same size, the only difference between the latter two being in the construction of the top. The "French Novelty" is equipped with a lift-up slip plate over the fire for broiling purposes, and has an opening 14 ins. square, sufficiently large to carry any kind of broiling device.

Double oven ranges are equipped with heavy 2-bar grates and with extra efficient waterfronts.

DATA, DOUBLE OVEN RANGES

	"REGAL"	"FRENCH"	"HOME"
Size of ovens, ins.	18 x 20	14 x 20	14 x 20
Size of top, ins.	60 x 27½	50 x 28	50 x 28
Top construction	Ten 8-in. covers	*Three slip plates	Eight 8-in. covers
Size of smoke pipe, ins.	7½	6	6
Height of range and cooking top, ins.	27	32	32
Height including plate rack, ins.	49	48	48
Height including high closet, ins.	..	61½	61½

\*Three slip plates with 8 x 12-in. reducing covers.



"NOVELTY" DRAFT CHECK

Fills the twofold purpose of a check draft and smoke pipe damper. Is opened and closed by merely pushing the lever from one side to the other. Fire can be completely checked without removing lids. Furnished with all "Novelty" Ranges ordered with smoke pipe to top of closet or shelf





There is in this boiler at least 50% less ashes from a given amount of coal than from a boiler of the usual type—conclusive evidence of its economy.

**LESS DIRT**—Because the smoke is consumed, little soot is deposited throughout boiler flues.

**HEADER TYPE**—This type construction has many advantages as follows:

It provides for positive internal circulation and proper distribution.

All connections between sections are exterior, away from the action of fire and in plain view.

All connections are easily accessible and, furthermore, each section or part of boiler is absolutely independent of the other.

If for any reason a section of this type should be broken, it is only necessary to remove the nipples which connect this section to the headers, and place ordinary plugs in the manifolds. The boiler can be operated in this condition for the balance of the season.

RATINGS, CAPACITIES, MEASUREMENTS AND LIST PRICES HART & CROUSE SMOKELESS WATER TUBE BOILERS

Boiler number	Ratings, sq. ft.		Grate surface, sq. ft.	Tappings, steam		Foundation		Total length, ins.	Chimney flues recommended		List price	
	Steam	Water		Flow, ins.	Return, ins.	Length, ins.	Width, ins.		Round, ins. ft.	Square, ins. ft.	Steam	Water
558	15,000	24,000	60	1-8	2-5	182	62	204	36 x 80	36 x 100	\$4,415	\$4,395
557	14,500	23,200	60	1-8	2-5	172	62	194	32 x 100	36 x 95	4,181	4,161
556	14,000	22,400	60	1-8	2-5	162	62	184	32 x 90	36 x 90	3,947	3,927
555	13,500	21,600	60	1-8	2-5	152	62	174	32 x 80	36 x 85	3,713	3,693
554	12,500	20,000	52.5	1-8	2-5	142	62	164	30 x 80	36 x 80	3,479	3,459
553	12,000	19,200	52.5	1-8	2-5	132	62	154	30 x 75	36 x 75	3,245	3,225
552	11,250	18,000	52.5	1-8	2-5	122	62	144	28 x 90	32 x 90	3,011	2,991
551	10,250	16,900	45	1-8	2-5	112	62	134	28 x 80	32 x 80	2,777	2,757
550	9,500	15,700	45	1-8	2-5	102	62	124	28 x 70	32 x 70	2,543	2,523
549	8,750	14,400	45	1-8	2-5	92	62	114	24 x 70	28 x 70	2,309	2,289
548	7,600	13,000	37.5	1-8	2-5	82	62	104	24 x 70	28 x 70	2,075	2,055
414	7,000	11,600	35.5	1-8	2-5	100	52	116	24 x 80	24 x 85	1,756	1,736
413	6,500	10,800	31.66	1-8	2-5	93	52	109	24 x 75	24 x 80	1,606	1,586
412	6,000	10,000	31.66	1-8	2-5	86	52	102	24 x 70	24 x 75	1,470	1,450
411	5,500	9,300	31.66	1-8	2-5	79	52	95	24 x 65	24 x 70	1,368	1,348
410	5,000	8,500	27.5	1-8	2-5	72	52	88	24 x 60	24 x 65	1,266	1,246
409	4,500	7,750	24	1-8	2-5	65	52	81	24 x 60	24 x 65	1,164	1,144
347	4,750	7,900	28	1-6	2-4	100	40	120	24 x 65	24 x 70	1,288	1,268
346	4,500	7,750	28	1-6	2-4	97	40	114	24 x 65	24 x 70	1,222	1,202
345	4,200	7,000	28	1-6	2-4	91	40	108	24 x 60	24 x 65	1,156	1,136
344	4,000	6,650	25.1	1-6	2-4	85	40	102	20 x 60	20 x 75	1,092	1,072
343	3,800	6,350	25.1	1-6	2-4	79	40	96	20 x 60	20 x 75	1,026	1,006
342	3,600	6,000	22.5	1-6	2-4	73	40	90	20 x 60	20 x 65	962	942
341	3,350	5,550	22.5	1-6	2-4	67	40	84	20 x 60	20 x 65	912	892
340	3,000	5,000	19.65	1-5	2-3	61	40	78	20 x 60	20 x 60	864	844
339	2,600	4,450	17	1-5	2-3	55	40	72	20 x 50	20 x 60	796	776
338	2,250	3,600	14.23	1-5	2-3	49	40	66	16 x 50	16 x 50	730	710
251	2,100	3,450	16.32	1-4	2-2½	81	31	81	16 x 60	16 x 65	690	670
250	1,800	3,000	15.7	1-4	2-2½	75	31	75	16 x 60	16 x 60	610	600
249	1,500	2,500	12.32	1-4	2-2½	69	31	69	16 x 60	16 x 60	530	510
248	1,200	2,000	10.33	1-4	2-2½	63	31	63	16 x 50	16 x 50	460	450
247	900	1,500	8.33	1-4	2-2½	57	31	57	16 x 40	16 x 40	400	390

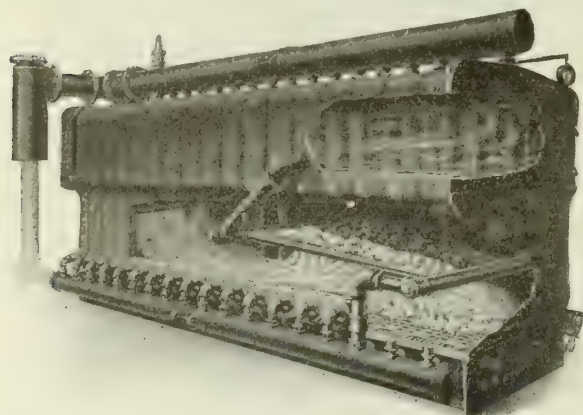
ADDITIONAL INFORMATION NOT GIVEN ABOVE

Series	Heights, ins.				Widths, ins.			Size of smoke-pipe, ins.
	Water line	Boiler	To center of smoke-pipe	Ash-pit	Boiler	Boiler at foundation	Fire-box	
558 to 548	68	108	68	13½	97	62	54	24
414	68	99	70	13½	72	52	40	24
413 to 409	68	99	70	13½	72	52	40	21
347 to 345	63	90	65	15	60	40	33	21
344 to 338	63	90	65	15	60	40	33	18
251 to 247	57	80	56¾	15	44	31	24	15

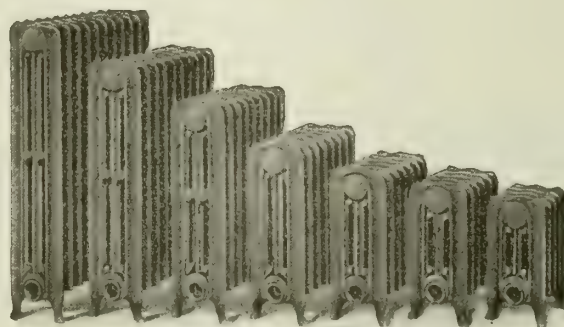
Measurements are for both steam and water.

LIST PRICES ROYAL HOT WATER SUPPLY BOILERS

No.	Tank capacity, gals.	List price	Height floor to top outlet, ins.	Diameter grate, ins.	Size of smoke-pipe, ins.	Supply and return tappings, ins.	Rating sq. ft. radiation
10	125	\$ 50	32	10	5	1½	200
13	250	74	33¾	13	6	2	300
16	450	122	37	16	7	2½	400



HART & CROUSE SMOKELESS WATER TUBE BOILER  
Showing double fire bed and direction of heat travel

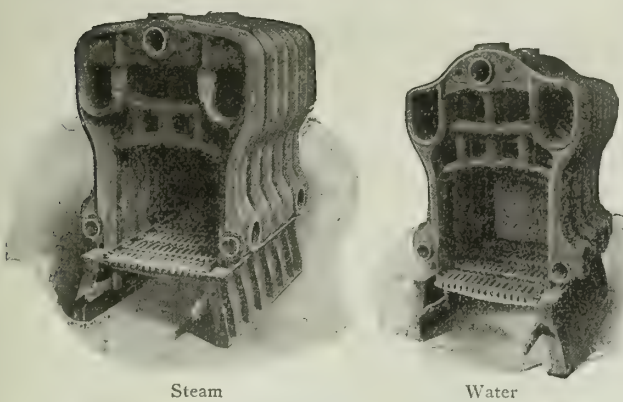


STEAM AND WATER RADIATORS

Made in all heights

Write nearest office for details.





INTERIOR VIEWS STEAM AND WATER BOILERS

NOTE.—The latest feature in cast iron boilers—separate construction throughout.

LIST PRICES AND CAPACITIES

No. including sections		Size of grate, ins.	Smoke pipe	Outlets, ins.	Return, ins.	Steam		Water	
Steam	Water					Ratings	List price	Ratings	List price
S-22-4	W-22-4	22x22	22	10	1-4	2-3	600	\$294	1,000
S-22-5	W-22-5	22x29	10	1-4	2-3	800	357	1,300	346
S-22-6	W-22-6	22x36	10	1-4	2-3	1,000	420	1,650	410
S-22-7	W-22-7	22x43	10	1-4	2-3	1,200	483	2,000	472
S-22-8	W-22-8	22x50	10	1-4	2-3	1,400	546	2,350	535
S-28-5	W-28-5	28x33	12	1-5	2-4	1,300	514	2,150	504
S-28-6	W-28-6	28x41	12	1-5	2-4	1,625	616	2,675	606
S-28-7	W-28-7	28x49	12	1-5	2-4	1,950	718	3,200	708
S-28-8	W-28-8	28x57	12	1-5	2-4	2,275	820	3,725	799
S-36-5	W-36-5	36x37	15	1-6	2-4	2,100	766	3,450	745
S-36-6	W-36-6	36x46	15	1-6	2-4	2,625	887	4,325	866
S-36-7	W-36-7	36x55	15	1-6	2-4	3,150	1,008	5,200	987
S-36-8	W-36-8	36x64	15	1-6	2-4	3,675	1,128	6,050	1,108
S-36-9	W-36-9	36x72	15	1-6	2-4	4,200	1,250	6,925	1,228
S-36-10	W-36-10	36x82	15	1-6	2-4	4,725	1,375	7,800	1,348
S-36-11	.....	36x91	15	1-6	2-4	5,250	1,500	.....	.....
S-36-12	.....	36x100	15	1-6	2-4	5,775	1,625	.....	.....
S-554	W-554	54x40	24	2-6	4-4	6,350	2,010	10,350	1,990
S-564	W-564	54x50	24	2-6	4-4	7,350	2,410	11,350	2,390
S-574	W-574	54x60	24	2-6	4-4	8,350	2,810	12,500	2,790
S-584	W-584	54x70	24	2-6	4-4	9,350	3,210	14,000	3,190
S-594	W-594	54x80	24	2-6	4-4	10,000	15,000	15,000	.....
S-604	W-604	54x80	24	2-6	4-4	10,650	16,500	16,500	.....
S-614	W-614	54x80	24	2-6	4-4	11,275	18,000	18,000	.....
S-624	W-624	54x80	24	2-6	4-4	11,900	19,500	19,500	.....
S-634	W-634	54x80	24	2-6	4-4	12,500	20,650	20,650	.....
S-644	W-644	54x80	24	2-6	4-4	13,000	21,450	21,450	.....
S-654	W-654	54x80	24	2-6	4-4	13,500	22,250	22,250	.....
S-664	W-664	54x90	24	2-6	4-4	14,000	23,000	23,000	.....
S-674	W-674	54x90	24	2-6	4-4	14,500	23,500	23,500	.....
S-684	W-684	54x90	24	2-6	4-4	15,000	24,000	24,000	.....

LIST PRICES AND CAPACITIES ROYAL HEADER TYPE STEAM AND WATER BOILERS

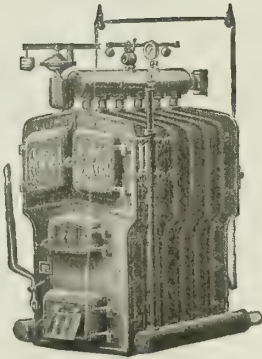
No. of heaters		Size of grate, ins.	Size of smoke pipe, ins.	Size of steam connections, ins.	No. and size of return connections, ins.	Steam		Water	
Steam	Water					Rating	List price	Rating	List price
065	035	19x16	9	2 1/2	2-2	300	\$257	500	\$247
066	036	19x20	9	2 1/2	2-2	400	289	650	278
067	037	19x24	9	2 1/2	2-2	500	323	800	313
068	038	19x28	9	2 1/2	2-2	600	353	950	342
069	039	19x32	9	2 1/2	2-2	700	383	1,100	373
070	040	19x36	9	2 1/2	2-2	800	415	1,250	404
264	134	21x19	9	2 1/2	2-2	500	299	800	289
265	135	21x25	9	2 1/2	2-2	650	352	1,050	341
266	136	21x31	9	2 1/2	2-2	800	405	1,300	395
267	137	21x37	9	2 1/2	2-2	950	458	1,550	447
268	138	21x43	9	2 1/2	2-2	1,100	510	1,800	500
275	145	24x25	10	3	2-2	800	404	1,300	394
276	146	24x31	10	3	2-2	1,000	481	1,650	470
277	147	24x37	10	4	2-2 1/2	1,200	551	2,000	541
278	148	24x43	10	4	2-2 1/2	1,400	620	2,350	609
279	149	24x49	10	4	2-2 1/2	1,600	688	2,650	677
286	156	33x30	12	4	2-2 1/2	1,400	674	2,350	663
287	157	33x36	12	4	2-2 1/2	1,800	780	3,000	770
288	158	33x42	12	5	2-3	2,200	902	3,700	881
289	159	33x48	12	5	2-3	2,600	992	4,300	971
290	160	33x54	15	5	2-3	3,000	1,086	5,000	1,064
291	161	33x60	15	6	2-4	3,350	1,176	5,600	1,155
292	162	33x66	15	6	2-4	3,700	1,266	6,200	1,245
293	.....	33x66	15	6	2-4	3,950	1,357	.....	.....
294	.....	33x66	15	6	2-4	4,200	1,447	.....	.....
295	.....	33x66	15	6	2-4	4,450	1,537	.....	.....
296	.....	33x72	15	6	2-4	4,700	1,627	.....	.....
297	.....	33x72	15	6	2-4	4,950	1,718	.....	.....
306	176	40x38	15	6	2-4	2,800	1,155	5,000	1,134
307	177	40x45	15	6	2-4	3,350	1,302	5,900	1,281
308	178	40x52	15	7	2-4	3,900	1,454	6,800	1,433
309	179	40x59	18	7	2-4	4,450	1,580	7,700	1,554
310	180	40x66	18	8	2-5	5,000	1,660	8,600	1,634
311	181	40x73	18	8	2-5	5,550	1,753	9,500	1,727
312	182	40x80	18	8	2-5	6,000	1,803	10,300	1,777
313	.....	40x80	18	8	2-5	6,400	1,887	.....	.....
314	.....	40x80	18	8	2-5	6,800	2,016	.....	.....
315	.....	40x80	18	8	2-5	7,200	2,146	.....	.....
316	.....	40x80	18	8	2-5	7,500	2,276	.....	.....
S-854	W-854	54x40	24	2-6	2-4	6,350	2,210	10,350	2,190
S-864	W-864	54x50	24	2-6	2-4	7,350	2,610	11,350	2,590
S-874	W-874	54x60	24	2-6	2-4	8,350	3,010	12,500	2,990
S-884	W-884	54x70	24	2-6	2-4	9,350	3,410	14,000	3,390
S-894	W-894	54x80	24	2-6	2-4	10,000	.....	15,000	.....
S-703	W-703	54x80	24	2-6	2-4	10,650	.....	16,500	.....
S-713	W-713	54x80	24	2-6	2-4	11,275	.....	18,000	.....
S-723	W-723	54x80	24	2-6	2-4	11,900	.....	19,500	.....
S-733	W-733	54x80	24	2-6	2-4	12,500	.....	20,650	.....
S-743	W-743	54x80	24	2-6	2-4	13,000	.....	21,450	.....
S-753	W-753	54x80	24	2-6	2-4	13,500	.....	22,250	.....
S-763	W-763	54x90	24	2-6	2-4	14,000	.....	23,000	.....
S-773	W-773	54x90	24	2-6	2-4	14,500	.....	23,500	.....
S-783	W-783	54x90	24	2-6	2-4	15,000	.....	24,000	.....

LIST PRICES AND CAPACITIES, ROYAL ROUND STEAM AND WATER BOILERS

No. of heaters		Diameter grate, ins.	Size smoke pipe, ins.	Steam		Water	
Steam	Water			Rating	List price	Rating	List price
317-S	317-W	17	7	300	\$168	500	\$158
417-S	417-W	17	7	350	186	600	175
517-S	517-W	17	7	400	204	650	187
420-S	420-W	20	8	450	222	750	211
520-S	520-W	20	8	550	254	850	227
.....	0423-W	23	9	.....	.....	925	242
423-S	423-W	23	9	600	284	1,025	271
523-S	523-W	23	9	700	315	1,100	284
.....	0426-W	26	9	.....	.....	1,150	299
426-S	426-W	26	9	800	341	1,250	326
526-S	526-W	26	9	950	395	1,350	341
.....	0429-W	29	10	.....	.....	1,600	379
429-S	429-W	29	10	1,050	433	1,750	417
529-S	529-W	29	10	1,150	469	1,850	449
.....	629-W	29	10	.....	.....	1,950	471



ROYAL ROUND BOILER  
For steam or water



ROYAL HEADER TYPE BOILER  
For steam and water  
See table above for data.



ROYAL WARM AIR FURNACE  
Write nearest office for details.

# INTERNATIONAL HEATER COMPANY

## Makers of Heating Apparatus

GENERAL OFFICES

UTICA, N. Y.

BRANCH OFFICES

NEW YORK, N. Y., 601 West 27th Street

CHICAGO, ILL., 1933 Wentworth Avenue

### Products.

INTERNATIONAL WARM AIR FURNACES, ECONOMY COMBINATION HEATERS, INTERNATIONAL ONEPIPE HEATERS, INTERNATIONAL STEAM and HOT WATER BOILERS and HOT WATER SUPPLY BOILERS, AUXILIARY WATER HEATERS.

Furnace Pipe and Fittings.

Only a partial list of this company's products are described in the following pages. For the full line, consult complete catalogues.

### Ratings.

The ratings given for International warm air furnaces are necessarily *estimated* and *approximate* only, and are to be considered as suggestive, rather than absolute. The exposed glass and wall surface, exposure and construction of the building, prevailing winds, climatic conditions, together with the location of the heater and manner of piping, are the determining factors that make each individual job a matter of judgment and experience.

A warm air furnace that is larger than is absolutely required will give better satisfaction, last longer, and be more economical in fuel consumption than one just large enough to fulfill a guarantee; and a furnace properly set and piped will give better satisfaction than a size larger poorly installed.

The ratings on International boilers provide for all piping (mains, risers, flows and returns) to be figured as radiating surface, in addition to the direct cast iron radiation used.

Ratings are based on the assumption that there shall be used sufficient radiation to properly heat the building; the piping shall be of sufficient size and properly run, and the boiler connected to a flue of ample capacity, with steam at 2 lbs. pressure as it leaves the boiler, or in case of a water boiler, with water at 180° Fahr. as it leaves the boiler.

When soft coal is used, a boiler of larger size should be used. When a pipe coil or cast iron section is introduced into the fire pot for heating water for domestic use, additional capacity should be figured in determining the size of boiler.

Ratings for both warm air furnaces and steam and hot water boilers are conservatively made in accordance with accurate standards; but on account of the varying conditions surrounding installation, no guarantee is given except to the extent of furnishing new castings for any found to be defective in manufacture. Claims for expenses can not be entertained.

### Prices.

This company sells to the trade only. For several



years past, in this catalogue, prices on warm air furnaces have been given, at which they would be furnished to house owners by any regular dealer in International Heaters.

Unstable market conditions and increasing costs on practically all raw material, as well as labor, have made it impractical to follow this practice in the present edition.

Prices quoted on boilers and combination heaters are *list prices*, and are subject to regular trade discounts and freight terms, which vary with the market.

### Warm Air Furnaces.

All warm air furnaces listed here, which have a 20-in. fire pot or larger, are provided with coil openings for the insertion of a coil or cast iron water front for heating the domestic water supply, the heavy duty and wood burner patterns being excepted.

The warm air furnace casings made by us are double; i. e., an outer casing of galvanized iron, and an inner casing (with air space between) of black iron. Cold air necks are furnished free with all orders specifying them, but not otherwise.

### International Carton Warm Air Furnace, 1915 Pattern.

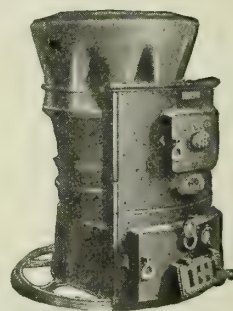
A heavy all-cast furnace designed for the best class of high grade heating. Made for burning either hard or soft coal. Self-cleaning radiator, cast in one piece; large air flues; straight two-piece fire pot; heringbone triangular grate hung in drop frame.

For over half a century Carton furnaces have maintained a high record for efficiency, durability and economy. The 1915 Pattern Carton is the latest improved design. Recommended for the best class of residence work, and for churches and stores where efficiency and durability are sought.

SIZES AND CAPACITIES

Number, hard coal	Number, soft coal	Diam. fire pot, ins.	Diam. grate, ins.	Diam. casing, ins.	Estimated heating capacity, cu. ft.
40-2	40-3	20	18	40	10-14M
44-2	44-3	22	20	44	14-17M
48-2	48-3	24	22	48	17-20M
52-2	52-3	26	24	52	20-30M
58-2	58-3	28	26	58	30-45M
60	060	33	30	60	55-80M

†Nos. 60 and 060 have single door only



INTERNATIONAL CARTON FURNACE

### International Heavy Duty Warm Air Furnace.

Designed especially for school and church heating, and can be had in either portable or brick set form. It is constructed entirely of cast iron, and all parts are very heavy and durable. The radiator has a long gas

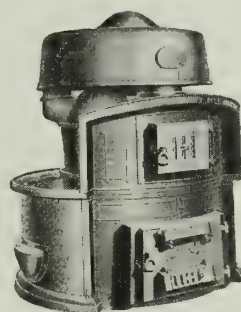


travel and plenty of free air space to provide 30 cu. ft. of fresh air per pupil, per minute, for space heated. Triangular revolving grate bars hung in a drop frame are used. For heating two 50-pupil rooms, a No. 62 furnace is recommended.

SIZES AND CAPACITIES

Number	Diam. fire pot, ins.	Diam. casing, ins.	*Height castings, ins.	Estimated heating capacity, cu. ft.
56	30	56	64	45-60 M
62	32	62	67	60-90 M

\* Furnaces cased with pitch top are approximately 12 ins. higher.



INTERNATIONAL HEAVY DUTY FURNACE

### International Queen Warm Air Furnace.

A high grade warm air furnace of tubular construction. The radiator or combustion chamber consists of a series of heavy lap-welded boiler tubes, firmly embedded in upper and lower cast iron decks, and surrounded by a shell made of No. 12-gauge steel.

The tubes are set close together at the back and spaced wider apart at the front, so that the flames and gases pass to the front, between and around these tubes, and then back to the smoke exit, while the air passing up through them is rapidly heated. The entering air is drawn close to the fire pot; and as it rises and expands, an extension ring increases the furnace diameter.

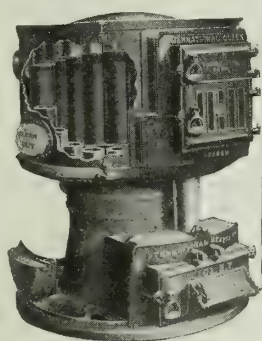
The castings are heavy and durable. Has large feed door, coil openings and triangular grate. Can be furnished with gas ring attachment for natural gas. Recommended for high grade work with hard coal or wood for fuel.

SIZES AND CAPACITIES

Number	Diam. fire pot, ins.	Diam. casing, ins.	Height castings, ins.	Estimated heating capacity, cu. ft.
237 D	18	37	47	8-15 M
241 D	21	41	50	12-20 M
245 D	24	45	51	16-28 M
249 D	26	49	51	22-38 M
259 D	29	59	54	35-60 M
*268	34	68	57	50-80 M

Double feed doors have 15 by 15½-in. opening.

\* No. 268 is not made with double door.



INTERNATIONAL QUEEN FURNACE

### International Steel Warm Air Furnace.

"Built like a boiler." The shell which makes the ash pit, fire pot and combustion chamber is made of a single sheet of heavy steel plate, with a steel head or top, and all closely riveted under pneumatic pressure.

The feed chute, which is cast in one piece and closely riveted to the combustion chamber, extends through the front, the feed doors being hung on the chute on the outside.

The radiator consists of 3 heavy steel tubes and a horseshoe-shaped cored cast base, and is connected to the combustion dome by 2 heavy reinforced cast elbows. The radiator is supported from the base by brackets, relieving the fire pot and combustion dome of all strain.

Has large double feed door, brick lined fire pot, hollow bar revolving grate hung in a drop frame. Guaranteed absolutely gastight and dusttight. Especially desirable where soft coal is used for fuel.

SIZES AND CAPACITIES

Number	Diam. fire pot, ins.	Diam. casing, ins.	Height castings, ins.	Estimated heating capacity, cu. ft.
40	18½	40	57	5-10 M
44	21½	44	61	10-20 M
50	24½	50	65	20-30 M
56	26½	56	67	30-45 M

The feed door of No. 40 is 12 by 14 ins. All other sizes, 14 by 14 ins.

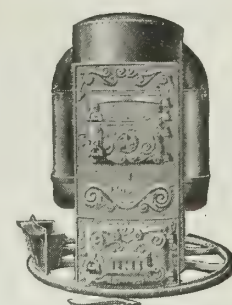
### International Princess Warm Air Furnace.

Very plain and substantial. It has a large ash pit cast in one piece and ample feed door, with perforated lining. The two-piece fire pot is corrugated on the outside and smooth on the inside, with no projections to which ashes can cling. The feed neck is cast solid with the combustion dome, with no joints to leak gas. Three styles of radiators are made, 12-in. and 18-in. high steel radiators for hard coal, and 12-in. high single-piece cast radiator for either hard or soft coal.

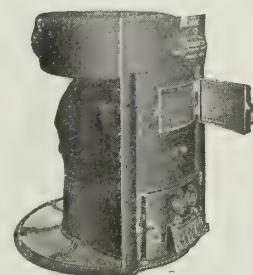
The International Princess is equipped with coil openings for inserting domestic water heater; the latest pattern herringbone triangular revolving grate hung in a drop frame, and is an aristocrat among heaters.

It is sufficiently heavy to last the user a generation. Its interior construction has been carefully worked out to secure as nearly perfect

combustion as possible, and the heating surfaces have been proportioned so as to give the greatest amount of heat with the least consumption of fuel.



INTERNATIONAL STEEL FURNACE



INTERNATIONAL PRINCESS FURNACE

SIZES AND CAPACITIES

Number #12-in. steel radiator	Diam. fire pot, ins.	Diam. casing, ins.	Height castings, ins.	Estimated heating capacity, cu. ft.
*32-0	18	32	49	8-10 M
36-0	20	36	49	10-14 M
40-0	22	40	50	14-18 M
44-0	24	44	50	18-22 M
48-0	26	48	53	22-30 M
52-0	28	52	55	30-40 M

WITH CAST RADIATOR FOR HARD OR SOFT COAL

*32-2	§32-3	18	32	48	8-10 M
36-2	36-3	20	36	48	10-14 M
40-2	40-3	22	40	48	14-18 M
44-2	44-3	24	44	49	18-22 M
48-2	48-3	26	48	50	22-30 M
52-2	52-3	28	52	51	30-40 M

\* If wanted with an 18-in. steel radiator, the numbers will read 32-1, 36-1, etc.

† Furnaces cased with pitch top are approximately 10 ins. higher.

‡ For hard coal.

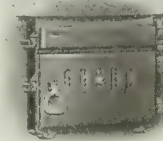
§ For soft coal.

### International Baronet Furnace.

Constructed on the same general lines as the Princess. It differs in that the feed door is double and much larger, the 32-in., 36-in. and 40-in. having feed doors 12 ins. wide and 11 ins. high; the 44-in., 48-in. and 52-in. have feed doors 14 ins. wide and 11¼ ins. high. This changes the height of the combustion dome, making the casting 2 or 3 ins. higher over all and slightly increasing the cost.

This large feed door is a decided advantage in feeding large chunks of wood or an extra large lump of soft coal.

The lower part can be opened without disturbing the upper one.



BARONET FURNACE FEED DOOR



**International Count Warm Air Furnace.**

A moderate price, all-cast furnace; low in height and built to give good service. A substantial, economical heater strongly recommended to the house owner who is limited in his investment. Has herringbone triangular revolving grate, hung in drop frame, large ash pit, corrugated sectional fire pot and combustion dome, single-piece cored cast radiator.

Particular attention is called to the shape of this radiator, by which all the air impinging on it is held close to the surface, rapidly absorbing the heat. This furnace has an extension casing ring providing for the air expansion as it ascends. Large feed door and three-quarter shield front.

SIZES AND CAPACITIES

Number, hard coal	Number, soft coal	Diam. fire pot, ins.	Diam. casing, ins.	*Height castings, ins.	Estimated heating capacity, cu. ft.
32-2	32-3	18	32	48	8-10 M
36-2	36-3	20	36	48	10-14 M
40-2	40-3	22	40	48	14-18 M
44-2	44-3	24	44	48	18-22 M
48-2	48-3	26	48	50	22-30 M
52-2	52-3	28	52	51	30-40 M

\*Furnaces cased with pitch top are approximately 10 ins. higher.

This furnace can be furnished with a steel radiator if desired.



INTERNATIONAL COUNT FURNACE

**International Duke Warm Air Furnace.**

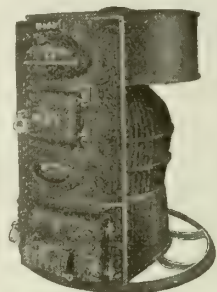
Has a steel radiator, triangular grate, corrugated fire pot and combustion dome; 12-in. radiator with cast top and bottom, and steel sides; large ash pit, full shield front. A moderate priced well built furnace that will give good satisfaction and wear well.

SIZES AND CAPACITIES

Number	Diam. fire pot, ins.	Diam. casing, ins.	*Height castings, ins.	Estimated heating capacity, cu. ft.
28-0	18	28	49	6-9 M
32-0	20	32	49	8-10 M
36-0	22	36	49	10-14 M
40-0	24	40	50	14-18 M
44-0	26	44	53	18-22 M
48-0	28	48	55	22-30 M

\*Furnaces cased with pitch top are approximately 10 ins. higher.

The International Duke furnace can also be had with an 18-in. steel radiator or a one-piece all-cast iron radiator.



INTERNATIONAL DUKE FURNACE

**International Earl Warm Air Furnace.**

Similar to the Duke in general construction. It has a three-quarter shield front instead of a full front.

SIZES AND CAPACITIES

Number, hard coal	Number, soft coal	Diam. fire pot, ins.	Diam. casing, ins.	*Height castings, ins.	Estimated heating capacity, cu. ft.
28-2	28-3	18	28	48	7-9 M
32-2	32-3	20	32	48	8-10 M
36-2	36-3	22	36	48	10-14 M
40-2	40-3	24	40	49	14-18 M
44-2	44-3	26	44	50	18-22 M
48-2	48-3	28	48	51	22-30 M

\*Furnaces cased with pitch top are approximately 10 ins. higher.

Earl furnaces are also made with steel radiators.



INTERNATIONAL EARL FURNACE

The illustration shows its construction with a one-piece cast radiator. It can be furnished with a 12-in. steel radiator at a slightly lower price.

**International Onepipe Heater.**

Casting part essentially the same as Duke furnace. Differs from the regular warm air furnace in that it has double casing. Heat is all discharged through central portion of one large duplex register. Cooled air is returned through outer portion of same register and between inner and outer casing, being re-warmed and re-circulated. Requires free circulation of air between rooms for successful operation. Made in 4 sizes; capacities from 4 to 14 ordinary size rooms.



INTERNATIONAL ONEPIPE HEATER

**International Regent Warm Air Furnace.**

A low furnace with a large steel plate radiator. Not a high priced heater, but designed for the house owner who seeks real and lasting service for a comparatively modest expenditure. Particularly recommended for rural residences where wood is used for fuel all or part of the time. Has large double feed door, revolving triangular grates, sectional fire pot, reversible flue radiator with triple heating surfaces. A wood burning grate, to be used on top of the coal grate, will be furnished without extra charge, on request.

SIZES AND CAPACITIES

Number	Diam. fire pot, ins.	Diam. casing, ins.	Height castings, ins.	Estimated heating capacity, cu. ft.
29	16	29	45	5-10 M
34	19	34	46	8-15 M
39	22	39	48	12-20 M
44	25	44	48	16-28 M
49	27	49	49	22-38 M

Double feed doors have 14 by 14½-in. opening.



INTERNATIONAL REGENT FURNACE

**International Wood Furnace.**

For wood burning only. Has long, corrugated, cast body; deep, elliptical radiator with long reversible flue travel; large feed door (14 by 17-in. opening); generous ash pit and solid cast front. The two sections of the body have a covered deep cup joint, which allows for contraction and expansion without leaking smoke. This furnace is very heavy and durable, and should not be compared with the ordinary makeshift type of wood burning heaters.

Made in 2 sizes, to burn either 3-ft. or 4-ft. wood.

SIZES AND CAPACITIES

Number	Length of wood, ft.	Height castings, ins.	Estimated heating capacity, cu. ft.
3	3	52	25-35 M
4	4	55	35-50 M

Cased with pitch top the furnaces are approximately 14 ins. higher.



INTERNATIONAL WOOD FURNACE



**International Combination Heating Systems.**

WITH STEAM AND WARM AIR, WITH HOT WATER AND WARM AIR—Many architects appreciate the advantages of a well planned combination heating system over either direct steam, direct hot water, or a warm air furnace alone. For those who have never specified this method, attention is called to the following facts:

In rooms that can be most easily reached by warm air pipes (and these are usually the ones most used), fewer and smaller radiators are required, and valuable wall space is saved; while distant rooms and exposed bays are easily protected with direct radiation, where it would be impossible to warm them with a furnace.

In mild weather and on chilly nights and mornings in late fall and early spring, a little fire will quickly diffuse a pleasant supply of freshly warmed air through the entire building, where a steam plant would make the building intolerable and a hot water heater would be so slow in heating up as oftentimes not to be available until the necessity was past.

In designing a combination system, registers are placed near inside walls as close to heater as possible. Radiators are placed in exposed locations, under windows, near doors, in distant rooms, etc. It is desirable always to have one hall or large room connected both for warm air and steam or hot water to balance the combination.

Do not confuse the Economy steam and air, or the Economy water and air combinations, with the makeshift arrangements and attachments used to convert some types of furnaces into so-called combination heaters.

Economy combination heating systems are not cheaper in first cost than direct steam or hot water; the *economy* lies in the fuel saving and durability, combined with ideal ventilation in connection with the heating.

**Economy Steam and Air Combination Heaters.**

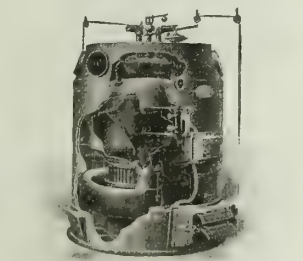
**LOW DOWN PATTERN, PORTABLE AND BRICK SET FORM**—The boiler is constructed of plate steel,  $\frac{3}{16}$  to  $\frac{1}{4}$  in. thick, with standard 2-in. boiler tubes, suspended directly above the fire. The combustion dome is of plate steel, No. 12-gauge sides and No. 8- or 10-gauge heads according to size. Sectional corrugated fire pot is of cast iron, very heavy, and with nearly straight sides. Low hung radiator is cast in one piece, without joints.

The hot gases of combustion pass up through the boiler tubes and are deflected by the V-shaped flue strips over the outer surface and down to the radiator, around which they must pass to the smoke flue.

SIZES AND PRICES							
Number	Diam. fire pot, ins.	Diam. casing, ins.	Height cased, ins.	List price, portable castings	List price, double casings	*List price, brick set castgs	List price, covering bars, per set
310	20	43	70	\$346	\$24	\$376	\$ 8
314	22	48	74	404	26	448	9
316	25	52	76	440	30	490	13
318	27	52	76	480	30	532	13
320	32	64	82	700	40	770	20

\*Brick set price includes 16 by 28-in. manhole door, which is shipped unless otherwise specified.

For data relative to capacities, see table opposite.



LOW DOWN PATTERN STEAM AND AIR COMBINATION HEATER

**REGULAR PATTERN, PORTABLE AND BRICK SET FORM**—It differs in construction from the low down pattern in the manner of attaching the warm air radiator, which is made of steel plate. It differs also in this par-

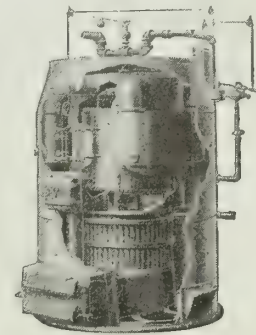
ticular, that while a regular pattern combination will heat the same *total space* as the same corresponding size in the low down pattern, more of the space is heated by warm air.

With the low down patterns over 60% of the space to be heated is taken care of by radiators, and the warm air is auxiliary. With the regular pattern 50% or more of the heating is done by warm air, and the steam is auxiliary. This gives a wide range of adaptation. (See table at bottom of page.)

SIZES AND PRICES							
Number	Diam. fire pot, ins.	Diam. casing, ins.	Height cased, ins.	List price, portable castings	List price, double casings	*List price, brick set castgs	List price, covering bars, per set
310	20	43	72	\$286	\$24	\$316	\$ 8
314	22	48	79	364	26	408	9
316	25	52	82	390	30	440	13
318	27	52	82	440	30	492	13
320	32	64	90	600	40	670	20

\*Brick set price includes 16 by 28-in. manhole, which is shipped unless otherwise specified.

For data relative to capacities, see table below.



REGULAR PATTERN STEAM AND AIR COMBINATION HEATER

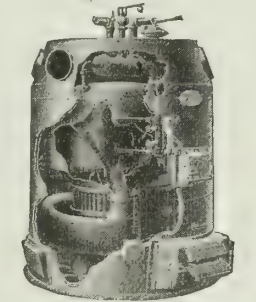
**Economy Water and Air Combination Heater.**

This has the same general construction as the low down pattern, except that flat cast iron hollow discs make up the water heating surfaces. One, two, or three discs are used, depending on the amount of water radiation required. The illustration shows the combination with 3 discs inserted.

SIZES AND PRICES							
Number	Diam. fire pot, ins.	Diam. casing, ins.	Height cased, ins.	List price, portable castings	List price, double casings	*List price, brick set castgs	List price, covering bars, per set
310-3	20	43	67	\$256	\$24	\$286	\$ 8
314-3	22	48	71	294	26	338	9
316-3	25	52	72	350	30	400	13
318-3	27	52	72	390	30	442	13
320-3	32	64	83	600	40	670	20

\*Also made in brick set form at a little higher price per size.

For data relative to capacities, see table below.



ECONOMY WATER AND AIR COMBINATION HEATER

**CAPACITIES AND ADJUSTMENT COMBINATION HEATING SYSTEMS**

		Number	Estimated total radiation including piping	Estimated cubic space heated by radiation	Estimated total area warm air pipes, sq. ins.	Estimated cubic space heated by warm air	Total estimated heating capacity cu. ft. of space	Approximate adjustment by radiators	Approximate adjustment by registers
STEAM AND AIR	LOW DOWN PATTERN	310	275	10000	150	4000	14000	70%	30%
		314	325	13000	200	5000	18000	70	30
		316	400	16000	300	10000	26000	60	40
		318	475	19000	350	14000	33000	60	40
		320	825	33000	450	17000	50000	65	35
		310	150	6000	250	8000	14000	45%	55%
STEAM AND AIR	REGULAR PATTERN	314	225	9000	300	9000	18000	50	50
		316	275	11000	400	15000	26000	40	60
		318	325	13000	475	20000	33000	40	60
		320	500	20000	600	30000	50000	40	60
	1-Section	310-1	185	4500	300	9500	14000	30%	70%
		314-1	225	5000	350	13000	18000	30	70
		316-1	280	6500	450	19500	26000	25	75
		318-1	400	9500	525	23500	33000	30	70
		320-1	675	16000	720	34000	50000	30	70
	2-Section	314-2	375	9000	300	9000	18000	50%	50%
		316-2	560	13000	350	13000	26000	50	50
		318-2	675	16000	400	17000	33000	50	50
		320-2	1050	25000	550	25000	50000	50	50
	3-Section	310-3	440	10000	150	4000	14000	70%	30%
		314-3	560	13000	200	5000	18000	70	30
		316-3	675	16000	300	10000	26000	60	40
		318-3	800	19000	350	14000	33000	60	40
		320-3	1375	33000	450	17000	50000	65	35

Steam is based on 1 sq. ft. of radiation heating 50 cu. ft. of space.

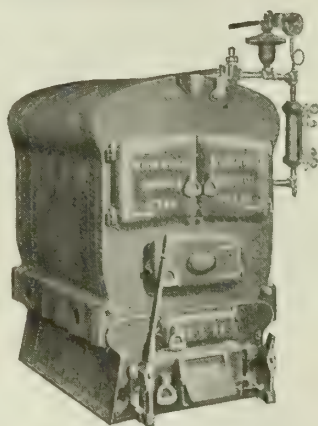
Water is based on 1 sq. ft. of radiation heating 30 cu. ft. of space.



### International Steam and Hot Water Boilers.

Boilers are sold only through the trade. The prices here given are list prices, subject to the regular dealers' discounts, and change with the market. Freight rates vary to such an extent that it has not seemed to be practical to quote nets.

Architects will be furnished trade discount sheets applying to their section at time of writing, on request.

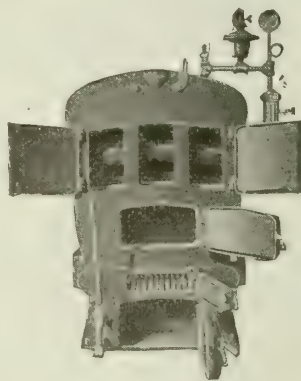


INTERNATIONAL EXPRESS  
STEAM BOILER

### International Express Boilers.

Vertical sectional cast boilers of the highest type. They have large deep combustion chambers, commodious ash pits, balanced grates, thin waterways, and a large amount of prime heating surface.

The sections are connected with cast nipples accurately machined and drawn tight by means of heavy rods, which pass through cored openings, entirely protecting them from fire, water or steam.



INTERNATIONAL EXPRESS  
STEAM BOILER  
Front view

NUMBERS, CAPACITIES AND PRICES

Size of grate, ins.	Fire chamber area, sq. ft.	*Outside size of base at floor, ins.	STEAM			WATER		
			Number	Capac. direct radiation	Price	Number	Capac. direct radiation	Price
21 1/4 x 26	4.00	29 1/2 x 29	4-20	700	\$310.00	20-4	1150	\$300.00
21 1/4 x 30	4.66	29 1/2 x 33 3/8	4-20A	800	340.00	20-4A	1300	330.00
21 1/4 x 34	5.33	29 1/2 x 37	5-20	900	370.00	20-5	1500	360.00
21 1/4 x 38	6.00	29 1/2 x 41 3/8	5-20A	1025	408.00	20-5A	1700	398.00
21 1/4 x 42	6.66	29 1/2 x 45	6-20	1150	445.00	20-6	1900	435.00
21 1/4 x 46	7.33	29 1/2 x 49 3/8	6-20A	1250	475.00	20-6A	2050	465.00
25 3/4 x 34	6.66	34 1/2 x 37	5-25	1200	\$460.00	25-5	2000	\$450.00
25 3/4 x 38	7.50	34 1/2 x 41 3/8	5-25A	1350	505.00	25-5A	2225	495.00
25 3/4 x 42	8.33	34 1/2 x 45	6-25	1500	550.00	25-6	2475	540.00
25 3/4 x 46	9.16	34 1/2 x 49 3/8	6-25A	1650	595.00	25-6A	2725	585.00
25 3/4 x 50	10.00	34 1/2 x 53	7-25	1800	640.00	25-7	2975	630.00
25 3/4 x 54	10.83	34 1/2 x 57 3/8	7-25A	1950	685.00	25-7A	3225	675.00
25 3/4 x 58	11.66	34 1/2 x 61	8-25	2100	730.00	25-8	3450	710.00
33 x 34	8.40	41 1/2 x 37	5-32	1600	\$580.00	32-5	2650	\$570.00
33 x 38	9.50	41 1/2 x 41 3/8	5-32A	1800	640.00	32-5A	2975	630.00
33 x 42	10.55	41 1/2 x 45	6-32	2000	700.00	32-6	3300	690.00
33 x 46	11.61	41 1/2 x 49 3/8	6-32A	2200	757.00	32-6A	3625	737.00
33 x 50	12.66	41 1/2 x 53	7-32	2400	810.00	32-7	3950	790.00
33 x 54	13.62	41 1/2 x 57 3/8	7-32A	2600	840.00	32-7A	4300	820.00
33 x 58	14.77	41 1/2 x 61	8-32	2800	904.00	32-8	4625	884.00
33 x 62	15.83	41 1/2 x 65 3/8	8-32A	3000	944.00	32-8A	4950	924.00
33 x 66	16.81	41 1/2 x 69	9-32	3200	984.00	32-9	5275	964.00
40 1/2 x 42	13.05	49 1/2 x 45	6-40	3250	\$994.00	40-6	5375	\$974.00
40 1/2 x 46	14.36	49 1/2 x 49 3/8	6-40A	3600	1064.00	40-6A	5950	1044.00
40 1/2 x 50	15.66	49 1/2 x 53	7-40	3900	1124.00	40-7	6450	1104.00
40 1/2 x 54	16.95	49 1/2 x 57 3/8	7-40A	4250	1194.00	40-7A	7025	1174.00
40 1/2 x 58	18.27	49 1/2 x 61	8-40	4550	1254.00	40-8	7525	1234.00
40 1/2 x 62	19.58	49 1/2 x 65 3/8	8-40A	4900	1324.00	40-8A	8100	1304.00
40 1/2 x 66	20.83	49 1/2 x 69	9-40	5200	1384.00	40-9	8600	1364.00
40 1/2 x 70	22.12	49 1/2 x 73 3/8	9-40A	5550	1454.00	40-9A	9175	1434.00
40 1/2 x 74	23.50	49 1/2 x 77	10-40	5850	1514.00	40-10	9675	1494.00
40 1/2 x 78	24.80	49 1/2 x 81 3/8	10-40A	6200	1584.00	40-10A	10250	1564.00
40 1/2 x 82	26.11	49 1/2 x 85	11-40	6500	1644.00	40-11	10750	1624.00

Height of boilers—steam..... 54 1/2 ins. 59 1/2 ins. 65 1/2 ins. 68 ins.  
 Add to height for trimmings..... 14 ins. 14 1/2 ins. 16 1/2 ins. 16 1/2 ins.  
 Height of boilers—water..... 51 1/2 ins. 56 ins. 62 1/2 ins. 68 ins.  
 \*Add to length for smoke box..... 21 ins. 23 ins. 26 ins. 30 ins.  
 Size smoke pipe..... 10 ins. 11 ins. 13 ins. 16 ins.

The openings between the sections of the lower crown sheet are of the same area as the size of the smoke pipe required. This insures an equal vertical travel of the products of combustion, which impinge uniformly on all parts of the upper crown sheet and then pass in equal volumes through the upper set of flues. All hinges and catches are separate countersunk castings. Damper control is very accurate and sensitive.

The flues are easily cleaned through the big double doors. When burning pea coal or slack, the slice bar can be inserted through the clinker door and run over the grate to break up the fire. Notice how these doors are heavily baffled.

### International Economy Boilers.

Simple, durable, efficient and easily operated round boilers. They have deep ash pits, herringbone triangular grates with drop frames, corrugated fire pots, thin waterways, large doors and clean-outs and push nipple connections. These boilers are very conservatively rated and are highly recommended.

NUMBERS, CAPACITIES AND PRICES

Coal capacity, lbs.	Free air space, through grates, sq. ft.	STEAM			WATER		
		Number	Evaporative power, lbs. steam per lb. coal	Capacity direct radiation, ft. 8 hrs.	Price	Number	Capacity direct radiation, ft. 8 hrs.
165	1.66	2-21	8.2	475	\$213.00	21-2	775
165	1.66	3-21	9.0	550	233.00	21-3	900
165	1.66	4-21	9.7	600	246.00	21-4	1000
210	2.16	2-24	8.2	575	240.00	24-2	950
210	2.16	3-24	9.0	675	293.00	24-3	1100
210	2.16	4-24	9.7	750	317.00	24-4	1250
210	2.16	5-24	10.3	800	331.00	24-5	1325
255	2.57	2-27	8.2	700	300.00	27-2	1150
255	2.57	3-27	9.0	825	338.00	27-3	1375
255	2.57	4-27	9.7	925	368.00	27-4	1550
255	2.57	5-27	10.3	1000	389.00	27-5	1650
385	3.11	2-30	8.2	1025	397.00	30-2	1675
385	3.11	3-30	9.0	1200	448.00	30-3	2000
385	3.11	4-30	9.7	1350	490.00	30-4	2225
385	3.11	5-30	10.3	1475	523.00	30-5	2400



INTERNATIONAL  
ECONOMY BOILER



INTERNATIONAL  
SULTAN HOT WATER  
HEATER

### International Sultan Steam and Hot Water Boilers.

Well constructed cast iron, push nipple round boilers. They are simple, durable, and easily operated. Have herringbone grates, corrugated fire pot, balanced draft doors, and ample clean-outs.

NUMBERS, CAPACITIES AND PRICES

Outside diam. fire pot, ins.	Diam. grate, ins.	Water line height, ins.	STEAM			WATER		
			Number	Commercial rating	Price	Number	Commercial rating	Price
18 1/2	15	40 1/2	130	225	\$123.00	131	375	\$113.00
18 1/2	15	45	132	275	141.00	133	450	132.00
18 1/2	15	49 1/2	134	300	150.00	135	500	141.00
21 1/2	18	42 3/4	140	325	158.00	141	550	154.00
21 1/2	18	47 3/4	142	375	177.00	143	625	172.00
21 1/2	18	52 3/4	144	425	200.00	145	700	191.00
24 1/2	21	44 3/4	150	475	213.00	151	775	204.00
24 1/2	21	49 3/4	152	525	226.00	153	875	218.00
24 1/2	21	54 1/4	154	575	240.00	155	950	230.00
27 1/2	24	46 3/4	160	625	275.00	161	1025	268.00
27 1/2	24	51 1/4	162	700	300.00	163	1150	290.00
27 1/2	24	55 3/4	164	775	324.00	165	1275	314.00
30	27	45 3/4	170	800	331.00	171	1325	321.00
30	27	50 3/4	172	900	361.00	173	1475	351.00
30	27	55 1/4	174	1000	390.00	175	1650	380.00



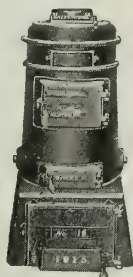
### International Hot Water Supply Boilers.

Designed to supply an abundance of hot water for domestic purposes in hotels, apartments, church baptisteries, etc. They have deep corrugated fire pots; large ash pits; draft and check doors equipped with ratchet attachment; clinker door at base of fire pot.

Rated only after exacting tests, and will be found conservative.

NUMBERS, CAPACITIES AND PRICES

Number	Tank capacity, gals.	Price	Height from floor to top outlet, ins.	Outside diam. fire pot, ins.	Diam. to grate, ins.	Size of smoke pipe, ins.
1	100	\$27.00	32 1/4	12 1/2	10	5
2	175	32.00	36	12 1/2	10	5
3	250	50.00	31 3/8	15	12 1/2	6
4	325	64.00	34 3/4	15	12 1/2	6
15	400	76.00	39 3/8	16 3/4	15	7
16	500	90.00	43 1/2	16 3/4	15	7
17	600	100.00	41	19 3/4	18	7
18	700	114.00	45 3/4	19 3/4	18	7



INTERNATIONAL HOT WATER SUPPLY BOILER

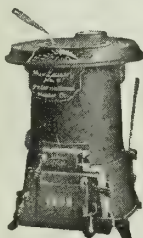
Nos. 1 and 2 are made with ash pit bottoms and stand on legs. Nos. 2, 4, 16 and 18 have a water section above the fire pot.

**RATINGS.**—International hot water supply boilers are rated on a basis of imparting 25° of heat per hour to the water in the storage tank. In the ordinary use of a water heater in a residence, it has been found that such a heater is sufficiently large. If a greater amount of water is required, a larger heater should be selected.

When water heaters are subjected to some unusual pressure, as is the case when tanks are connected direct to city pressure, it is recommended that the system be equipped with a water pressure reducing valve.

### International Laundry Water Supply Boiler.

A convenient heater for supplying large quantities of hot water, providing at the same time the advantages of the house range for the heating of flatirons, wash boilers, etc. It is made in but one size, with deep fire pot, large ash pit, and rocking and dumping grate.



INTERNATIONAL LAUNDRY WATER SUPPLY BOILER

NUMBERS, CAPACITIES AND PRICES

Number.....	0
Tank capacity.....	100 gals.
Size of top.....	18 ins. in diam.
Heats at once.....	7 flatirons
Holds.....	27 lbs. coal
Grate.....	10 ins. in diam.
List price....	\$27.00

### International Gas Rings.

The International Prince and Sultan boilers can be equipped with gas rings for use in communities where natural gas is used for fuel. A boiler so equipped can be used with gas alone, coal alone, or with gas and coal combined, without any change in operation except regulating the supply of gas or adding coal.

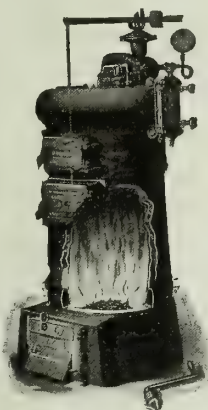
A hollow cast section, having two or more gas intakes, is placed between the ash pit and fire pot section. The gas outlets can not become clogged when coal is used for fuel, and the grate is in no way interfered with.

The use of a gas ring increases the height of the boiler 3 1/2 ins. on all except the 27-in. grate, which is 5 ins. higher.

The net added cost is, 15-in. size, \$6.00; 18-in. size, \$7.50; 21-in. size, \$9.50; 24-in. size, \$11.50; 27-in. size, \$15.00.

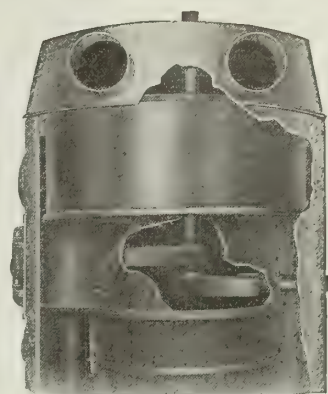
Price does not include mixer, which is not furnished.

INTERNATIONAL BOILER WITH GAS RING



### International Auxiliary Water Heaters.

Its range of adaptation covers all needs, from heating a small radiator or kitchen boiler, to supplying heat for several hot water radiators. The shape is such that it can be readily inserted through an ordinary furnace feed-door, and the peculiar shape of the disks does not interfere with the easy firing of the furnace.



INTERNATIONAL AUXILIARY WATER HEATER  
Double auxiliary disk

One hole drilled through back of heater and one through top of combustion chamber are all that are necessary to allow for flow and return pipes. These outlets are protected by asbestos packed collars, and held in place by set screws, effectually preventing any leakage of gas at these points.

SINGLE AUXILIARY DISK

Number tapped side inlet, top outlet	Number, tapped bottom inlet, top outlet	*Capacity sq. ft. direct radiation	*Cap. gals. domestic water supply	
			Residence 25° per hour	Apartments 40° per hour
10	010	50	40	27
13	013	100	82	53
16	016	150	120	79
20	020	200	168	106

DOUBLE AUXILIARY DISK

Number	*Capacity sq. ft. direct radiation	*Cap. gals. domestic water supply	
		Residence 25° per hour	Apartments 40° per hour
10-010	85	66	45
13-010	135	117	65
13-013	175	147	94
16-013	225	192	120
16-016	265	221	141
20-013	275	235	147
20-016	315	260	164
20-020	350	294	188

\*See table of capacities given below.

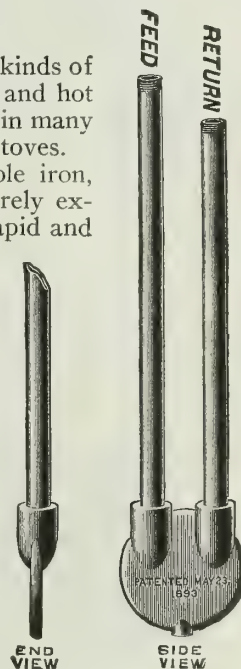
### The International Howard Disk.

This heater is designed for all kinds of combination work where both air and hot water are desired, and can be used in many patterns of furnaces and heating stoves.

The disk is made of malleable iron, and, being located in the fire entirely exposed to the direct rays of heat, rapid and positive circulation is assured.

Both feed and return pipes pass out through the top of the heater. The disk is very easily adjusted, and can be raised or lowered in the heater. The feed and return pipes on all sizes are 1 1/2 ins.

**CAUTION**—Do not use a disk in any fire pot having a diameter of less than 8 to 10 ins. larger than the diameter of the disk.



END VIEW  
SIDE VIEW  
INTERNATIONAL HOWARD DISK

CAPACITIES

Number	Diam. of disk, ins.	*Sq. ft. direct radiation
10	10	100
12	12	150
14	14	200
16	16	275
18	18	350
22	22	500

\*Including all piping figured as direct radiation in the usual way.

# KANAWHA MANUFACTURING CO.

## Bernhard Water Tube Boilers

175 West Jackson Boulevard  
CHICAGO, ILL.

Thompson Street  
CHARLESTON, W. VA.

### Products.

BERNHARD WATER TUBE BOILERS: Steam Boilers and Hot Water Heaters.

Bernhard Smokeless Down-draft Steam and Hot Water Boilers.

### Water Tube Boilers.

Bernhard water tube boilers are built to produce greatest amount of heat with least amount of fuel, and they comprise the latest invention of J. B. Bernhard, whose experience extends over twenty-five years.

CONSTRUCTION—Made of cast iron sections having series of tubes set so that fire strikes them at nearly right angles, with greatest effect.

ASH PIT OR BASE—Depth, 16 ins.; draft door at each end. Ashes taken *across* base. Front to rear,  $1\frac{2}{3}$  to  $3\frac{1}{3}$  ft., according to boiler series.

GRATE—Short rocking grates, shaken in sets of either two or three bars at once; also, vertical grates at both sides and back. Accessible throughout, and easily removed or replaced.

FIRE TRAVEL—Three long, different and distinct fire travels: (1) From grate through tubes; (2) through ports between sections into combustion chamber to one end of boiler; (3) through return flue to other end of boiler and smoke pipe.

COMBUSTION—Perfect combustion. By reason of a special port or flue, all gases strike back of combustion chamber with full expansion and are practically all consumed there. No heat units are lost up the chimney.

CIRCULATION—Hot water, rising in tubes in firebox of boiler, draws cold water down tubes at rear, causing rapid circulation. Hottest fire at crown sheet is covered by about 3 ins. of water only.

WATER LINE—Low, steady water line. Water receives maximum heat direct, causing water to rise rapidly in circulation.

No PIT—Boiler is so low that it can be installed in any basement deep enough

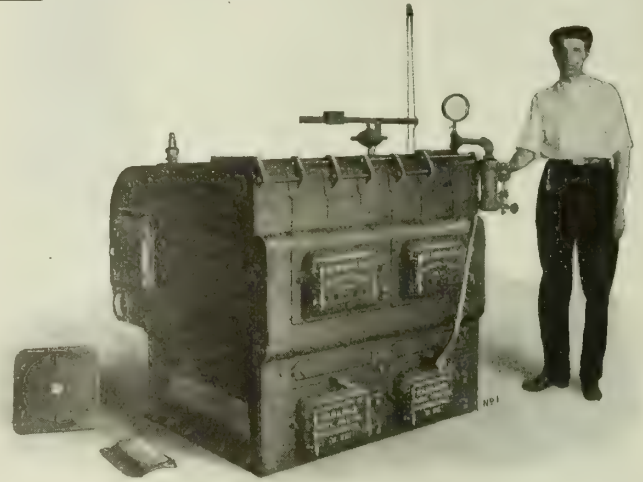


FIG. 2. BERNHARD WATER TUBE BOILER  
Capacity, 2000 sq. ft. of steam radiation

for a man to stand in, thus making a pit unnecessary. See Fig. 2.

FUEL USED—Anthracite or bituminous coal, coke, wood, gas or fuel oil.

### Installation.

The whole Bernhard line is built of only 15 different hollow or cored castings, and, consequently, the assembling and installation are readily performed with ease by any ordinary mechanic.

### Down-draft Boilers.

For down-draft boilers, see our Smokeless Catalogue.

### Prices.

All prices, catalogues, and further information sent on application.

### SIZES, RATINGS AND PRICES, BERNHARD WATER TUBE BOILERS

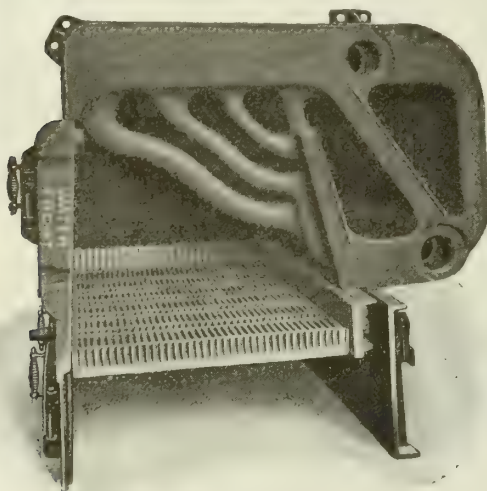


FIG. 1. SECTION OF BOILER

STEAM BOILERS								HOT WATER HEATERS		
No.	Rating sq. ft. rad.	List price	B. t. u. per hour	Grate	Grate area, sq. ft.	No. fire doors	Flow and return 2 each. ins.	No.	Rating sq. ft. rad.	List price
26-S	750	\$320.00	187500	20 x 35	4.85	2	4	26-W	1250	\$310.00
27-S	900	370.00	225000	20 x 42	5.82	2	4	27-W	1500	360.00
28-S	1050	420.00	262500	20 x 49	6.80	2	4	28-W	1750	410.00
35-S	1200	485.00	300000	30 x 28	5.83	1	4	35-W	2000	475.00
36-S	1600	585.00	400000	30 x 35	7.29	2	4	36-W	2650	575.00
37-S	2000	685.00	500000	30 x 42	8.75	2	4	37-W	3300	675.00
38-S	2400	785.00	600000	30 x 49	10.21	2	4	38-W	4000	775.00
39-S	2800	885.00	700000	30 x 56	11.67	2	4	39-W	4650	875.00
310-S	3300	985.00	825000	30 x 63	13.13	2	4	310-W	5450	975.00
46-S	2500	810.00	625000	40 x 35	9.72	2	5	46-W	4150	790.00
47-S	3200	960.00	800000	40 x 43	11.66	2	5	47-W	5300	940.00
48-S	3900	1110.00	975000	40 x 49	13.60	2	5	48-W	6450	1090.00
49-S	4600	1260.00	1150000	40 x 56	15.54	2	5	49-W	7600	1240.00
410-S	5300	1410.00	1325000	40 x 63	17.48	2	5	410-W	8700	1390.00
411-S	6000	1560.00	1500000	40 x 70	19.43	3	5	411-W	9900	1540.00
412-S	6700	1710.00	1675000	40 x 77	21.35	4	5	412-W	11200	1690.00
413-S	7400	1860.00	1850000	40 x 84	23.32	4	5	413-W	12300	1840.00
414-S	8100	2010.00	2025000	40 x 91	25.27	4	5	414-W	13500	1990.00
415-S	8800	2160.00	2200000	40 x 98	27.22	4	5	415-W	14700	2040.00
416-S	9500	2310.00	2375000	40 x 105	29.17	4	5	416-W	15900	2190.00

Water Line Series Height to Flow Opening  
38 ins. 20 ins. 43 ins.  
43 ins. 30 ins. 48 ins.  
47 ins. 40 ins. 54 ins.

Water heater measurements are the same as steam boilers of same number



# KEWANEE BOILER COMPANY

KEWANEE, ILL.

## BRANCHES

CHICAGO, Washington and Market Streets  
SALT LAKE CITY, Scott Building  
ST. LOUIS, Chemical Building  
MINNEAPOLIS, Plymouth Building  
DETROIT, MICH., Ford Building

NEW YORK, 47 West 42d Street  
KANSAS CITY, 1420 McGee Street  
LOS ANGELES, Baker-Detwiller Building  
PITTSBURGH, PA., Commonwealth Building  
DALLAS, TEX., Southwestern Life Building

MILWAUKEE, WIS., Majestic Building

CANADIAN REPRESENTATIVES: THE DOMINION RADIATOR COMPANY, LTD.

## Products.

KEWANEE FIREBOX BOILERS (BRICKSET), for Steam and Water Heating.

KEWANEE SMOKELESS FIREBOX BOILERS (BRICKSET), for Steam and Water Heating.

KEWANEE FIREBOX BOILERS (PORTABLE), for Steam and Water Heating.

KEWANEE SMOKELESS FIREBOX BOILERS (PORTABLE), for Steam and Water Heating.

KEWANEE POWER BOILERS, Horizontal, Vertical and Portable Locomotive Types.

KEWANEE WATER HEATING GARBAGE BURNERS.

TABASCO WATER HEATERS, Magazine Feed and Surface Burning.

KEWANEE and TABASCO WATER STORAGE and PRESSURE TANKS.

KEWANEE RADIATORS, Cast Iron, for steam and water heating.

Haxtun Boilers, for steam and water heating.

## Kewanee Smokeless Firebox Boilers.

These boilers are built with two grates, one above the other. Fuel is fed onto the top grate, and the draft, which is downward, draws the heat-giving gases down through the fire on the upper grate, then on down and over the hot coals on the lower grate. This burns all the gases contained in the coal before they can be condensed into smoke.

These are not, however, new nor untried, but are the combination of the down-draft furnace and the Kewanee firebox boiler. Below is a list of the principal cities in the United States which have smoke ordinances, and in which Kewanee smokeless firebox boilers have been approved, for the burning of soft coal, by the smoke inspectors.

This fact proves these boilers will burn soft coal smokelessly. Furthermore, rigid tests have shown their efficiency ranges from 73% to 81% when using soft coal and fired with the help usually obtainable for low pressure heating operations.

For purposes of personal inspection, this company will furnish a list showing where its boilers are installed, in any locality.

## CITIES HAVING SMOKE ORDINANCES WHERE KEWANEE BOILERS HAVE BEEN APPROVED FOR THE BURNING OF SOFT COAL

Chicago, Ill.  
St. Louis, Mo.  
Louisville, Ky.  
Salt Lake City, Utah  
Grand Rapids, Mich.  
Kansas City, Mo.  
Pittsburgh, Pa.  
Des Moines, Iowa  
Omaha, Nebr.  
Toledo, Ohio  
Minneapolis, Minn.  
Indianapolis, Ind.  
Kansas City, Mo.

Baltimore, Md.  
Washington, D. C.  
Knoxville, Tenn.  
St. Paul, Minn.  
Memphis, Tenn.  
Atlanta, Ga.  
Birmingham, Ala.  
Nashville, Tenn.  
New York, N. Y.  
Philadelphia, Pa.  
Milwaukee, Wis.  
Cincinnati, Ohio  
Toronto, Ontario

# KEWANEE

TRADE-MARK

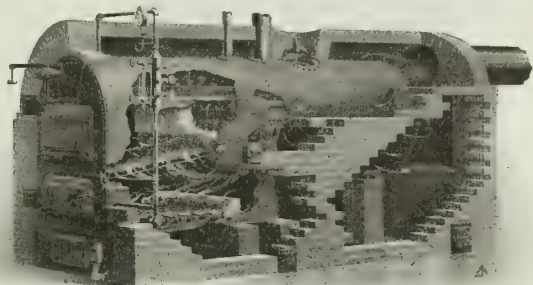
## Kewanee Portable Firebox Boilers.

To meet a demand for boilers which need not be set in brickwork, the company is now manufacturing a complete

line of portable Kewanee firebox boilers, regular and smokeless types.

## Ratings.

Every Kewanee firebox boiler will heat all of the radiation shown by its capacity. A Kewanee firebox boiler, rated at 4000 ft., will heat 4000 ft. radiation. This is true of the larger, as well as the smaller sizes. In choosing a Kewanee firebox boiler, figure the radiation needed, and specify a boiler rated at that amount.



SECTIONAL VIEW OF KEWANEE SMOKELESS FIREBOX BOILER (BRICKSET TYPE)

## Kewanee Power Boilers.

Kewanee power boilers, which include horizontal, vertical and locomotive types, are not described in this catalogue, nor are specifications given, as the company manufactures all power boilers in accordance with A. S. M. E. standard specifications.

## Kewanee Water Heating Garbage Burners.

For any installation where there is a necessity for the incineration of garbage or rubbish, and where hot water is needed, the Kewanee water heating garbage burner is recommended. They have proved in actual installations to be not only the best method of disposing of garbage and rubbish, but the cheapest water heater on the market. They are made in three styles, suitable for the smallest or largest apartment building, hotel, restaurant or hospital.

## Catalogues.

For greater convenience, catalogues of all Kewanee products are published, giving complete descriptions, specifications, setting plans and list prices, which will be sent on request.

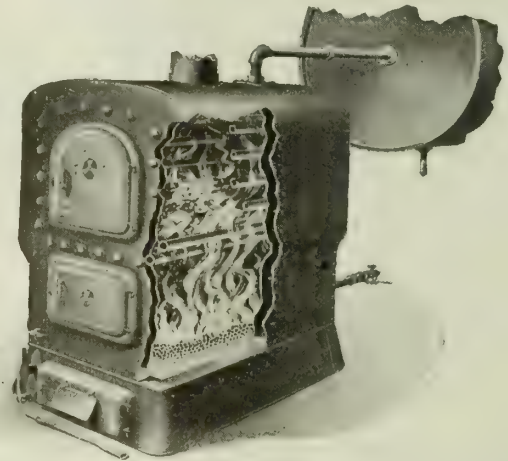
Blue prints of any Kewanee boiler will also be sent on request.

## SPECIFICATIONS, TYPE "A" KEWANEE WATER HEATING GARBAGE BURNERS

Catalogue number.....	30 Gay	31 Gaze	32 Gear
Cipher.....			
Capacity, gallons per hour, 50° raise.....	200	300	400
Capacity, garbage chamber, one charge, bushels.....	1	2	3
Height over all, ins.....	58	64	64
Diameter of floor space required, ins.....	22	25	30
Height to bottom of front garbage door, ins.....	33	37	37
Dimensions of garbage door, ins.....	7 x 8	7 x 8	7 x 8
Dimensions of coal or fire door, ins.....	7 x 8	7 x 8	7 x 8
Diameter of coal or lower grates, ins.....	12	16	20
Size, two each, flow and return flanges, ins.....	1½	2	2
Diameter of smoke pipe, ins.....	6	8	8
Approximate shipping weight, lbs.....	600	800	1,000

TYPE "A" KEWANEE  
WATER HEATING  
GARBAGE BURNER

TYPE "D" KEWANEE WATER HEATING GARBAGE BURNER



TYPE "H" KEWANEE WATER HEATING GARBAGE BURNER

## SPECIFICATIONS, TYPE "D" KEWANEE WATER HEATING GARBAGE BURNERS

Catalogue number.....	34 Gain	35 Gale	36 Gamy	37 Gang	38 Gap	39 Garb	40 Gash
Cipher.....							
Capacity, gallons per hour, 50° raise.....	500	600	800	1000	1200	1500	1800
Capacity, garbage chamber, one charge, bushels.....	2	3	4	5	7	9	12
Height over all, ins.....	56	56	56	56	56	56	56
Dimensions of floor space required, ins.....	29 x 29	29 x 35	35 x 35	35 x 41	35 x 47	41 x 53	41 x 59
Height to bottom of garbage door, ins.....	32	32	31	31	31	31	31
Dimensions of garbage door, ins.....	14 x 16	14 x 16	16 x 16	16 x 16	16 x 16	16 x 16	16 x 16
Dimensions of coal or fire door, ins.....	14 x 10	14 x 10	16 x 10	16 x 10	16 x 10	16 x 10	16 x 10
Dimensions of coal or lower grates, ins.....	18 x 18	18 x 24	24 x 24	24 x 30	24 x 36	30 x 42	30 x 48
Size, one each, flow and return flanges, ins.....	2	2	2½	2½	2½	3	3
Diameter of smoke pipe, ins.....	9	9	10	10	10	12	12
Approximate shipping weight, lbs.....	1,600	1,800	2,100	2,300	2,500	3,000	3,300

## SPECIFICATIONS, TYPE "H" KEWANEE WATER HEATING GARBAGE BURNERS

Catalogue number.....	41 Gait	42 Game	43 Gasp	44 Germ	45 Gift
Cipher.....					
Capacity, gallons per hour, 50° raise.....	1200	1500	1800	2200	2600
Capacity, garbage chamber, one charge, bushels.....	6	8	9	11	12
Height over all, ins.....	69	69	69	71	71
Dimensions of floor space required, ins.....	38 x 36	38 x 42	38 x 48	38 x 54	38 x 60
Height to bottom of garbage door, ins.....	37	37	37	37	37
Dimensions of garbage door, ins.....	16 x 16	16 x 16	16 x 16	16 x 16	16 x 16
Dimensions of coal or fire door, ins.....	16 x 8	16 x 8	16 x 8	16 x 8	16 x 8
Dimensions of coal or lower grates, ins.....	24 x 24	24 x 30	24 x 36	24 x 42	24 x 48
Size, one each, flow and return flanges, ins.....	3	3	4	4	8
Diameter of smoke pipe, ins.....	10	10	10	12	12
Approximate shipping weight, lbs.....	2,800	3,100	3,400	3,700	4,000

One full charge of garbage can be completely destroyed, on an average, in 1 hour.

In large operations, it is recommended that circulating mains and branches be covered.

Best results are obtained when the capacity of water storage tank is 50% greater than the capacity of garbage burner to which it is attached.



Tabasco Water Heater.

These are all-steel, self-feed surface burners.

SPECIFICATIONS, TABASCO WATER HEATERS						
Heater	Cipher	Heating capacity, gallons per hour	Size of heater, ins.	Total height, ins.	Sizes, flows and returns, ins.	Wgt., lbs.
17	Fabian	130	17 x 30	52	2-1½	400
18	Fable	150	17 x 36	57	2-1½	420
21	Facade	200	21 x 30	52	2-2	520
22	Facial	250	21 x 36	59	2-2	550
25	Factor	300	25 x 36	59	2-2	780
26	Faculty	350	25 x 42	65	2-2	810
27	Facund	400	25 x 48	71	2-2	840
30	Faddle	500	30 x 42	65	2-3	1100
31	Faggot	600	30 x 48	75	2-3	1150
32	Faint	700	30 x 54	81	2-3	1240

Magazine feed heaters are always shipped unless surface burners are specified in order. Provided with brass clean-out plugs.  
On all Tabasco heaters, the heating capacity is based on raising the water in the storage tank 50° Fahr. in 1 hour.



TABASCO WATER HEATER

**Standard Tabasco Tanks.**  
Tested to 100 lbs. hydrostatic pressure, and for use where water working pressure does not exceed 65 lbs.  
Regularly made with openings so that they may be used horizontally or vertically.  
Manholes, handholes, and coils furnished only when specially ordered.  
It is recommended that tanks containing coils be made with a manhole.

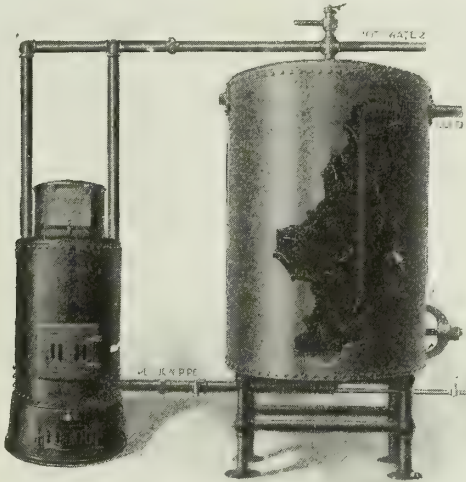
SPECIFICATIONS, STANDARD TABASCO TANKS				
Capacity, gallons	Size, ins.	Approx. shipping weight, lbs.	Openings, ins.	Size coil, ins.
66	20 x 4	225	1½	4 Pipes 1
85	20 x 5	260	1½	4 " 1
100	24 x 4	280	1½	4 " 1¼
120	24 x 5	325	1½	4 " 1¼
140	24 x 6	360	1½	4 " 1¼
150	30 x 4	425	2	4 " 1¼
180	30 x 5	490	2	4 " 1¼
220	30 x 6	555	2	4 " 1¼
250	30 x 7	620	2	4 " 1¼
295	30 x 8	685	2	4 " 1¼
315	36 x 6	740	2	4 " 1½
365	36 x 7	825	2	4 " 1½
420	36 x 8	910	2	4 " 1½
525	36 x 10	1080	2	4 " 1½
430	42 x 6	890	2	4 " 1½
500	42 x 7	985	2	4 " 1½
575	42 x 8	1080	2	4 " 1½
720	42 x 10	1270	2	4 " 1½
865	42 x 12	1460	2	4 " 1½
1000	42 x 14	1650	2	4 " 1½

**Extra Heavy Tabasco Tanks.**  
Tested to 150 lbs. hydrostatic pressure, and for use

where water working pressure does not exceed 100 lbs.; otherwise arranged the same as standard tanks.  
For greater pressure, prices and specifications will be submitted on application.

SPECIFICATIONS, EXTRA HEAVY TABASCO TANKS						
Cap-acity gallons	Size, ins.	Thick-ness shell, ins.	Convex head, ins.	Concave head, ins.	Approx. shipping weight, lbs.	Size open-ings, ins.
120	24 x 5	3/16	1/4	5/16	410	1½
140	24 x 6	3/16	1/4	5/16	470	1½
180	30 x 5	3/16	1/4	5/16	530	2
220	30 x 6	3/16	1/4	5/16	600	2
250	30 x 7	3/16	1/4	5/16	670	2
295	30 x 8	3/16	1/4	5/16	750	2
315	36 x 6	3/16	1/4	5/16	950	2
365	36 x 7	3/16	1/4	5/16	1060	2
420	36 x 8	3/16	1/4	5/16	1170	2
525	36 x 10	3/16	1/4	5/16	1390	2
430	42 x 6	3/16	1/4	5/16	1140	2
500	42 x 7	3/16	1/4	5/16	1270	2
575	42 x 8	3/16	1/4	5/16	1400	2
720	42 x 10	3/16	1/4	5/16	1660	2
865	42 x 12	3/16	1/4	5/16	1940	2
1000	42 x 14	3/16	1/4	5/16	2200	2
750	48 x 8	3/16	1/4	5/16	1600	3
940	48 x 10	3/16	1/4	5/16	1900	3
1130	48 x 12	3/16	1/4	5/16	2200	3
1300	48 x 14	3/16	1/4	5/16	2500	3
1500	48 x 16	3/16	1/4	5/16	2800	3
1700	48 x 18	3/16	1/4	5/16	3100	3

**Extra Heavy Tabasco Heaters and Vertical Tanks.**  
Tested to 150 lbs. for 100 lbs. working pressure.



Type "R" Type "S"						
EXTRA HEAVY TABASCO HEATER AND VERTICAL TANK						
Good for a working pressure of 100 lbs.						
All Tabasco heaters are supplied with brass clean-out plugs						
DATA, EXTRA HEAVY TABASCO HEATERS—TYPE "R"						
Number.....	150	200	300	400	500	700
Cipher.....	Goss	Gode	Gore	Goad	Golf	Gown
Capacity, gallons....	150	200	300	400	500	700
Total height.....	5' 3"	4' 10"	5' 4"	6' 4"	5' 10"	7' 2"
Diameter fire pot....	12"	16"	20"	20"	25"	25"
Size flow and returns.	2-1½"	2-2"	2-2"	2-2"	2-3"	2-3"
Weight, lbs.....	600	700	950	1130	1500	1650
DATA, EXTRA HEAVY TABASCO TANKS AND STANDS—TYPE "S"						
Size.....	38"x5'	42"x5'	46"x5'	54"x5'	60"x5'	60"x6'
Cipher.....	Gorn	Gole	Goen	Glad	Gibe	Gist
Capacity, gallons....	265	360	470	590	730	875
Total height, tank and stand.....	7' 2"	7' 3"	7' 6"	7' 5"	7' 6"	8' 6"
Weight tank, lbs.....	900	1200	1475	1900	2300	2500
Wgt., tank, stands, lbs.	160	180	200	220	250	250

# LORD & BURNHAM CO.

Manufacturers of Steam and Hot Water Boilers

IRVINGTON-ON-HUDSON, N. Y.

BOSTON, MASS.

BRANCHES  
PHILADELPHIA, PA.

CHICAGO, ILL.

## Products.

SECTIONAL STEAM and HOT WATER BOILERS.

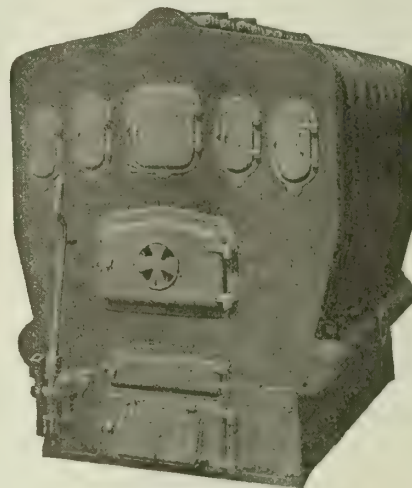
HOT WATER TANK BOILERS

For Sash Operators, see page 747; for Green-houses, see pages 1458-61.

## Burnham Square Sectional Boilers.

Burnham square sectional boilers are based on the principle that a long fire travel (correctly proportioned) reduces fuel bills. The hot gases go back and forth the length of the boiler, *on each side of the boiler*, before they are led to the smoke box opening. Because of the individual side flue openings, each section absorbs an equal amount of heat.

Burnham steam boilers have such a low water line that they can be used in shallow cellars. They are so constructed that the size of the steam dome is not sacrificed.



**BURNHAM SQUARE SECTIONAL BOILER**  
Note its broad, generous lines. Every operating part is handy in front of boiler. Every flue has a separate clean-out door

**RATINGS—SQUARE SECTIONAL HOT WATER BOILERS**

Series	No.	List price	Direct radiation, sq. ft.	Number of sections	Average dimensions of fire pot, ins.	Grate area, sq. ft.	Dimensions of grate, ins.	Supply tappings, ins.	Return tappings, ins.	Total length, ins.
18-in.	W-18-4	\$255	1100	4	24x24	3.00	18x24	2-3½	2-3½	41
	W-18-5	317	1400	5	24x31½	3.94	18x31½	2-3½	2-3½	48½
	W-18-6	372	1700	6	24x39	4.88	18x39	2-3½	2-3½	56
	W-18-7	426	2000	7	24x46½	5.81	18x46½	3-3½	3-3½	63½
24-in.	W-24-4	330	1425	4	30x23½	3.92	24x23½	1-4	1-4	42
	W-24-5	405	1900	5	30x31	5.17	24x31	2-4	2-4	49½
	W-24-6	480	2375	6	30x38½	6.42	24x38½	2-4	2-4	57
	W-24-7	555	2850	7	30x46	7.67	24x46	2-4	2-4	64½
	W-24-8	630	3325	8	30x53½	8.92	24x53½	3-4	3-4	72
30-in.	W-30-5	490	2475	5	36x31	6.46	30x31	2-4	2-4	52½
	W-30-6	595	3125	6	36x38½	8.02	30x38½	2-4	2-4	60
	W-30-7	700	3750	7	36x46	9.58	30x46	3-4	3-4	67½
	W-30-8	770	4350	8	36x53½	11.15	30x53½	3-4	3-4	75
	W-30-9	830	4950	9	36x61	12.71	30x61	4-4	4-4	82½
36-in.	W-36-5	660	3500	5	41x32	8.00	36x32	2-4	2-4	55½
	W-36-6	770	4375	6	41x39½	9.88	36x39½	3-4	3-4	63
	W-36-7	880	5200	7	41x47	11.75	36x47	3-4	3-4	70½
	W-36-8	990	6075	8	41x54½	13.63	36x54½	4-4	4-4	78
	W-36-9	1100	6950	9	41x62	15.50	36x62	4-4	4-4	85½
	W-36-10	1210	7825	10	41x69½	17.38	36x69½	5-4	5-4	93
	W-36-11	1320	8700	11	41x77	19.25	36x77	5-4	5-4	100½
	W-36-12	1430	9575	12	41x84½	21.12	36x84½	5-4	5-4	108
	W-36-13	1540	10450	13	41x92	23.00	36x92	5-4	5-4	115½

All boilers (except W-18-4 and W-24-4) have double shaker bar, operating grate in two sections.

**RATINGS—SQUARE SECTIONAL STEAM BOILERS**

Series	No.	List price	Direct radiation, sq. ft.	Number of sections	Average dimensions of fire pot, ins.	Grate area, sq. ft.	Dimensions of grate, ins.	Supply tappings, ins.	Return tappings, ins.	Total length, ins.
18-in.	S-18-4	\$265	650	4	24x24	3.00	18x24	1-3½	1-3½	41
	S-18-5	327	850	5	24x31½	3.94	18x31½	2-3½	2-3½	48½
	S-18-6	382	1050	6	24x39	4.88	18x39	2-3½	2-3½	56
	S-18-7	436	1250	7	24x46½	5.81	18x46½	2-3½	2-3½	63½
24-in.	S-24-4	345	900	4	30x23½	3.92	24x23½	1-4	1-4	42
	S-24-5	420	1175	5	30x31	5.17	24x31	2-4	2-4	49½
	S-24-6	495	1450	6	30x38½	6.42	24x38½	2-4	2-4	57
	S-24-7	570	1725	7	30x46	7.67	24x46	2-4	2-4	64½
	S-24-8	645	2000	8	30x53½	8.92	24x53½	2-4	2-4	72
30-in.	S-30-5	510	1475	5	36x31	6.46	30x31	2-4	2-4	52½
	S-30-6	615	1875	6	36x38½	8.02	30x38½	2-4	2-4	60
	S-30-7	720	2250	7	36x46	9.58	30x46	2-4	2-4	67½
	S-30-8	790	2650	8	36x53½	11.15	30x53½	3-4	3-4	75
	S-30-9	850	3050	9	36x61	12.71	30x61	3-4	3-4	82½
36-in.	S-36-5	680	2100	5	41x32	8.00	36x32	2-4	2-4	55½
	S-36-6	790	2625	6	41x39½	9.88	36x39½	2-4	2-4	63
	S-36-7	900	3150	7	41x47	11.75	36x47	2-4	2-4	70½
	S-36-8	1010	3675	8	41x54½	13.63	36x54½	2-4	2-4	78
	S-36-9	1120	4200	9	41x62	15.50	36x62	3-4	3-4	85½
	S-36-10	1230	4725	10	41x69½	17.38	36x69½	4-4	4-4	93
	S-36-11	1340	5250	11	41x77	19.25	36x77	4-4	4-4	100½
	S-36-12	1450	5775	12	41x84½	21.12	36x84½	4-4	4-4	108
	S-36-13	1560	6300	13	41x92	23.00	36x92	4-4	4-4	115½

All boilers (except S-18-4 and S-24-4) have double shaker bar, operating grate in two sections.



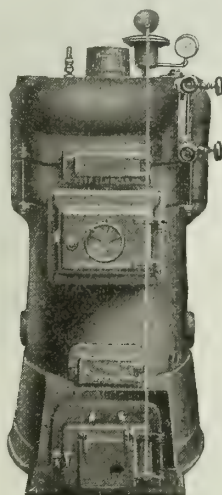
**Burnham Round Sectional Boilers.**

The crown sheet is *corrugated*, more than doubling the surface directly over the fire. The nipple openings are beyond the sides of the boiler where they do not take up fire-surface room. The intermediate sections have flue clean-out openings at both front and rear, so that no matter how many sections are added, the back and front fire travel will be maintained, and the outlet in the dome section will always come to the rear. The fire pot and crown sheet are in separate sections, making it easier to handle. In case of breakage, only the part broken need be repaired.

On steam boilers, the top or dome section is half again as



Water



Steam

BURNHAM ROUND SECTIONAL BOILERS

large as on the water boiler, and considerably longer than on any other round boiler made. There is plenty of room for rapid, frictionless expansion.

**Round Junior Hot Water Tank Boilers.**

As gas ranges are now almost universally used, it is often a good plan to have a round furnace boiler installed and connected to the hot water tank. Insures a plentiful supply of hot water at minimum cost.

Also adapted to the heating of small garages, chicken and brooder houses.

The Junior boiler is built along the same sturdy lines as the larger Burnham boilers.



ROUND JUNIOR BOILER  
With side broken through to give glimpse of interior construction

RATINGS—ROUND JUNIOR BOILERS

No.	110	112	114	116	181
Diameter grate, ins.	10	12	14	16	18
Direct radiation, sq. ft.	125	200	300	450	550
Tank capacity, gals.	175	275	375	550	700
Total diameter, ins.	16	18	20	26	27
Total height, ins.	32 <sup>3</sup> / <sub>4</sub>	36 <sup>5</sup> / <sub>8</sub>	39	40 <sup>1</sup> / <sub>4</sub>	41 <sup>1</sup> / <sub>4</sub>
Size, supply, ins.	2	2	2 <sup>1</sup> / <sub>2</sub>	3	3
Size, return, ins.	2	2	2 <sup>1</sup> / <sub>2</sub>	3	3
Diameter smoke pipe, ins.	5	6	7	7	7
List price.	\$45	65	80	120	140

Cast iron bases with legs, suitable for setting boiler on wood floor, can be furnished with Nos. 110, 112 and 114 boilers at special prices.

Brass water sections can be furnished in above sizes. Special prices on application

RATINGS—IMPROVED ROUND SECTIONAL WATER BOILERS

No.	List price	Direct radiation, sq. ft.	Diameter of grate, ins.	Grate area, sq. ft.	Supply tappings, ins.	Return tappings, ins.	Diameter of smoke box, ins.
W-17-4	\$120	450	17	1.58	2-2	2-2	7
W-17-5	130	500	17	1.58	2-2	2-2	7
W-17-6	140	550	17	1.58	2-2	2-2	7
W-19-4	146	575	19	1.97	2 2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	7
W-19-5	170	650	19	1.97	2 2 <sup>1</sup> / <sub>2</sub>	2 2 <sup>1</sup> / <sub>2</sub>	7
W-19-6	180	725	19	1.97	2 2 <sup>1</sup> / <sub>2</sub>	2 2 <sup>1</sup> / <sub>2</sub>	7
W-22-4	190	775	22	2.64	2 2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	8
W-22-5	208	900	22	2.64	2-2 <sup>1</sup> / <sub>2</sub>	2 2 <sup>1</sup> / <sub>2</sub>	8
W-22-6	240	1025	22	2.64	2-2 <sup>1</sup> / <sub>2</sub>	2 2 <sup>1</sup> / <sub>2</sub>	8
W-25-4	230	1000	25	3.41	2-3	2-3	9
W-25-5	265	1150	25	3.41	2-3	2-3	9
W-25-6	292	1300	25	3.41	2-3	2-3	9
W-28-4	303	1375	28	4.28	2-3 <sup>1</sup> / <sub>2</sub>	2-3 <sup>1</sup> / <sub>2</sub>	10
W-28-5	340	1600	28	4.28	2-3 <sup>1</sup> / <sub>2</sub>	2-3 <sup>1</sup> / <sub>2</sub>	10
W-28-6	377	1825	28	4.28	2-3 <sup>1</sup> / <sub>2</sub>	2-3 <sup>1</sup> / <sub>2</sub>	10
W-31-4	410	1950	31	5.25	2-4	2-4	11
W-31-5	455	2225	31	5.25	2-4	2-4	11
W-31-6	490	2500	31	5.25	2-4	2-4	11

RATINGS—IMPROVED ROUND SECTIONAL STEAM BOILERS

No.	List Price	Direct radiation, sq. ft.	Diameter of grate, ins.	Grate area, sq. ft.	Supply tappings, ins.	Return tappings, ins.	Diameter of smoke box, ins.
S-17-4	\$130	275	17	1.58	2-2	2-2	7
S-17-5	140	300	17	1.58	2-2	2-2	7
S-17-6	150	325	17	1.58	2-2	2-2	7
S-19-4	156	350	19	1.97	2-2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	7
S-19-5	180	400	19	1.97	2-2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	7
S-19-6	191	450	19	1.97	2-2 <sup>1</sup> / <sub>2</sub>	2 2 <sup>1</sup> / <sub>2</sub>	7
S-22-4	200	475	22	2.64	2 2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	8
S-22-5	218	550	22	2.64	2-2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	8
S-22-6	257	625	22	2.64	2-2 <sup>1</sup> / <sub>2</sub>	2-2 <sup>1</sup> / <sub>2</sub>	8
S-25-4	240	600	25	3.41	2-3	2-3	9
S-25-5	278	700	25	3.41	2-3	2-3	9
S-25-6	306	800	25	3.41	2-3	2-3	9
S-28-4	314	825	28	4.28	2 3 <sup>1</sup> / <sub>2</sub>	2 3 <sup>1</sup> / <sub>2</sub>	10
S-28-5	351	960	28	4.28	2-3 <sup>1</sup> / <sub>2</sub>	2-3 <sup>1</sup> / <sub>2</sub>	10
S-28-6	389	1100	28	4.28	2-3 <sup>1</sup> / <sub>2</sub>	2 3 <sup>1</sup> / <sub>2</sub>	10
S-31-4	420	1175	31	5.25	2-4	2-4	11
S-31-5	467	1350	31	5.25	2-4	2-4	11
S-31-6	502	1525	31	5.25	2-4	2-4	11

# FRANK PROX COMPANY

## Steam and Hot Water Boilers

TERRE HAUTE, IND.

### BRANCH OFFICES

INDIANAPOLIS, IND., 512 Board of Trade Building

LOUISVILLE, KY., 1020 Starks Building

DES MOINES, IOWA, Hubbell Building

### Products.

Manufacturers of ECONOMIC "SMOKELESS DOWN DRAFT" BOILERS; ECONOMIC HEAVY DUTY "SMOKELESS DOWN DRAFT" BOILERS; DUPLEX ECONOMIC HEAVY DUTY and EXTRA HEAVY DUTY BOILERS; and ECONOMIC and RADIUM STEAM and WATER BOILERS.

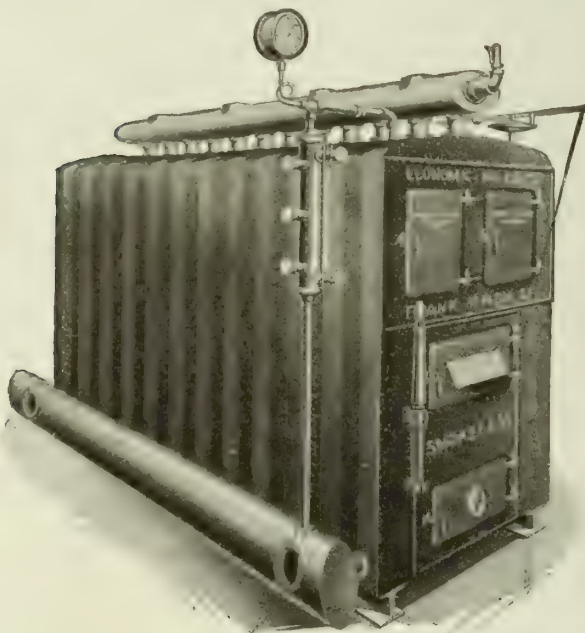
### Features of Duplex Economic Heavy Duty Boiler.

Only cast iron sectional boiler that will handle blast or fan system. Only boiler made for uninterrupted service. In case of accident, plug header and continue in use.

"Down draft" grate is a part of the section. No outside connections to give trouble. It is always safe, easy to erect, economical in fuel, and everlasting.

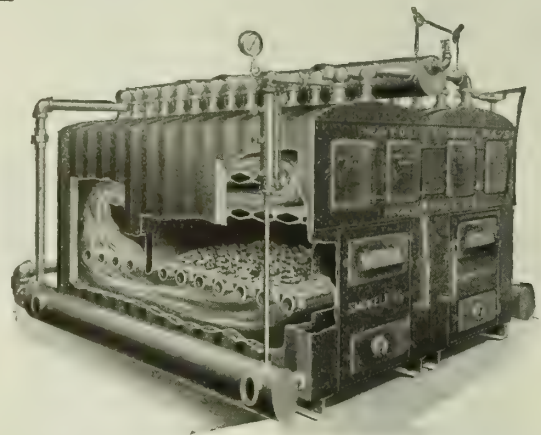
### Catalogue.

Send for catalogue.



ECONOMIC "SMOKELESS DOWN DRAFT" BOILER FOR STEAM OR WATER—100 "S" SERIES  
Single water tube shaking grate (patented)

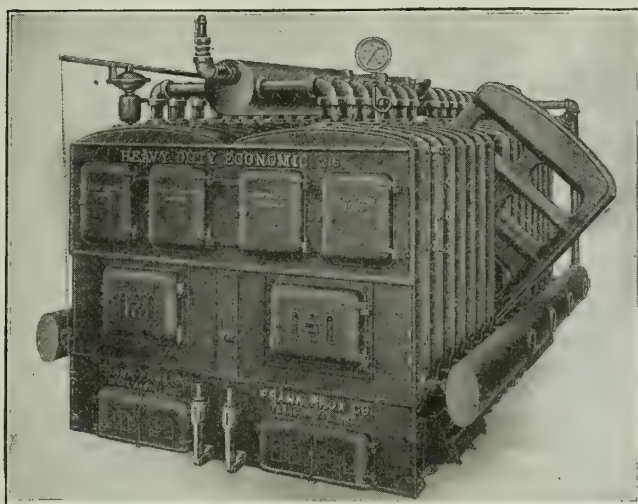
Number	Number of sections	Total length, inches	Total width over header, inches	Size of top grate, inches	Flows— inches	Returns— inches	Rating, square feet	List price, complete
STEAM								
106-3 S	6	67	47	23 x 30	2-4	2-4	1600	\$580.00
107-4 S	7	74	47	30 x 30	3-4	3-4	1850	655.00
108-5 S	8	81	47	37 x 30	3-4	3-4	2100	730.00
109-6 S	9	88	47	42 x 30	3-4	3-4	2375	795.00
110-7 S	10	95	47	49 x 30	4-4	4-4	2650	845.00
111-8 S	11	102	47	56 x 30	4-4	4-4	3150	960.00
112-9 S	12	109	47	63 x 30	4-4	4-4	3675	1075.00
HOT WATER								
306-3 S	6	67	47	23 x 30	2-4	2-4	2650	\$570.00
307-4 S	7	74	47	30 x 30	3-4	3-4	3050	645.00
308-5 S	8	81	47	37 x 30	3-4	3-4	3450	710.00
309-6 S	9	88	47	42 x 30	3-4	3-4	3900	770.00
310-7 S	10	95	47	49 x 30	4-4	4-4	4325	825.00
311-8 S	11	102	47	56 x 30	4-4	4-4	5200	940.00
312-9 S	12	109	47	63 x 30	4-4	4-4	6050	1055.00



DUPLEX ECONOMIC HEAVY DUTY "SMOKELESS DOWN DRAFT" BOILERS—200 SERIES  
Single water tube shaking grate (patented)

Number	Grate, square feet	Length, inches	Flows— inches	Returns— inches	Rating, square feet	Chimney, feet	List price, complete
HEAVY DUTY STEAM, REAR SMOKE OUTLET							
A-207-4S	11.4	78	2-5	4-4	4200	24 x 60	\$1190.00
A-208-5S	14.4	85	2-5	4-4	4750	24 x 60	1294.00
A-209-5S	14.4	92	2-5	4-4	5250	24 x 65	1389.00
A-210-6S	17.2	99	3-5	4-4	5700	24 x 70	1484.00
A-211-6S	17.2	106	3-5	4-4	6650	24 x 75	1674.00
A-212-6S	17.2	113	3-5	4-4	7150	24 x 80	1770.00
A-213-7S	20.2	120	3-5	4-4	7600	24 x 80	1864.00
EXTRA HEAVY DUTY STEAM, REAR SMOKE OUTLET							
B-210-7S	20.2	108	1-8	4-4	8000	24 x 80	\$1932.00
B-211-7S	20.2	115	1-8	4-4	8800	24 x 90	2125.00
B-212-7S	20.2	122	1-8	4-4	9600	28 x 80	2320.00
B-213-7S	20.2	129	1-8	4-4	10400	28 x 80	2520.00
B-214-8S	23.0	136	2-8	4-4	11200	28 x 90	2720.00
B-215-8S	23.0	143	2-8	4-4	12000	28 x 100	2920.00
B-216-8S	23.0	150	2-8	4-4	12800	32 x 80	3120.00
B-217-9S	26.0	157	2-8	4-4	13600	32 x 90	3320.00
B-218-9S	26.0	164	2-8	4-4	14400	32 x 100	3520.00
B-219-10S	28.8	171	2-8	4-4	15200	36 x 100	3710.00
B-220-10S	28.8	178	2-8	4-4	16000	36 x 100	3900.00
HEAVY DUTY HOT WATER, REAR SMOKE OUTLET							
A-407-4S	11.4	78	2-5	4-5	6925	24 x 60	\$1170.00
A-408-5S	14.4	85	2-5	4-5	7825	24 x 60	1274.00
A-409-5S	14.4	92	2-5	4-5	8625	24 x 65	1370.00
A-410-6S	17.2	99	3-5	4-5	9400	24 x 70	1464.00
A-411-6S	17.2	106	3-5	4-5	10975	24 x 75	1654.00
A-412-6S	17.2	113	3-5	4-5	11810	24 x 80	1749.00
A-413-7S	20.2	120	3-5	4-5	12550	24 x 80	1844.00
EXTRA HEAVY DUTY HOT WATER, REAR SMOKE OUTLET							
B-410-7S	20.2	108	1-8	1-8	12800	24 x 80	\$1912.00
B-411-7S	20.2	115	2-8	2-8	14080	24 x 90	2105.00
B-412-7S	20.2	122	2-8	2-8	15360	28 x 80	2300.00
B-413-7S	20.2	129	2-8	2-8	16640	28 x 80	2500.00
B-414-8S	23.0	136	2-8	2-8	17920	28 x 90	2700.00
B-415-8S	23.0	143	2-8	2-8	19200	28 x 100	2900.00
B-416-8S	23.0	150	2-8	2-8	20480	32 x 80	3100.00
B-417-9S	26.0	157	2-8	2-8	21760	32 x 90	3300.00
B-418-9S	26.0	164	2-8	2-8	23040	32 x 100	3500.00
B-419-10S	28.8	171	2-8	2-8	24320	36 x 100	3690.00
B-420-10S	28.8	178	2-8	2-8	25600	36 x 100	3880.00
HEAVY DUTY							
Grate.....				Single		Double	
Series.....				A	B	A	B
Height to top of header, ins.....				74½	82	80	92
Water line, ins.....				52½	57	58	67
Size of smoke pipe, ins.....				18	24	18	24
Height to center of smoke pipe, ins.....				52½	57	58	67
Total width over headers, ins.....				93	93	93	93
EXTRA HEAVY DUTY							
Grate.....				Single		Double	
Series.....				A	B	A	B
Height to top of header, ins.....				74½	82	80	92
Water line, ins.....				52½	57	58	67
Size of smoke pipe, ins.....				18	24	18	24
Height to center of smoke pipe, ins.....				52½	57	58	67
Total width over headers, ins.....				93	93	93	93





DUPLEX ECONOMIC HEAVY DUTY BOILER—STEAM AND HOT WATER—200 SERIES

Number	Grate, square feet	Length, inches	Flows, inches	Returns, inches	Rating, square feet	Chimney, feet	List price, complete
HEAVY DUTY STEAM							
Rear Smoke Outlet, A-200 Series				Front Smoke Outlet, A-700 Series			
A-206-4	12.7	71	2-5	4-4	3675	20x50	\$1075.00
A-207-5	15.9	78	2-5	4-4	4200	20x60	1190.00
A-208-5	15.9	85	2-5	4-4	4750	20x60	1294.00
A-209-6	19.0	92	2-5	4-4	5275	24x60	1395.00
A-210-6	19.0	99	3-5	4-4	5700	24x65	1484.00
A-211-6	19.0	106	3-5	4-4	6650	24x70	1674.00
A-212-6	19.0	113	3-5	4-4	7325	24x70	1805.00
A-213-7	22.2	120	3-5	4-4	7600	24x70	1872.00
A-214-7	22.2	127	4-5	4-4	8550	24x80	2058.00
A-215-8	25.4	134	4-5	4-4	9500	28x70	2296.00
A-216-8	25.4	141	4-5	4-4	10000	28x70	2434.00

Height to outlet, 72 ins.; water line, 50 ins.; smoke pipe, 18 ins.; width, 93 ins.

EXTRA HEAVY DUTY STEAM							
Rear Smoke Outlet, B-200 Series				Front Smoke Outlet, B-700 Series			
B-210-7	22.2	108	1-8	4-4	8350	24x80	\$2010.00
B-211-7	22.2	115	1-8	4-4	8800	24x80	2125.00
B-212-7	22.2	122	1-8	4-4	9600	28x70	2320.00
B-213-7	22.2	129	1-8	4-4	10400	28x70	2520.00
B-214-8	25.4	136	2-8	4-4	11200	28x80	2720.00
B-215-8	25.4	143	2-8	4-4	12000	32x70	2920.00
B-216-8	25.4	150	2-8	4-4	12800	32x70	3120.00
B-217-9	28.6	157	2-8	4-4	13600	32x70	3320.00
B-218-9	28.6	164	2-8	4-4	14400	32x80	3520.00
B-219-10	31.7	171	2-8	4-4	15200	36x80	3710.00
B-220-10	31.7	178	2-8	4-4	16000	36x80	3900.00

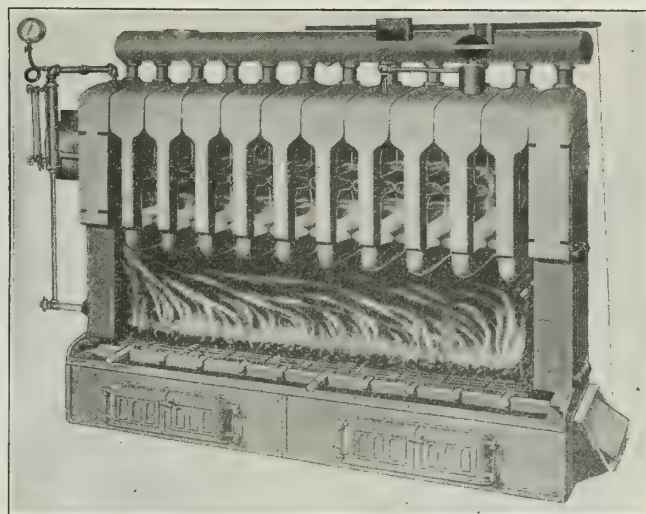
Height to outlet, 80 ins.; water line, 55 ins.; smoke pipe, 24 ins.; width, 93 ins.

HEAVY DUTY HOT WATER							
Rear Smoke Outlet, A-400 Series				Front Smoke Outlet, A-900 Series			
A-406-4	12.7	71	2-5	4-5	6050	20x50	\$1055.00
A-407-5	15.9	78	2-5	4-5	6925	20x60	1170.00
A-408-5	15.9	85	2-5	4-5	7825	20x60	1274.00
A-409-6	19.0	92	2-5	4-5	8700	24x60	1375.00
A-410-6	19.0	99	3-5	4-5	9400	24x65	1464.00
A-411-6	19.0	106	3-5	4-5	10975	24x70	1654.00
A-412-6	19.0	113	3-5	4-5	12050	24x70	1785.00

Height to outlet, 72 ins.; smoke pipe, 18 ins.; width, 93 ins.

EXTRA HEAVY DUTY HOT WATER							
Rear Smoke Outlet, B-400 Series				Front Smoke Outlet, B-900 Series			
B-410-7	22.2	108	1-8	1-8	13725	24x80	\$1990.00
B-411-7	22.2	115	2-8	2-8	14080	24x80	2105.00
B-412-7	22.2	122	2-8	2-8	15360	28x80	2300.00
B-413-7	22.2	129	2-8	2-8	16640	28x80	2500.00
B-414-8	25.4	136	2-8	2-8	17920	28x80	2700.00
B-415-8	25.4	143	2-8	2-8	19200	32x80	2900.00
B-416-8	25.4	150	2-8	2-8	20480	32x80	3100.00
B-417-9	28.6	157	2-8	2-8	21760	32x80	3300.00
B-418-9	28.6	164	2-8	2-8	23040	32x80	3500.00
B-419-10	31.7	171	2-8	2-8	24320	36x80	3690.00
B-420-10	31.7	178	2-8	2-8	25600	36x80	3880.00

Height to outlet 80 ins.; smoke pipe, 24 ins.; width, 93 ins.



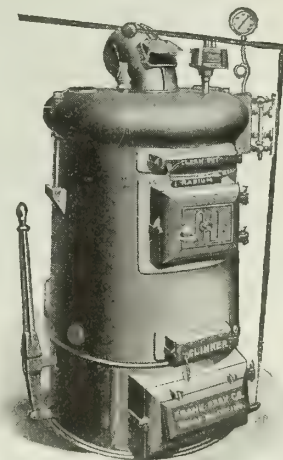
ECONOMIC SIDE FIRED BOILER—STEAM AND HOT WATER  
Sectional view, showing fire travel

Number	Number of sections	Total length end to end, inches	Total width over header, inches	Grate area, square feet	Flows, inches	Returns, inches	Rating, square feet	List price, complete
STEAM								
105-3	5	60	50	6.00	2-4	2-4	1200	\$460.00
106-4	6	67	50	8.19	2-4	2-4	1600	580.00
107-5	7	74	50	9.54	3-4	3-4	1850	655.00
108-6	8	81	50	10.20	3-4	3-4	2100	730.00
109-7	9	88	50	11.66	3-4	3-4	2375	795.00
110-8	10	95	50	13.12	4-4	4-4	2650	845.00
111-9	11	102	50	14.58	4-4	4-4	3150	960.00
112-10	12	109	50	16.60	4-4	4-4	3675	1075.00
HOT WATER								
305-3	5	60	50	6.00	2-4	2-4	2000	\$450.00
306-4	6	67	50	8.19	2-4	2-4	2650	570.00
307-5	7	74	50	9.54	3-4	3-4	3050	645.00
308-6	8	81	50	10.20	3-4	3-4	3450	710.00
309-7	9	88	50	11.66	3-4	3-4	3900	770.00
310-8	10	95	50	13.12	4-4	4-4	4325	825.00
311-9	11	102	50	14.58	4-4	4-4	5200	940.00
312-10	12	109	50	16.60	4-4	4-4	6050	1055.00

Height to top of header, 70 ins.; water line, 50 ins.; size smoke pipe, 12 ins.; height to center of smoke pipe, 50 ins.

RADIUM STEAM AND HOT-WATER BOILERS  
Hard and Soft Coal and Coke

Number	Height to top of outlet, inches	Rating, square feet	Price, complete
STEAM			
1319	49	300	\$149.50
1419	53½	400	193.00
1519	58	500	219.50
1619	62½	575	240.00
1423	53½	550	233.00
1523	58	650	287.50
1623	62½	800	331.00
1723	67	900	360.50
1426	53½	700	300.00
1526	58	850	346.00
1626	62½	1000	389.50
1726	67	1100	419.00
HOT WATER			
2319	43½	500	\$140.50
2419	48	650	184.00
2519	52½	825	210.50
2619	57	950	230.00
2423	48	900	224.00
2523	52½	1075	277.50
2623	57	1325	321.50
2723	61½	1500	350.50
2426	48	1150	290.00
2526	52½	1400	336.00
2626	57	1650	380.00
2726	61½	1825	409.00



RADIUM BOILER—STEAM AND HOT WATER

ESTABLISHED 1850

## THATCHER FURNACE CO.

TELEPHONE:  
GREELEY 1466131-137 West 35th Street  
NEW YORK, N. Y.WESTERN OFFICE: CHICAGO, ILL., 134-140 West Lake Street  
PLANTS: NEWARK, N. J., GARWOOD, N. J.

## Products.

SECTIONAL STEAM and WATER BOILERS.  
ROUND STEAM and WATER BOILERS.  
WARM AIR FURNACES.  
COAL RANGES.  
COMBINATION RANGES.  
Hot Water Supply Boilers and Laundry Stoves.

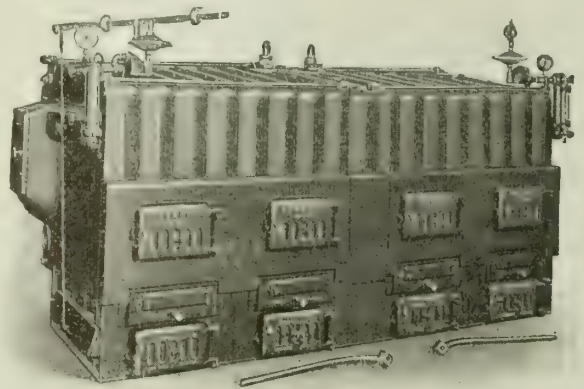
## Thatcher "Progress" Twin Boiler.

SCOPE OF USE—Twin "Progress" boilers, with capacities up to 18,000 sq. ft. of steam radiation, are especially adapted for use in churches, schools, libraries, hospitals, hotels, restaurants, public halls, apartment houses, large private dwellings, greenhouses, etc.

EFFICIENT DESIGN—The basic principle of triangular shaped sections remains always the ruling factor, producing the lowest practical waterline on the market, perfect water circulation and triple fire travel. Because of the several feed doors and the short depth of grate, the "Progress" is the most easily fired boiler, and every foot of the grate produces maximum results.

ECONOMY—A twin boiler costs much less to install than two single boilers. There is less complica-

tion in piping and valves, and less loss in radiation because only two ends of boiler are exposed instead of four; considerable economy is effected in less consumption of coal due to the "bridgewall" construction; and, further, there is the saving of floor space, which is often important.



THATCHER "PROGRESS" TWIN STEAM BOILER

DATA, "PROGRESS" TWIN BOILERS (STEAM)

No. TS.	Rating	Length, ins.	Depth, ins.	Height, ins.	Grate area, sq. ft.	Flow and return tap'gs (4 each) ins.	No. of feed doors	List price
1228	3,500	94 $\frac{1}{2}$	46	55	14.64	4	4	\$1,180
1328	4,000	101 $\frac{1}{2}$	46	55	16.12	4	4	1,300
1428	4,450	108 $\frac{3}{4}$	46	55	17.60	4	4	1,420
1528	4,900	116	46	55	19.02	4	4	1,540
1628	5,350	123 $\frac{1}{4}$	46	55	20.44	4	4	1,660
1728	5,800	130 $\frac{1}{2}$	46	55	21.84	4	4	1,780
1828	6,250	137 $\frac{3}{4}$	46	55	23.24	4	4	1,900
1928	6,700	145	46	55	24.64	4	4	2,020
2028	7,150	152 $\frac{1}{4}$	46	55	26.04	4	4	2,140
1540	7,600	116	64	64	27.15	5	5	2,200
1640	8,300	123 $\frac{1}{4}$	64	64	29.16	5	5	2,350
1740	9,000	130 $\frac{1}{2}$	64	64	31.11	5	5	2,500
1840	9,700	137 $\frac{3}{4}$	64	64	33.06	5	5	2,650
1940	10,400	145	64	64	35.14	5	5	2,800
2040	11,100	152 $\frac{1}{4}$	64	64	37.22	5	5	2,950
2140	11,800	159 $\frac{1}{2}$	64	64	39.23	5	5	3,100
2240	12,600	166 $\frac{3}{4}$	64	64	41.24	5	6	3,250
2340	13,400	174	64	64	43.25	5	6	3,400
2440	14,200	181 $\frac{1}{4}$	64	64	45.26	5	6	3,550
2540	15,000	188 $\frac{1}{2}$	64	64	46.66	5	8	3,700
2640	15,800	195 $\frac{3}{4}$	64	64	48.06	5	8	3,850
2740	16,600	203	64	64	50.69	5	8	4,100
2840	17,300	210 $\frac{1}{4}$	64	64	53.32	5	8	4,250

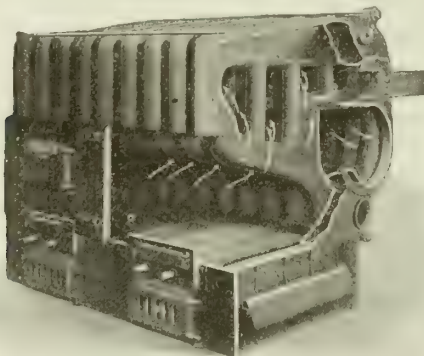
Waterline: 48-in. in 28-in. grate series boilers and 55-in. in 40-in. grate series boilers.

## "Thatcher" Round Boiler.

The "Thatcher" round boiler, in tests made under identical working conditions with other standard heaters, proved to be the most powerful house heater for rated capacity, not only in B.t.u. transmitted to the water, but in length of time between firing periods.

FIRE TRAVEL and WATER CIRCULATION—The efficient staggered fire travel between each section, from body to dome (causing flames to mushroom between sections), and the double surface formed by deep corrugations in dome section, are shown in accompanying illustration.

Large and unobstructed waterways and three legs



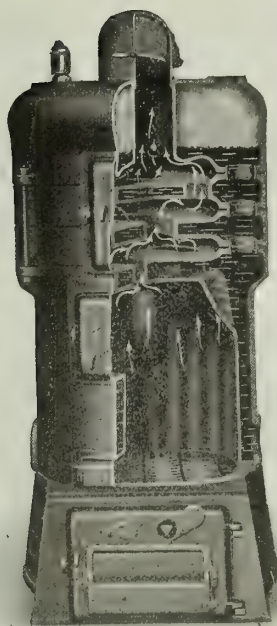
"PROGRESS" SINGLE HOT WATER BOILER, NO. 1040

DATA, "PROGRESS" SINGLE BOILERS (STEAM AND WATER)

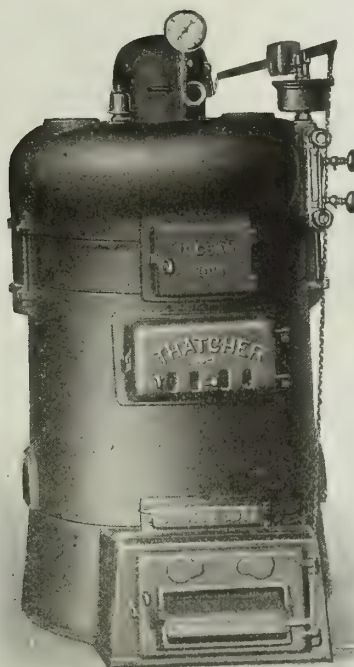
No. S	Rating steam	Rating hot water	Length, less trim, ins.	Depth, ins.	Height, ins.	Grate area, sq. ft.	Flow and return (2 each) ins.	Smoke collar, ins.	Feed doors
428	800	1300	29	46	55	4.54	4	10	1
528	1,150	1925	36 $\frac{1}{4}$	46	55	5.98	4	12	1
628	1,550	2600	43 $\frac{1}{2}$	46	55	7.32	4	12	1
728	2,000	3350	50 $\frac{3}{4}$	46	55	8.80	4	12	2
828	2,450	4100	58	46	55	10.22	4	12	2
928	2,900	4850	65 $\frac{1}{4}$	46	55	11.62	4	12	2
1028	3,350	5650	72 $\frac{1}{2}$	46	55	13.02	4	12	2
1128	3,800	6100	79 $\frac{3}{4}$	46	55	14.42	4	12	2
640	2,600	4350	43 $\frac{1}{2}$	64	64	10.55	5	18	1
740	3,200	5275	50 $\frac{3}{4}$	64	64	12.57	5	18	2
840	3,800	6325	58	64	64	14.58	5	18	2
940	4,500	7500	65 $\frac{1}{4}$	64	64	16.53	5	18	2
1040	5,200	8675	72 $\frac{1}{2}$	64	64	18.61	5	18	2
1140	5,900	9850	79 $\frac{3}{4}$	64	64	20.62	5	18	2
1240	6,700	11175	87	64	64	22.63	5	18	2
1340	7,500	12500	94 $\frac{1}{4}$	64	64	24.03	5	18	3
1440	8,300	13850	101 $\frac{1}{2}$	64	64	26.66	5	18	4

Waterline: 48-in. in 28-in. grate series boilers and 55-in. in 40-in. grate series boilers.

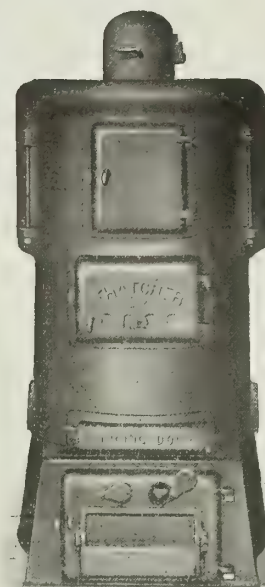




"Thatcher" No. 19-2 Steam Boiler  
Cut open to show fire travel and  
water circulation



"Thatcher" No. 28-1 Steam Boiler



"Thatcher" No. 19-2 Hot Water Boiler  
Showing low dome for quick water  
circulation

"THATCHER" ROUND STEAM AND HOT WATER BOILERS

"THATCHER" STEAM BOILERS

No. of boiler.....	19-0S	19-1S	19-2S	22-0S	22-1S	22-2S	25-0S	25-1S	25-2S	28-0S	28-1S	28-2S
Rating, sq. ft. ....	300	350	400	450	525	575	600	675	750	800	900	1,000
Diam. grate, ins. ....	19	19	19	22	22	22	25	25	25	28	28	28
Grate area, sq. ft. ....	1.90	1.90	1.90	2.65	2.65	2.65	3.40	3.40	3.40	4.30	4.30	4.30
Flow and return openings, ins. ....	2-3	2-3	2-3	2-3	2-3	2-3	2-3½	2-3½	2-3½	2-4	2-4	2-4
Diam. smoke pipe (round) ins. ....	7	7	7	8	8	8	9	9	9	9	9	9
List price. ....	\$149.50	167.00	193.00	206.50	226.00	240.00	267.00	295.00	316.00	331.00	360.50	389.50

"THATCHER" HOT WATER BOILERS

No. of boiler.....	19-0W	19-1W	19-2W	22-0W	22-1W	22-2W	25-0W	25-1W	25-2W	28-0W	28-1W	28-2W
Rating, sq. ft. ....	500	575	650	750	875	950	1,000	1,150	1,225	1,325	1,500	1,650
Diam. grate, ins. ....	19	19	19	22	22	22	25	25	25	28	28	28
Grate area, sq. ft. ....	1.90	1.90	1.90	2.65	2.65	2.65	3.40	3.40	3.40	4.30	4.30	4.30
Flow and return openings, ins. ....	2-3	2-3	2-3	2-3	2-3	2-3	2-3½	2-3½	2-3½	2-4	2-4	2-4
Diam. smoke pipe (round) ins. ....	7	7	7	8	8	8	9	9	9	9	9	9
List price. ....	\$140.50	158.00	184.50	197.00	217.50	230.00	260.00	290.00	310.00	321.50	350.50	380.00

extending into fire pot, which has straight sides, are important features.

**GRATES**—Of the triangular revolving type, which are the most efficient and easily operated.

**BASE**—High, with ample space under the grates for the convenient removal of ashes.

**FIREBOX**—1½ ins. deeper than the accepted standard.

**THE AUTOMATIC DAMPER CONTROL**—Another superior feature of the Thatcher boiler.

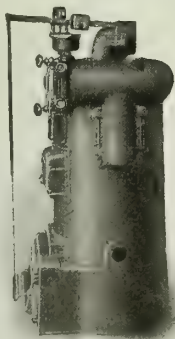
Delicately balanced draft damper door (in smoke hood) is connected directly with check draft damper door (in ash pit door) by a chain through regulator.

No necessity for long chain and pulley wheels usually fastened to ceiling.

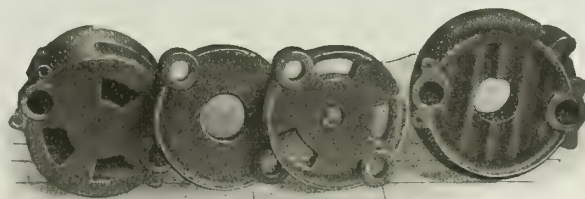
**THE REGULATOR**—Of multiple disk type, with disks of rustproof phosphor bronze, which are extremely sensitive and cause regulator to respond to slightest pressure.



"THATCHER" BOILER BASE WITH  
REVOLVING TRIANGULAR GRATES  
Grates may be easily removed without disturbing the boiler



"THATCHER" STEAM  
BOILER NO. 19-1  
Showing automatic  
damper control



"THATCHER" BOILER BODY, 2-WHEEL SECTIONS AND DOME

"Thatcher" Tubular Furnace.

IMPORTANT PARTS OF "THATCHER" TUBULAR FURNACE.

**Radiator**—Smoke ring is cast in one piece, therefore, absolutely gastight, cup joints preventing any escape of gas from combustion chamber. Legs of radiator placed into cup joints so that smoke pipe will lead in any direction required.

**Tubular Combustion Chamber**—Constructed to allow complete combustion of hot gases. Tubes conduct the fresh air through chamber so rapidly that it is neither burned nor scorched.

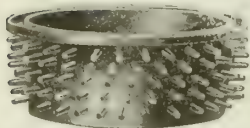
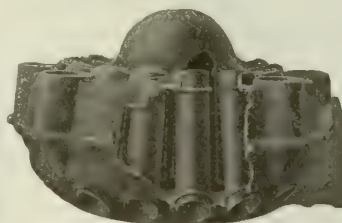


**"Porcupine" Fire Pot**—Circular, with straight sides, insuring a live and efficient fire throughout. Projecting pins provide double radiating surface.

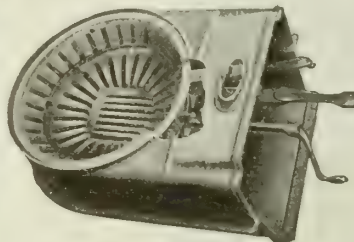
**Anticlinker Patented Grate**—Ball bearing, and easily operated.



RADIATOR

**"PORCUPINE" FIRE POT**

COMBUSTION CHAMBER

ANTICLINKER GRATE  
(Patented)

Grates move in a circular manner insuring a clean fire on all sides, and quick combustion.

**"THATCHER" TUBULAR FURNACE**

No. of furnace	Diam. casings, ins.	Height, castings, ins.	Diam. castings, ins.	Diam. smoke collar, ins.	Heat pipe capacity, sq. in.	Price, less casing
38	38	52	32	7	403	\$126.00
42	42	53	37	7	579	152.00
46	46	55	39	8	640	189.00
50	50	58	42	8	700	231.00
54	54	59	45	8	848	292.00
58	58	62	48	9	1030	347.00
62	62	64	53	9	1215	431.00

### **"Thatcher" Ranges.**

In addition to the "Thatcher" line of boilers and furnaces this company has, since 1850, pioneered in the manufacture of kitchen ranges, both for coal and for coal and gas in combination. Thatcher ranges are made of finest grade of gray iron and are carefully fitted and mounted. They are absolutely gastight and

dustproof. Every range is thoroughly inspected and tested before leaving the foundry.

### **Thatcher "Twin-fire" Combination Coal and Gas Range.**

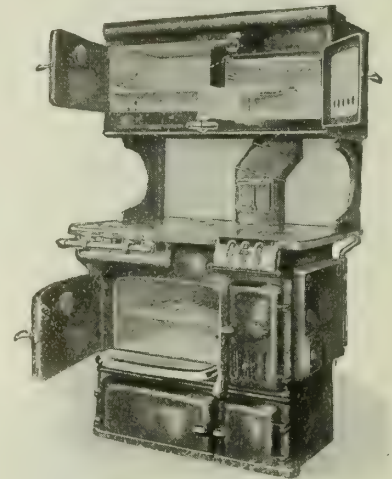
The total width of the "Twin-fire," including gas hot water heater is only 40 ins. All gas cocks are in front, saving much space.

Gas oven is heated by the Thatcher special "center action" burner, which concentrates the heat in the oven instead of diverting it around surrounding flues.

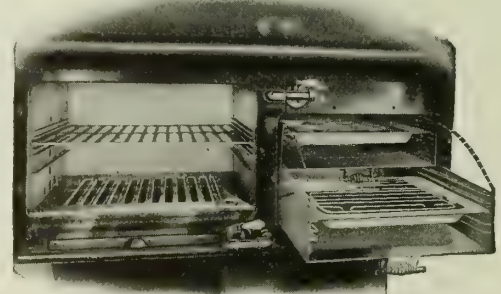
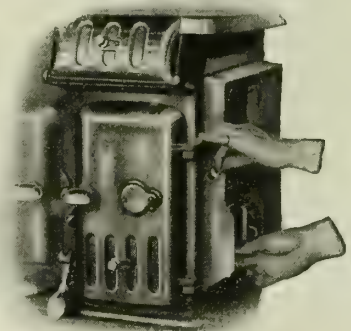
The gas broiler has 8 rows of flames, giving a sufficient capacity to cook the largest steak in the shortest time. One of the most important features of the "Twin-fire" range is the "U" shaped

design of the gas bake oven burner. Both this and the broiler oven burner are controlled by only 1 gas cock each instead of 3. This original design makes them easier to light and regulate, eliminating any possible danger of explosion.

Furnished with solid top over gas burners with 4 openings and covers; also 2 open grid covers to replace solid round covers for use with extra large cooking vessels. The solid top provides free combustion and insures all consumed or vitiated air being carried directly into chimney flue through specially constructed passageway. Solid top also provides space on which to heat irons or do slow cooking at back of range when front burners are being used. Four 8-in. covers are used with the coal firebox, assuring maximum efficiency with minimum coal consumption.

**"TWIN-FIRE" COMBINATION COAL AND GAS RANGE ON CABINET BASE**

Leg base furnished if desired

SWING DOWN BROILER RACK FEATURE  
Swings broiler pan downward and outward

COMBINATION WATERBACK

DIMENSIONS OF THATCHER "TWIN-FIRE" RANGE

Extreme width, ins.	Total height, ins.	Height to cooking top, ins.	Extreme top, ins.	Gas oven, ins.	Gas broiler, ins.	Coal oven, ins.
40	67½	33½	40x26½	19x16x11¼	16¼x12½x10	18½x19x12



# TUTTLE & BAILEY MFG. CO.

## Registers, Ventilators, Grilles and Screens

52 Vanderbilt Avenue  
NEW YORK, N. Y.

BRANCH OFFICES

CHICAGO, ILL., 225 West Lake Street  
BOSTON, MASS., 52-54 Union Street

CLEVELAND, OHIO, 910 Swetland Building  
BROOKLYN, N. Y., 83 North Tenth Street

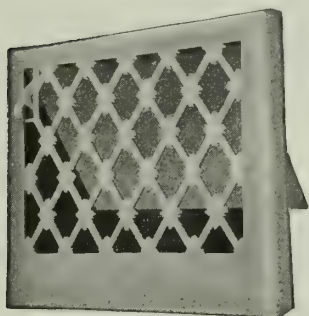
BRIDGEBURG, ONT.

### Products.

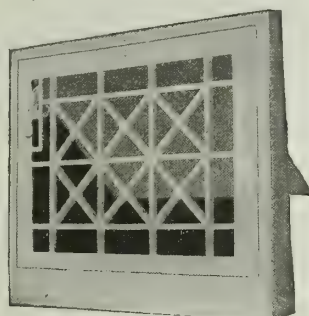
REGISTERS, VENTILATORS, GRILLES and SCREENS of  
Stock or Special Design, in Bronze, Brass, Cast Iron,

Steel, or Wire.

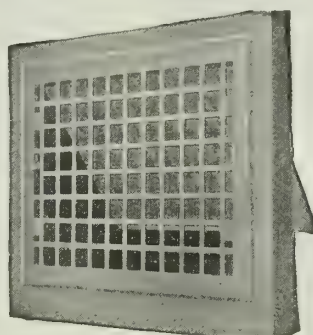
Special Design Tablets, Architectural Bronze and  
Ornamental Iron Works of every description.



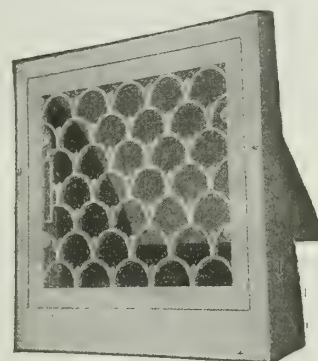
Style 22, Cast Iron



Style 44, Cast Iron

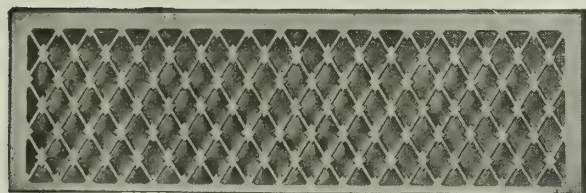


Style 99, Steel

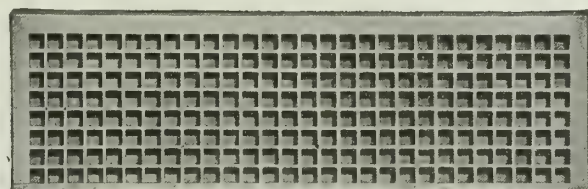


Style 100, Semisteel

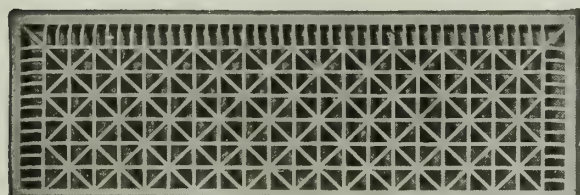
THE NEW T. & B. BASEBOARD REGISTERS  
All styles of baseboard registers fit the same stackheads



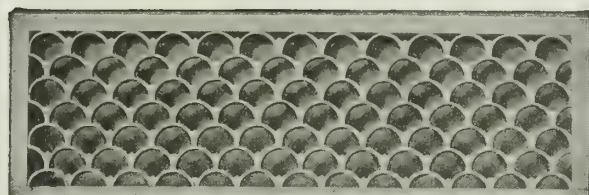
Style N22, Cast Iron Intake



Style N99, Steel Intake

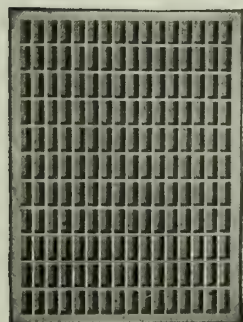


Style N44, Cast Iron Intake

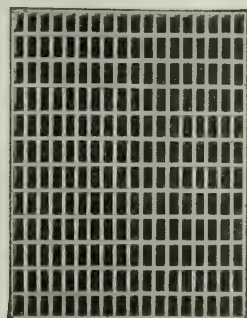


Style N100, Cast Iron Intake

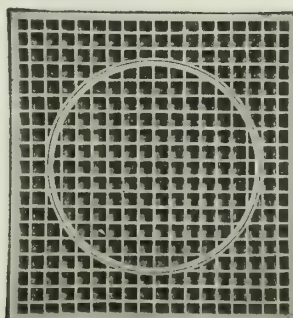
T. & B. BASEBOARD INTAKES



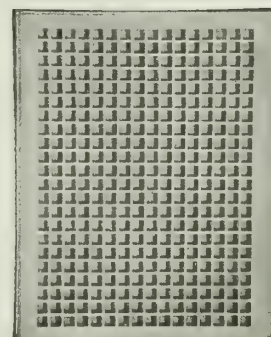
Style C, Cast Iron



Style W, Wood



Style D, Duplex



Style L, Steel

GRATINGS



### Cast Grilles.

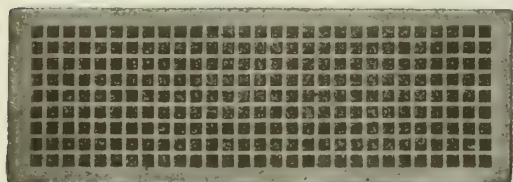
Bronze or cast iron grilles have rims which vary in width according to size, the thickness of the rim being less than that of the fretwork. In the section shown below, A is the body size or size of opening to be covered; B is the extreme outside measure and C the daylight opening. Unless otherwise stated it is assumed that sizes given on orders are body sizes "A."

Plain lattice cast grilles are made in almost all sizes (body sizes) of even inches. The mesh is  $\frac{7}{8}$  in. square, and the bars approximately  $\frac{1}{4}$  in. Various methods of fastening these grilles and providing means of access to steam valves or for cleaning purposes are

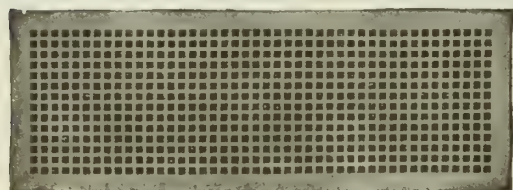
shown. Any of the special design grilles can be similarly arranged. Estimates for providing hinges and catches or the special frames shown will be sent on application.

### Steel Grilles.

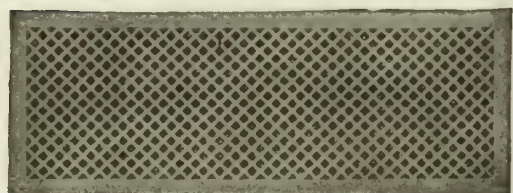
While not as substantial in appearance or as lasting as cast iron, steel grilles are cheaper, and have their uses under certain conditions. They are made of sheet steel perforated in  $\frac{7}{8}$ -in. or  $\frac{1}{2}$ -in. mesh. The  $\frac{7}{8}$ -in. mesh is standard and is always supplied unless otherwise specified, but this company also makes  $\frac{1}{2}$ -in. mesh in both square and diagonal lattice.



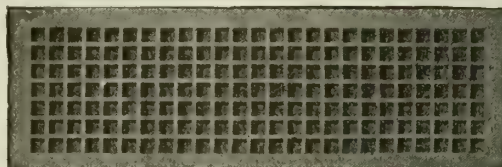
Standard  $\frac{7}{8}$ -in. Square Mesh



$\frac{1}{2}$ -in. Square Mesh



$\frac{1}{4}$ -in. Diagonal Mesh



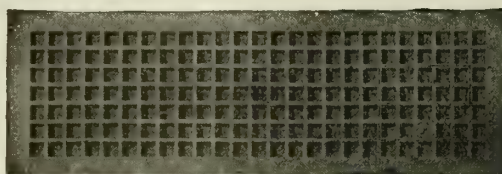
Standard  $\frac{7}{8}$ -in Mesh Grille



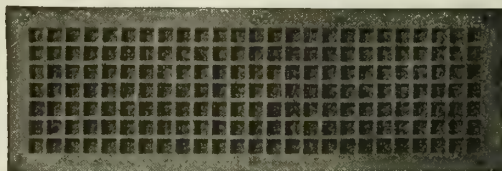
Grille Hinged to Woodwork



Grille Hinged to Angle Frame



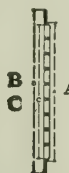
Grille with Door in Fretwork



Grille Attached to Iron Wall Frame



Grille Held in Place by Wood Molding  
CAST GRILLES

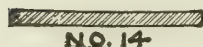


### STEEL GRILLES

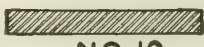
WIDTH IN DAYLIGHT OPENING "C" IN INS.					
$\frac{7}{8}$ -in. square mesh	Number of squares	$\frac{1}{2}$ -in. square mesh	Number of squares	$\frac{1}{4}$ -in. diagonal mesh	Number of squares
$1\frac{1}{8}$	2	$1\frac{7}{8}$	3	2	2
3	3	$2\frac{1}{8}$	4	$2\frac{1}{2}$	$2\frac{1}{2}$
4	4	$3\frac{1}{8}$	6	$3\frac{1}{8}$	4
$5\frac{1}{8}$	5	$5\frac{1}{8}$	8	$5\frac{1}{8}$	$5\frac{1}{2}$
$6\frac{1}{8}$	6	6	9	$5\frac{7}{8}$	6
$7\frac{1}{8}$	7	$7\frac{3}{8}$	11	$7\frac{5}{8}$	$7\frac{1}{2}$
$8\frac{1}{4}$	8	8	12	$8\frac{1}{4}$	$8\frac{1}{2}$
$9\frac{1}{8}$	9	$8\frac{3}{4}$	13	$9\frac{1}{4}$	$9\frac{1}{2}$
$10\frac{3}{8}$	10	$10\frac{1}{8}$	15	$10\frac{3}{8}$	$10\frac{1}{2}$
$11\frac{3}{8}$	11	$11\frac{7}{8}$	17	$11\frac{3}{8}$	$11\frac{1}{2}$
$12\frac{3}{8}$	12			$12\frac{1}{8}$	$12\frac{1}{2}$



Extreme size "B" as desired. Unless otherwise ordered, rims will vary from  $\frac{5}{8}$  to 1 in., all around, according to size of grille. Estimates for heavier gage or wider sizes furnished on application.



NO. 14



NO. 10



NO. 12

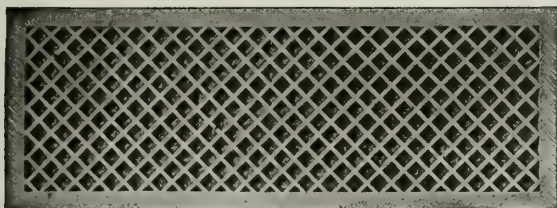


NO. 8

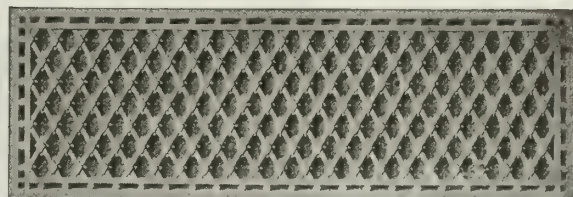
### GAGES

Showing thickness of gage of sheet steel, U. S. Standard from which steel grilles are punched

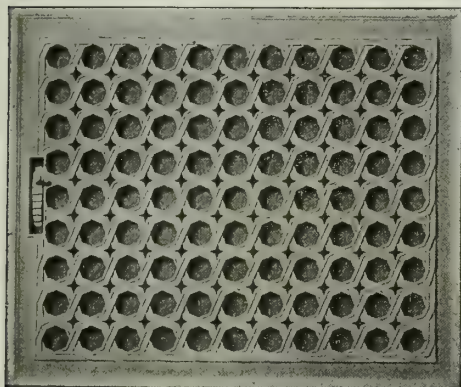




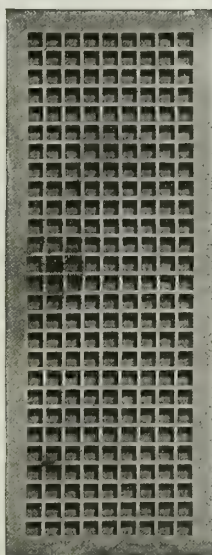
T. & B. 56



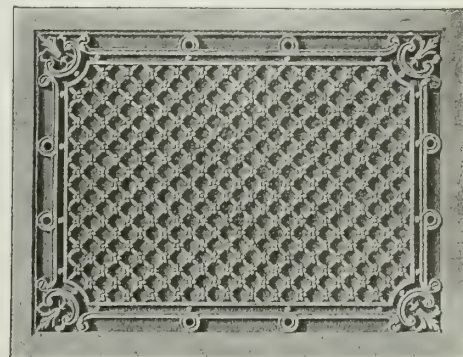
T. & B. 59



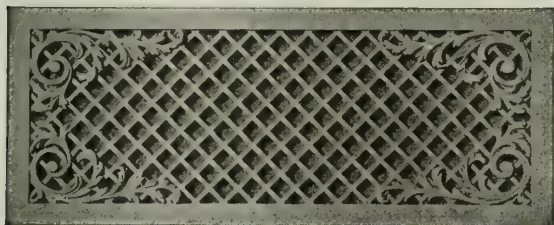
T. & B. 82



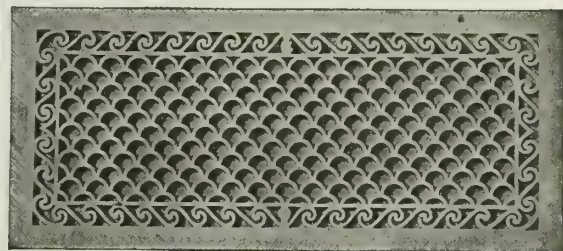
T. & B. 85



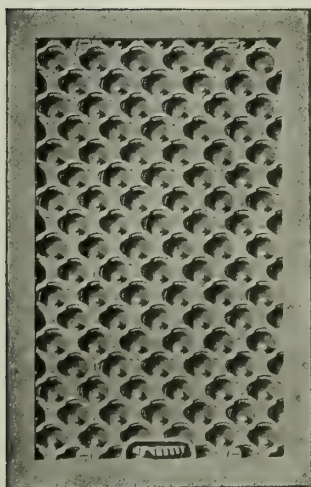
T. & B. 83



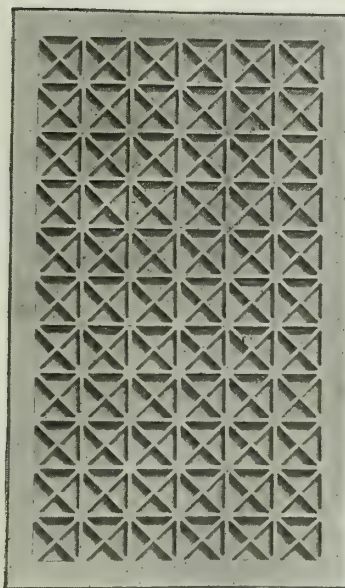
T. & B. 12



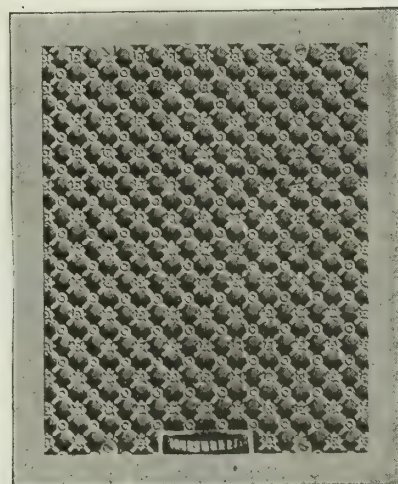
T. & B. 118



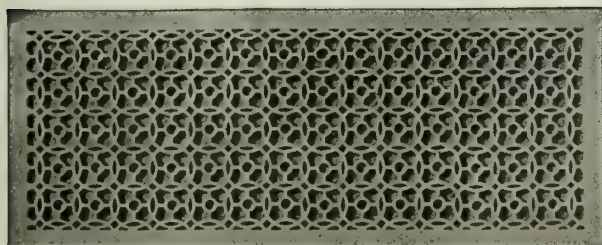
T. & B. 30



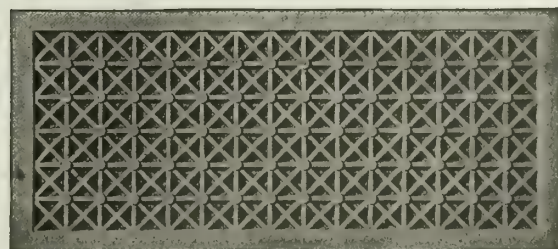
T. & B. 381



T. & B. 80



T. & B. 26



T. & B. 42

A FEW EXAMPLES OF REGISTERS, GRILLES AND SCREENS SELECTED FROM OVER 400 SPECIAL DESIGNS  
Made to order only, with an additional charge over the cost of stock goods. Write for Catalogue 66A referring to above goods



# THE BEST REGISTER COMPANY

## Registers, Ventilators, Grilles and Screens

1500 Oklahoma Avenue

MILWAUKEE, WIS.

NEW YORK, N. Y. 889 East 134th Street  
PHILADELPHIA, PA., 5 South 18th Street  
JACKSONVILLE, FLA., Heard Building

PITTSBURGH, PA., 421 Wood Street  
CLEVELAND, OHIO, Guardian Building  
BALTIMORE, MD., Builders' Exchange

DETROIT, MICH., Builders' Exchange  
OAKLAND, CAL., 5300 Genoa Street  
TORONTO and WINNIPEG, CAN.

### Products.

REGISTERS, VENTILATORS, GRILLES and SCREENS, of stock or special designs and finishes, in Bronze, Brass, Copper, White Porcelain Enamel, White or Black Japan, etc., made in Cast Iron, Semisteel, Brass or Bronze Metal, and Steel; Mushroom Ventilators.

Gratings, Wall Frames, Sheet Steel Boxes, Floor Borders, Double Slide Dampers, Perforated Steel Grilles, Wire Screens, etc.

Specialists in Semisteel Registers.

### Facilities.

The factory is equipped throughout with the most improved modern machinery. The capacity is unlimited; and the efficiency of the entire equipment, together with new methods of construction, insure a high quality of workmanship and finish.

### The "Best" Semisteel Register.

Patented July 14, 1908; August 9, 1910. The faces are made of cast iron; the boxes, valves, operator, etc., of sheet steel. Each register is coated with heavy rust-proof metal coating, and carefully inspected. Manufactured regularly in two designs.

### Special Designs.

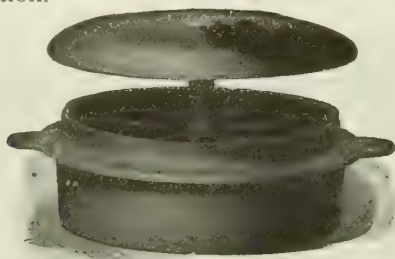
Special design goods are made to order only. In all cases, pattern work is necessary to produce. Any designs can be produced from architect's drawings or sketches, and can be made to conform to any conditions and be supplied in any finish.

### References.

Goods are not sold on their antiquity, but solely on merit. Used and accepted by leading architects and engineers, and installed in many hotels, hospitals, post offices, and other public buildings.

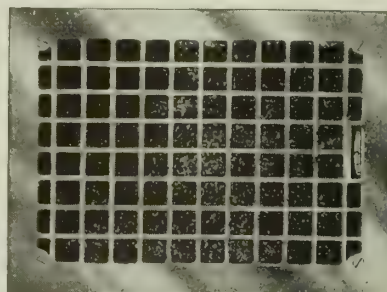
### Catalogues and Prices.

Illustrated catalogues, showing a large variety of register designs and prices, sizes and finishes, as well as further information concerning "Best" deflecting wall and baseboard registers and other products, will be sent on application.

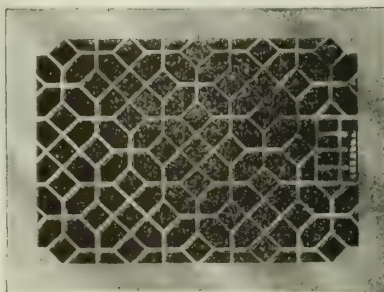


"BEST" MUSHROOM VENTILATOR

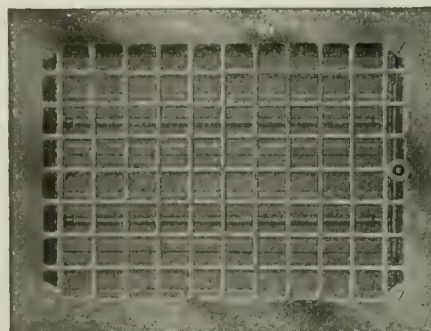
Made in 5 sizes to fit ducts or flues of the following diameters (dimensions being the size of the flue opening of duct): 4, 5, 6, 8 and 10 ins.



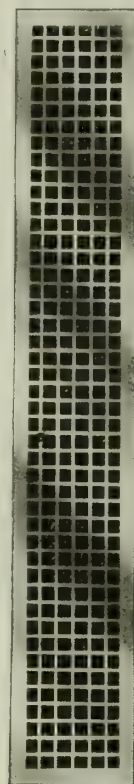
PLAIN LATTICE DESIGN  
Made in any style



ARABIAN LATTICE DESIGN  
Made in many stock sizes

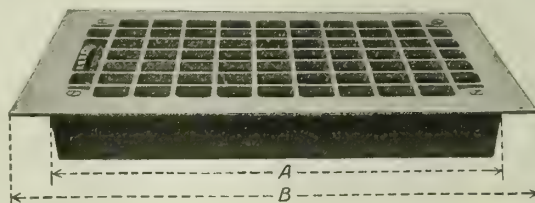


KEY-OPERATED REGISTER  
Phosphor bronze operator parts. Can not wear or rust out

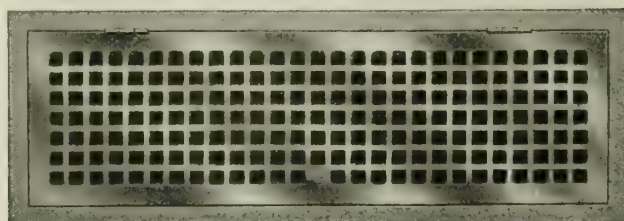


PLAIN LATTICE VENTILATING FACE

Made to order only. This design made in any length and width desired

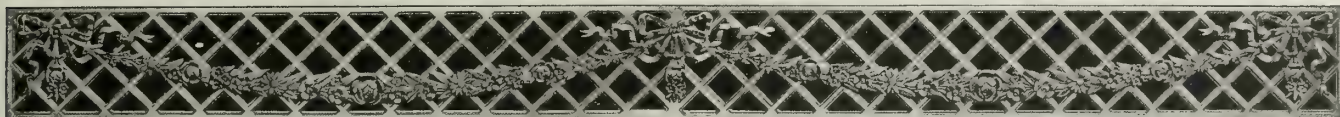


METHOD OF MEASURING REGISTERS  
A—Flue or opening size  
B—Extreme measurement

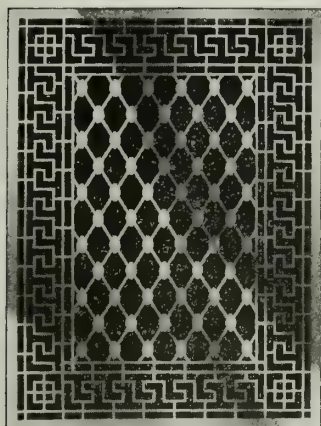


GRILLE HINGED IN ANGLE IRON FRAME

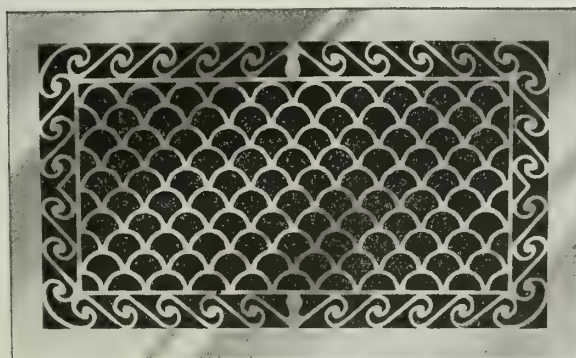




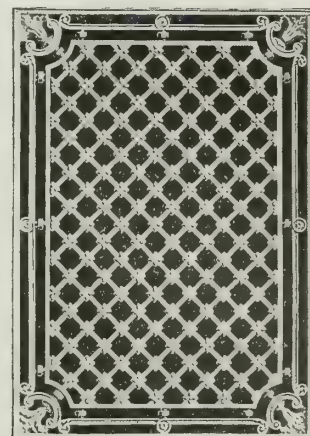
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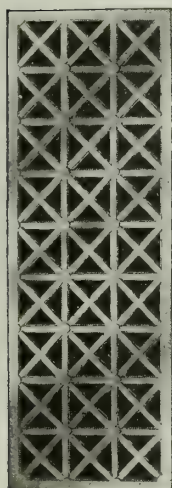
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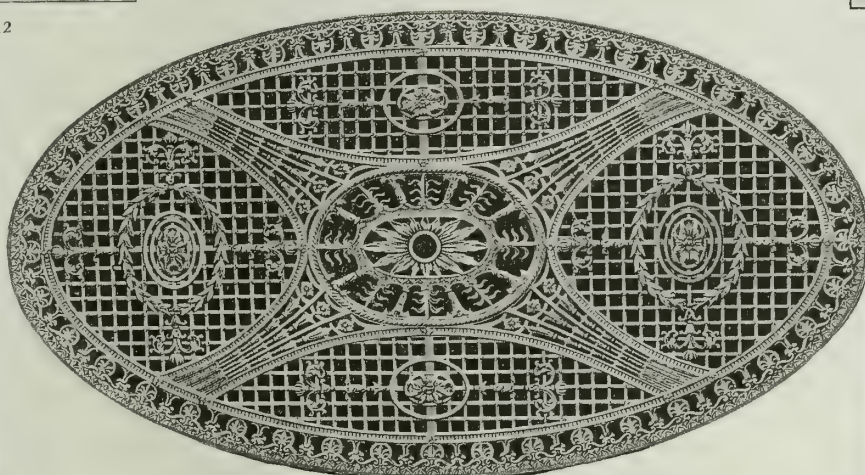
No. 306



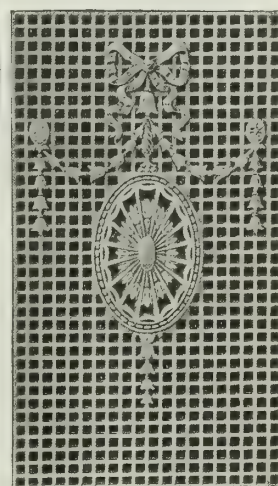
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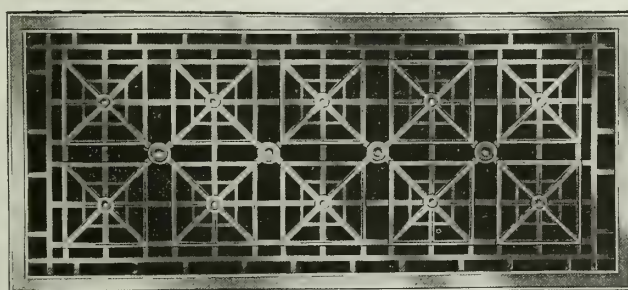
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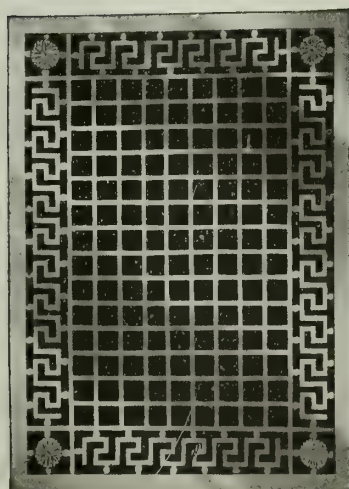
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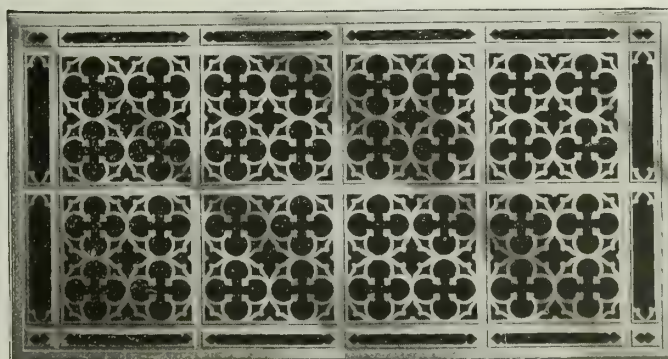
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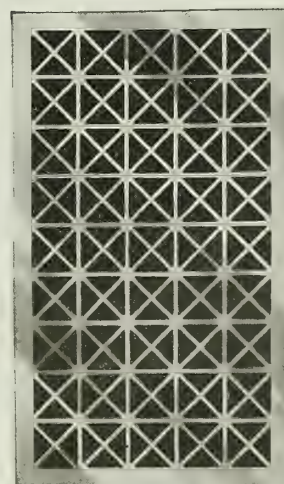
No. 119



No. 543



No. 14



No. 110

SOME OF MANY SPECIAL DESIGNS PRODUCED  
This company will make anything. Nothing too small, too large or too complicated



# CLINTON WIRE CLOTH COMPANY

Manufacturers of Perforated Metal Products

Sears Building  
BOSTON, MASS.

BRANCH OFFICES

CHICAGO, Conway Building, Washington and Clark Streets

NEW YORK, 949 Broadway

FACTORY, CLINTON, MASS.

## Products.

GRILLES and PERFORATED METALS.

For Concrete Reinforcing Fabrics, Woven Wire Lath, and Welded Sheathing, see pages 227-31.

## Perforated Metal Grilles.

The CLINTON WIRE CLOTH COMPANY, manufacturers of all kinds of perforated metal products, is equipped with an elaborate assortment of dies and automatic machines especially adapted for the making of perforated metal grilles for ventilator and register faces, cupboard doors and other purposes.

While certain floral and other designs can not be produced with automatic punching machines, still the equipment is such as to enable the company to offer a great variety of combinations in perforated patterns, giving an almost unlimited assortment of designs.

**ADVANTAGES**—Perforated metal grilles are artistic, strong and durable. They have no points of weakness like cast grilles, which are brittle and very easily broken between openings. The perforated grille is light and economical, and eliminates the excess weight which must necessarily be used in making a satisfactory casting. Being made from rolled sheets of steel, brass or bronze, the perforated grille can be given a finishing plate, which can not be obtained on castings.

Either in large or small lots, the perforated grille may be accurately, cheaply and quickly made, and often actually delivered in less time than would be consumed in preparing the patterns for castings.

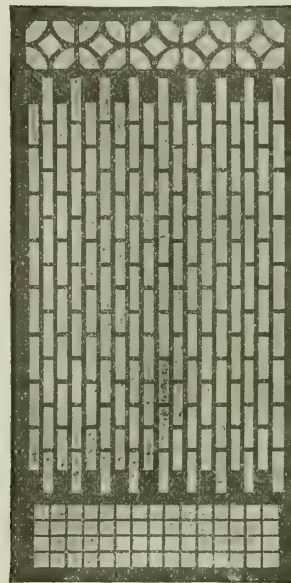
**DESIGNS and SIZES**—Perforated grilles made to order only, in steel, brass, copper or bronze in any size up to 56 by 156 ins. in one piece.

Steel grilles may be either electroplated copper up to size 40 by 72 ins.; electroplated brass or bronze up to size 56 by 72 ins., or enameled with vitreous porcelain enamel up to size 36 by 72 ins.

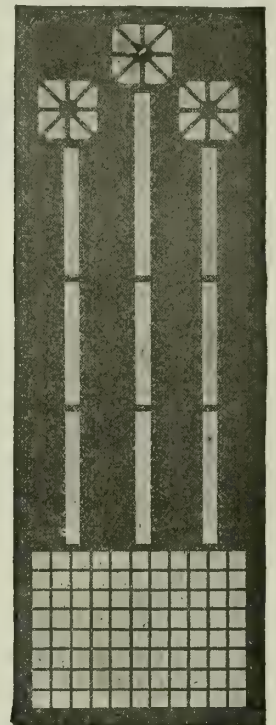
Grilles painted one priming coat of paint, or with baked white or black japan finish when desired; but hinges, locks, latches and other hardware are not furnished. Such hardware is put on if furnished by customer. Screw holes drilled in margins when so ordered, and electroplating made to match the building hardware if sample is sent.

**INFORMATION**—A special grille catalogue, showing a large variety of designs, may be obtained on request.

Prices quoted only on inquiries giving outside dimensions, sizes and quantity desired.

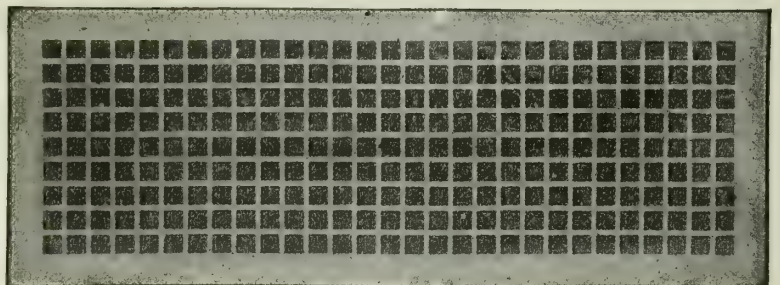


Design No. 119, 47.2% Openings

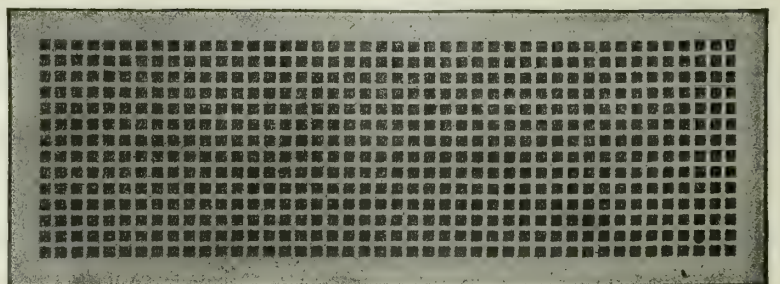


Design No. 113, 40% Openings

SPECIAL DESIGNS, CLINTON WIRE CLOTH COMPANY'S GRILLES



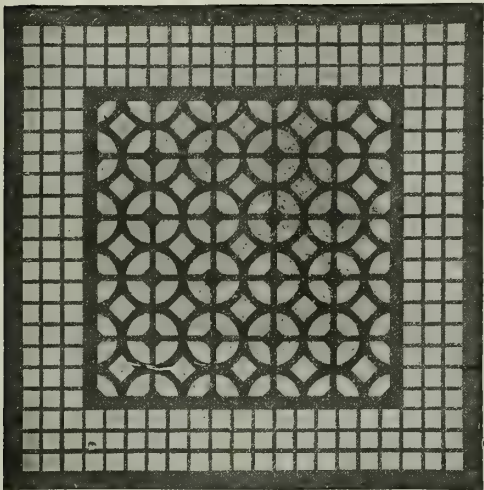
7/8-in. Mesh, 73% Openings



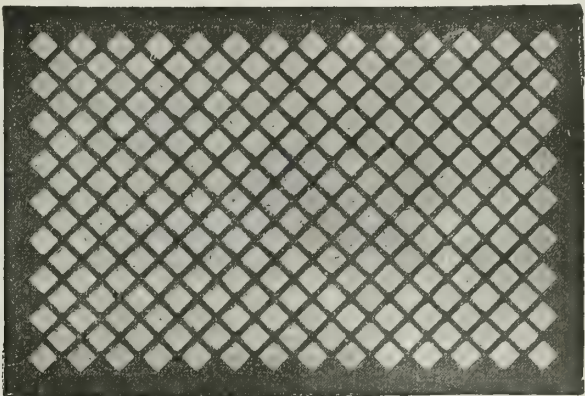
1/2-in. Mesh, 49.5% Openings

PLAIN LATTICE DESIGNS, CLINTON WIRE CLOTH COMPANY'S GRILLES  
Furnished in perforations of 1/2, 3/4 and 7/8 in.

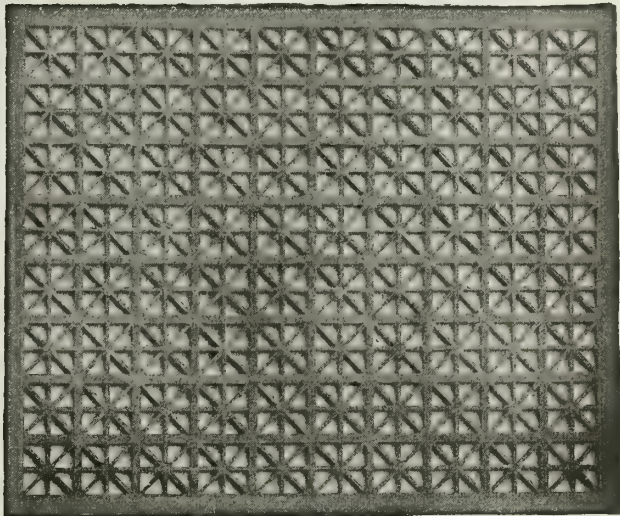




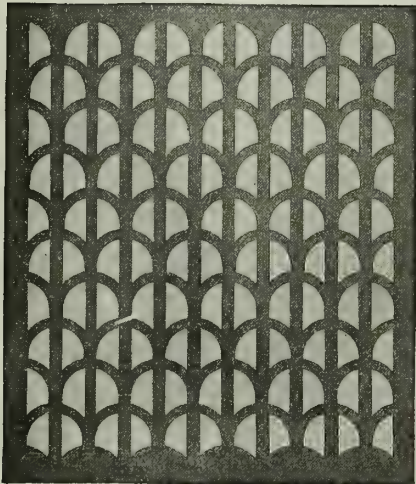
Design No. 131, 49.4% Openings



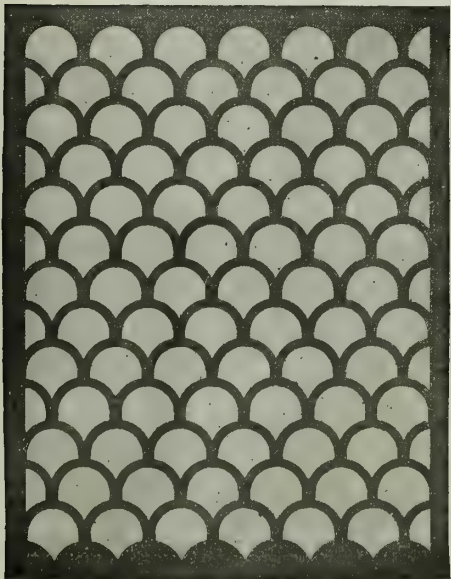
Design No. 123, 60.9% Openings



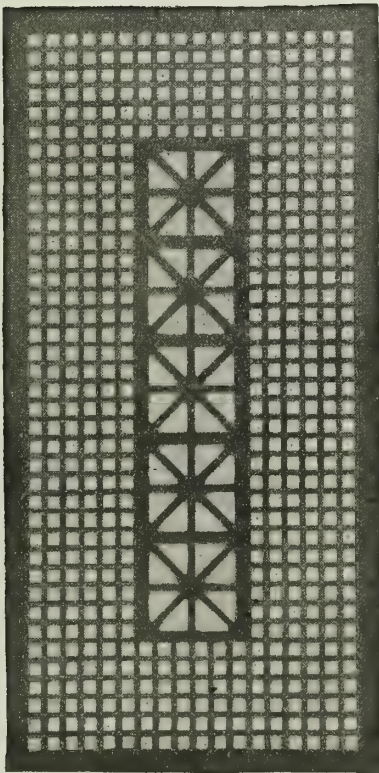
Design No. 105, 49.4% Openings



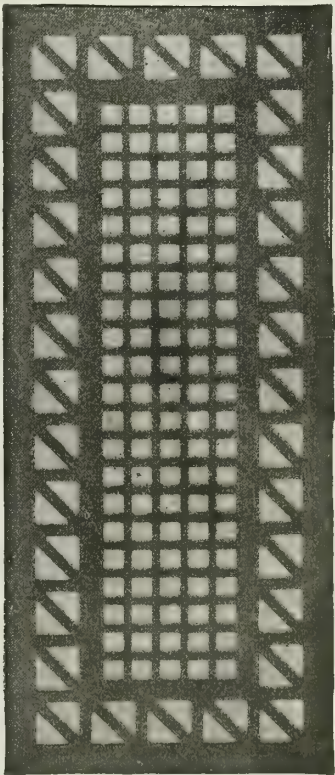
Design No. 121, 50% Openings



Design No. 117, 62.8% Openings



Design No. 114, 59.6% Openings



Design No. 116, 55.2% Openings

SPECIAL DESIGNS, CLINTON WIRE CLOTH COMPANY'S GRILLES



## WM. HIGHTON &amp; SONS COMPANY

Registers, Ventilators, Grilles and Screens

HOME OFFICE AND WORKS

NASHUA, N. H.

BRANCH WAREROOMS

BOSTON, MASS., 6 Portland Street

PHILADELPHIA, PA., 144 North 2nd Street

**Products.**

Manufacturers of a complete line of REGULAR and LOCK CONTROLLED REGISTERS, VENTILATORS, GRILLES, SCREENS and REGISTER BORDERS, in Brass, Bronze, Cast Iron, Steel and Wire.

Ornamental Brass, Bronze, Iron and Aluminum Work, including Memorial Tablets, Signs, Fine Name Plates, etc.

**"Highton" Quality.**

The "Highton" make of registers has stood the test of fifty-eight years. In design, workmanship and materials, they represent a high standard of quality, every phase of their production being carefully supervised by trained men.

**Designs and Finishes.**

"Highton" stock registers, grilles, screens, etc., are made in a large variety of designs and sizes which will regularly meet the requirements of various styles of decoration. When specially desired, however, exclusive designs can be produced from architects' or this company's special drawings.

Standard finishes are black japanned or priming coat, white japanned, gold bronzed, white porcelain enamelled and electroplated. Electroplated finish and solid bronze or brass can be furnished to match hardware if desired.

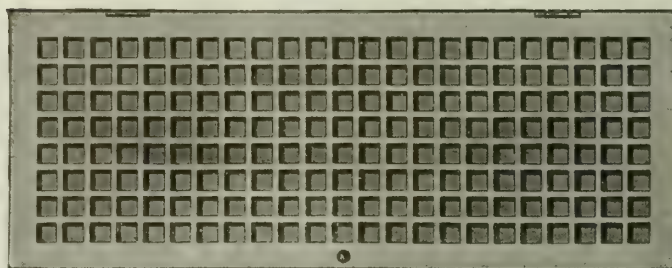
**Registers.**

**CAST**—The cast register admits of a large variety of designs, is the most durable register made, and presents a more substantial appearance than any other type.

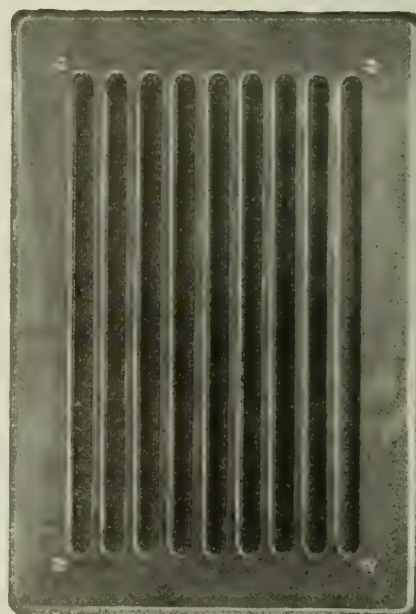
**SEMISTEEL**—Large air capacity, light weight, and strength are secured in this type of register. The face is cast iron; all other parts are of wrought steel.

**Grilles and Screens.**

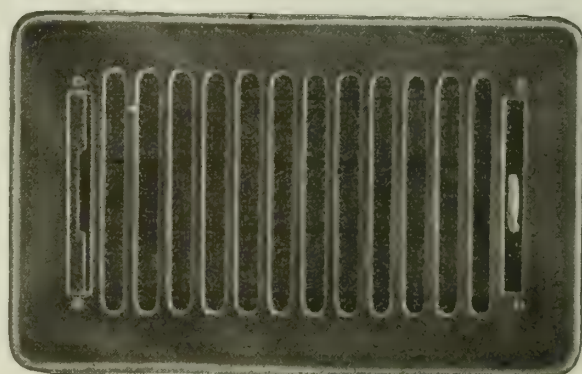
Cast brass, cast bronze and cast iron are recommended as the most suitable materials for finely finished grilles to cover steam coils and enclosed radiators, or for ventilation. These are made also in perforated steel and woven wire. All finishes.



GRILLE HINGED TO WOODWORK AND WITH CATCH FOR ACCESS TO VALVES AND FOR CLEANING PURPOSES



SANITARY DESIGN GRILLE ATTACHED TO WALL FRAME



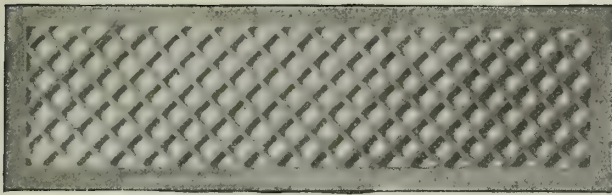
SANITARY DESIGN REGISTER

For hospitals and other public institutions, office buildings and wherever the best sanitary conditions are desired

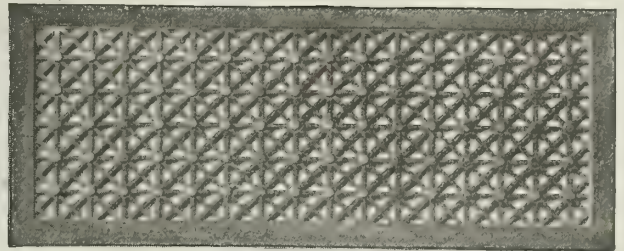


GRILLE NO. 261

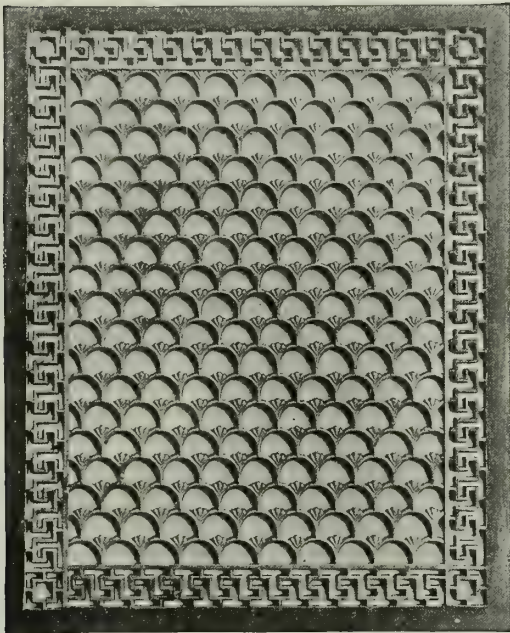




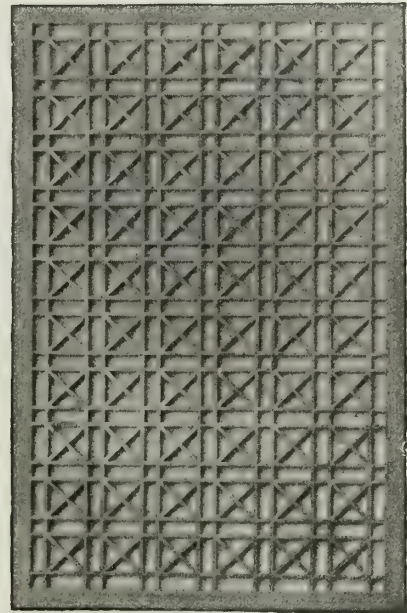
GRILLE NO. 50



GRILLE NO. 36



GRILLE NO. 144



GRILLE NO. 195

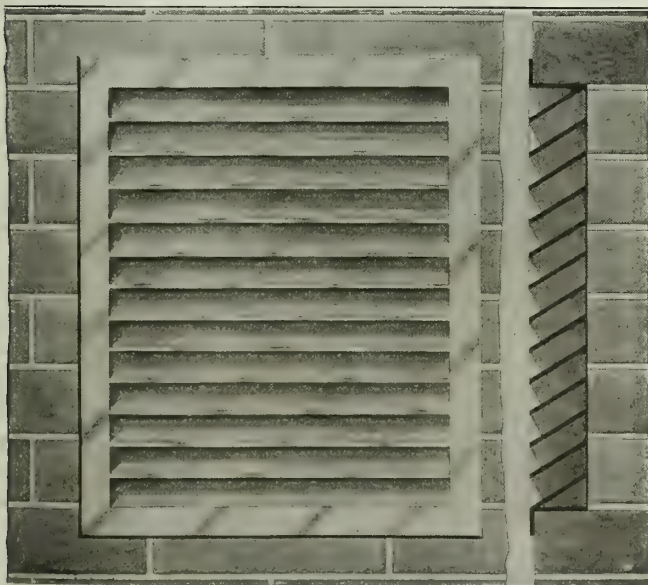
### The Highton Special Side Wall Air Inlet Ventilator.

With stationary louvers for use on outside of building as a fresh air inlet. Made in any size and to order only, cast iron, brass or bronze metal.

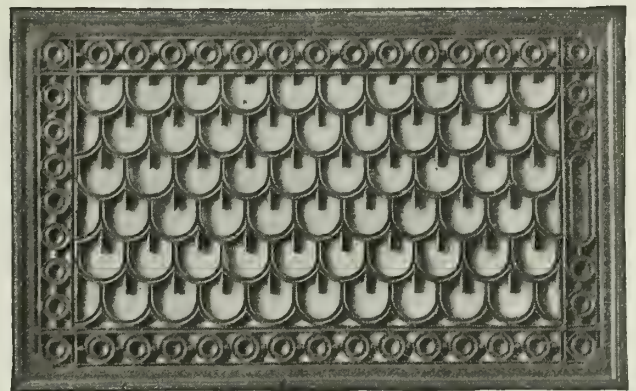
Extra heavy and constructed so as to exclude rain or snow.

When ordering give horizontal first and mark "wide" and "high" after the dimensions.

Write for further information.



THE HIGHTON SPECIAL SIDE WALL AIR INLET VENTILATOR



REGISTER NO. 83

### Deliveries.

This organization takes pride in its splendid record for delivering first-class goods promptly on schedule time. All orders, large or small, receive the prompt and careful attention of a trained and experienced force.

### Catalogue.

Complete catalogue sent on request.

### References.

"Highton" products have been installed in many of the principal buildings throughout this country and Europe, and are specified by the leading architects and engineers.



# ROCK ISLAND REGISTER CO.

Manufacturers of Wall Registers and Furnace Supplies

1226-1230 Fifth Avenue  
ROCK ISLAND, ILL.

## Products.

WALL REGISTERS and FACES, REGISTER BOXES and FITTINGS.

## Rock Island "No Streak" Registers.

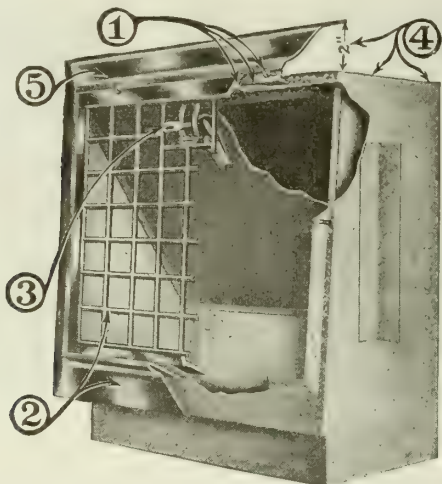
The Rock Island register is guaranteed to prevent the streaking of walls when installed according to this company's methods.

Boxes made of double galvanized iron with tin linings, having ample space between lining and outside of box for ventilation and protection, thereby insuring durability and the highest possible efficiency.

These boxes have equal boot area as the round pipe specified in the lists.

Illustration shows the expanding, interlapping slip-joint of the register on box, which is an exclusive feature of the Rock Island register.

This joint is made by placing the steel frame over the single metal projection on the box and then fastening the frame to the box. The grille is now inserted in position at bottom of frame and pushed back into place, thereby automatically expanding the single metal projection of box out between the frame and grille. The grille is then fastened into position with two large oval head bolts. This makes an absolutely tight joint without additional labor other than the usual connecting operations.



SECTIONAL CUT SHOWING INDIVIDUAL FEATURES OF ROCK ISLAND "NO STREAK" REGISTER

INDIVIDUAL FEATURES—(1) The expanding interlapping slip-joint connection which prevents the air from streaking the walls.

(2) Steel frame and removable grille having over capacity free air opening.

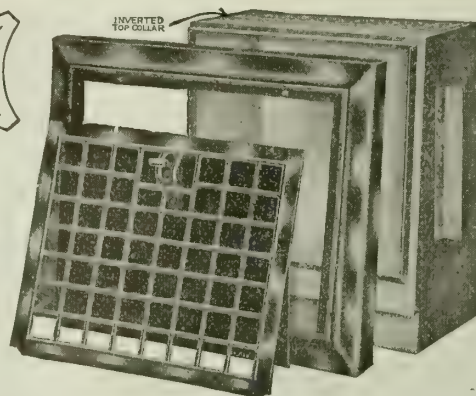
(3) Malleable lever, operated by foot or hand.

(4) Recessed top collars allowing for full 2-in. trimming space above and around box.

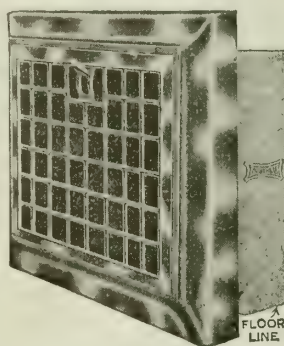
(5) Two large oval head bolts that fasten grille in place.



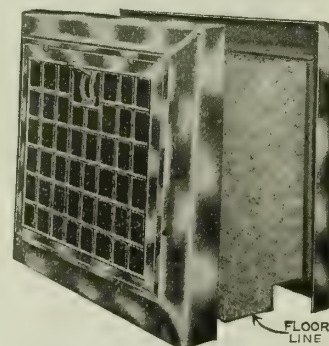
TRADE-MARK



SINGLE HEAD ROCK ISLAND "NO STREAK" FIRST FLOOR REGISTER



SINGLE HEAD "NO STREAK" SECOND FLOOR REGISTER



DOUBLE HEAD "NO STREAK" SECOND FLOOR REGISTER

After determining the size of pipe required, consult list for the number of register to use.

## LIST PRICE OF SINGLE REGISTERS

	No.	Square and round pipe size	Boot size	Top collar	Free air in grille	B. J.	White	Ox. Cop., Nickel or b. brass
For second floor	8 1/2	3 3/8 x 10 3/8	3 3/8 x 10 3/8	None	55-in.	\$5.00	\$6.10	\$7.20
	9 1/2	3 3/8 x 12 3/8	3 3/8 x 12 3/8	None	70-in.	5.75	7.00	8.00
	10 1/2	3 3/8 x 13 3/8	3 3/8 x 13 3/8	None	85-in.	8.00	9.10	10.00
For first floor	8	8-in.	5 1/2 x 10 3/8	None	55-in.	6.50	7.75	8.60
	9	9-in.	5 1/2 x 12 3/8	None	70-in.	8.60	9.75	10.80
	10	10-in.	6 3/4 x 12 3/8	3 3/8 x 12 3/8	85-in.	9.40	10.50	11.50
	12 X	12-in.	8 1/4 x 13 3/8	3 3/8 x 12 3/8	85-in.	9.60	11.20	12.20
	12	12-in.	8 1/4 x 13 3/8	3 3/8 x 12 3/8	115-in.	10.00	12.00	13.00
	14	14-in.	9 x 16	3 3/8 x 12 3/8	155-in.	14.00	16.00	17.00

## LIST PRICE OF DOUBLE REGISTERS

	No.	Square and round pipe size	Boot size	Top collar	Free air in grille	B. J.	White	Ox. cop., nickel or b. brass
For second floor	16 1/2	3 3/8 x 10 3/8	3 3/8 x 10 3/8	None	110-in.	\$9.40	\$11.20	\$13.00
	18 1/2	3 3/8 x 12 3/8	3 3/8 x 12 3/8	None	140-in.	10.80	13.00	14.40
	20 1/2	3 3/8 x 13 3/8	3 3/8 x 13 3/8	None	170-in.	12.20	14.70	16.60
For first floor	16	9-in.	7 1/4 x 10 3/8	None	110-in.	11.00	13.00	15.20
	18	10-in.	7 1/4 x 12 3/8	None	140-in.	13.00	15.60	17.25
	20	12-in.	9 1/8 x 12 3/8	3 3/8 x 12 3/8	170-in.	14.40	17.00	18.80
	24 X	14-in.	14 3/8 x 13 3/8	5 3/8 x 12 3/8	170-in.	14.80	17.50	19.00
	24	14 or 16-in.	12 7/8 x 13 3/8	3 3/8 x 12 3/8	230-in.	15.20	18.00	19.40
	28	16 or 18-in.	14 3/8 x 16	3 3/8 x 12 3/8	310-in.	21.00	23.40	28.00



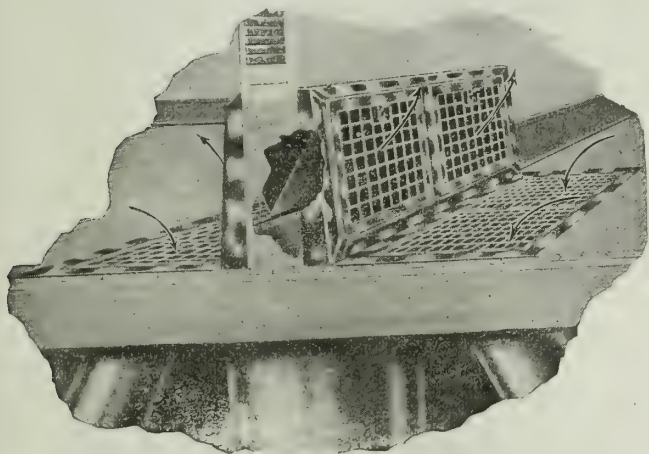
Rock Island Special Registers.

For 1-, 2- or 3-pipe installations.  
Particularly designed to make a sanitary and efficient heating plant.  
They have full capacity for warm air pipes, and by dividing warm and cold air returns there is thorough circulation, the same as with a pipe job.  
When installed with our extension wall frame, as

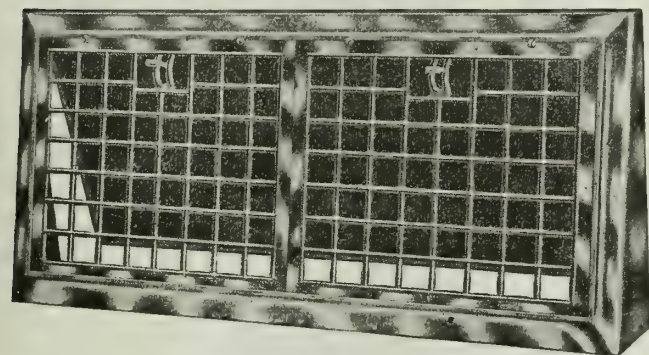
illustrated below, these registers are particularly adapted for church, hall and like large room jobs.

Craftsman Steel Registers and Faces.

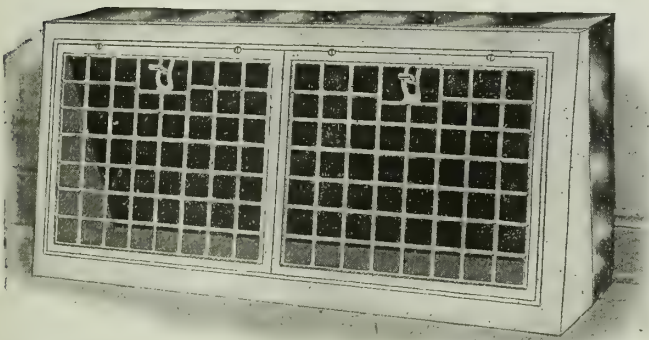
A new all-steel register for bungalow and cottage work, having thumb button fasteners for easily removing and replacing grille.  
These registers have full free air opening and ample trimming margin around the box and are made to fit standard sizes of register boxes.



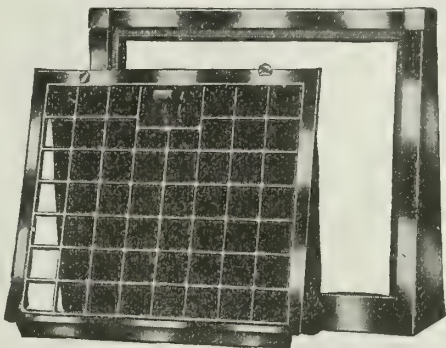
SPECIAL "NO STREAK" REGISTER INSTALLED



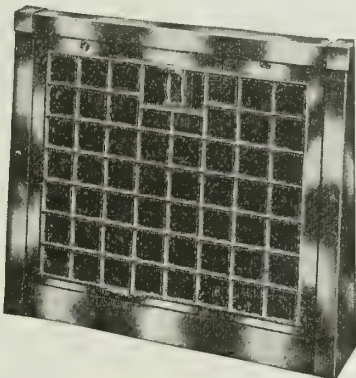
SPECIAL "NO STREAK" REGISTER



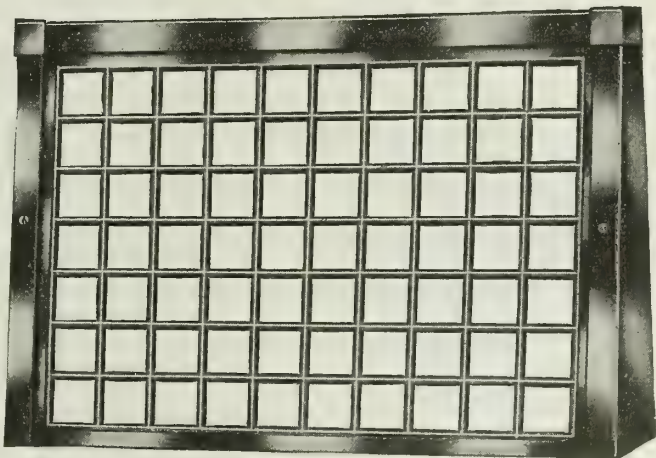
SPECIAL "NO STREAK" REGISTER WITH EXTENSION FRAME



CRAFTSMAN REGISTER



CRAFTSMAN REGISTER



CRAFTSMAN COLD AIR FACE

LIST PRICES, ROCK ISLAND SPECIAL REGISTERS

SINGLE HEAD						
No.	Round pipe size, ins.	Boot size, ins.	Outside dimensions, ins.	Free air	Black japanned	Oxidized copper
150	14	9 x 16½	17 x 20½	155	\$21.25	\$26.25
200	16	8¼ x 26	13½ x 29	170	26.60	33.00
250	18	8¼ x 27½	16 x 32	200	30.30	38.90
300	20 or 22	9 x 33	17½ x 37½	310	38.00	49.45
350	24	9 x 50	17½ x 54	465	54.60	68.90
DOUBLE HEAD						
150	18	14¾ x 16½	17 x 20½	310	36.90	\$46.90
200	20	12¾ x 26	13½ x 29	340	46.00	58.90
250	22 or 24	12¾ x 27½	16 x 32	400	52.45	69.60
300	26	14¾ x 33	17½ x 37½	620	64.90	87.70
350	30	14¾ x 50	17½ x 54	930	95.45	124.00

LIST PRICES OF CRAFTSMAN COLD AIR FACES

Size of face, ins.	Size of pipe, ins.	Capacity, ins.	Black japanned	Oxidized copper	Nickel or dull brass
9 x 16	12	113	\$2.50	\$4.50	\$4.80
9 x 32	16	201	5.00	9.00	10.00



# AMERICAN BLOWER COMPANY

DETROIT, MICH.

WORKS: DETROIT, MICH.; TROY, N. Y.; WINDSOR, ONT., CANADIAN SIROCCO CO.

## BRANCH OFFICES

ATLANTA, Empire Building  
BOSTON, 10 High Street  
BUTTE, ANACONDA COPPER MINING Co.  
CHARLOTTE, ISAAC HARDEMAN, 816  
Realty Building  
CHICAGO, Marquette Building  
CLEVELAND, Swetland Building

DENVER, HENDRIE & BOLTHOFF MFG. &  
SUPPLY Co., 1621 17th Street; HOWARD  
H. FIELDING, Boston Building  
INDIANAPOLIS, Lemcke Annex Building  
KANSAS CITY, 1416 R. A. Long Building  
LOS ANGELES, Hollingsworth Building  
MINNEAPOLIS, 501 South Sixth Street

NEW YORK, 141 Broadway  
PHILADELPHIA, 1328 Chestnut Street  
PITTSBURGH, Empire Building  
ROCHESTER, Insurance Building  
SAN FRANCISCO, 667 Mission Street  
SEATTLE, Central Building  
ST. LOUIS, Title Guaranty Building

## Products.

Manufacturers of Heating, Ventilating, Purifying, Cooling, Humidifying, Drying and Blast Equipment:

"SIROCCO" FANS and BLOWERS, "SIROCCO" PURIFIERS, "SIROCCO" HUMIDITY CONTROLLING SYSTEM; "A B C" CONE FANS; "VENTURA" DISC VENTILATING FANS; "A B C" SELF-OILING ENGINES; "A B C" PIPE COIL HEATERS; EXHAUST FANS and BLOWERS; PRESSURE BLOWERS; "A B C" MUSHROOM VENTILATORS; DETROIT TILTING AUTOMATIC STEAM TRAP; SPECIAL DRYING SYSTEMS.

## Scope of Use.

The AMERICAN BLOWER COMPANY's lines of fans and blowers include a type of machine to meet every air handling problem, from a small office fan to a complete ventilating or heating system for the largest factories and public buildings. The superiority of these fans is proved by their adoption in the world's largest plants.

"ABC" fans are adapted to heating, ventilating, exhausting, purifying, cooling, humidifying, dehumidifying and drying equipment in office, public, educational and industrial buildings.

## Air Purification.

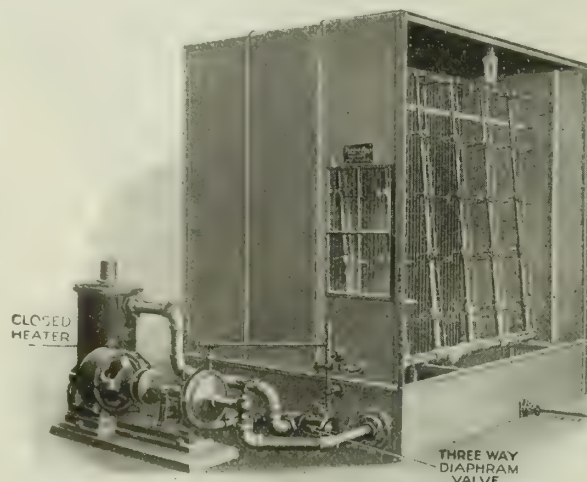
All improvements made in air washers (for the purification of air) during the past 18 or 20 years are embodied in the "Sirocco" purifier, cooler and humidifier. See illustrations opposite.

**BACTERIA TESTS**—Tests and chemical examinations of impurities removed by air washers distinctly prove that millions of dust particles and bacteria germs are removed by these machines, as well as ammonia compounds, chlorides, sulphates, sulphuric acid and iron.

## The "Sirocco" Purifier.

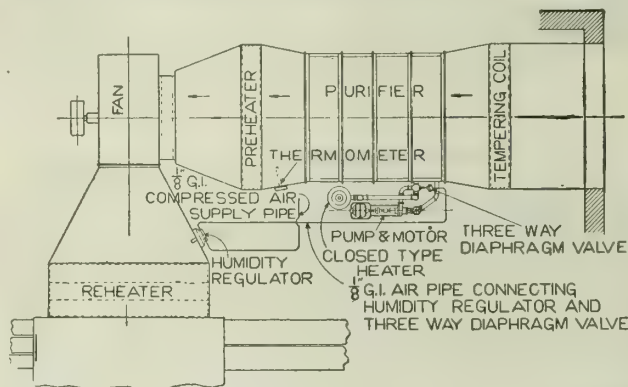
The "Sirocco" purifier, to properly cleanse air, removing practically all of the foreign material and gases, incorporates every one of the following qualifications:

- (1) Mist spray from adjustable nozzles.
- (2) Large spray chamber, so that the air will be in contact with a bank of mist for a comparatively long period.
- (3) Wet, or scrubbing surfaces, arranged for least resistance; therefore, low operating cost.



"SIROCCO" PURIFIER, WITH CLOSED HEATER HUMIDITY CONTROL

Built in sizes with capacities of 3500 to 300,000 cu. ft. of air per minute



ARRANGEMENT OF HUMIDITY CONTROL WHERE PREHEATER IS AUTOMATICALLY CONTROLLED

Closed heater shown; ejector heater can also be used

(4) Sufficient eliminator surface for removal of entrainment.

The wet or scrubbing surfaces are necessary for the removal of some foreign matter, because such surfaces, against which cinders, soot and grease covered particles of dirt must impinge, require to be *flooded*, so that the lighter particles may at once become saturated with water and be washed into the tank.

**TYPES**—"Sirocco" purifiers are built in 3 types, as follows: Type A, used in connection with heating and ventilating systems in public buildings; Type B, "Sirocco" purifier and humidifier, for maximum cooling by evaporation, in manufacturing plants, etc.; and



Type C, "Sirocco" purifier and dehumidifier, used with refrigerating systems. The "Sirocco" humidity controlling system can be applied to all types of "Sirocco" purifiers.

**CONSTRUCTION**—All these purifiers are strongly constructed, down to the minutest details—rivets, joints, etc. No foreign material, as rubber or canvas packing, is used, all metal to metal joints and solder sweated space between surfaces being filled with solder. All rivet heads, etc., are covered with non-corrosive material; casings and tank are permanently flanged and absolutely tight; bottom of tank is double riveted; and all parts readily fit together, without the services of an expert workman.

### "Sirocco" Humidity Controlling System.

This system automatically controls the relative humidity (i. e., ratio per cent of moisture in air to amount of moisture contained in air when saturated at same temperature) in a room or building. Controlling device used is a "Sirocco" humidity regulator which controls action of a diaphragm valve or a diaphragm air motor. This control is accomplished by regulating the supply of compressed air to the valve or air motor. In public buildings and manufacturing plants, where temperature regulation is installed results are obtained by varying the temperature of the spray water. See illustration of arrangement of humidity control on preceding page. Further particulars sent on application.

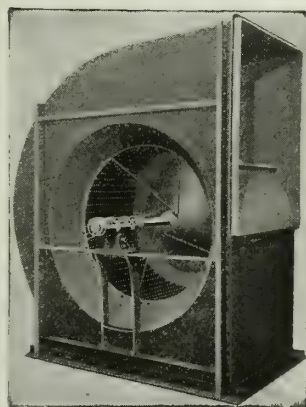
### "Sirocco" Fans.

"Sirocco" fans in all sizes are regularly constructed with full housings; larger fans are built, however, with  $\frac{7}{8}$  housings. Housings being small for any given capacity, it is usually possible to use full housed fans; but when headroom is limited,  $\frac{7}{8}$  housed fans are used.

Full housed fans, up to and including No. 4, are adjustable as to discharge, it being possible with the same fan to change the discharge to any direction desired and to shift the pulley from one side of the fan to the other. This can not be done with the  $\frac{7}{8}$  housed fans, each fan being constructed to meet the requirements of individual installation. If desirable to have ducts leading from the fan in opposite directions, double discharge fans can be furnished.

Single inlet fans are constructed with either overhung wheel or pulley, as conditions require. Double inlet fans can not be built with overhung wheels.

**DRIVE**—"Sirocco" fans may be engine, motor or turbine driven, both direct connected or by belt.



SINGLE INLET AMERICAN  
"SIROCCO" FAN  
Full housed. Left hand. Top  
horizontal discharge, inlet side

### Cone Fans.

**APPLICATIONS**—Cone fans are designed for installations where conditions will not permit of the use of fans with housings. For such special conditions and purposes the cone fan is the most practical means of moving the volume of air required, particularly in connection with warm air furnace heating plants.

Cone fans are ordinarily used as plenum fans, discharging into chambers from which ducts emanate, but they are also often used for exhausting air from buildings. They will overcome resistance in places where disc fans would not be applicable.

### Disc Ventilating Fans.

Adapted to ventilation of all types of buildings, for the removal of smoke, noxious fumes and gases, steam and dust; to heating and drying in connection with heating apparatus, either furnaces or steam coils. Also more economical and effective than the aspirating coils frequently employed to assist the draft in ventilating shafts or education flues in large public buildings.

### "Ventura" Disc Ventilating Fans.

"Ventura" disc ventilating fans handle large volumes of air freely, or against resistances up to 1-in. water gauge.

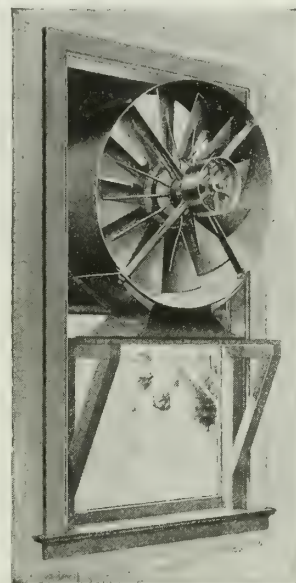
They have 10 broad blades riveted to a large central disc, which absolutely prevents a back flow of air through the center, when working against pressure.

They are suitable for ventilating rooms and buildings; for ventilating small mines, or at any mine where a disc fan (engine or motor driven) can be used, with capacities of 650 to 100,000 cu. ft. of air per minute, resistance not exceeding 1-in. water gauge.

### "ABC" Vertical, Enclosed, Self-oiling Engines.

These engines are superior in every way, are especially adapted for direct connection to fans and generators, and only the best workmanship and materials are employed in their manufacture.

Lubrication, which is procured by means of a pump



BASE FAN SET IN TOP OF  
WINDOW  
Showing standard base and pulley



"VENTURA" FAN  
Wall type

and gravity flow, makes the engine absolutely noiseless in operation. The easily removable panels allow ready access to every adjustable part.

On account of their low steam consumption, only one-half or two-thirds the usual rate, and the friction, which has been reduced to 4%, the efficiency of these engines is the very highest obtainable in its class.

They are ideal for the work intended, being smooth running, and at most require only four adjustments per year.

**TYPE A ENGINE—**The "ABC" Type A engine is a single cylinder, high or low pressure engine.

The high pressure engine is usually operated on pressures up to 200 lbs., while the low pressure engine operates with an initial pressure of from 10 to 40 lbs. All engines are carefully tested at the factory and are sold on guarantee.

**TYPE E ENGINE—**The "ABC" Type E engine is a double cylinder high pressure engine. It is used for work requiring higher speeds and more power than can be obtained with the single cylinder engine.

It possesses the same points of superiority and is recommended where hard continuous duty with economy and reliability are required.

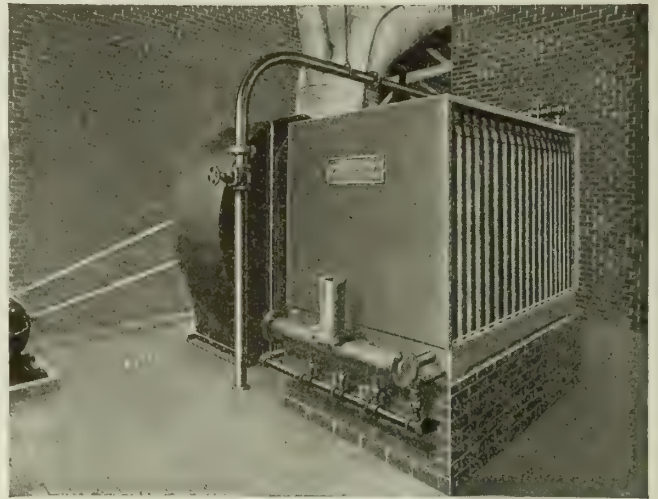
Tables of sizes and horsepowers will be furnished on request.

#### "ABC" Pipe Coil Heaters.

"ABC" pipe coil heaters are admirably adapted for heating and ventilating factories and other buildings requiring large volumes of warmed air. Steam or hot water may be used in the coils. "ABC" heaters are also well adapted for drying and cooling purposes.

"ABC" heaters are built in sizes to meet every requirement—2 and 4 rows deep; up to 40 pipes wide, and pipe lengths from 2 to 12 ft.

**CONSTRUCTION—**This heater has a sectional base. Sections consist of heavy cast iron base, with 2 or 4 rows of holes tapped into the top, into which holes



"ABC" PIPE COIL HEATERS ON FACTORY HEATING SYSTEM

are screwed 1-in. steam pipes. Upper ends of each alternate row are jointed together by elbows with short horizontal nipples between.

Cast iron bases made of varying lengths, and pipes of varying heights. Base is divided into 2 compartments by a partition running its whole length from end to end. No access between the 2 compartments except through the vertical heating pipes; hence no short circuiting of the steam.

Heater contains from 1 to 10 sections, depending on temperature desired as well as steam pressure and velocity of the air.

Casing (see illustration) around the standard apparatus is a sheet steel jacket enclosing both sides and top. Heater, however, is frequently enclosed by brick or hollow tile walls.

A fan can be attached to force the air through the coils or draw it through, according to local conditions.

#### "ABC" Mushroom Ventilators.

USE—Adapted for use with heating, cooling and



"ABC" MUSHROOM VENTILATOR



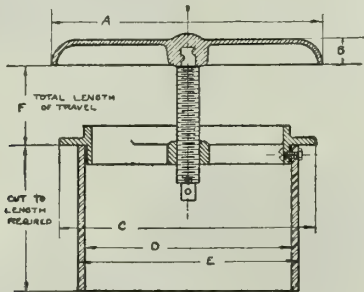
ventilating systems for theaters, churches, schools, auditoriums and public buildings.

**TYPES**—The automatic locking type and prong type. Both types regulate quantity of air at delivery points, compelling it to flow evenly in all directions, thus preventing drafts.

**CONSTRUCTION**—3 principal parts—cap or head, floor socket, and thimble. Cap made of cast iron; thimble of black iron pipe or galvanized sheet iron.

**LOCKING FEATURE**—In center of cap is a steel bar with a pin at bottom. Bar fits inside a piece of pipe threaded on outside; pipe screws into hub of floor socket. Adjustment of head for height is made by simply lifting and turning head, but head is so lifted that pin in bar engages with slotted adjusting pipe. As soon as head is dropped it becomes automatically locked, thus delivering a *uniform* volume of air.

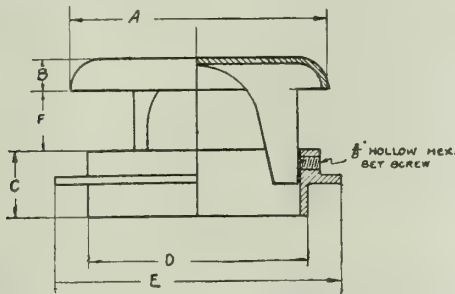
**PRONG TYPE**—Adjustment is made by raising or lowering head to proper position and setting same in place by tightening the socket set screw.



SECTION THROUGH "ABC" MUSHROOM VENTILATOR  
Automatic locking type

Dimensions in ins.							
Size	A	B	C	D	E	F	Weight, *lbs.
5	7½	1	7	5 ⅞	5 ⅞	2¾	8
6	9½	1	8	6 ⅞	6 ⅞	2¾	10
7	9½	1	9	7 ⅞	7 ⅞	2¾	13
8	10½	1	10	7 ⅞	8 ⅞	2¾	15

\*Weight does not include thimble.



SECTION THROUGH "ABC" MUSHROOM VENTILATOR  
Prong type

Dimensions in ins.							
Size	A	B	C	D	E	F	Weight, lbs.
5	6	¾	1 ⅞	4 ⅞	6½	1 ⅞	6
6	7	¾	1 ⅞	5 ⅞	7½	1 ⅞	10
7	8	¾	1 ⅞	6 ⅞	8½	1 ⅞	11
8	9	¾	1 ⅞	7 ⅞	9½	2¼	12

Tilting Automatic Steam Traps.

There is a Detroit steam trap for every condensation handling requirement.

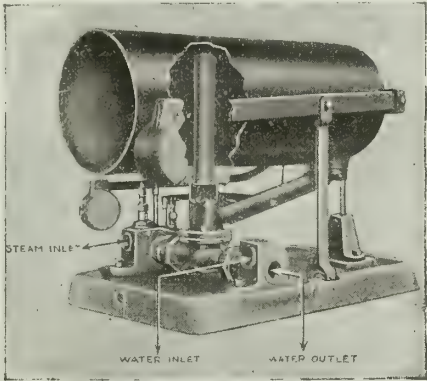
Return type, for returning condensation from any source directly to the boiler or feed water heater without pumping.

Separating type, for removing condensation from low pressure lines.

Vacuum type, for draining vacuum heating systems, vacuum pans, or any system upon which a vacuum is carried.

Condensing type, for creating a vacuum within the trap to accelerate circulation in the system.

Any condensation problem can be successfully handled by one or another of the various types of Detroit traps.



DETROIT RETURN TRAP  
No working parts inside the tank

Size trap, ins.	Water inlet and outlet, ins.	Size steam inlet, ins.	Capacity			Approx. shipping weight, lbs.
			Lbs. per hour	Sq. ft. direct radiation	Lineal feet 1-in. pipe direct radiation	
10	¾	½	830	2800	8400	275
11	1	¾	1500	5000	15000	325
12	1¼	1	2500	8300	25000	425
13	1½	1¼	5000	16500	50000	500
14	2	1½	6600	22000	66000	700
15	2½	2	15000	50000	150000	900
16	3	2	24000	80000	240000	1000

Special Drying Systems.

"ABC" dryers can be designed to meet the requirements of almost every material. "ABC" engineers have designed successful systems for drying such materials as glue, enamel on metal surfaces, cereals, leather, salt, soap, pottery, varnish, cloth, asbestos, ginger, starch, tobacco, paper, cocoa, sugar, powders, etc.

Shipments.

Having an enormous and completely equipped factory, this company can make prompt shipments.

Co-operative Engineering Service.

Those considering the installation of a ventilating or heating system are at liberty to make use of the Engineering Department of this organization in solving their problems. In writing, state size of room (width, length, height), for what room is used and number of persons employed in it, etc.

# BICALKY FAN CO.

## Air Engineers and Manufacturers

### BUFFALO, N. Y.

#### Products and Services.

Manufacturers and installers of AIR WASHERS and HUMIDIFIERS, BICALKY FANS, ROOF FAN VENTILATORS, etc.

Dust Arresters, Dust Separators.

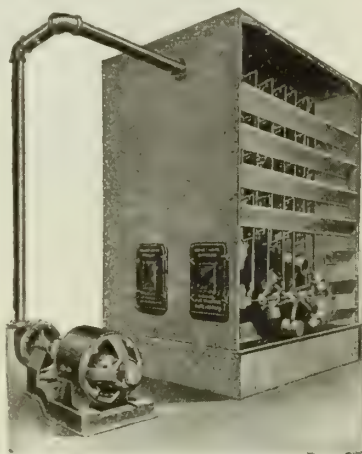
#### Bicalky Air Washer.

This machine is designed for cleansing, cooling and humidifying air by passing it through a mist-filled chamber. A series of spray heads placed in a vertical plane across the chamber produce the mist.

The construction and mechanical manipulation of the Bicalky air washer is such that the mist from the spray heads remains intact while flushing. This is of the greatest importance for the reason that it offers no weak spot in the mist sheets during the flushing operations to permit of any foreign matter passing through the air washer.

**AUTOMATIC FLUSHING**—A rigid shaft is placed across the air washer above the sump. This runs freely and is rotated by means of buckets filled with falling waste water from the spray heads. Cams are arranged on this shaft, under each vertical row of spray heads, so as to operate a series of tee iron rods connected with the different rows of heads. When released

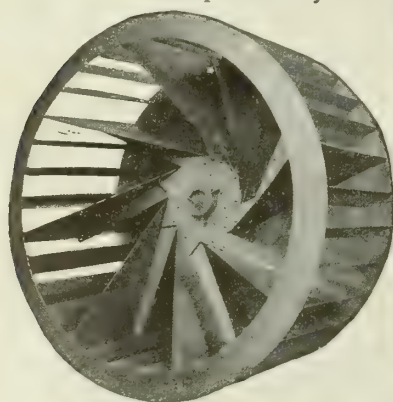
by the cams these rods fall and produce a hammer blow on the center rods of the spray heads, causing a rush of water through the nozzles, which dislodges any dirt which may have accumulated in hindrance to a perfect mist spray. The cams are set so as to drop one tee at a time, which in turn flushes this vertical row of spray heads.



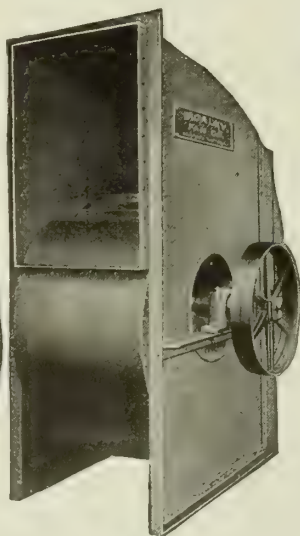
BICALKY AIR WASHER

#### Bi-multi Fans.

Bi-multi fans are used all over the country and abroad and are specified by



BI-MULTI FAN WHEEL



BI-MULTI FANS

leading engineers and architects. They owe their popularity to first class, scientific construction, which permits operating these fans at the highest pressures without racking and with minimum horsepower.

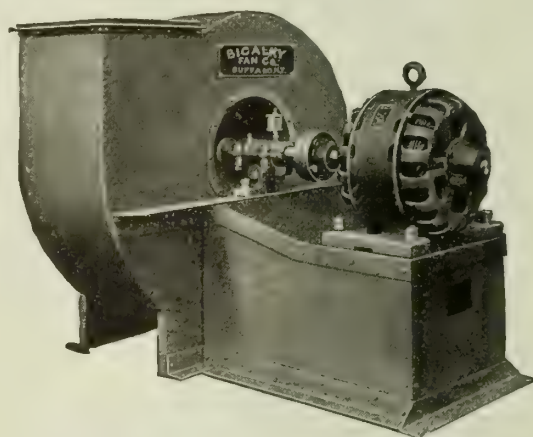
#### Bicalky Patent Steel Plate Fans.

These fans are built very strong, and are guaranteed to handle the largest volume of air per horsepower of any steel plate fan known. They have gained such a wide reputation throughout the continent, that it is not necessary going into detail about them.

The above is due to their patented construction, which makes them indestructible and puts them in a class by themselves.



BICALKY STEEL PLATE FAN DIRECT CONNECTED TO MOTOR  
With inquiry, state electrical current available

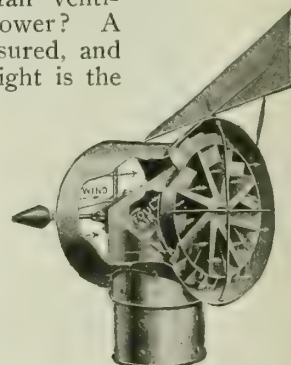


BICALKY SLOW SPEED FAN DIRECT CONNECTED TO MOTOR  
Bicalky slow speed P. M. X. fans are made direct connected to motor, also with pulley drive. With inquiry, give electrical current available

#### Bicalky Roof Fan Ventilator.

It fills the place of a power driven fan, and is operated by the outdoor moving currents of air. Why not install a Bicalky roof fan ventilator and utilize this free power? A positive upward suction is assured, and perfect ventilation day and night is the result.

The Bicalky works on an entirely new principle. The large area is exposed to outdoor currents of air which the double cone shape opening compresses and brings into contact with the outer turbine fan wheel that causes the inner fan wheel to suck out the foul air.



BICALKY ROOF FAN VENTILATOR



# HACKNEY VENTILATING COMPANY

University and Prior Avenues  
ST. PAUL, MINN.

## Products.

Hackney System of Ventilation for offices, restaurants, schools and homes: CEILING VENTILATORS for churches, theaters and factories.

## Hackney System of Ventilation.

About 25% of the working efficiency of an office is lost through a lack of proper ventilation.

Impure air produces drowsiness, and depression, which prevents employees working at full capacity.

The Hackney system of ventilation provides an ample supply of fresh air with doors and windows closed, thus eliminating outdoor noise, dust, soot and objectionable drafts.

A perfect balance is maintained by replacing the dead, stale, contaminated air by free circulation of fresh, pure, washed, humidified and tempered air *without draft*.

The effect of the Hackney system is entirely satisfactory as indicated by the following statement of one of our patrons. "Papers are no more disturbed by air currents from open windows; desks are clean; office force keeps fresh throughout the whole day; drowsiness and depression have disappeared and everyone works with 100% efficiency, and enjoys it. We would not be without it for many times its cost."

This system can be installed in any existing building as easily as it can be incorporated in plans for new construction.

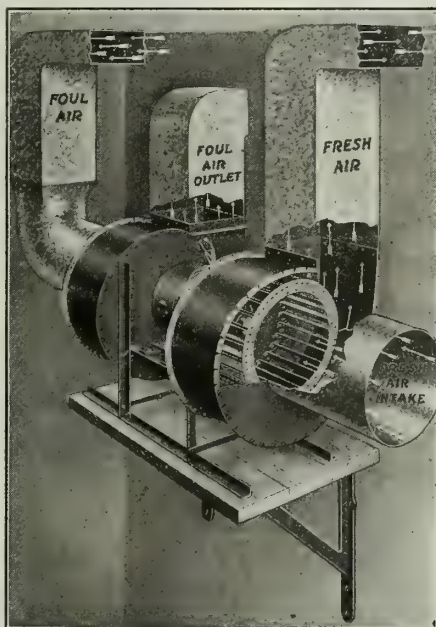
To ventilate large rooms or auditoriums perfectly, the air should be brought in and taken out at the ceiling through a series of alternating fresh and foul air openings, the fresh air being properly diffused. In this way the air is evenly distributed and passes the breathing zone only once. This is the Hackney system; and with our method of balancing the air pressure, does away entirely with drafts and also the necessity of increased radiation. With this modern method an air washer may be connected, which eliminates 98% of solid matter.

## Co-operative Service.

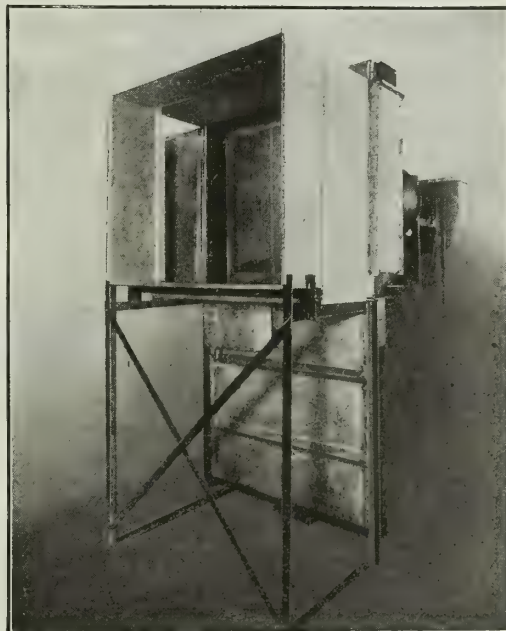
The information department will furnish free service of engineers for estimates and such information as may be desired.

## References.

Janney, Semple, Hill & Co., Minneapolis, Minn.  
Municipal Court Rooms, Minneapolis, Minn.  
New England Furniture & Carpet Co., Minneapolis, Minn.  
Sterling Electric Co., Minneapolis, Minn.  
Wormser Hat Company, Minneapolis, Minn.  
Winston, Harper, Fisher Co., Minneapolis, Minn.  
Wells-Dickey Company, Minneapolis, Minn.  
Dyckman Hotel (Hawaiian Cafe), Minneapolis, Minn.  
Snyder's Billiard Hall, Minneapolis, Minn.  
St. Paul Gas Light Company, St. Paul, Minn.  
Strand Theater, Fairmont, Minn.  
Minneapolis Drug Company, Minneapolis, Minn.  
Tolerton & Warfield Co., Sioux City, Iowa  
North Western Supply Co., St. Paul, Minn.  
Wm. Joerns & Co., Duluth, Minn.



POWER PLANT, SHOWING MOTOR END  
AND BLOWERS FOR CEILING OR  
FLOOR INSTALLATION



HACKNEY AIR WASHER



HACKNEY VENTILATING SYSTEM INSTALLED IN CEILING

# ILG ELECTRIC VENTILATING CO.

Manufacturers of Fans, Blowers, Exhausters

150 Whiting Street

CHICAGO, ILL.

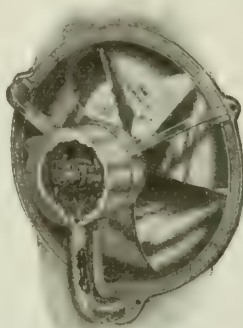
## BRANCHES

NEW YORK, N. Y., 13 Park Row  
Telephone, Cortlandt 8739  
CLEVELAND, OHIO, 1314 Schofield Building  
Telephone, Main 776  
PITTSBURGH, PA., 559 Union Arcade  
Telephone, Grant 4325

PHILADELPHIA, PA., 327 Commercial Trust Building  
Telephone, Spruce 2099  
BOSTON, MASS., TOMPKINS-STODDARD Co., 136 Federal Street  
Telephone, Fort Hill 6454  
DETROIT, MICH., 25 Montcalm Avenue, West  
Telephone, Cherry 5231.

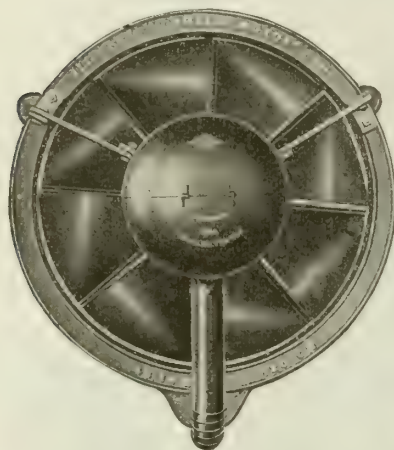
## Products.

Manufacturers of a complete line of ELECTRIC PROPELLER and DISK FANS, direct connected; EXHAUST FANS; VENTILATING FANS; MULTI-BLADE BLOWERS and EXHAUSTERS, direct connected and belted; MOTORS for driving fans and blowers; AUTOMATIC LOUVERS or SHUTTERS.



SELF-COOLED MOTOR FAN

Used for handling gases at temperature up to 400° Fahr., also for handling steam, acid, etc.



SELF-COOLED MOTOR PROPELLER FAN

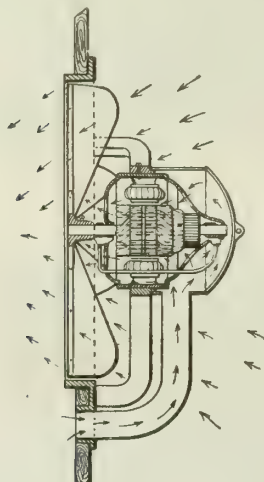
Furnished with direct connected motor for any current or voltage. Sizes 12 to 72 ins.



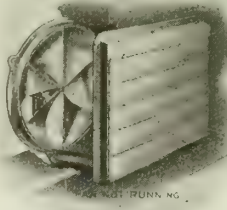
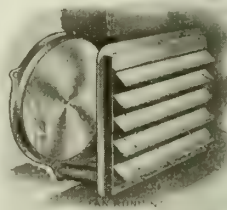
SELF-COOLED PROPELLER FANS FOR HEATING AND DRYING  
Very valuable and efficient



SELF-COOLED PROPELLER FANS FOR OFFICES  
Also ideal for ventilation of schools, factories, laundries, etc.



SECTIONAL VIEW OF FAN SHOWING OILING SYSTEM AND MOTOR VENTILATION

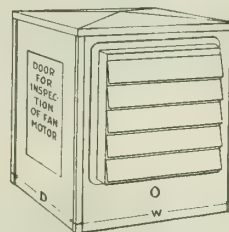


ILG AUTOMATIC SHUTTER

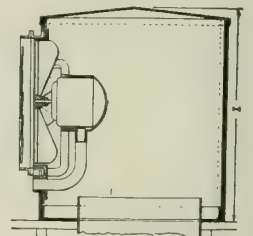
Used on the outside of propeller fans to protect fan when not running and to keep out wind, rain and cold.

Built of special hard rolled aluminum leaves pressed on Whiting alloy copper coated rods supported in cast iron frame.

When fan is running, shutter is held open by force of air current; when shut off, the shutter closes automatically by gravity. Shutters are moistureproof and need no attention after installation.



Penthouse with Automatic Shutter



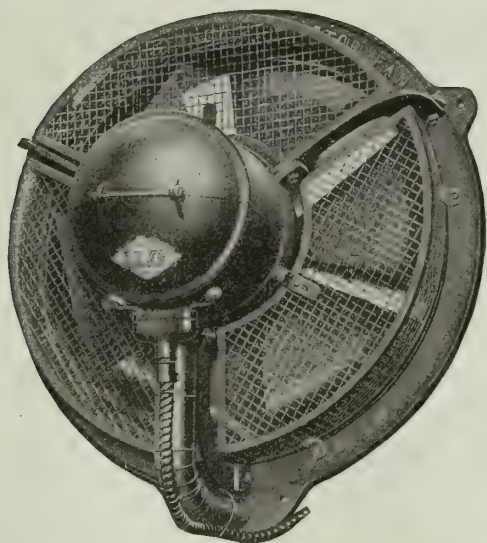
Section showing installation of fan, automatic shutter and duct leading through roof

STANDARD PROPELLER FANS IN PENTHOUSE  
Better than vertical running fans

## Further Information and Prices.

Write for further information and prices. Also for special information on self-cooled propeller fans for heating and drying, and special propeller fan book.

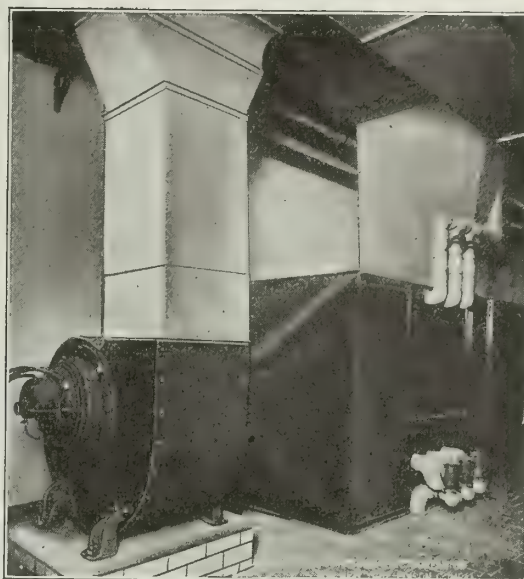




**PROPELLER FAN WITH THREE-SECTION GUARD**

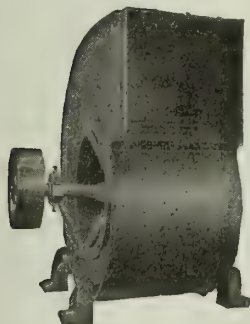
Used where fan is installed within 6 ft. or less from floor.

Guards are furnished at a small extra price for all sizes of Ilg self-cooled motor propeller fans and are recommended wherever fans are installed near floor. Guards can be attached to any Ilg fan in service at any time

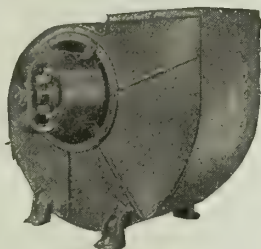


**ILG UNIVERSAL BLOWER**

For large blast heating and ventilating systems. Desirable because compact, quiet, and low in power consumption



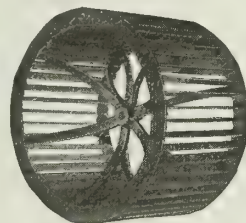
**Universal Blower Belted**



**Motor Side of Direct Connected Blower**



**Inlet Side of Blower**



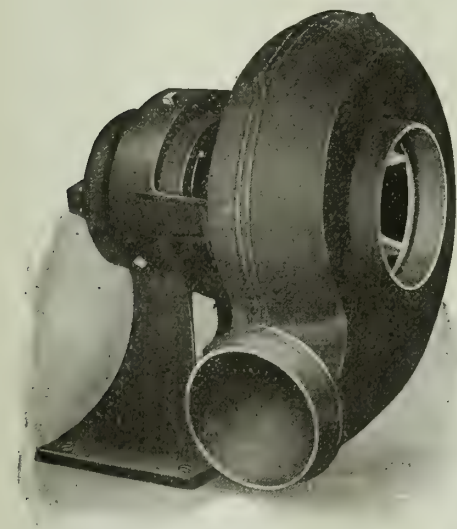
**ILG MULTIBLADE WHEEL**

Has malleable hub, hand wrought spider, Whiting ribbon steel blades, and is electrically welded

**ILG UNIVERSAL BLOWER**

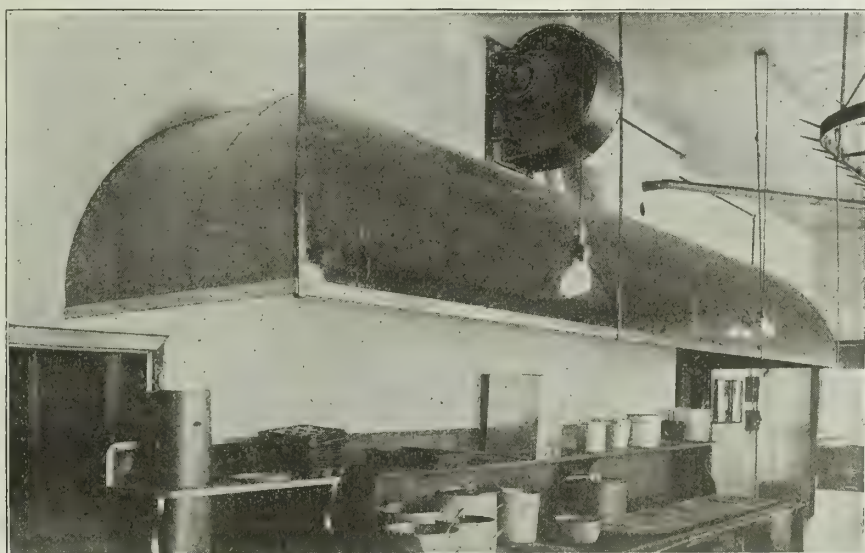
Furnished direct connected or belted. Size 10 to 100 ins., single width or double width. Compact, easy to install, universal as to discharge and drive and low in power.

Fan and motor are both Ilg—one responsibility. Send for 100-page complete catalogue



**ILG VOLUME BLOWER**

Used for ventilating of toilets, laboratory hoods, etc. 3 sizes



**ILG UNIVERSAL BLOWER DIRECT CONNECTED**

Ideal for ventilation of kitchens, toilets, etc. Easily installed and can be suspended from side wall or ceiling



# KNOWLES MUSHROOM VENTILATOR CO.

TELEPHONE:  
CORTLANDT 2090

9 Church Street  
NEW YORK, N. Y.

## Products.

AIR CONTROLLING HEADS (ADJUSTABLE MUSHROOM VENTILATORS) and SHIP VENTILATORS.

## Uses and Operation of Air Controlling Heads.

Adapted for use in connection with mechanical systems of air purifying or ventilation, for controlling the distribution of the supply of fresh air or the exhaust of vitiated air.

Particularly valuable in the ventilation of auditoriums of theaters, schools, public buildings and large rooms in manufacturing establishments.

Equally effective in up-draft or down-draft methods; the heads are usually located on the floor under seats or other fixtures, and connected with the plenum chamber or ducts supplying tempered fresh air forced by a blower fan, or exhausting vitiated air by suction.

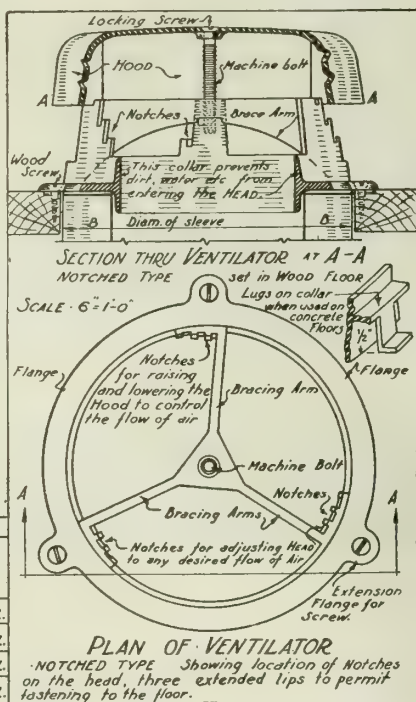
They are individually adjusted for their relative distances from the fan so that each will distribute an equal quantity of fresh air, or so that the distributing may be regulated for different parts of the room as desired.

## Air Controlling Head Types.

Made in several types with different methods of adjustment and diffusion, and for use on different kinds of floors. These types vary largely to suit individual ideas of mechanical betterment. Each is well made on scientific principles, and will satisfactorily perform the functions for which it is designed.

Each will deliver, when fully opened, the maximum quantity from the diameter of the sleeve to which it is attached.

**KNOWLES "NOTCH" AIR CONTROLLING HEAD**—Equipped with 3 bearings, and is absolutely rigid. Set adjustments in notches and perfect air distribution. Only 2 interlocking parts, the hood and floor piece. Adjusted by loosening screw, raising head to desired notch, and tightening screw. Made as shown, or with lugs to set in concrete floor, or without lugs and drilled for riveting to timbles. Can not be tampered with.



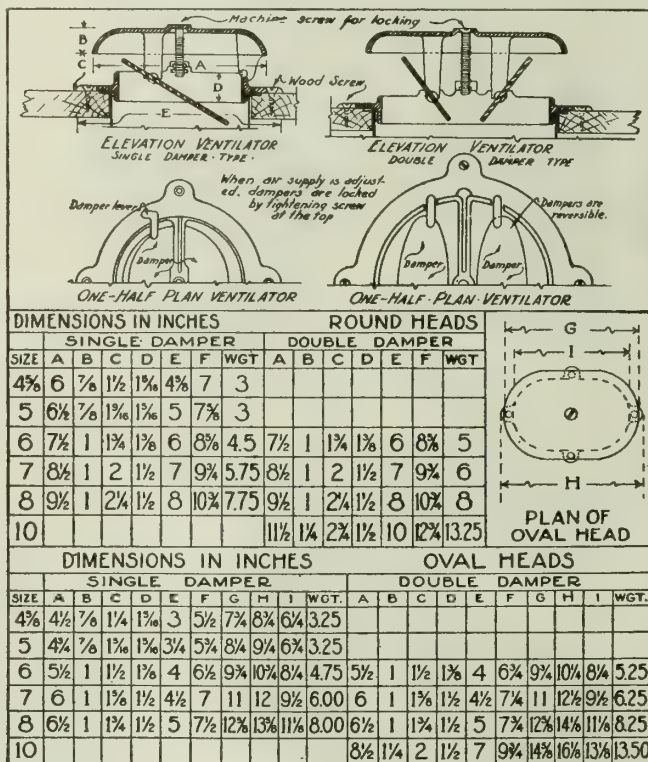
STOCK SIZES		
Diam. of Head & Sleeve	Area in Sq. in.	Weight in pounds
4 1/2" 4"	12.566	1 lb. 12 1/2 oz.
5 1/2" 5"	19.635	2 lb. 10 oz.
6 1/2" 6"	28.274	3 lb. 7 oz.
8 1/2" 8"	50.625	6 lb. 3 oz.

**Specification Data**—For Concrete Floors: Furnish and place 6-in. cast iron mushroom air diffusers with recessed notches for permanent adjustment of mushroom caps at any desired opening; to have center screw locking feature, as manufactured by KNOWLES MUSHROOM VENTILATOR CO.

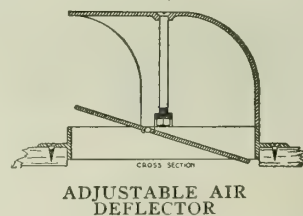
Provide for each opening No. 20 galvanized iron sleeve extending through concrete floor; to be set when floor slab is laid.

Sleeve to have 2 supporting pieces riveted to top and resting on floor slab. Place air diffusers on top of sleeves and secure with cement when top dressing is laid.

For Wood Floors: Same as above, except top of sleeve to be fitted with 1/4-in. turn over the flange, to set flush with floor, on which air diffusers are placed and fastened to floor with 3 lag screws.



**KNOWLES AIR HOOD AND DEFLECTOR**—Where desired to admit a volume of air to room from heads in a certain direction only, the aisle hood air deflector may be used with positive results. This is frequently the case in theaters and churches where it is desirable to bring air in at right angles to the aisle. The deflector is adjustable to any position and locked so that it can not be tampered with.



## Ship Ventilator.

This company also manufactures special and standard mushroom vents for ship decks.



# MASSACHUSETTS BLOWER COMPANY

SUCCESSOR TO  
CONSOLIDATED ENGINEERING COMPANY AND MASSACHUSETTS FAN COMPANY

Howard Street, Watertown Post Office  
BOSTON, MASS.

## SALES OFFICES AND AGENCIES

BOSTON, MASS., 247 Atlantic Avenue  
CHICAGO, ILL., 1229 South Michigan Avenue  
ATLANTA, GA., 57 East 13th Street  
ST. PAUL, MINN.

BALTIMORE, MD., 100 West Fayette Street  
NEW YORK, N. Y., 103 Park Avenue  
CLEVELAND, OHIO, East 49th Street and Hamilton Avenue  
OKLAHOMA CITY, OKLA.

## Products.

Manufacturers of FANS, BLOWERS, HEATERS and AIR WASHERS for Heating, Ventilating, Purifying, Cooling, Humidifying, Dehumidifying; FORCED and INDUCED DRAFT, COMMERCIAL DRYING and BLAST EQUIPMENT.

### Squirrel Cage Multiblade Fans.

For heating, ventilating, drying and mechanical draft the squirrel cage fan will meet every requirement, except for moving material. Built in all sizes from 6-in. diameter wheels and up.

### Steel Plate Blowers and Exhausters.

Adapted for same purposes as the squirrel cage type fan. Can be designed for moving materials.

### Massachusetts Propeller and Disc Fans.

For moving large volumes of air under low pressures. Built for pulley drive or direct connection to motors or engine. Built in all sizes from 12-in. diameter and up.

### Cone Fans.

Designed for installations where the conditions will not permit the usual housing.

### Pipe Coil Heaters.

Massachusetts pipe coil heaters are built to meet all requirements, for hot water and steam. Adapted for high and low pressure work.

### Air Washers.

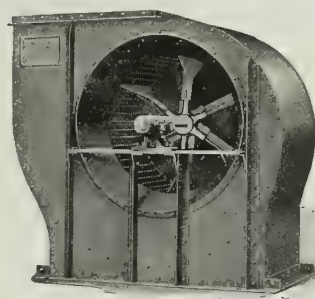
For purifying, cooling, humidifying and dehumidifying air for industrial and commercial purposes. Made in all sizes.

### Commercial Drying Systems.

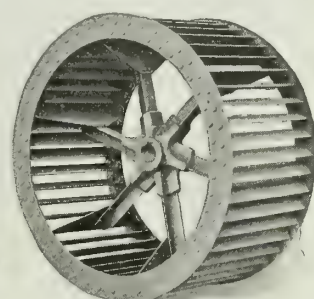
Dry kilns and special drying systems designed and equipments furnished.

### Cooling Systems.

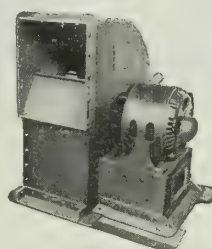
This company is thoroughly prepared to design and furnish equipment for cooling and ventilating systems for auditoriums, hotels, restaurants and industrial plants.



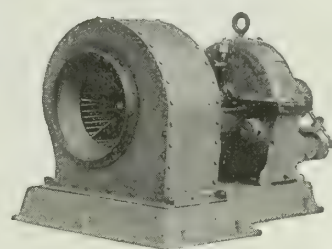
MODIFIED SQUIRREL  
CAGE FAN



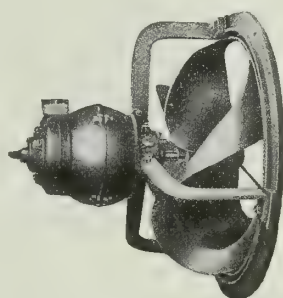
MODIFIED SQUIRREL  
CAGE FAN WHEEL



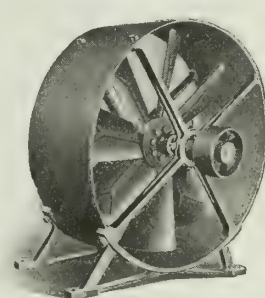
MODIFIED SQUIRREL CAGE  
FAN WITH DIRECT CON-  
NECTED MOTOR



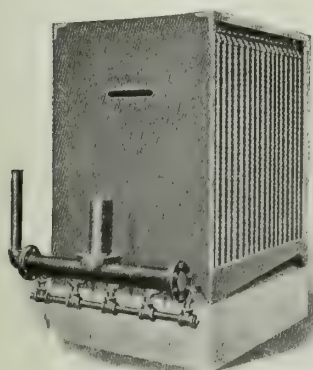
MODIFIED SQUIRREL CAGE  
FAN WITH DIRECT CON-  
NECTED TURBINE



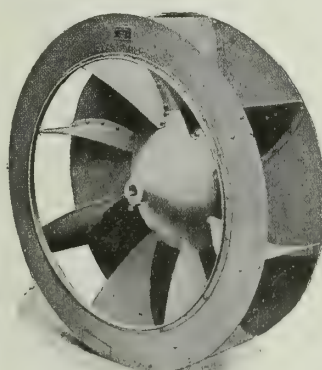
MASSACHUSETTS-DAVIDSON  
PROPELLER FAN WITH  
DIRECT CONNECTED MOTOR



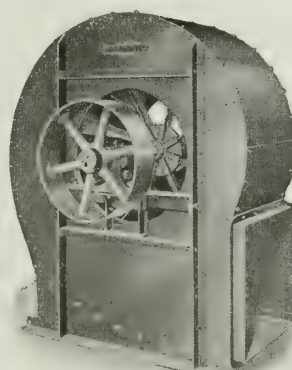
DISC FAN WITH PULLEY



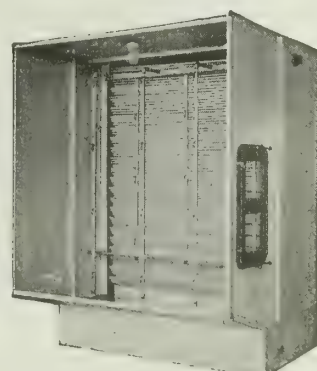
MASSACHUSETTS PIPE  
COIL HEATER



MASSACHUSETTS CONE  
FAN WHEEL



STEEL PLATE FAN



MASSACHUSETTS AIR  
WASHER

# B. F. STURTEVANT COMPANY

Fans, Fan Systems, Heating and Ventilating Apparatus, and Allied Products

HYDE PARK, BOSTON, MASS.

## BRANCH OFFICES

ATLANTA, GA., 57 East 13th Street  
 BOSTON, MASS., 555 John Hancock Building  
 BUFFALO, N. Y., 100 Bedford Avenue, Nye Park  
 CHICAGO, ILL., 530 South Clinton Street  
 CINCINNATI, OHIO, 514 Provident Bank Building  
 CLEVELAND, OHIO, 330 Guardian Building  
 DALLAS, TEX., 4004 Rawlings Street  
 DETROIT, MICH., 406 Marquette Building  
 HARTFORD, CONN., 324 Connecticut Mutual Building, 36 Pearl Street

KANSAS CITY, MO., 412 Reliance Building  
 MINNEAPOLIS, MINN., 837 Metropolitan Life Building  
 NEW YORK, N. Y., 52 Vanderbilt Avenue  
 PHILADELPHIA, PA., 135 North Third Street  
 PITTSBURGH, PA., 711 Park Building  
 PORTLAND, ORE., 62-66 First Street  
 ROCHESTER, N. Y., 1108 Granite Building  
 SALT LAKE CITY, UTAH, 811 Walker Bank Building  
 ST. LOUIS, MO., 2086 Railway Exchange Building  
 WASHINGTON, D. C., 1006 Loan and Trust Building

THE B. F. STURTEVANT COMPANY (INCORPORATED IN CALIFORNIA)  
 SAN FRANCISCO, CAL., 759 Monadnock Building SEATTLE, WASH., 1134 Henry Building

B. F. STURTEVANT COMPANY OF CANADA, LIMITED  
 GALT, ONT., MONTREAL, WINNIPEG AND VANCOUVER

STURTEVANT ENGINEERING COMPANY, LONDON, PARIS, AND TURIN

## Products.

FANS, BLOWERS and EXHAUSTERS;  
 HEATERS, STEAM TRAPS, AIR WASHERS,  
 ENGINES, MOTORS and GENERATORS.

Gas Fans, Mechanical Draft Apparatus, Drying Apparatus, Steam Turbines, Turbine Driven Centrifugal Pumps, Fuel Economizers, Heating and Ventilating Apparatus, Vacuum Cleaners.

For Autoforce Ventilators, see page 476.

## LIST OF CATALOGUES ISSUED

NO.	NAME AND SUBJECT	NO.	NAME AND SUBJECT
195.	General Catalogue.		DRYING APPARATUS
213.	Power Apparatus.	202.	Drying Clay Products.
	FANS, BLOWERS AND EXHAUSTERS	220.	Lumber Drying.
126.	Gas Boosters.		MOTORS AND GENERATORS
148.	Gas Blowers.	144.	DC Eight-pole Type.
179.	Combined Gas Exhauster, Automatic Regulator and Tar Exhauster.	147.	DC Two-pole and Four-pole Types.
134.	Steel Pressure Blowers.	193.	DC Type H.
199.	Monogram Blowers and Exhausters.	217.	DC Type D Commutating Poles.
175.	High Pressure Blowers.		STEAM TURBINES
145.	Steel Plate Fans.	209.	"How the Chief Engineer was Convinced"—A visit to our plant.
149.	Disc and Propeller Fans.	210.	Steam Turbines.
155.	Steel Plate Planing Mill Exhausters.		HEATING AND VENTILATING
185.	Slow Speed, Low Power Planing Mill Exhausters.	112.	Mechanical Ventilating and Heating by a Forced Circulation of Warm Air.
180.	Multivane Fans, Type MV-V.	240.	Heaters.
196.	Steel Plate Fans. Light hanger type.	119.	Steam Traps.
186.	Turbo-Undergrate Blower Design 1.	137.	Flinn Steam Traps.
214.	Turbo-Undergrate Blower Design 2.	138.	Centrifugal Exhaust Heads.
177.	Electric Multivane Forge Blower.	187.	Economical Fire Room Methods.
201.	Dust Blowing Set—Horse Groomer.	192.	Pullman Car Ventilating Set.
1019.	"A Cooler Booth"—on Telephone Booth Ventilators.	1011.	Heating and Ventilating Factories.
R.R.	Ready-to-Run Ventilating Sets	1012.	Heating and Ventilating Schools.
219.	Electric Air Heater and Blower.	1013.	Heating and Ventilating Public Buildings.
	FUEL ECONOMIZERS	1014.	Heating and Ventilating Government Buildings.
150.	Sturtevant Fuel Economizers.	1015.	Heating and Ventilating Book, complete.
163.	Economizers in Steel Mills.	1016.	Heating and Ventilating Watervliet Shops.
222.	Economizers in Paper Mills.		MISCELLANEOUS
191.	Letters from Users of Economizers.	225.	Air Washers.
	ENGINES	230.	Heating Coils.
188.	Vertical Single Cylinder—VS-5.	235.	Pneumatic Dust Collecting and Conveying Systems.
141.	Vertical Compound—VC-6.	1024.	Portable Vacuum Cleaners.
218.	Vertical Single Cylinder—VS-7 and VS-8.		Stationary Vacuum Cleaners
	GENERATING SETS	1017.	Horse Grooming Sets.
142.	With VC-6 Engines.		TREATISE
143.	With HC-1 Engines.	98.	Mechanical Draft, cloth. Price, \$1.50.
188.	With VS-5 and VS-2 Engines.	215.	Heating and Ventilation. Price, \$1.00.
205.	Gasoline Electric Generating Sets.		
206.	With VS-7 and VS-8 Engines.		

# Sturtevant

(REG. U. S. PAT. OFF.)

TRADE-MARK

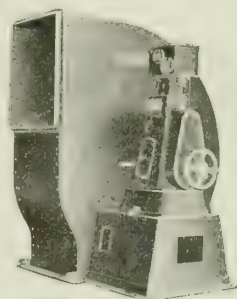
## Co-operative Service to Architects and Engineers.

The large and experienced engineering organization maintained by this company is at the disposal of engineers and architects and will co-operate with them. The organization is divided into departments which are in charge of experts in that particular line. Each department has available the data accumulated during 50 years' experience in building, applying and installing apparatus peculiar to that department.



READY-TO-RUN PORTABLE VENTILATING SET

Also used for drying, cooling and blowing. Made in 5 sizes, capacities 58 to 1440 cu. ft. of air per minute. 3 smaller sizes can be used with ordinary lamp sockets



MULTIVANE FAN DRIVEN BY STURTEVANT ENGINE

Used for heating and ventilating, drying and forced draft. Operate at low and medium pressures. Deliver large volumes of air. Occupy small space. Their light weight permits suspension from ceilings or structural iron work. For sizes and range of performance, see table



STEEL PLATE FAN MOTOR DRIVEN

Steel plate fans have approximately same range of sizes, volumes, and pressures as multivane fans. Are used to a large extent for the same service, but specially suitable for induced draft work or in places where fan handles acid or corrosive gases.

## RANGE OF MULTIVANE FANS AT EFFICIENT SPEEDS

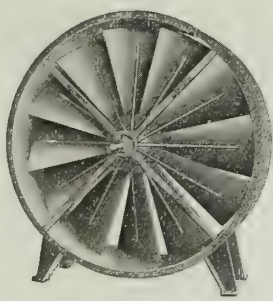
Size of fan, ins.	Range of volumes, cu. ft. per min.	Size of fan, ins.	Range of volumes, cu. ft. per min.
2	436 to 5450	12	10900 to 136000
3	682 to 8510	13	13200 to 165000
4	987 to 12300	14	15800 to 197000
5	1330 to 16600	15	18500 to 231000
6	1750 to 21800	16	21500 to 268000
6½	2220 to 28000	17	24700 to 307000
7	2730 to 34000	18	28000 to 314000
8	3960 to 49300	20	35300 to 441000
9	5350 to 66800	22	43600 to 545000
10	7020 to 87500	24	52800 to 658000
11	8730 to 110000	26	62800 to 785000





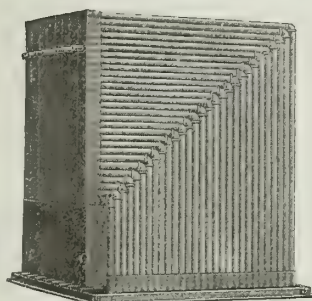
**STURTEVANT PROPELLER FAN**

Very efficient for low pressure work

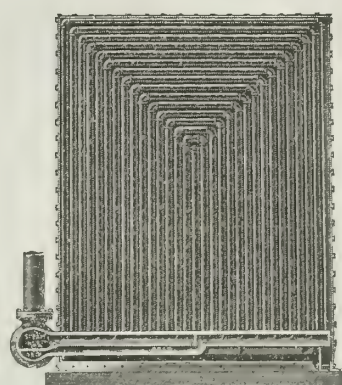


**STURTEVANT DESIGN 2 MULTI-BLADE DISC FAN**

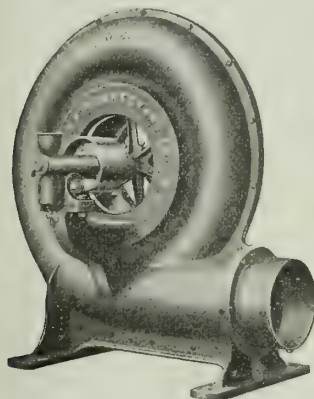
Will retain its efficiency against static pressure as high as  $1\frac{1}{2}$ "



**MITRE TYPE HEATER**

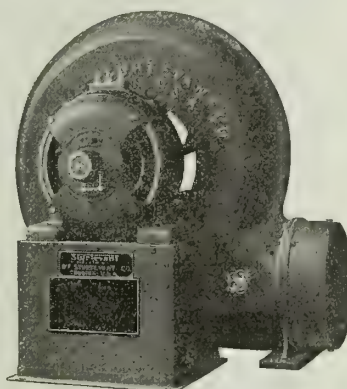


**STURTEVANT STANDARD HEATER**



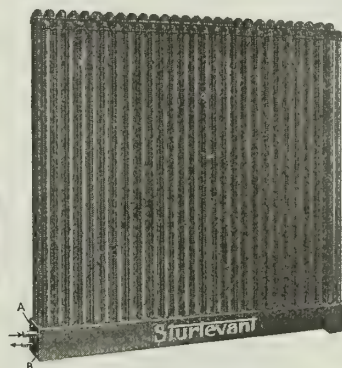
**STEEL PRESSURE BLOWERS FOR PRESSURES UP TO 30 INCHES**

Volumes delivered are not as great as in the case of monogram or multivane fans



**ELECTRIC MONOGRAM BLOWERS**

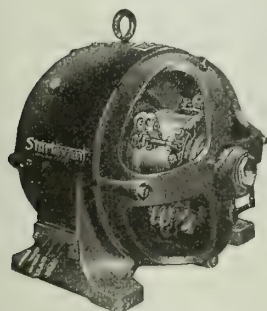
Exhausters also manufactured. As regards performance these are half-way between steel pressure blowers and multivane fans. Used for supplying air under pressure, for collecting dust, and for conveying materials. Maximum working static usually recommended, about 15 ins. but higher pressures are used



**RETURN BEND TYPE OF STURTEVANT HEATER**

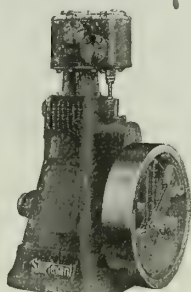


**STURTEVANT INDEPENDENT HEATER UNIT WITH TURBO-UNDERGRATE BLOWER**  
Used for heating shops or industrial establishments



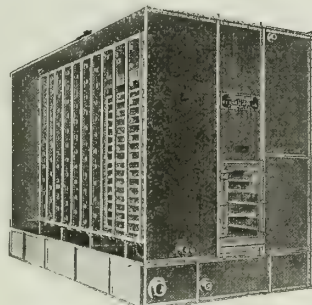
**STURTEVANT TYPE D MOTOR WITH COMMUTATING POLES**

Two-pole and eight-pole type motors also manufactured. All motors made enclosed, semi-enclosed or open. Horsepower range from 1/25 to 800. For direct current only



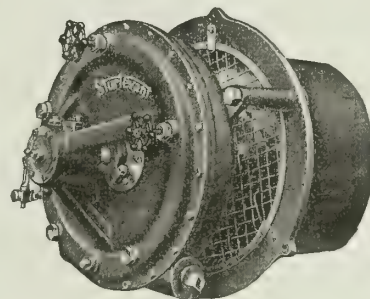
**STURTEVANT VERTICAL ENGINE BUILT IN SIZES UP TO 150 H.P.**

Horizontal engines also built in sizes up to 150 h.p. Generating sets up to 100 kw. also furnished



**STURTEVANT ATOMIZING TYPE AIR WASHER**

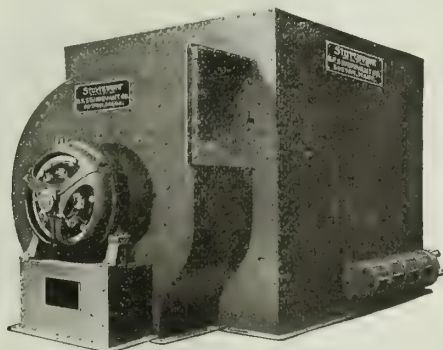
Made in more than 50 sizes. Capacities 25,000 to 100,000 ft. per minute. Rain spray type also supplied



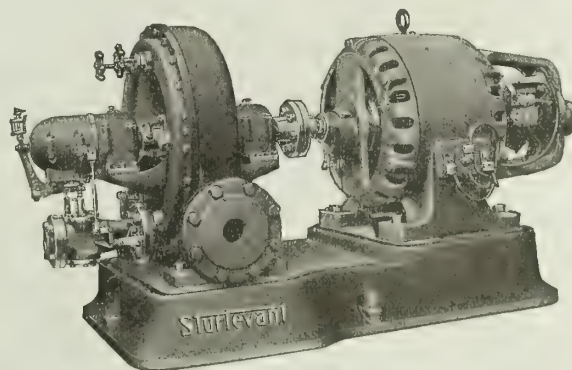
**TURBO-UNDERGRATE BLOWER**  
For supplying forced draft to small boilers



**FLINN STEAM TRAP FOR HEATING SYSTEMS**



**STURTEVANT MOTOR DRIVEN MULTIVANE FAN AND HEATER**



**STURTEVANT TURBO GENERATING SET**

Sizes up to 150 kw. Engine generating sets with either horizontal or vertical engines, also made in sizes up to 100 kw. Turbines also furnished separately



## L. J. WING MFG. CO.

Manufacturers of Fans and Blowers

TELEPHONE:  
CHELSEA 7465-6350-364 West 13th Street  
NEW YORK, N. Y.

BRANCH OFFICES IN PRINCIPAL CITIES

## Products.

DISC and SCREW PROPELLER VENTILATING and EXHAUST FANS, Motor, Belt and Steam Turbine driven.

Steel Plate and Multi-Vane Fans and Blowers; Steam Turbine Blowers for Mechanical Draft, Damper Regulators; Feed Water Regulators; Positive Pressure Blowers, and Vacuum Pumps.

## Wing Screw Propeller Fan.

In the Wing screw propeller fan the design of the fan wheel or blade is such as to propel the air with uniform velocity over its entire area and to deliver an absolutely straight column of air. These features lend to extremely high efficiency when working against heavy pressure or suction and may, therefore, be used very advantageously for blowing or drawing air through duct work as well as for open ventilation.

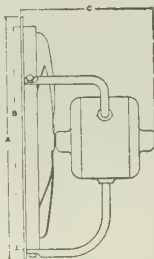
The motors are fully enclosed and dustproof; no cooling device is necessary. The motor is supported by a heavy cast iron ring, which may be bolted to a wall framework, etc.

WING SCREW PROPELLER FAN



DIMENSIONS OF WING SCREW PROPELLER FANS IN INCHES

Size	A	B	C	Size	A	B	C
10	12 $\frac{1}{2}$	10	9	30	35	31	21
13	16	13	13	36	41 $\frac{1}{2}$	37	24
17	20	17	17	42	48	43	27
22	25	22	18	48	56	49	32
24	27 $\frac{1}{2}$	26	19				



DIAGRAM

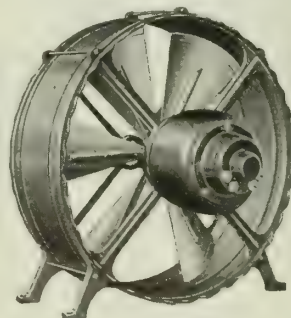
DATA, WING SCREW PROPELLER FANS

Fan diam., ins.	Speed, r.p.m.	Air delivery, ft. per min.	Horse-power	Fan diam., ins.	Speed, r.p.m.	Air delivery, ft. per min.	Horse-power
10	2,000 1,750	1,100 950	1/10 1/20	24	850	5,000	3/10
13	1,150 1,500 1,750	1,530 2,000 2,340	1/8 1/6 1/4	30	650	7,000	2/5
17	1,150 1,575 1,700	3,150 4,350 4,700	1/4 6/10 7/8	36	550	10,500	3/5
22	1,150 1,575 1,700	3,550 4,850 5,250	1/4 6/10 7/8	42	475	13,500	3/4
				48	450	18,500	1

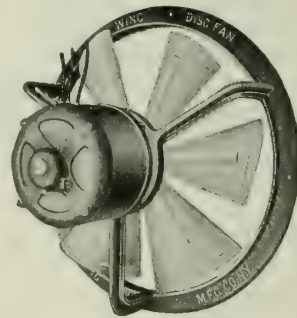
NOTE—The 13-, 17- and 22-in. sizes in speeds above 1,500 r.p.m. are designed for industrial plants and locations where a little noise is not objectionable. All other speeds given are "quiet speeds"

## Wing Disc Fan.

Wing disc fans are essentially curved blade fans. The blades though radially straight are curved in their width, which feature is responsible for a greater capacity of 25% to 50%, size for size, than other fans of its type. It is, therefore, used very advantageously where space conditions are such as to preclude a fan of larger dimensions. Wing fans operate quietly at their standard speeds. All motors are fully enclosed and dustproof; no cooling device is required.



Type A



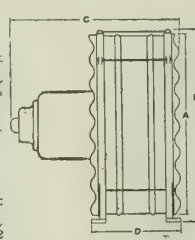
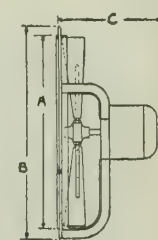
Type B

WING DISC FANS—MOTOR DRIVEN  
Also made for belt driveDIMENSIONS OF TYPE A  
Fan Sizes in inches, 18 to 60

A	18	24	30	36	42	48	54	60
B	19	25	33	38	45 $\frac{3}{4}$	52 $\frac{1}{2}$	56	63 $\frac{3}{4}$
C	20	23 $\frac{1}{2}$	25 $\frac{1}{2}$	27 $\frac{3}{4}$	31	33 $\frac{1}{2}$	37	41
D	9 $\frac{1}{2}$	12	12 $\frac{1}{2}$	13 $\frac{1}{2}$	14	15	16	17

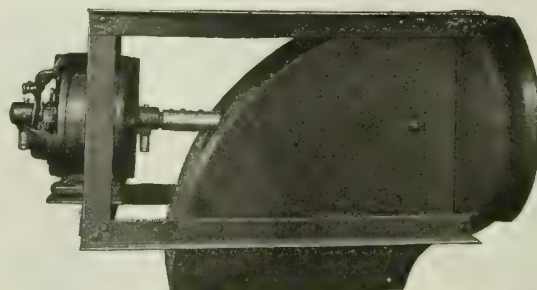
DIMENSIONS OF TYPE B  
Fan Sizes in inches, 18 to 60

A	18	24	30	36	42	48	54	60
B	18 $\frac{3}{4}$	24 $\frac{1}{2}$	31 $\frac{1}{2}$	37 $\frac{1}{2}$	43	49	55 $\frac{1}{2}$	61 $\frac{1}{2}$
C	21 $\frac{1}{2}$	27 $\frac{1}{2}$	35 $\frac{1}{2}$	41 $\frac{1}{2}$	47 $\frac{3}{4}$	55	62	69
D	16 $\frac{3}{4}$	19 $\frac{3}{4}$	21 $\frac{3}{4}$	23 $\frac{3}{4}$	27 $\frac{1}{2}$	32	34	36

DIAGRAM OF  
TYPE ADIAGRAM OF  
TYPE B

DATA, WING DISC FANS

Size, ins.	Air ft. per min.	Horse-power	Average speed, r.p.m.	Size, ins.	Air ft. per min.	Horse-power	Average speed, r.p.m.
18	3,400	.28	900	42	18,400	1.3	450
24	5,900	.48	800	48	23,800	1.75	400
30	8,100	.6	600	54	28,600	1.9	350
36	13,400	.97	500	60	37,200	2.7	350



WING SCREW PROPELLER EXHAUSTER

Motor entirely outside air passage; therefore, machine handles air laden with smoke, grease, steam, acid fumes, air and gas at high temperatures, etc. Built in standard units, 10, 13, 17 and 22 ins. diam. For speeds and capacities see table opposite



# NATIONAL COMMERCIAL GAS ASSOCIATION

LOUIS STOTZ, SECRETARY

128 East 15th Street  
NEW YORK, N. Y.

## Objects.

The NATIONAL COMMERCIAL GAS ASSOCIATION is the representative commercial body of the gas industry. It has for its objects DEVELOPING and PROMULGATING METHODS for the EFFICIENT USE of GAS, and ENCOURAGING the MANUFACTURE of SUITABLE APPLIANCES for the proper utilization of gas for lighting, heating and power.

## Membership.

The Association is composed of 3,000 individuals, representing 500 gas companies and 200 manufacturers of gas appliances located throughout the United States and Canada.

## Co-operation with Architects.

The Association will, on request, correspond with architects and place at their disposal its services. It will also, on request, place upon its mailing list the names of architects and furnish them, from time to time, with various publications containing data covering the different applications of gas.

All gas companies will co-operate with architects in the preparation of plans and specifications for new buildings, or for old buildings in process of alteration.

*Practically all gas companies employ trained specialists, whose services are available to architects at any time and without any cost to them. These specialists will co-operate with architects in every way and will be of material assistance in devising means and methods for the proper and scientific lighting and heating of buildings; also for adequate cooking, water heating, refuse disposal, and laundry equipment, if their services are sought.*

## Uses and Conveniences of Gas.

The modern commercial building should possess every facility for the utilization of all agencies available in the lighting, fuel and power fields. This is important, in view of the constant changes in the character of the occupancy of commercial buildings, and the increased rental values obtainable where such complete equipment is available.

Gas for lighting, fuel and power is universally demanded by a wide range of industries, because in point of economy, ease of control, cleanliness, reliability of quantity and quality of supply, it stands pre-eminent.

## Gas Piping for Business Buildings.

All factories, loft buildings and office buildings demand a gas fuel service, and should be adequately piped to supply the demand.

Architects should remember that fully 90% of the manufacturing industries to-day require a gas fuel service and will rent space only where such service is available. An architect who omits a gas piping layout in erecting a building limits the owner's rental opportunities to those industries which do not require gas for fuel or power, and they constitute a very small percentage of the industrial world.

## Gas Piping for Dwellings.

The demand made upon gas companies during the winter of 1917-1918 for gas-fired room heaters has demonstrated to architects and owners alike the advisability of providing for an auxiliary method for heating. This can readily be provided during the construction or alteration of a dwelling or apartment house, by extending branch lines from the kitchen gas riser to each room and installing Conceal-O outlets at suitable places, including fuel outlets for fireplaces. In all buildings where this auxiliary system is installed (and in justice to owners and lessees it should be made a part of the equipment of every residence), the gas company can immediately supply any demand that may be made upon it for gas for room heating.

Surely, the lesson of the coal shortage has amply demonstrated the necessity of providing for an auxiliary system for heating the homes of the people.

## Gas Lighting.

Occupants of houses that are completely piped for gas have at their disposal a wide variety of incandescent burners, artistic fixtures, side-wall bracket lights, reading lamps, domes, direct and semi-indirect lighting units. These fixtures are readily and conveniently lighted or extinguished by the pushing of a button or the pulling of a chain.

The cost of extending the side fuel lines upward for side-wall bracket lights is indeed little.

## Important.

A careful study of present day economic conditions discloses the fact that many buildings, not properly piped originally, have required costly alterations to provide for an adequate gas supply. This makes it obligatory, as a protection to the owner, that all buildings should be adequately and completely piped for gas during their construction.

A piping schedule and other information for the assistance of architects will be found in SWEET'S ARCHITECTURAL CATALOGUE, 12th Edition, 1917. Other gas data will be found in the Structural Service Book of the American Institute of Architects, Vol. 1.

# BRAMHALL, DEANE COMPANY

## French Ranges and Cooking Utensils

261-265 West 36th Street

TELEPHONE, GREELEY 4254

NEW YORK, N. Y.

### Products and Services.

Specialists in COMPLETE KITCHEN EQUIPMENT for Clubs, Residences, Hotels, Hospitals and other Institutions, Cooking Classes, etc.

Included among the products of this company are French Ranges for coal, gas and electric heating; Grills, Broilers, Brick and Iron Baking Ovens, Laundry Stoves for coal and gas, Jacket Kettles, Coffee Urns, Plate Warmers, Cook's Steel Tables, etc.

Culinary Utensils, Dishwashers, Ice Cream Machines, Cast Iron Sinks, Coal Water Heaters, Range Boilers, Sterilizers for hospitals and barber shops, etc.

Contracts solicited for all parts of the United States.

### Experience, Quality and Facilities.

This organization has back of it over fifty years of specialized experience as manufacturers and contractors of high class kitchen equipments. The wide range of practical knowledge gained during this period has given it an expert grasp of requirements in this field, and has helped in the improvement and development of its full line of products. These facts insure installations of highest quality, efficiency and economy.

The manufacturing facilities of this company are most modern, and are sufficiently extensive to insure prompt execution of contracts. Shipping facilities are sufficiently convenient to insure economy and despatch in shipments to all parts of the United States.

All work is done under expert supervision.

### Co-operation.

In the study of kitchen equipment, it is very necessary that elements be selected and placed with utmost regard to efficiency of operation as well as economy of first cost. It is, therefore, important that the architect take advantage of the specialized expert advice that the engineering department of this concern offers. Its recommendations are made only after careful study of all conditions and requirements, such as number of people to be served, style of service, whether for hotel, institution or club. The service required varies also with the locality; for instance, a resort hotel in New England demands a different layout from one in the South.

After consideration of these factors, an equipment is recommended which not only represents completeness in equipment, but also real kitchen service—scientific, simplified, efficient and economical.

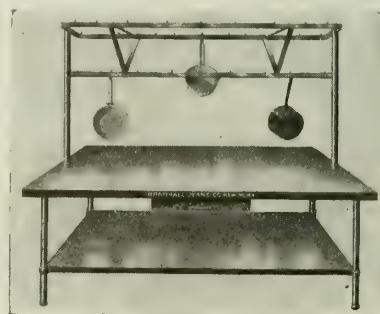
Suggested plans and specifications as well as estimates will be gladly supplied, free of charge, and without obligating the inquirer, on receipt of such request from architects or others in authority. These inquiries should be accompanied with full particulars and blue prints, if possible. A representative will be sent for

consultation, if necessary, to discuss possibilities and costs.

Upon acceptance of contract, full detail drawings are prepared by this organization, together with plans showing roughing-in dimensions for all fixture plumbing, steam, gas and electrical connections.

### Cook's Table and Saucepan Rack.

A cook's table is a necessity in all kitchens. The tables are made of wood, steel or other materials, and are furnished either with glass or metal tops as wanted. We recommend supporting a rack for heavy saucepans over this table, as it keeps these utensils in full view and away from all dark closets.



COOK'S TABLE AND SAUCEPAN RACK

### Deane French Ranges.

The durability and efficiency of these ranges have recently been enhanced by several patented improvements.

Deane French ranges cost more because they are worth more. They are the result of best workmanship, best material and best design.

All vital parts are made of Armco iron, the pure rust resisting iron of uniform quality. All fuels, whether coal, wood or gas, subject the range to corrosive sulphur fumes, and alternating heating and cooling hurry the rusting process. Armco iron resists these attacks better than any other sheet iron or steel.

FEATURES—(1) Oven door supports so constructed that they can not be broken by allowing the door to drop suddenly.

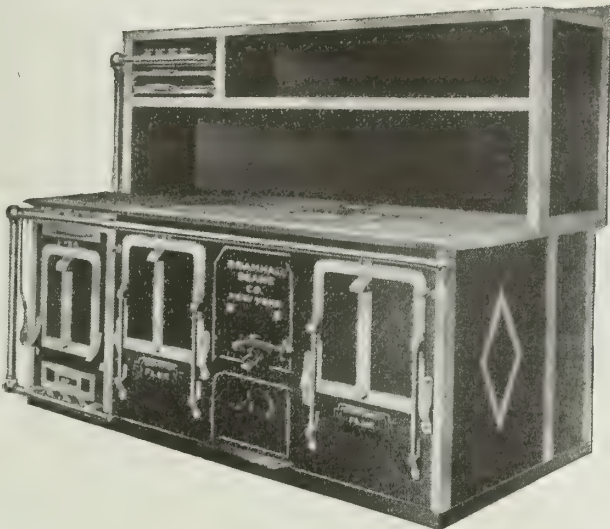
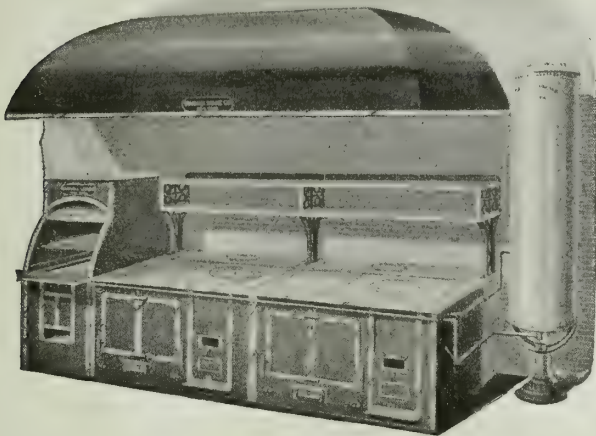
(2) Waterbacks of various sizes may be put into any of the fire chambers to suit the capacity of the boilers.

(3) Grates, either flat, anticlinker, duplex revolving, or a semirevolving grate, as desired, in any range.

(4) Adjustable flue brakes for adjusting the draft for each oven.



- (5) New patent flue door which can not be misplaced.
- (6) Patent non-warping oven bottom, so made that the bottom is always level.



RESIDENCE TYPE DEANE COMBINATION COAL AND GAS FRENCH RANGE, PLATE 20-S

Waterbacks, plate shelves and flat or revolving grates, as ordered  
Coal range, 4 ft. 6 ins. long; 1 fire, 2 ovens. One 18-in. gas range. Double plate warming shelf shown. Elevated gas broiler over gas range, right or left of coal range, as preferred

HOTEL TYPE DEANE PATENT FRENCH RANGE, BRICK SET, PLATE 107-S

Range consists of two primary units, which are the basis of all hotel work  
Waterbacks, plate shelves and flat or revolving grates, as ordered

SIZES, ETC., HOTEL TYPE DEANE PATENT FRENCH RANGES OTHER SIZES TO ORDER

Extreme length	Floor space	Size of flue	No. of fires	Ovens	
				No.	Size
3' 0"	36" x 26"	8" x 8"	1	1	16 3/4" x 15 " x 12"
3' 6"	42" x 29"	8" x 8"	1	2	12 " x 19 1/2" x 13"
4' 0"	48" x 29"	8" x 8"	1	2	12 1/2" x 19 1/2" x 14"
4' 6"	54" x 33"	8" x 8"	1	2	14 1/2" x 24 " x 14"
5' 0"	60" x 33"	8" x 8"	1	2	16 1/2" x 24 " x 14"
6' 0"	72" x 39"	8" x 8"	1	2	22 3/4" x 28 " x 16"
7' 0"	84" x 39"	10" x 10"	2	2	28 " x 18 " x 16"
8' 0"	96" x 39"	12" x 12"	2	2	28 " x 22 3/4" x 16"
9' 0"	108" x 39"	12" x 12"	2	3	28 " x 20 1/4" x 16"
10' 0"	120" x 39"	12" x 12"	2	3	28 " x 22 3/4" x 16"
10' 6"	126" x 39"	12" x 12"	3	3	28 " x 18 " x 16"
12' 0"	144" x 39"	12" x 12"	3	3	28 " x 22 3/4" x 16"
14' 0"	168" x 39"	12" x 12"	3	4	28 " x 18 " x 16"
16' 0"	192" x 39"	12" x 16"	4	4	28 " x 22 3/4" x 16"
17' 0"	210" x 39"	12" x 16"	5	5	28 " x 18 " x 16"
20' 0"	240" x 39"	12" x 16"	5	5	28 " x 22 3/4" x 16"

NOTE—All sizes are made in either brick set or portable form, and have the anticlinker or revolving grate, as desired. Fuel can be hard or soft coal, or wood, as ordered.

Suggested Specification Form for Ranges.

"This contractor shall deliver and set all of the following equipment for kitchen and supplementary service, furnishing all necessary materials to complete the job, and leaving the work ready for steam plumbing and electric connections to be made thereto by other contractors."

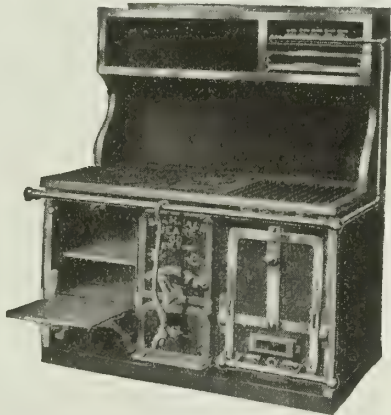
"ITEM 1, RANGE—One Deane's patent Armco iron French range, 39 ins. wide, containing .... ovens and .... fires; fires lined with extra quality fire brick, and fitted with revolving, dumping and shaking grates; ovens to have quadruple section non-warping Armco iron bottoms of No. 14-U. S. gauge; to measure .... wide, 28 ins. deep and 16 ins. high; oven doors to be of platform pattern with springless lifting latches and forged hinges; body of range to be made of No. 16-U. S. gauge Armco iron, with top of extra heavy gray iron castings, trimmed with heavy polished band iron around doors, top and bottom, and to have polished guard rail; tops to be neatly fitted together. Range provided with revolving dampers, and concealed flue brakes for independent control of each oven."

"ITEM 2, PLATE SHELF—One plate shelf to be set on top of range 14-ins. wide and .... long, made of same material as range."

REGULAR SIZES

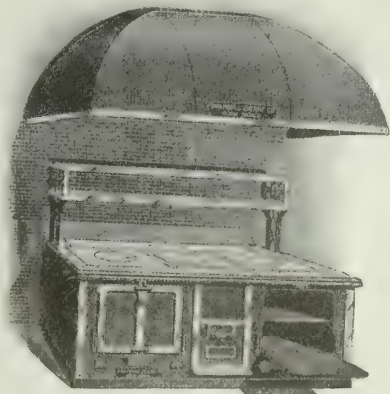
Coal Range				Gas Range	
Length	Depth	No.	Ovens	Front	Oven
			Size		
5'	2' 5"	2	19 1/2" x 12 " x 13"	18"	23" x 14" x 12"
5 1/2'	2' 5"	2	19 1/2" x 12 1/2" x 14"	18"	23" x 14" x 12"
6'	2' 9"	2	24 " x 14 1/2" x 14"	18"	23" x 14" x 12"
6 1/2'	2' 9"	2	24 " x 16 1/2" x 14"	18"	23" x 14" x 12"

Other sizes to order; special sizes for heating large quantities of water



DEANE COMBINATION GAS AND COAL RANGE FOR RESIDENCES, PLATE 209-S

1 gas heated oven, 1 coal heated oven, and elevated broiler. A compact outfit easily kept clean. Regular size, 48 ins. long, 27 ins. deep, 30 1/2 ins. high. Size of ovens, 13 1/2 by 18 1/2 ins. by 13 ins. high



DEANE PATENT FRENCH COAL RANGE AND HOOD FOR RESIDENCES, PLATE 210-S

# WILLIAM M. CRANE COMPANY

Manufacturers of Gas Ranges and Appliances

TELEPHONE:  
MADISON SQUARE 1058

16-20 West 32nd Street  
NEW YORK, N. Y.

CABLE ADDRESS:  
"VULCAN, NEW YORK"

## Products.

"VULCAN" GAS RANGES for hotels, apartments, institutions and private residences; GAS LOGS.

"Vulcan" Water Heaters, Hotel Gas Appliances, Broilers, Toasters, Warming Closets, Plate Warmers, Laundry Appliances, Gas Irons (industrial and domestic), Burners (industrial, illuminating and acetylene), Heaters, Bake Ovens, Hot Plates, Brass Fittings, Tubing, etc.

## Installing Gas Ranges.

All cities have ordinances governing the installation of gas ranges, and practically no two agree, but if the following suggestions are followed, all conditions, with perhaps a few exceptions, will be satisfactorily fulfilled.

In planning the kitchen and selecting the type of range to be specified, the first consideration should be: "What will be the possible cooking requirements of the apartment or house?" There are many styles and sizes of gas ranges, and care should be exercised to make their selection proper to meet these requirements.

A flue opening of at least 24 sq. ins. in area should be provided. A direct flue connection should never be made; that is, the flue pipe from the range should not lead directly into the flue opening. Such connections are undesirable, for in the event of a strong back draught the oven burner might be extinguished.

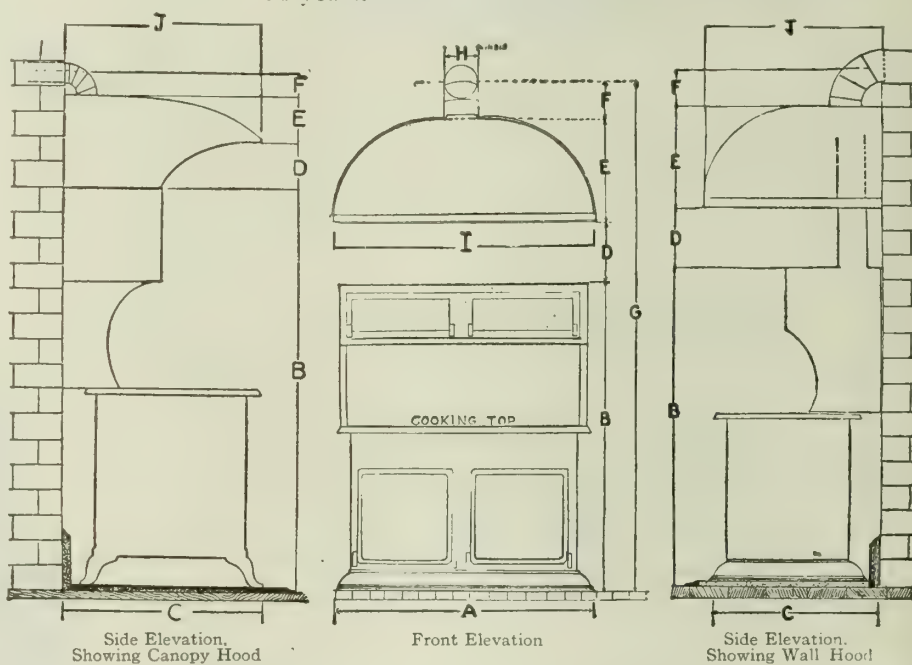
The best method of connection is to furnish a separate hood to be set over the range, the hood to be connected directly to the flue opening as shown in the illustration on this page. This provides an indirect flue connection for the range, which is positive in action.

The importance of these suggestions will be readily understood when it is stated that at times gas companies and contractors, when called upon to install the kitchen equipment, especially in apartment houses, have found it impossible to install a gas range of the proper size to fulfill the requirements, because the proper space was not provided for the range or the hood, nor had arrangements been made for flue connection.

Certain types of "Vulcan" ranges have the hood attached to the range, which type of construction is preferred by many. Cabinet ranges are generally provided with a combination hood and shelf fitting over

the top cooking burners, and connected with the oven flue, so as to form an acceptable type of indirect flue connection.

In details, such as the above and any others that might arise, this company will co-operate with architects, and will furnish specifications to meet requirements, if tentative sketches are submitted. "Vulcan" gas appliances have given perfect satisfaction for over 31 years.



DIMENSION DIAGRAMS OF "VULCAN" GAS RANGES

DIMENSIONS IN INCHES OF "VULCAN" GAS RANGES

Range number	WITH WALL HOOD					WITH CANOPY HOOD				
	831	833	889	886	845	831	833	889	887	845
A.....	55	45 <sup>3</sup> / <sub>4</sub>	44 <sup>1</sup> / <sub>2</sub>	42 <sup>1</sup> / <sub>2</sub>	36	55	45 <sup>3</sup> / <sub>4</sub>	44 <sup>1</sup> / <sub>2</sub>	42 <sup>1</sup> / <sub>2</sub>	36
B.....	67 <sup>1</sup> / <sub>2</sub>	67 <sup>1</sup> / <sub>2</sub>	65 <sup>1</sup> / <sub>2</sub>	49 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub>	67 <sup>1</sup> / <sub>2</sub>	67 <sup>1</sup> / <sub>2</sub>	65 <sup>1</sup> / <sub>2</sub>	49 <sup>1</sup> / <sub>2</sub>	55 <sup>1</sup> / <sub>2</sub>
C.....	31	31	27 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	31	31	27 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>
D.....	4 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	7	22 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>2</sub>	6	7	7	7 <sup>1</sup> / <sub>2</sub>	...
E.....	20	20	18	20	18	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	11	3	...
F.....	6	6	6	6	6	6	6	6	6	6
G.....	98	99	97	98	96	89 <sup>1</sup> / <sub>2</sub>	90	90	66	61 <sup>1</sup> / <sub>2</sub>
H.....	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>
I.....	54	48	42	48	42	48 <sup>1</sup> / <sub>2</sub>	39	33	40	...
J.....	28	28	28	28	28	28	28	28	21	20 <sup>1</sup> / <sub>2</sub>

## Representative Types.

A few representative types of "Vulcan" gas ranges are described here.

### No. 831E "Vulcan" Double Oven Range, with Elevated Broiler and Warming Closet.

A popular gas range for large apartments or wherever cooking requirements are heavy. It is handsomely finished, substantially constructed, and offers unusual cooking capacity.

Each oven is heated by 2 pipe burners lighted by oven lighters from outside.



White enamel door panel, broiler pan, burner tray and splasher around top burners. Cooking top has 8 burners (2 giant, 6 regular) and 2 simmering. Can be supplied with solid base, instead of legs, as shown in illustration of No. 833E below. Can be supplied with black panels, broiler pan and galvanized burner tray instead of white enamel.

#### No. 833E "Vulcan" Range with Solid Base.

A new model, practically adapted to the requirements of apartment houses where space will not permit a larger size. Has white enamel door panels, broiler pan, burner tray and splasher around top burners. Cooking top has 6 burners (2 giant, 4 regular) and 1 simmering. Can be supplied with legs, instead of solid base, as shown in illustration of No. 831E. Can be supplied with black panels, broiler pan and galvanized burner tray instead of white enamel.

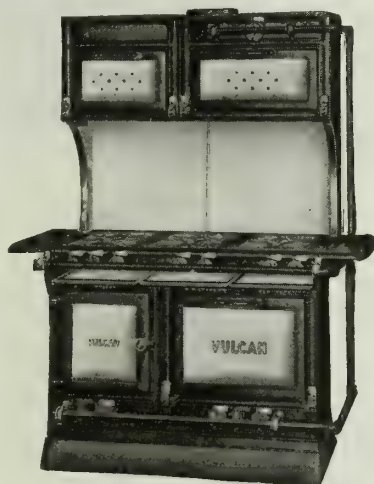
#### No. 889 "Vulcan" Range.

A combination that serves a variety of requirements. Fitted with large lower oven, large cooking top, elevated broiler and breakfast oven. Cooking top has 6 burners (2 giant, 4 regular) and 1 simmering. White enamel door panels, broiler pan and burner tray. Can be supplied with white enamel splasher same as No. 833E. Can be supplied with canopy hood and without end shelves.



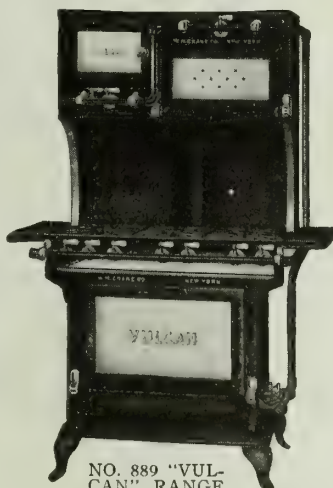
NO. 831E "VULCAN" RANGE

Ovens, 18" wide, 18" deep, 14" high  
Broiler, 18" wide, 13" deep, 8¾" high  
Warming closet, 25¾" wide, 13" deep, 14" high  
Cooking top, 48¾" wide, 21" deep  
For other dimensions, see diagram on opposite page



NO. 833E "VULCAN" RANGE

Solid base  
Breakfast oven, 12½" wide, 18" deep, 14" high  
Roasting oven, 18" wide, 18" deep, 14" high  
Broiler, 18" wide, 13" deep, 8¾" high  
Warming closet, 17½" wide, 13" deep, 13½" high  
Cooking top, 39½" wide, 21" deep, 33½" high  
For other dimensions, see diagram on opposite page



NO. 889 "VULCAN" RANGE

Lower oven, 22" wide, 18" deep, 14" high  
Breakfast oven, 12" wide, 14" deep, 9" high  
Broiler, 16" wide, 14" deep, 8½" high  
Cooking top, 33" wide, 21" deep  
For other dimensions, see diagram on opposite page

#### No. 845 "Vulcan" Short Cabinet Gas Range.

Useful to builders because of its small size and large cooking capacity. Can be set in a space a little more than 36 ins. wide and has a cooking capacity that will fill most requirements. Cooking top fitted with 4 burners (1 giant, 3 regular) and 1 simmering. Furnished with white enamel door panels, broiler pan and burner tray. Can be supplied with white enamel splasher around top burners, if desired.

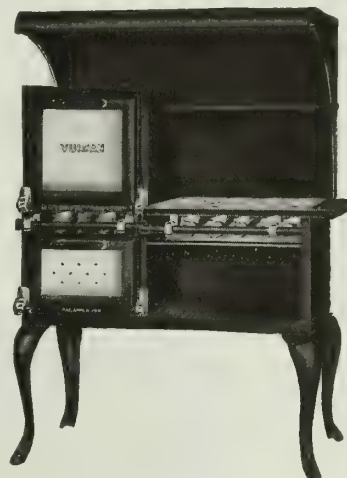


NO. 845 "VULCAN" RANGE

Oven, 14" wide, 18" deep, 14" high  
Broiler, 12" wide, 18" deep, 9" high  
Cooking top 21½" wide, 20½" deep  
For other dimensions, see diagram on opposite page

#### No. 887 "Vulcan" Range.

Only 40 ins. wide, with a cooking capacity that will fill all requirements. Canopy hood is attached. Furnished with white enamel door panel, broiler pan and burner tray. Can be supplied with white enamel splasher around top burners. Cooking top has 4 burners (1 giant, 3 regular) and 1 simmering. Can be supplied with black panels, broiler pan and galvanized burner tray instead of white enamel.



NO. 887 "VULCAN" RANGE

Oven, 14" wide, 18" deep, 14" high  
Broiler, 14" wide, 18" deep, 9" high  
Cooking top, 22" wide, 20½" deep  
For other dimensions, see diagram on opposite page

#### Right or Left Ovens.

All "Vulcan" cabinet gas ranges can be supplied with either right or left ovens, as desired.

#### White Enameled Splashers and Automatic Lighters.

All "Vulcan" gas ranges can be supplied with white enameled splasher around top burners. Automatic lighters for top burners can be attached to all "Vulcan" ranges.

#### New Wall Cabinet Range.

A new cabinet range consisting of an elevated combination oven and broiler, and 3-burner cooking top; white enameled equipment. Can be set upon brackets in wall or upon built-in dresser. Occupies no floor space. Write for photograph.

#### Gas Logs.

"Vulcan" gas logs are made in 12 sizes and 4 styles. They are natural in appearance, whether burning or extinguished, and will give good service under variations of pressure and quality of gas.

#### Catalogue.

Catalogue showing complete line of gas appliances forwarded upon request.

ESTABLISHED 1865

# THOMAS, ROBERTS, STEVENSON CO.

## Ranges for Manufactured Gas

GENERAL OFFICE, FOUNDRY AND WAREHOUSE

American and Dauphin Streets

PHILADELPHIA, PA.

### Products.

Manufacturers of "FORTUNE" SINGLE OVEN, DOUBLE OVEN, SHORT CABINET, BOX CABINET, and SPECIAL CABINET GAS RANGES.

### "Fortune" Gas Ranges.

"Fortune" gas ranges are perfect in construction, original in design and economical in operation.

All "Fortune" ranges are constructed according to the specifications of the National Commercial Gas Association, and are sold through gas companies. They can be obtained anywhere in the United States.

### Shipping Facilities.

Philadelphia, as the largest manufacturing city, is admirably situated as a distributing point for manufactured goods. Its shipping facilities, both by rail and water, make it possible to guarantee prompt delivery of "Fortune" gas ranges north, south, east and west, at rates which permit competition with shipments from any other point in the United States.

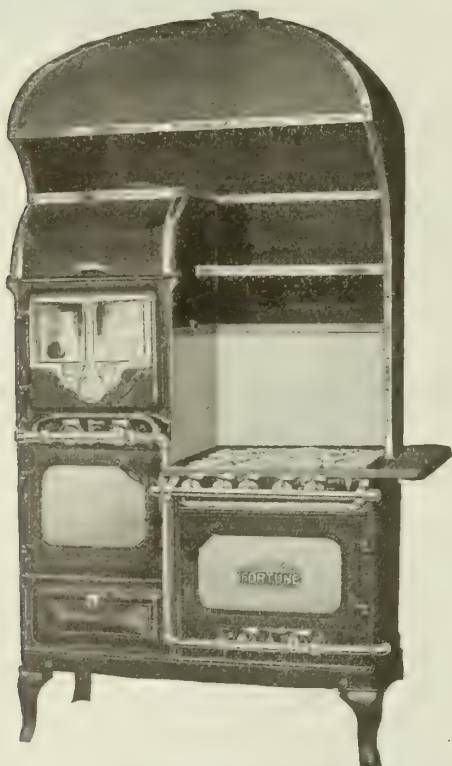


BOX CABINET

1844 Left hand oven 1845 Right hand oven  
With high shelf and top splash plate; enameled panels in broiling and baking oven doors

#### DIMENSIONS IN INCHES

Baking oven.....	18 by 18 by 12	Floor space, less end shelf	45
Broiling oven.....	18 by 18 by 9	Cooking top, with end shelf.....	27½ by 19½
Height from floor to burner top.....	33	Cooking top, less end shelf	22 by 19½
Floor space, with end shelf.....	50	Shipping weight, 265 lbs.	

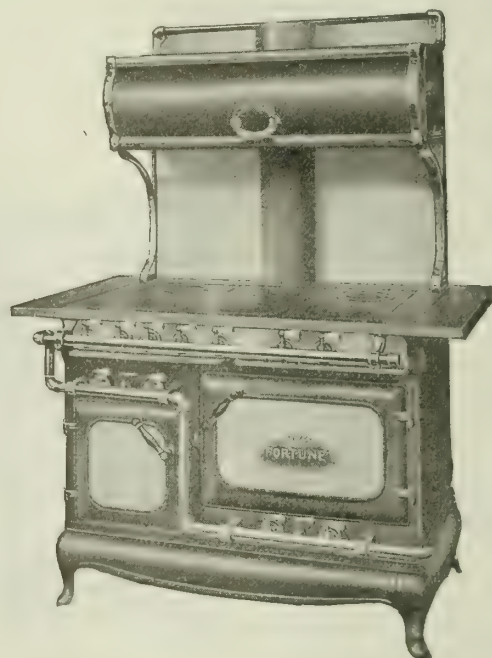


GRAND CABINET 4 BURNERS

3010 Left hand oven 3110 Right hand oven  
With canopy C, glass door, thermometer, enamel panels in broiling and lower baking oven doors, and enamel splash plates.

#### DIMENSIONS IN INCHES

Upper baking oven.....	18 by 16 by 14	Height, floor to bottom of top baking oven.....	40
Lower baking oven.....	18 by 20 by 12	Height, floor to burner.....	35
Broiling oven.....	18 by 16 by 14	Floor space.....	51
Top, with end shelf.....	30 by 22		
Top, less end shelf.....	24 by 22	Shipping weight, 475 lbs.	



CAFE RANGE

No. 2038 with warming closet and white enameled door panels, and white enameled splash plate.

#### DIMENSIONS IN INCHES

Baking oven.....	20 by 20 by 12	Width over all.....	47¾
Broiling oven.....	12 by 20 by 12	Height, floor to burner.....	32½
Shipping weight, 600 lbs.			



# ECONOMY HEATER COMPANY

Manufacturers of Combination Boilers and Gas Water Heaters

TELEPHONE:  
FRANKLIN 4668

108 South La Salle Street  
CHICAGO, ILL.

## Products.

"ECONOMY" COMBINATION BOILERS and GAS WATER HEATERS, in automatic and regular types; "PEERLESS" KITCHEN BOILERS, Gas Heating.

### "Economy Automatic" Combination Boiler and Gas Water Heater.

**DESCRIPTION**—The "Economy Automatic" meets a building construction need ably and thoroughly in a manner which nothing else on the market can equal. It is a complete piece of hot water service equipment in itself, working independently and furnishing instant and continuous hot water for the residence or apartment building at a very modest fuel cost. It uses gas for fuel and requires no attention by owner, landlord or tenant.

It keeps an ample storage of hot water constantly ready for use, and with return piping of hot water, this means that the hot water is always at the faucet when wanted and the supply always abundant.

It renders true, instantaneous hot water service every hour of the day and night, 365 days in the year—no bother, no worry, no dirt, no danger of any kind, and all with a plain piece of equipment which is not expensive in first cost—no mechanism to get out of order and under ordinary conditions good for 10 to 15 years of service.

The "Economy Automatic" requires no special gas piping for its supply—the regular  $\frac{3}{8}$ -in. and  $\frac{1}{2}$ -in. house supply serves it fully.

In addition to its serviceability as a distinctly separate piece of equipment working independently as outlined, it is in every respect a practical boiler for hot water storage to be served by the regular heating plant.

It can be connected with the water coil in the furnace, and thus during the months

when the house heating system is operating it becomes the plain boiler and need not be operated with its own interior gas heating equipment except at such times as the furnace fire is kept low and hotter water is desired than that which the heating plant is making.

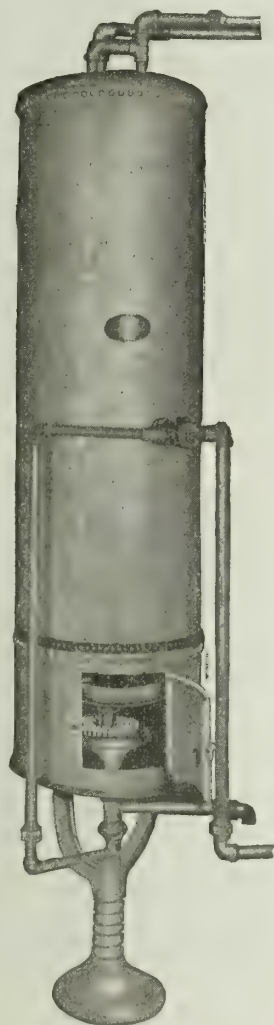
**ADVANTAGES**—The "Economy Automatic" combination boiler and gas water heater recommends itself to the architect and the professional builder because it solves many of their problems, and once specified and installed completely provides for all the hot water needs in the home and apartment building.

Where a plain boiler is specified, then something in addition is required. Perhaps it will be a coal stove side heater or a gas side heater. In the case of the coal stove side heater it is quite certain that sooner or later something instead of it will be wanted.

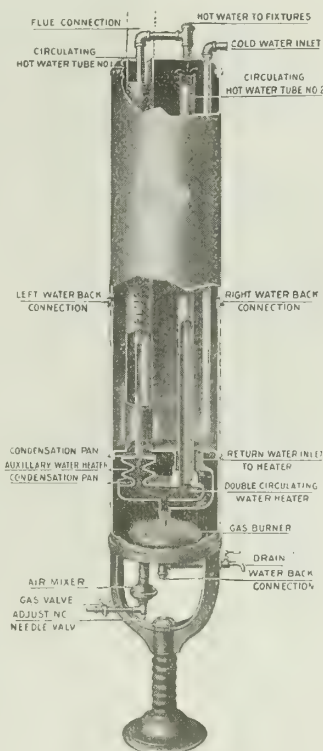
Owners do not want to be their own janitors for a coal stove in the basement merely to get hot water, nor can they afford to pay for janitor service just to have the hot water needs looked after during the many months of the year when the house heating plant is shut down. As a result they turn to gas to do away with the work and dirt and annoyance of the coal heater. If they then install a gas side heater to furnish the hot water for the boiler it has no control and needs personal and careful attention.

In addition, no auxiliary gas side heater, even of the most expensive type, can make the hot water as economically as the "Economy" boiler makes it.

But if, in the first place, the "Economy Automatic" boiler is installed, every need is met. The burner is lighted, the boiler is soon filled with hot water of the temperature desired, and the positive thermostatic control valve operates to turn the flame down to a point which keeps the water in the boiler constantly at the predetermined desired temperature. The ex-



"ECONOMY AUTOMATIC" COMBINATION BOILER AND GAS WATER HEATER  
Showing thermo-valve control



"ECONOMY" COMBINATION BOILER AND GAS WATER HEATER  
Showing interior patented construction

pense is not more than would be the cost of coal for a side heating stove and much less than would be the cost for gas consumed by a gas side heater, and no one needs to go near the equipment from month's end to month's end.

The owner of the two-flat or three-story apartment building who lives in one of the apartments and undertakes to furnish hot water for the tenants will, with the "Economy Automatic" boiler installed, have all the hot water needs looked after completely by the boiler itself. This relieves him of all care in the matter, and at a monthly cost less than would be sustained by any other method of providing the hot water, and with a certainty of freedom from complaint which could not be accomplished in any other way or with any other equipment.

The "Economy Automatic" combination boiler and gas water heater is manufactured under patent No. 1,035,636 and is not competed with by anything else on the market. The ordinary type of center flue combination boilers made automatic by the use of a thermostat are entirely different from the "Economy Automatic" in their operation—more expensive in their fuel cost, and do not accomplish the results of our piece of equipment.

When an "Economy Automatic" is specified, be sure that a real "Economy Automatic" is installed and not merely a center flue combination boiler with a thermostat. There is a great difference in the operation and results, and the "Economy" boiler can not be copied nor can its operation be successfully duplicated by anything else.

Also bear in mind that the "Economy Automatic" combination boiler and gas water heater is not one of the so-called "instantaneous water heaters," the machines which heat water instantly by throwing on a tremendous volume of gas to do it and which are open to serious objections in respect to danger, to complicated mechanism, to expensive piping for gas supply, to heavy operation expense and to unnecessarily large first cost. They are subject as well to the very practical objection that while they may heat water instantly, they can not possibly deliver hot water at the faucet instantly, and also that they can not serve as the boiler for storage of hot water when the house heating plant is able to make it.

The "Economy Automatic" combination boiler and gas water heater is open to no criticism. First cost is reasonable; cost of operation is very modest; its service is universal. It renders true instantaneous hot water service on the storage principle and only by the storage principle can complete and perfect hot water service be had.

In specifying, it is well to be sure that the size boiler selected is large enough. Do not make the mistake of putting in a number 52 or 66 where a number 82 or 100 should go.

Greatest economy is achieved with ample reserve storage. It is always better to have oversize than a boiler too small.

### "Economy Regular" Combination Boiler and Gas Water Heater.

The "Economy Regular" combination boiler and gas water heater is identical in construction and material with the "Economy Automatic" in the respective sizes, but it is not provided with the thermostatic control valve, nor is it tapped with the opening for the valve.

The combination gas heating boiler has become so well known and its advantages so fully recognized, that no argument for its use need be presented here. However, some parts of the United States are far behind others in the adoption of this type of boiler. As a general statement we would say that in a majority of cases it would be better to install "Economy Regular" combination boilers and gas water heaters than to install plain boilers.

The combination boiler does everything that the plain boiler does, and in addition it is capable of independently providing hot water through its own gas heating equipment. Usually a plain boiler is supplemented by a gas or coal side heater later on, and the result is that more expense is thereby incurred and less efficiency secured than where the "Economy" combination boiler is installed in the first place.

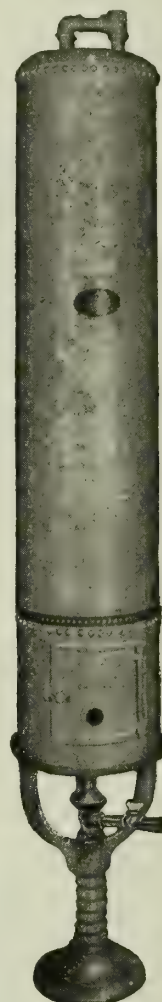
For kitchen installation the "Economy Regular" in the number 30 size is the standard. It has side tapplings for connection with the water back in the range. It takes up only the space of a regular 30-gal. plain boiler and thus saves in floor space as against a side arm coil gas heater connected with a plain boiler.

Through its remarkable interior construction it gives greater heating efficiency than the highest priced gas side heater. It has longer life and is in every respect a better piece of equipment.

For low priced flat buildings and for workmen's homes in industrial communities, the "Economy Regular" combination boiler and gas water heater in the best possible manner meets a need which is now generally recognized.

Adequate housing accommodations for labor must include the provision for the laborer and his family to have hot water quickly and at low cost in summer as well as in winter. At a very small additional cost per home or per apartment this modern necessity is provided by an "Economy" combination gas heating boiler.

This one piece of equipment alone represents a selling and renting inducement which is an important consideration to those who build large numbers of homes and low-priced apartments to rent and sell.



"ECONOMY  
REGULAR"  
COMBINATION  
BOILER AND  
GAS WATER  
HEATER





# AMERICAN WATER HEATER COMPANY, INC.

Manufacturers of Automatic Gas Fired Water Heaters

EXECUTIVE OFFICES AND PLANT

6th and Carr Streets  
ST. LOUIS, MO.

## Products.

AMERICAN AUTOMATIC GAS FIRED WATER HEATERS.

## General Description.

The American heater, illustrated herewith, is a modern appliance designed to furnish hot water instantly and automatically.

It uses gas as a fuel, the admission of gas to the burners being controlled by an ingenious mechanism that permits the flow of gas to the burners only when any hot water fixture to which the heater may be connected is opened.

This mechanism not only admits gas to the burners, but ignites it, predetermines the quantity used, and permits of no wastage.

It controls both the temperature and the flow of the hot water.

It is used principally in homes and varied industries.

When placed in a home, it is usually installed in the basement, and water connection made from the nearest cold water pipe. The hot water connection is made from the hot water outlet of the heater to the nearest hot water pipe.

Suitable flue or vent pipe is provided to give the heater the proper draft and carry off any by-products of the gases.

As the heater is connected to the main hot water line, the opening of any hot water fixture throughout the building immediately and automatically turns on the gas to the heater, at the same time causing the cold water to flow through a copper coil, over 100 ft. in length, converting this cold water instantly to hot and delivering it at any fixture, predetermined in volume and temperature, at the will of the operator.

The American heater has become a household necessity. It is as indispensable as a gas range or a telephone.

It is a silent, vigilant servant, only awaiting the touch to a faucet to immediately respond with a continuous supply of piping hot water, and relaxing only when the faucet is closed. Even then it does not overlook its final duty in properly closing off the gas to avoid unnecessary expense, the only gas used by the heater when not heating water being that from the pilot

light, which, in the American heater, comes from two small lava tips, the consumption from which is negligible.

*Specify the American for efficient service.*

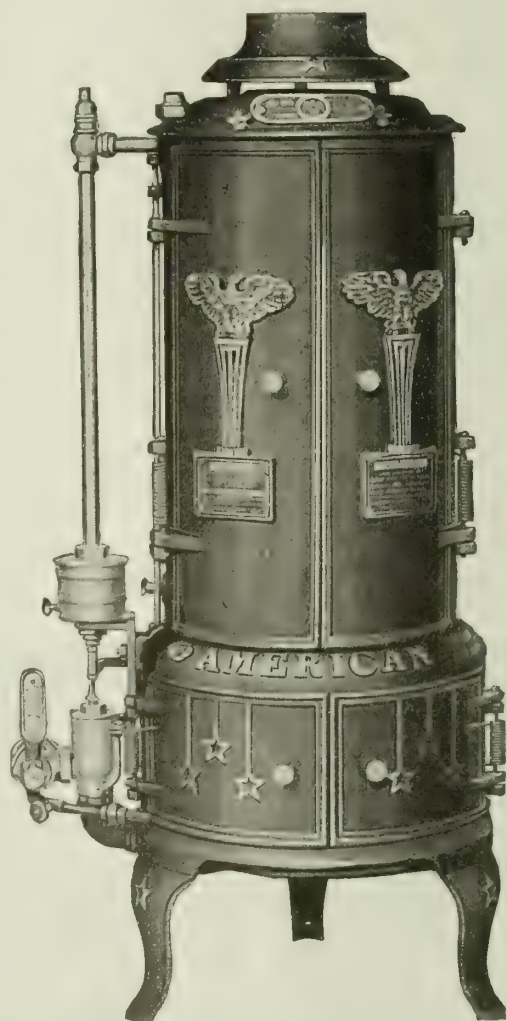


FIG. 1. AMERICAN AUTOMATIC GAS FIRED WATER HEATER

SIZES AND CAPACITIES

Size	Gals. per min.	Water inlet, ins.	Water outlet, ins.	Gas inlet, ins.	Weight crated, lbs.	Floor space required, sq. ft.	Height over all, ins.
3	3	1 1/2	1 1/2	1	326	24	48
4	4	1 1/2	1 1/2	1	380	24	48
6	6	3/4	3/4	1 1/4	533	30	56



**Construction, Operation and Advantages.**

Coil is made from No. 18-gauge copper tubing, over 100 ft. in length, and is so designed and wound as to give it the longest possible flame travel (Fig. 2).

Its heat absorption is wonderful and stack losses have been reduced to a minimum.

The coil has a radial lock, which, together with a rigid central core of cast iron, holds it firmly in position, and when the doors are opened the coil can be removed without dissecting the casing.

Note its accessibility and how easily it can be cleaned.

The burners are placed around and outside the periphery or outer edge of the coil, and are protected from any water of condensation by the canopy top (Fig. 3).

The water of condensation passes  $\frac{1}{2}$  in. in front of the burners. It is caught in a drip pan placed under the burner combs and is evaporated by the heat from the burners.

There is absolutely no opportunity for erosion through the acid effects of the condensate water, nor is the burner efficiency impaired, even to the slightest degree, as the condensate water at no time comes in contact with the burners or any part of the heater, with the exception of the drip pan.

The burner ring or manifold is below the combustion chamber, leaving the floor of the heater base clear so that no residue can accumulate.

The air to the burners is taken from the bottom and center of the heater, and is deflected from the bottom of the drip pan to the burner tubes, the air being kept at a uniform temperature not affected by the heat from the burners.

The ignition to the burners is secured from a pilot light having but two small lava tips.

It will be readily noted from the illustration that this pilot light gives instant ignition to the burners. It is protected from the condensate water, and furthermore, from any down-drafts that might occur. The possibility of its being blown out or overheated is eliminated.

Immediately above the pilot is a mica covered ori-

fice, through which it can always be readily ascertained whether the pilot light has been inadvertently extinguished. It, furthermore, saves much effort in the lighting of the pilot.

This system of combustion has proved remarkably efficient. The flame is floating and so projected that each part of the coil is equally influenced. It concentrates on no particular point. It is even in distribution, and this, together with the long flame travel, produces an efficiency equalled by no other heater.

American automatic water heaters are built in three sizes, 3, 4 and 6 gals. per minute. Will operate on artificial, natural or gasoline gas.

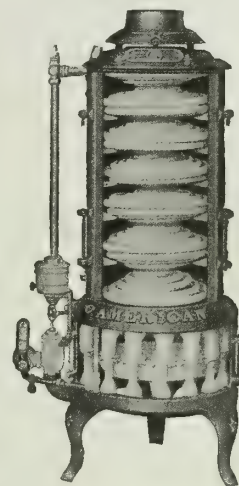


FIG. 2. AMERICAN HEATER WITH BOTH DOORS REMOVED

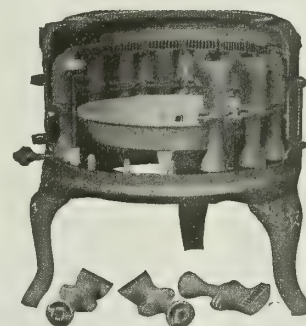


FIG. 3. PATENTED COMBUSTION CHAMBER IN SECTION, FRONT HALF CUT AWAY

# THE HOFFMAN HEATER COMPANY

Manufacturers of Water Heaters and Thermostatic Valves

FACTORY AND EXECUTIVE OFFICES

Washington Street and N. Y. C. and St. L. R. R.

LORAIN, OHIO

## Products.

HOFFMAN COPPER COIL GAS WATER HEATERS, including AUTOMATIC INSTANTANEOUS WATER HEATERS, MULTICOIL STORAGE HEATERS, DOUBLE COIL TANK HEATERS, and MULTICOIL HOUSE HEATERS, for heating with hot water or steam; THERMOSTATIC VALVES.

Single Copper Coil Tank Heaters and Cast Iron Coil Heaters.

## Installation of Hoffman Heaters.

Any plumber can install these heaters from drawings and instructions supplied with each outfit.

## Hoffman Instantaneous Automatic Water Heaters.

The Hoffman instantaneous automatic heater is essentially an economical apparatus, conserving the full power of the gas flame in its direct application to the water. With its patented burner and thermostatic valve, it is a markedly foolproof, efficient and superior heater. It requires practically no attention, and provides, within 15 seconds, at the mere turn of the hot water faucet, an abundant supply of hot

water for laundry, kitchen, lavatory, bath and other purposes.

The apparatus is connected with the gas and water supply pipes, and burns gas (excepting in the case of the very small pilot light) only when the water of the hot water faucet is running, automatically shutting off the gas when the faucet is closed.

**ADVANTAGES OF HOFFMAN INSTANTANEOUS HEATING**—The hot water service is ready at any time and under all conditions, winter or summer, from the earliest hour in the morning to the latest hour in the night.

The Hoffman heater provides, when manufactured gas (at \$1.00 per 1,000) is used, hot water at the rate of approximately 10 gals. for 1¢, or a bath for about 1¢. With a range boiler a bath costs about five times as much, and besides is dependent upon the convenience of the kitchen service. When natural gas is used, a hot bath will cost on an average ½¢.

No more water is heated than is actually required.

The hot water is fresh and clean, as the water is not stored to become stale and rusty, but is heated "instantly" as it passes through the copper coils.

**ADAPTABILITY OF TYPES AND CAPACITIES**—No. 2½-D—Suitable for bungalow, cottage or small residence.

No. 3-D—Suitable for small dwellings, usually having only bathroom and kitchen connections for hot water.

No. 4-D—This is the standard size, and is the heater recommended for the modern home having bathroom, kitchen and laundry. This size will supply the average household with all the hot water needed.

No. 6-F—This size is adapted for dwellings having two or more bathrooms, butler's pantry, and other hot water fixtures.

**SUPERIOR CONSTRUCTION**—*Jacket*—The jacket of the heater consists of a double cast iron shell with ⅞-in. dead air space between. The double doors, above and below, are self-closing; and Nos. 4-D and 6-F (see "Adaptability of Types and Capacities") are also equipped with double doors in the rear to give ready access to the rear of the coils. The top rests on lugs, leaving a space of 1 in. between the shell and the top. There is a deflector at the top of the coils, which catches the down-draft, throwing it out through this opening, thus preventing the down-draft from blowing out the pilot light, and doing away with the unsightly hood or the need of a damper.

*Coils*—The coils are of the highest grade No. 18-gage seamless drawn copper tubing, and are wound in a manner to produce the greatest efficiency. The lower section, which lies in the fire zone, is detachable and removable. The No. 2½-D contains 75 ft. of ⅝-in. tubing; the No. 3-D, 75 ft. of ¾-in. tubing; the No. 4-D, 100 ft. of ¾-in. tubing; and the No. 6-F, 125 ft. of ⅞-in. tubing—all tested to 300 lbs. pressure. Water and gas valves are of red brass castings specially ground and fitted.

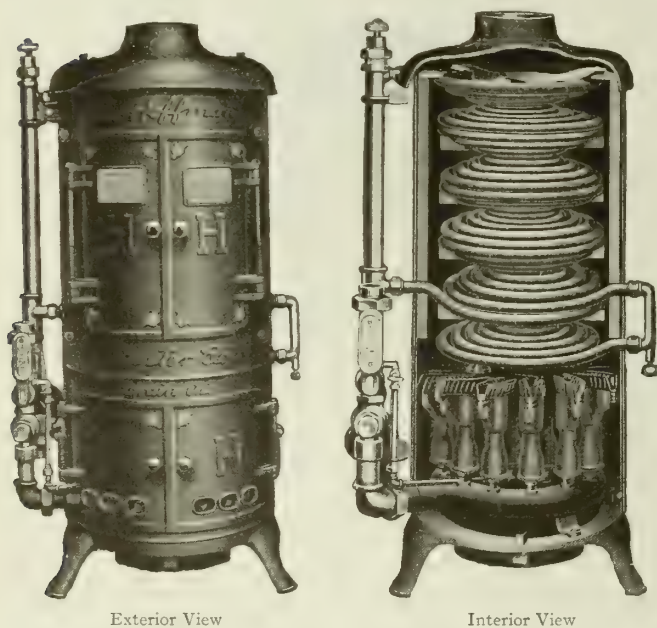


FIG. 1. VIEWS OF HOFFMAN INSTANTANEOUS AUTOMATIC GAS WATER HEATERS

DIMENSIONS, WEIGHTS, ETC.

No.	Capacity, gallons per minute	Diameter	Height	Gas supply from meter to heater	Water connections	Flue connections	Shipping weight, lbs.
1½-D	1½	10"	31"	¾"	1½"	4"	100
2½-D	2½	13"	39"	1"	1½"	5"	200
3-D	3	15"	41"	1"	1½"	6"	300
4-D	4	17"	45"	1½"	2"	6"	380
6-F	6	19"	49"	1½"	2½"	7"	520



**New Improved Patent Hoffman Burner**—As may be seen in Fig. 2, the gas is introduced through a minute hole in the nipple and rushes to the top of the burner, carrying with it an increased volume of air, which it siphons through the openings that surround the nipple at the bottom of the burner. The air and gas strike against the solid iron at the top of the burner, from which they rebound and are thoroughly mixed, taking the natural rotary motion of gas and escaping through the cylindrical gauze to the tip of the burner, where ignition takes place. The large proportion of air that the gas naturally takes up in this arrangement makes for a flame of highest efficiency and economy.

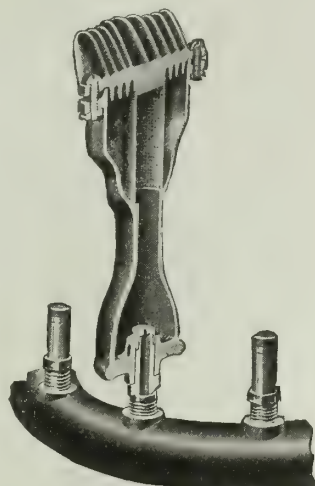


FIG. 2. CROSS SECTION HOFFMAN BURNER

The top of the burner is so constructed that the flame is thrown in two directions and is thoroughly protected from condensation.

**Patent Thermostatic Valve, etc.**—These heaters are equipped with the Hoffman new and improved type of thermostat. It is very simple in construction and positive in action, because it acts on the water valve instead of on the gas valve. In operating, it reverses the action of the water valve, by opening a port. This throws the water pressure on the opposite side of the plunger, driving it back to place, and releasing the pressure from the gas valve, which is forced shut by this reversed action of the water valve.

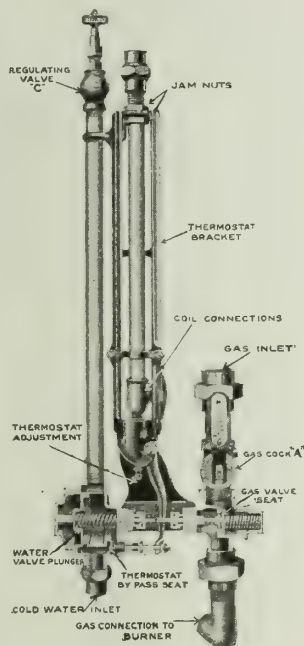


FIG. 3. HOFFMAN THERMOSTATIC VALVE

**GUARANTEE**—The Hoffman is guaranteed against defect in workmanship or material for one year from date of installation.

It is further guaranteed that, with artificial gas testing 650 B. t. u., 1 cu. ft. of gas will raise the temperature of 1 gal. of water 63°.

It is further guaranteed that, if the Hoffman heater has been installed properly in accordance with instructions accompanying each heater, it will do the work which that particular heater is specified for.

It is further guaranteed to the purchaser that, should the heater, after being installed properly in accordance with instructions accompanying each heater, not perform the work as specified, the heater may be returned at any time within a period of 30 days, and all money paid to this company for that heater will be refunded.

**INDORSEMENTS**—The buildings in the Panama-Pacific Exposition were supplied with hot water through Hoffman heaters. The Hoffman received the "Medal

of Honor," the highest award granted to any water heater in the country. These and other authoritative and scientific indorsements have won for the Hoffman recognition from many of the leading architects and gas men.

### Instantaneous Heaters as Auxiliaries to Range Boilers.

By connecting the Hoffman instantaneous automatic heater, as indicated in Fig. 4, the water from the range boiler is made to pass through the heater before it reaches the water fixtures. If this water is not of a predetermined temperature (according to thermostatic adjustment), sufficient additional heat is added to it by an automatic lighting of the burner. If sufficiently hot, the water will pass through the heater without igniting the gas. The economy and convenience of this application is obvious.

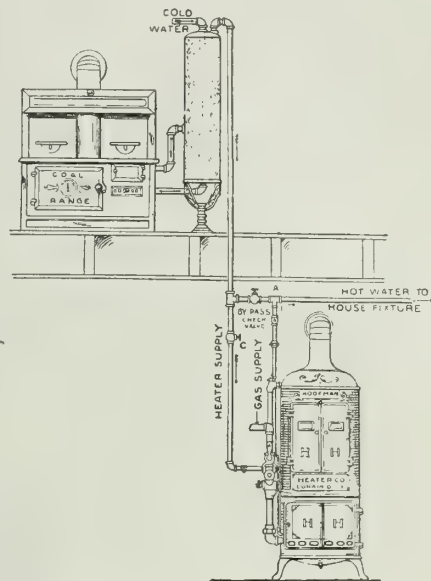


FIG. 4. ELEVATION, SHOWING INSTANTANEOUS HEATER INSTALLED AS AUXILIARY TO RANGE BOILER

### Double Copper Coil Tank Heater.

These heaters (lighted and extinguished by hand) are built to meet the most exacting requirements. They heat rapidly and economically, and are used to heat range boilers of 30 to 60 gals. capacity.

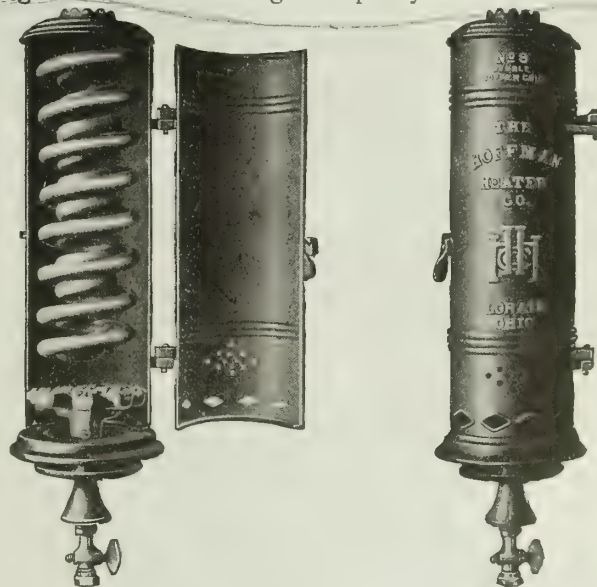


FIG. 5. VIEW OF HOFFMAN DOUBLE COPPER COIL TANK HEATER, NO. 9

### Hoffman Automatic Hot Water Storage System.

This system is designed to furnish a continuous supply of domestic hot water at the rate of 100 to 500 gals. per hour. It is especially adaptable to large residences, apartments, store and office, hospital, school and factory buildings.

**OPERATION**—Automatically provides instant hot water at a turn of the faucet, and maintains uniformly the predetermined degree of temperature, usually 150°. Requires no attention after pilot light is once lighted. Hot water drawn from tank is instantly replaced by cold. This immediately acts upon the thermostat which automatically turns on the gas. Water circulates through heater, and tank temperature is rapidly restored, causing thermostat to shut off gas. When all faucets are closed tank temperature is automatically maintained by gravity circulation.

The system, as sold complete, consists of a Hoffman storage heater, storage tank, 85% magnesia tank covering, tank supports, Hoffman thermostatic gas valve and boiler thermometer.

**SIZE OF SYSTEM REQUIRED—No. 110**—For large residences with 2 or 3 baths and shower, and apartment houses with 3 to 6 apartments.

**No. 200**—Large residences having 3 to 6 baths, showers, kitchen and laundry service. Apartment buildings with 6 or 8 suites and laundry service. Small hotels with not over 5 baths, 10 lavatories, kitchen and laundry.

**No. 300**—Large residences, 6 to 15 baths, showers, etc. Apartment buildings with 8 to 20 suites and usual laundry service. Hotels with not over 10 baths, 50 lavatories, large laundry, etc., and gymnasiums having not over 15 or 18 hot water outlets.

**No. 500**—Adaptable to large hotels, apartment buildings, factories, bath-houses, gymnasiums, public buildings, etc., where hot water demands are greater than in cases previously mentioned.

**DETAILS OF SYSTEM—Hoffman Multicoil Storage Heater**—Combines simplicity, compactness and a high degree of efficiency, with economy in gas consumption. The coil and burner construction has been designed to transfer a maximum number of heat units from gas to water at the lowest possible cost for gas, radiation and flue losses being reduced to a minimum.



FIG. 6. VIEW OF HOFFMAN HOUSE HEATER AND STORAGE HEATER, SHOWING INTERIOR ARRANGEMENT

**Hoffman Sectional Multicoil Construction**—Ten separate sections of copper coil are connected, independently of each other, with unions, to brass manifolds at top and bottom. Highest grade No. 18-gage copper tubing is used; No. 200 contains 100 ft. of  $\frac{3}{4}$ -in.; No. 300 contains 125 ft. of  $\frac{3}{4}$ -in.; No. 500 contains 175 ft. of  $\frac{3}{4}$ -in.

No. 110 heater has only 4 coils made of 50 ft. of No. 18-gage copper tubing; 2 outer coils of  $\frac{7}{8}$ -in. and 2 inner ones of  $\frac{3}{4}$ -in. tubing.

Manifolds and all connections are contained in heater shell. By-pass increases circulation of water, and pitch of coils at the bottom manifold prevents accumulation of sediment, etc. A series of baffle plates interspersed among coil sections increases efficiency.

**Hoffman Cast Iron Shell**—Perfect insulation provided by double shell interpacked with 1 in. of asbestos. Entire shell comes off by removing four bolts. Upper and lower doors equipped with springs, making them self-closing.

**Hoffman Improved Burner**—Equipped with burner as described on preceding page, except for top which is so constructed as to throw flame directly against coils.

**Hoffman Thermostatic Gas Valve**—Compact, simple and efficient, automatically maintaining desired degree of temperature in storage tank.

Heating of water expands copper tube causing porcelain rod which is fastened to its extreme end to move out also. This relieves the pressure on lever A, which, through a series of levers, causes the ball valve to seat, closing gas inlet. As hot water is drawn off from tank, reverse action takes place, opening valve and admitting gas.

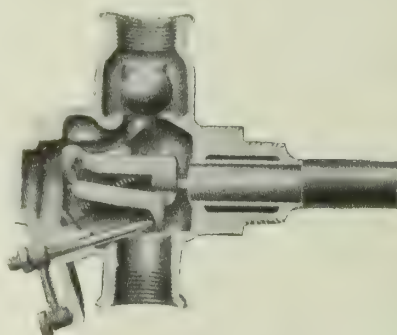
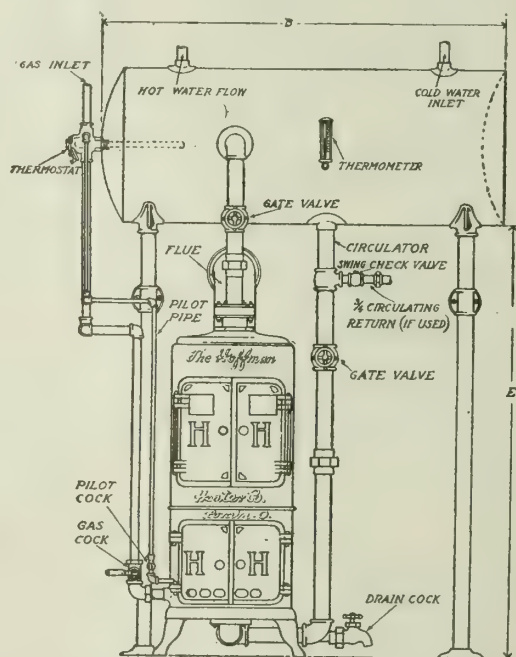


FIG. 7. HOFFMAN THERMOSTATIC GAS VALVE  
Showing details and operation



SHOWING METHOD OF INSTALLING IMPROVED HOFFMAN STORAGE HEATER

SIZES AND CAPACITIES OF HOFFMAN STORAGE HEATERS

Capacity heater, gals.	Capacity tank, gals.	A	B	C	D	E	F	G	H	K	Size circulator	Gas supply	Hot outlet	Cold inlet
100	80	28"	42"	46"	64"	50"	35"	4"	10 1/2"	9 1/2"	1 1/4"	3/4"	1"	1"
100	100	28	48	46	64	50	35	4	10 1/2	9 1/2	1 1/4	3/4	1	1
100	120	28	60	46	64	50	35	4	10 1/2	9 1/2	1 1/4	3/4	1	1
100	150	34	48	52	67	50	35	4	10 1/2	9 1/2	1 1/2	3/4	1	1
200	150	34	48	50	72	55	44	6	18	15	2	1 1/4	1 1/4	1 1/4
200	200	28	96	50	69	55	44	6	18	15	2	1	1 1/2	1 1/2
200	250	34	84	50	72	55	44	6	18	15	2	1	1 1/2	1 1/2
200	300	34	96	50	72	55	44	6	18	15	2	1	1 1/2	1 1/2
300	250	34	84	53	75	58	47	7	21	18	2	1 1/4	1 1/2	1 1/2
300	300	34	96	53	75	58	47	7	21	18	2	1 1/4	2	2
300	375	34	120	53	75	58	47	7	21	18	2	1 1/4	2	2
300	425	40	96	59	78	58	47	7	21	18	2	1 1/4	2	2
500	425	40	96	61	80	60	55	8	23	20	2 1/2	1 1/2	2	2
500	500	46	84	67	83	60	55	8	23	20	2 1/2	1 1/2	2	2
500	720	46	120	67	83	60	55	8	23	20	2 1/2	1 1/2	2	2
500	860	46	144	67	83	60	55	8	23	20	2 1/2	1 1/2	2	2

NOTE—Over all dimensions include 2-in. asbestos boiler covering.



# PARROTT HEATER COMPANY

FACTORY AND OFFICE  
224 Twenty-first Street  
DETROIT, MICH.

## Product.

PARROTT AUTOMATIC INSTANTANEOUS GAS WATER HEATERS.

## Description.

Automatic water and gas valve. One solid red bronze casting, having only two working parts. Simple to the last degree. Water valve piston is inverted cup form and self-cleaning. Piston stem is not connected to piston. Piston is floating type, and can not get out of line with piston stem or bind in valve. Gas valve has cone shape seat and large bearing surface. The hard rubber plunger is sulphur treated and not affected by gas products. The gas supply can be graduated according to amount of water drawn by adjusting screw at bottom of gas valve. This increases or decreases spring tension, allowing adjustment for low or high water pressure without changing spring.

Every effort has been made to simplify and remove all complicated parts and adjustments. All parts are standardized and interchangeable. More than 7,000 heaters are now in use with this automatic valve control.

## Burners.

The burners are circular in form, consisting of 6 burners held in position by interlocking with each other. The burner pipe or mixing chamber of burner is extra long, and allows for a perfect mixture of gas and air. A test at the University of Michigan records 87½ per cent. efficiency. Burner is not affected by condensation due to circular arrangement.

A finely slotted screen (not perforated) is held in place on burner face by a malleable face plate which insures a perfect fit. Burners can easily be cleaned without removing this plate.

## Exclusive Feature.

A condensation plate located above first section of coil, takes care of all condensation, which is immediately vaporized and assists in a more even distribution of heat.

## Heating Surface.

No. 3-63 heater has 86 ft. of No. 18 gage seamless drawn copper tubing ¾ in. in diameter. No. 20 gage tubing is used in upper sections.

No. 2-63 has more than 60 ft. of copper coil.

These long coils of smaller diameter give a larger exposed heating surface, allowing water to travel more rapidly and increasing the heating efficiency.

## Jacket.

Jacket or case is made of cast gray iron held in place with brass screws.

## Finish.

Two coats of black enamel. Panels striped in gold, Parrott green and gold bronze.

Heating temperature is raised 63° Fahr.

## Price.

No. 3-63 heating 3 gals. of water.....\$75.00

No. 2-63 heating 2 gals. of water..... 60.00

Liberal discount to distributors.

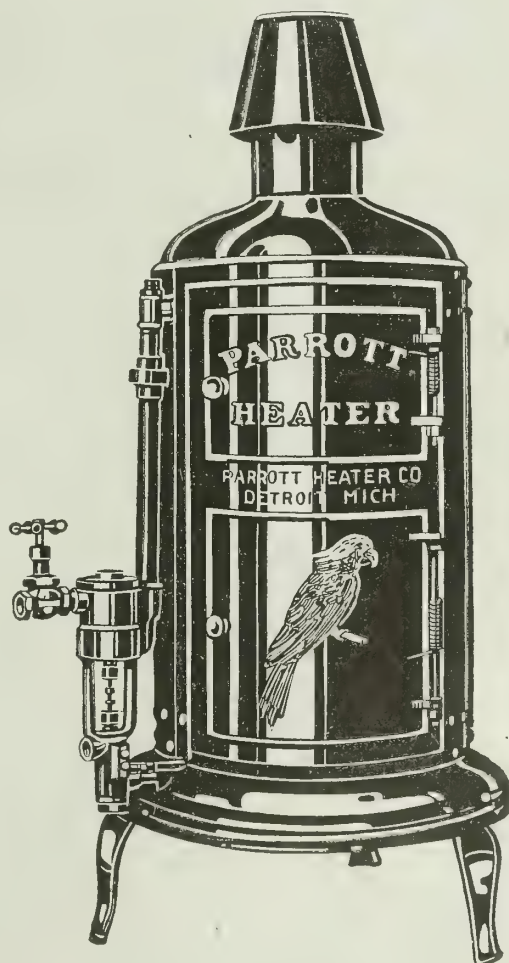
## Specifications.

Place at nearest point to kitchen and bathroom. Requires 10-light gas meter.

Connect to ¾-in. gas supply pipe. If more than 20 ft. use 1-in. pipe.

Connect cold water inlet to ¾-in. supply pipe, place union and stop cock near heater.

Hot water outlet. Put check valve at outlet and connect with ½-in. pipe.



PARROTT AUTOMATIC INSTANTANEOUS WATER HEATER

# PITTSBURGH WATER HEATER COMPANY

Patentees and Manufacturers of Gas Fired, Copper Coil Water Heaters

FACTORY AND MAIN OFFICE

PITTSBURGH, PA.

## BRANCH OFFICES AND MAIN AGENCIES

BALTIMORE, 203 North Liberty Street  
BAY CITY, 224 Ridotto Building  
BOSTON, 78 Broad Street  
BUFFALO, 86 West Huron Street  
CHICAGO, 175 West Jackson Boulevard  
CINCINNATI, 622 Main Street  
CLEVELAND, 1915 Euclid Avenue  
COLUMBUS, 346 North High Street  
DALLAS, 1523 Commerce Street  
DAYTON, 267 Fourth Street Arcade  
DENVER, 408 Fifteenth Street  
DETROIT, 26 Bagley Avenue  
DULUTH, 314 West First Street  
HOUSTON, 1021 Capitol Avenue  
INDIANAPOLIS, 602 Majestic Building  
KANSAS CITY, 1320 Main Street  
LOS ANGELES, 629 Grand Avenue

LOUISVILLE, 518½ South Second Street  
MINNEAPOLIS, 112 South Eighth Street  
NEW ORLEANS, 922-24 Common Street  
NEWARK, Room 25, 16-18 Clinton Street  
NEW YORK, 212 Livingston Street, Brooklyn  
OAKLAND, 402 Fifteenth Street  
PHILADELPHIA, 13th and Arch Streets  
PITTSBURGH (Showroom), 110 Jenkins Arcade  
ST. LOUIS, 1010 Olive Street  
ST. PAUL, Sixth and Jackson Streets  
SAN ANTONIO, 208 Avenue C  
SAN DIEGO, 758 Front Street  
SAN FRANCISCO, 478 Sutter Street  
TOLEDO, 703 Jefferson Street  
TORONTO, 124 Richmond Street, West; 12 Queen Street, East  
WASHINGTON, 1305 G Street, Northwest

## Products.

"PITTSBURGH" AUTOMATIC GAS WATER HEATER; "PITTSBURGH-BUNGALOW" AUTOMATIC GAS WATER HEATER; "BUNGALOW" AUTOMATIC GAS WATER HEATER; "PITTSBURGH" MULTICOIL AUTOMATIC STORAGE SYSTEMS and "PITTSBURGH" MULTICOIL HOT WATER HOUSE HEATERS; "LION" SINGLE, DOUBLE and TRIPLE COPPER COIL TANK WATER HEATERS.

## General Description of "Pittsburgh" Gas Water Heaters.

**SCOPE OF USE**—In the modern home, provision is invariably made for an adequate supply of hot water for domestic uses. Gas fired copper coil water heaters offer the most convenient and economical means of procuring this hot water service.

The "Pittsburgh" line includes heaters suitable for every purpose, and sufficient for the needs of the home, whether they be small or great. For public institutions, office buildings, schools, etc., the "Pittsburgh" water heater can be furnished in sizes and systems to provide unlimited volume of hot water.

**METHODS OF INSTALLATION**—The "Pittsburgh" automatic gas water heaters and the "Pittsburgh-Bungalow" heater (direct flow type) can be used in three ways.

**Direct**—The water is instantly heated in the coils when the hot water faucet is opened. A few moments elapse before the hot water reaches the faucet.

**Circulating**—By this installation, the water is kept hot at any or all faucets, and provides a service slightly more prompt than the direct system. Blue print on request.

**Supplementary**—This is the "re-heating" method of installing automatic heaters. (See Fig. 2.) The "Pittsburgh" is set up in connection with the house heating furnace coils and storage tank. It intercepts the water as it flows from the tank to the fixtures; and if the hot water in the tank is up to the desired temperature, it passes through the copper coils in heater, and over the thermostat or temperature regulator, without turning on the gas in heater. If temperature of water from tank drops, the heater is called into action and continuous hot water is provided at an even temperature.



## "Pittsburgh" Automatic Gas Water Heater.

**DESCRIPTION**—Made in three principal sizes with varying capacity. No. 4 will provide 4 gals. of hot water per minute; No. 6 is for 6 gals. and No. 8 for 8 gals.

On the next page is a table describing the situations to which each heater is adapted.

Specifications can be based upon these scales.

The "Pittsburgh" automatic gas water heater is a cast iron shell, double walled, incasing scientifically staggered copper coils and a battery of powerful, yet economical, Bunsen gas burners. The coils are of the best pure lake copper tubing, thoroughly tested to 300 lbs. hydrostatic pressure. The burners are protected from dropping condensation, and are provided with unbreakable "tented" copper flame check.

A chief distinguishing feature of the "Pittsburgh" is the single gas valve, controlled dually by the pressure and the temperature of the water. The gas valve is opened by a plunger operated upon by the water valve, and while the water flows the gas valve is alternately closed and opened by the operation of the thermostat. It can not be opened when the pressure from the water valve is off.

The "Pittsburgh" water valve is provided with non-corrosive cotton packing which prevents sticking and practically eliminates wearing of the parts, inevitable where metal is in contact with metal.

"Pittsburghs" should be installed in the cellar or laundry, and in the best location with reference to gas and water lines and the parts of the house to be served.

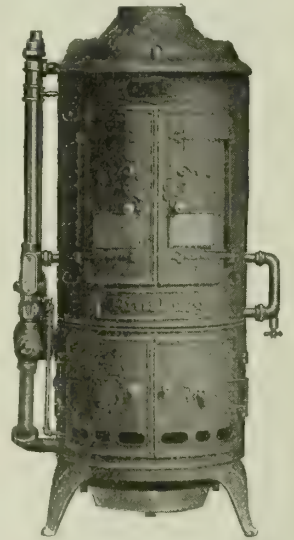


FIG. 1. "PITTSBURGH" AUTOMATIC GAS WATER HEATER



**SIZES AND CAPACITIES**—No. 4. Capacity 4 gals. of hot water per minute. This is a very popular size, and adapted to the home having bathroom, kitchen and laundry, with 1 or 2 extra lavatories.

No. 6. Capacity 6 gals. of hot water per minute. This size will meet the requirements of the house containing laundry, kitchen, 2 bathrooms, butler's pantry, 1 or more bedroom lavatories, and 1 shower.

No. 8. Capacity 8 gals. of hot water per minute. This size is suitable for large dwellings having 3 to 4 bathrooms, butler's pantry, several extra lavatories, 2 showers, besides kitchen and laundry fixtures.

**INSTALLATION AND FUEL**—Any competent plumber can install the "Pittsburgh" heaters, as detailed instructions are furnished with every heater. They will operate on as low as 8 lbs. of water pressure at highest faucet, using any gas as fuel, with the exception of acetylene.

**FLUE AND GAS CONDITIONS REQUIRED**—Indicate on the plan a separate flue opening where heater is to be located. Further, provide for an ample gas service, not only from the main to the house, but from the meter to the heater. A 1½-in. gas supply for modern homes having not over 2 bathrooms, and a 2-in. supply for homes having more, will be sufficient.

**COST OF OPERATING**—For every cubic foot of gas burned, 1 gal. of water is heated. With gas at \$1.00 per 1000 cu. ft., the "Pittsburgh" heaters furnish 10 gals. of hot water for 1¢, or an ordinary hot bath for 2¢. Under the "Pittsburgh" supplementary heating system, the operating cost is even less.

**SPECIFICATION FORM**—Install complete in basement, where indicated on plans, 1 No. .... "Pittsburgh" Automatic Gas Water Heater (to be furnished by owner), to be connected to gas, water and flue in exact accordance with directions as furnished by the manufacturers, PITTSBURGH WATER HEATER COMPANY, Pittsburgh, Pa.

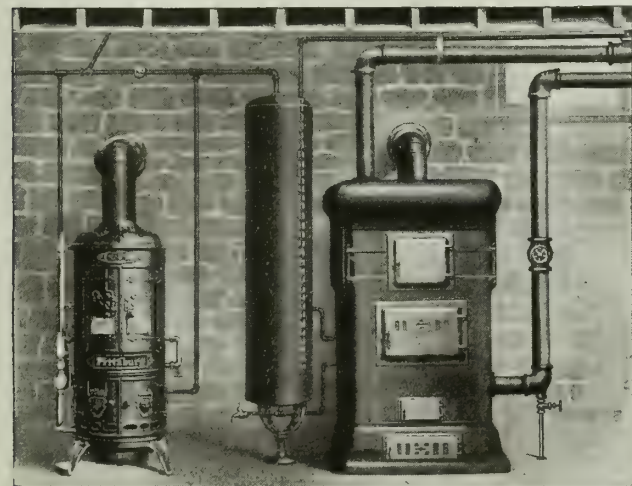


FIG. 2. THE "PITTSBURGH" SUPPLEMENTARY TO RE-HEATING SYSTEM

SIZES, CAPACITIES, PRICES AND MECHANICAL DATA OF THE "PITTSBURGH"

Size	*Prices		Avg. capacity in gals. per min.	Size of water connection, cold inlet, hot outlet, ins.	Gas supply, direct line from meter, ins.	Min. size of meter, lights	Size of flue connections, ins.	Height, ins.	Diam. of heater including mechanism, ins.	Weight, crated, lbs.
	Eastern	Western								
No. 4	\$135	\$145	4	1 3/4	1 1/4	45	6	47	23	370
No. 6	185	200	6	3/4	1 1/4	60	7	52	26	475
No. 8	250	265	8	3/4	1 1/2	80	8	58	29	700

\*Western is from eastern border of Montana, Wyoming, Colorado, and New Mexico, and including all of Canada.

"Pittsburgh-Bungalow" Automatic Instantaneous Gas Water Heater.

One size only: No. 65.

**DESCRIPTION**—The newest and, in many respects, the most radical innovation since the first water heater was introduced. The 3-diameter jacket provides: A space allowing the burners to be formed in a perfect circle; double wall in main heat chamber, with dead air space; converging wall at top, where double wall is not required, which also deflects heat toward the coils.

**FEATURES**—Two radical features are the new valve mechanism in connection with the horizontal internal thermostat and the tent gauze spout outlet burners.

**METHODS OF INSTALLATION**—The "Pittsburgh-Bungalow" heaters can be used in two ways:

**Direct**—The water is instantly heated in the coils when the hot water faucet is opened. A few moments elapse before the hot water reaches the faucet. This is the most frequent method of installation.

**Supplementary**—This is the "re-heating" method of installing automatic heaters. The heater is set up in connection with the house heating furnace coils and tank. It intercepts the water as it flows from the tank to the fixtures. If the water in the tank is up to the desired temperature, it passes through the heater and over the thermostat without turning on the gas in the heater. If the temperature of the water from the tank drops, additional heat, as required, is imparted by the heater as it intercepts the flowing water on its way to the fixtures.

**COST OF OPERATION**—For every cubic foot of gas burned, 1 gal. of water is heated. With gas at \$1.00 per 1000 cu. ft., the "Pittsburgh-Bungalow" heaters furnish 10 gals. of hot water for 1¢, or an ordinary hot bath for 2¢. Under the "Pittsburgh-Bungalow" supplementary heating system, the operating cost is even less.

**SPECIFICATION FORM**—Install complete in basement, where indicated on plans, 1 No. 65 "Pittsburgh-Bungalow" Automatic Gas Water Heater (to be furnished by owner), to be connected to gas, water and flue in exact accordance with directions, as furnished by the manufacturers, PITTSBURGH WATER HEATER COMPANY, Pittsburgh, Pa.

SIZES, CAPACITIES, PRICES AND MECHANICAL DATA OF "PITTSBURGH-BUNGALOW"

Size	†Prices		Avg. capacity in gals. per min.	Size of water connection, cold inlet, hot outlet, ins.	Gas supply, ins. (a)	Min. size of meter, lights	Size of flue connection, ins.	Height, ins.	Diameter, ins.	Weight, crated, lbs.
	Eastern	Western								
No. 40	\$60	\$65	1 1/2	1 1/2	3/4	10	4	31	10	143
No. 50	70	75	2	2	3/4	20	5	33	11	180
No. 60	80	85	2 1/2	2 1/2	3/4	30	5	36	12	205
*No. 55	80	80	2	2	3/4	20	5	33	11	184
*No. 65	110	115	3	3	3/4	30	5	37	16	300

\*With thermostat. (a) Gas supply direct from meter when possible.  
†Western is from eastern boundary of Montana, Wyoming, Colorado and New Mexico, and including all of Canada.

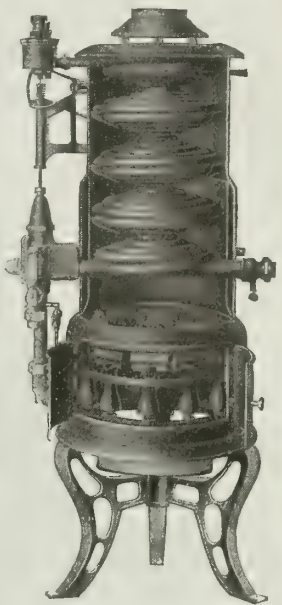


FIG. 3. "PITTSBURGH-BUNGALOW" WATER HEATER



**"Bungalow" Automatic Gas Water Heater.**

This type of heater equipped with water pressure valve control only. Made in three sizes; see table on preceding page.

**"Pittsburgh" Multicoil Automatic Storage Systems.**

**SCOPE OF USE**—For apartment buildings, large residences, office buildings, hospitals, factories, foundries, public institutions, schools, bathhouses and restaurants, where the situation requires hot water in quantities from 100 to 1000 gals. or more per hour.

These storage systems are frequently used where the water pressure or the gas supply may be inadequate to successfully operate the "Pittsburgh" automatic heater.

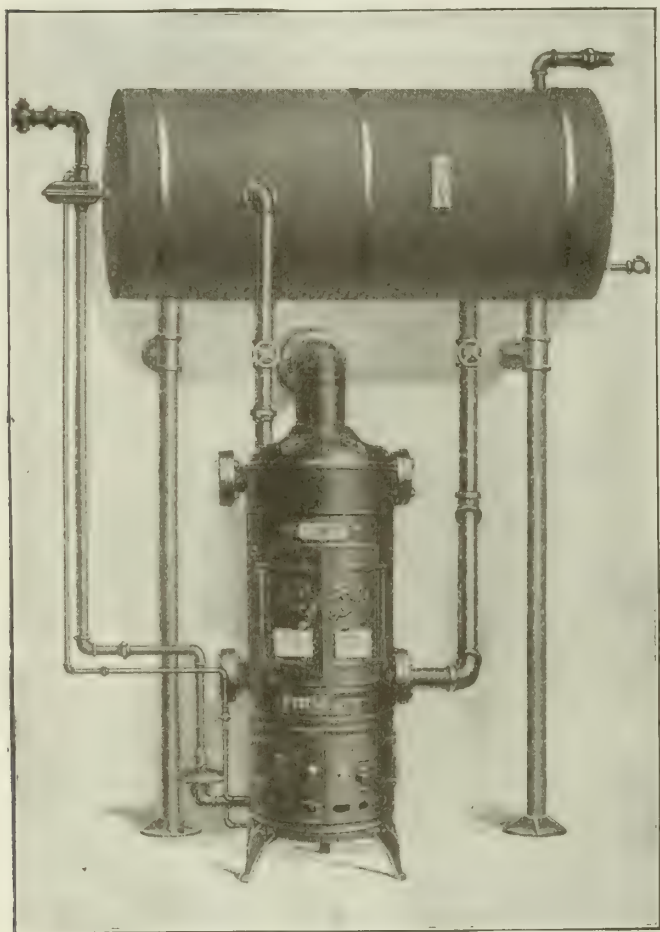


FIG. 4. "PITTSBURGH" MULTICOIL STORAGE SYSTEM  
Used in situations where large volume of hot water is required during short periods

**DESCRIPTION**—The "Pittsburgh" multicoil storage heater and system is equipped with "Pittsburgh" automatic temperature control or "moment valve," which will open and close the gas valve on the variation of but a few degrees in the temperature of water at the center of the tank. Copper tanks, suitably tapped, can be used in connection with "Pittsburgh" storage heaters.

The Duplex systems have two or more heaters in connection, and can be made to meet practically unlimited demands for hot water.

**HARD WATER ATTACHMENT**—Where the water supply is appreciably burdened with such minerals as lime, magnesia, or silica, it is advisable to include a hard water attachment. For this installation two compartment tanks are provided. In one is the regular hot water supply; in the other, the heating medium. Full

details, blue prints, prices and specifications supplied on request.

**SIZES**—In estimating the necessary size of storage systems, use the following table which gives approximate high demand for each class of service per hour.

Lavatories .....	2 gals.
Laundry trays.....	5 gals.
Slop sinks .....	15 gals.
Bathtubs .....	30 gals.
Showers .....	45 gals.
Apartments .....	25 gals.

**TYPES FOR VARIOUS SERVICES**—No. 100 "Pittsburgh" multicoil storage system for houses with 2 bathrooms, 1 additional lavatory, kitchen sink and laundry tubs, or 2-family apartment buildings.

No. 200 "Pittsburgh" multicoil storage system for houses with 2 bathrooms (1 with shower), 2 additional lavatories, kitchen and pantry sinks, laundry tubs, or 3-family apartment buildings.

No. 300 "Pittsburgh" multicoil storage system for houses with 3 bathrooms (2 with showers), 3 additional lavatories, kitchen and pantry sinks, laundry tubs, or 4-family apartment buildings.

No. 400 "Pittsburgh" multicoil storage system for large houses with 4 bathrooms (3 with showers), 4 additional lavatories, kitchen and pantry sinks, laundry sinks, or 6-family apartment buildings.

No. 500 "Pittsburgh" multicoil storage system for very large houses with long runs of supply and return piping, with 5 bathrooms (3 with showers), 5 additional lavatories, kitchen and pantry sinks, laundry tubs, or 8-family apartment buildings.

The above recommendations are made for the "Pittsburgh" multicoil automatic storage system when operated on manufactured gas.

**SPECIFICATION FORMS—**

For "Pittsburgh" Multicoil Automatic Storage Systems with a Single Heater—"Furnish and install at location indicated, 1 .... gal. extra heavy "Pittsburgh" ..... iron tank, to be supported in horizontal position on "Pittsburgh" tank supports, and properly connected with 1 No. .... "Pittsburgh" Multicoil Automatic Storage Heater, using .... in. brass pipe for circulators between heater and tank, with ..... brass fittings and gate valves.

"The system to be connected in exact accordance with the printed directions and blue prints of the PITTSBURGH WATER HEATER COMPANY. Run direct .... in. gas line to the heater with ..... in. gas cock in same. .... in. independent flue pipe should be run from the heater to a chimney having a good draft, and tank to be covered with PITTSBURGH WATER HEATER COMPANY'S special tank insulation, properly canvassed.

"The whole system to be set true and level in a workmanlike manner."

**For Duplex System**—Similar to form for single heater system, adding the number of heaters and other necessary alterations.

**Small Automatic Storage Systems.**

Small automatic storage systems, with "moment valve" temperature regulators and storage tanks of 40, 50, 66 or 80 gals. capacity, can be provided. This type of automatic storage system is recommended where the gas mains are small and gas pressures vary, and also where low pressure water supply prevails. Details and specifications on request.



## MECHANICAL DATA OF "PITTSBURGH" MULTICOIL AUTOMATIC STORAGE SYSTEMS

Heating capacity, gals. per hour	Capacity of tanks, gals.	Dimension of iron tanks, black—galv.	Size of circulating pipes, ins.	Size of hot supply to house—also cold inlet—ins.	Size of flue pipes, ins.	Height of heater, ins.	Weight of heater, lbs.	Weight of iron tank, lbs.	Heating surface of heater, sq. ins.	Size, moment valve and gas supply, ins.
100	80	5' x 20"	1½	1	6	43	375	290	1500	1
100	100	5' x 22"	1½	1½	6	43	375	325	1500	1
100	150	6' 4" x 24"	1½	1½	6	43	375	590	1500	1
200	100	5' x 22"	2	1½	6	43	405	325	2450	1
200	150	6' 4" x 24"	2	1½	6	43	405	590	2450	1
200	200	8' 6" x 24"	2	1½	6	43	405	740	2450	1
200	250	7' x 30"	2	1½	6	43	405	970	2450	1
200	300	8' x 30"	2	2	6	43	405	1050	2450	1
300	200	8' 6" x 24"	2½	1½	6	51½	570	740	3500	1½
300	250	7' x 30"	2½	1½	6	51½	570	970	3500	1½
300	300	8' x 30"	2½	2	6	51½	570	1050	3500	1½
300	365	10' x 30"	2½	2	6	51½	570	1210	3500	1½
400	300	8' x 30"	3	2	7	54	650	1050	4650	1½
400	365	10' x 30"	3	2	7	54	650	1210	4650	1½
400	425	8' x 36"	3	2½	7	54	650	1600	4650	1½
400	500	9' 6" x 36"	3	2½	7	54	650	1900	4650	1½
400	600	8' 6" x 42"	3	2½	7	54	650	2100	4650	1½
500	425	8' x 36"	3½	2½	8	60½	860	1600	5100	2
500	500	9' 6" x 36"	3½	2½	8	60½	860	1900	5100	2
500	600	8' 6" x 42"	3½	2½	8	60½	860	2100	5100	2
500	700	10' x 42"	3½	2½	8	60½	860	2250	5100	2
500	800	8' 6" x 48"	3½	2½	8	60½	860	2650	5100	2
500	1000	11' 2" x 48"	3½	2½	8	60½	860	3300	5100	2

All tanks should be provided with handholes for cleaning, and large sizes with manholes. Tanks of 200-gal. capacity and larger are furnished with extra tappings for connecting additional heaters. Dimensions, capacities and weights of tanks not guaranteed. Specify dimensions if exact size is important. Brown Bros. copper tanks can be furnished up to 300-gal. capacity.

**"Pittsburgh" Multicoil Hot Water House Heaters.**

A very efficient, enduring, and economical copper coil heater to be used in connection with hot water radiators. It furnishes a clean, healthful house heating system.

The "Pittsburgh" multicoil house heater conforms in every way to the most exacting requirements of the best heating practice.

The upright interlocked position of the coils presents to the flame the largest possible heating surface. The interlocked construction prevents any sagging or "trapping" of the coils. Coils are entirely free from all brazed joints or threaded connections within the heat zone. Any coil may be disconnected at the manifold and removed for cleaning.

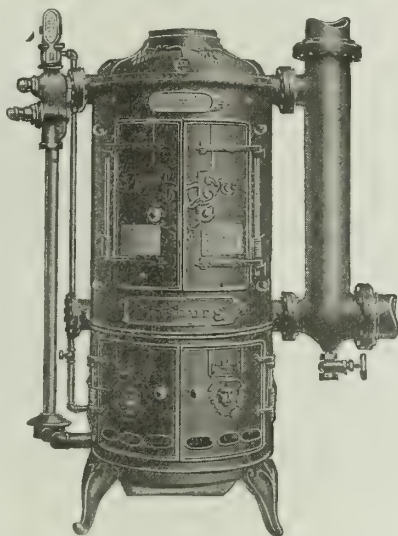


FIG. 5. "PITTSBURGH" MULTICOIL HOT WATER HOUSE HEATER

## SIZES AND CAPACITIES OF "PITTSBURGH" MULTI-COIL HOT WATER HOUSE HEATERS

No. of heater	Height to top of stand pipe, ins.	Diameter of heater shell, ins.	Diameter of inlet and outlet, ins.	Rated capacity of radiation (mains incl'd), sq. ft.
400	42	14	2½	400
600	51	16½	3½	600
900	52	17½	4	900
1200	58	18½	5	1200
1500	61	26¾	6	1500

Specifications, blue prints and quotations on request.

**"Lion" Copper Coil Tank Water Heaters.**

A popular water heater in sizes suitable for various situations. It is installed in kitchen or cellar, attached to the tank in the manner shown in illustration.

The small size has single coil; the larger sizes have double and triple coils.

The jacket is of cast iron, double diameter.

The heater has cast iron burner; coils are brazed to brass manifolds, all securely locked with the heavy jacket, and can not sag or get out of alignment.

The gas cock has spring "take-up," which prevents leakage from wear.

SPECIFICATION FORM—"Furnish and install in connection with 1 .... gal., extra heavy galvanized iron tank, where indicated, 1 No. .... "Lion" Tank Water Heater, in accordance with instructions of manufacturers, PITTSBURGH WATER HEATER COMPANY, Pittsburgh, Pa.

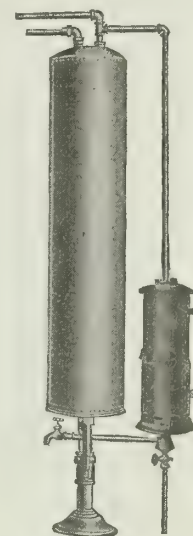


FIG. 6. "LION" WATER HEATER

As usually attached to kitchen boiler, independent of range or waterback

## SIZES, PRICES AND WEIGHTS OF "LION" TANK WATER HEATERS

Sizes	Prices	Size of tank, gals.	Gas supply, ins.	Size of flue, ins.	Height, ins.	Diameter, ins.	Weight, crated, lbs.
0	\$15.00	20	½	3	20	8¾	35
1	20.00	30-40	½	3	24	8¾	45
1½	25.00	40-50	½	3	26	8¾	50
2	35.00	50-80	¾	4	26	10	90

# GENERAL FIRE EXTINGUISHER COMPANY

Manufacturers of Gas Heating Systems

PROVIDENCE, R. I.

## Products.

The GENERAL FIRE EXTINGUISHER GAS BURNING SYSTEM OF GRINNELL READY-HEAT.

For Fire Extinguishers, see pages 1136-39.

## Description.

Grinnell Ready-heat amply fulfills all the requirements of modern heating with none of the drawbacks of the furnace or heating boiler.

It possesses, in addition, the advantage that it costs nothing for fuel, unless heating is actually required. Thus in mild weather, when a coal fire must be banked in order to maintain it for morning and evening use, the Grinnell System is out of operation entirely, but is ready for instantaneous service when heat is again required.

Grinnell Ready-heat is a gas burning system, with all the flexibility that gas heating permits, but minus all the usual gas disadvantages.

It operates by means of radiators, but employs neither steam nor hot water. Each radiator forms an independent heating unit that may be operated separately, or extinguished altogether without interfering with other radiators. Variations of temperature between different rooms are automatically controlled by thermostatic regulation, insuring the utmost economy in operation with the minimum of attention.

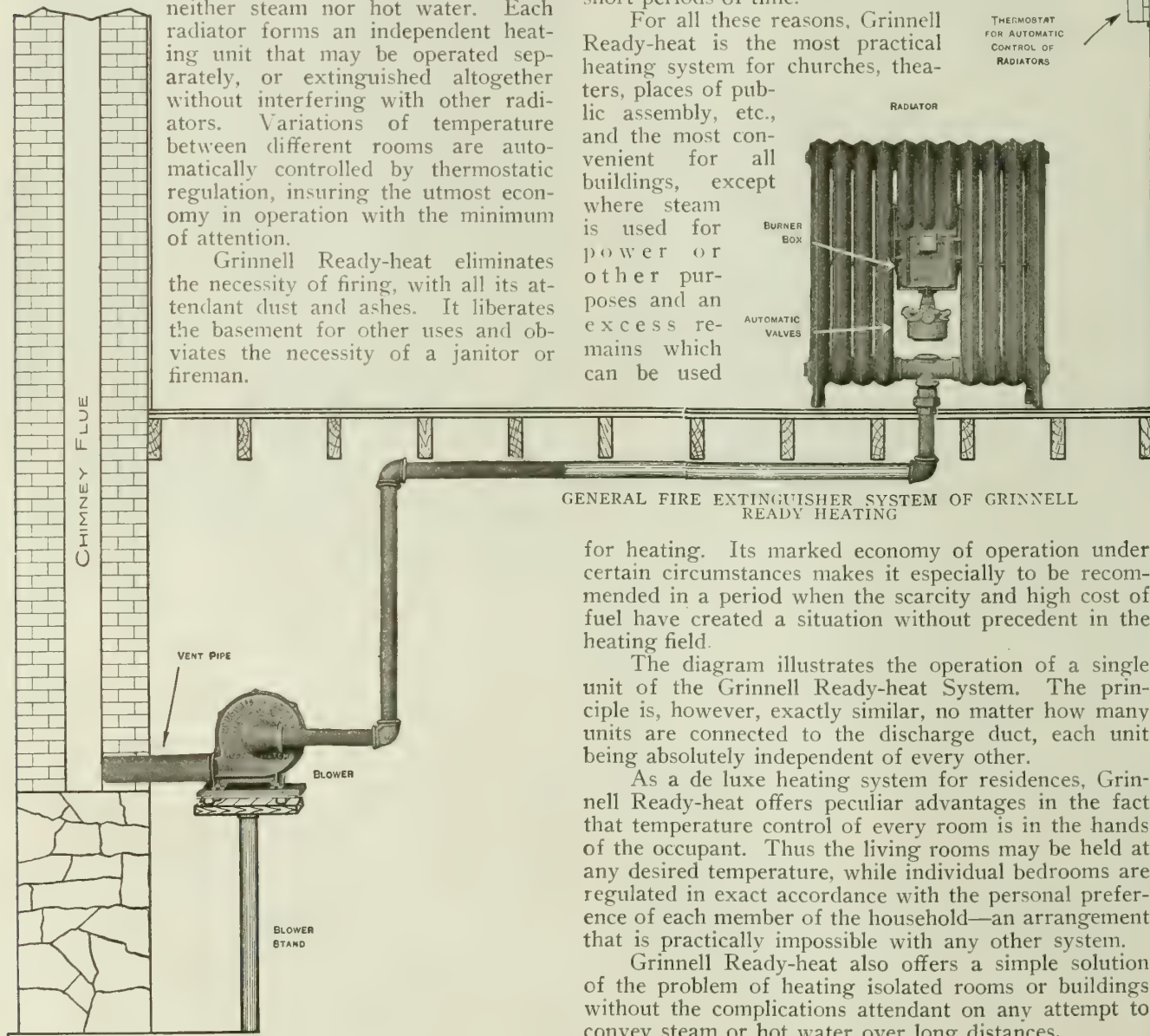
Grinnell Ready-heat eliminates the necessity of firing, with all its attendant dust and ashes. It liberates the basement for other uses and obviates the necessity of a janitor or fireman.

Every radiator carries its own system of partial ventilation, exhausting, by means of a central fan, into a common flue or chimney after all heat has been properly radiated. This obviates one common objection to gas heating, because there are no fumes or odors to escape into the room. Hence Grinnell Ready-heat is the most hygienic form of heating possible.

The automatic thermostat can be set to turn on or off the heat at any predetermined time. Thus it is possible to lower the heat at night, raising it in the early morning so that the house or building is thoroughly heated during the daytime. If the heat rises above the desired degree, it is automatically turned off, thus conserving fuel.

Because it need only be operated for a short period before the building is actually required, Grinnell Ready-heat is peculiarly suitable for all buildings which are in use at intervals and for only short periods of time.

For all these reasons, Grinnell Ready-heat is the most practical heating system for churches, theaters, places of public assembly, etc., and the most convenient for all buildings, except where steam is used for power or other purposes and an excess remains which can be used



for heating. Its marked economy of operation under certain circumstances makes it especially to be recommended in a period when the scarcity and high cost of fuel have created a situation without precedent in the heating field.

The diagram illustrates the operation of a single unit of the Grinnell Ready-heat System. The principle is, however, exactly similar, no matter how many units are connected to the discharge duct, each unit being absolutely independent of every other.

As a de luxe heating system for residences, Grinnell Ready-heat offers peculiar advantages in the fact that temperature control of every room is in the hands of the occupant. Thus the living rooms may be held at any desired temperature, while individual bedrooms are regulated in exact accordance with the personal preference of each member of the household—an arrangement that is practically impossible with any other system.

Grinnell Ready-heat also offers a simple solution of the problem of heating isolated rooms or buildings without the complications attendant on any attempt to convey steam or hot water over long distances.



GENERAL GAS LIGHT COMPANY

Manufacturers of Radiant Gas Heaters

GENERAL OFFICES  
KALAMAZOO, MICH.

BRANCH OFFICES  
NEW YORK, N. Y., 44 West Broadway      SAN FRANCISCO, CAL., 768 Mission Street

Products.

HUMPHREY RADIANTFIRE, a Gas Heater for the Fireplace.

Description of the Radiantfire.

The Radiantfire is an entirely new departure in gas heating, a radiant heater designed especially for use in open fireplaces.

The heater body consists of a cast iron frame and porcelain back wall, in front of which the burners and radiants are fitted, and over these the ornamental bronze housings. All exposed metal work is of the finest quality in finish and proof against tarnishing.

The burners distribute the blue flame into lacelike porcelain radiants, heating them to a radiant incandescence, which throws off intense heat and a cheerful firelight.

Advantages.

The Radiantfire is lighted and extinguished without the slightest "pop" or flashback, may be turned

down to any heat, and burns without sound or odor on normal gas pressure.

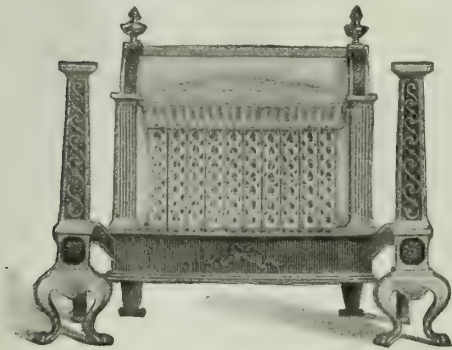
It consumes about 35 cu. ft. of gas per hour at full capacity, but from 10 to 15 minutes after lighting may be turned down to a consumption of from 20 to 25 ft. per hour with perfect results and with full firelight effects.

Tests.

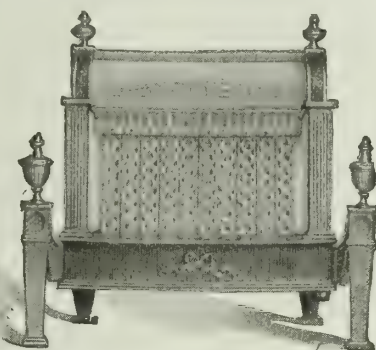
The Radiantfire has been passed by the National Board of Fire Underwriters, and enthusiastically accepted by gas companies throughout the country.

DETAILED SPECIFICATIONS, RADIANTFIRE HEATERS

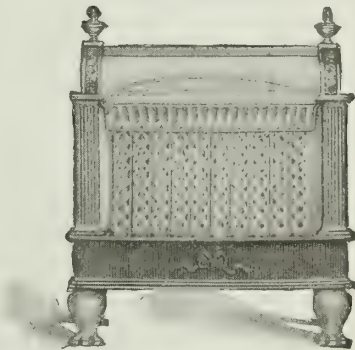
Style and number	Over all dimensions, ins.			Body dimensions, ins.			Fire surface, ins.		Size pipe, ins.	Height from floor, ins.
	Width	Height	Depth	Width	Height	Depth	Width	Height		
De Luxe 101	30	22 <sup>3</sup> / <sub>4</sub>	10-13	19	19 <sup>1</sup> / <sub>2</sub>	7	13	7 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>
De Luxe 102	24 <sup>1</sup> / <sub>2</sub>	22 <sup>3</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>4</sub>	19	19 <sup>1</sup> / <sub>2</sub>	7	13	7 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>
De Luxe 103	19 <sup>1</sup> / <sub>2</sub>	22 <sup>3</sup> / <sub>4</sub>	8	19	19 <sup>1</sup> / <sub>2</sub>	7	13	7 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>
Rustic 40	27	21	7	17	21	7	9	7 <sup>1</sup> / <sub>2</sub>	3	3
Rustic 41	17	21	7	17	21	7	9	7 <sup>1</sup> / <sub>2</sub>	3	3
Bungalow 20	17	21	7	17	21	7	9	7 <sup>1</sup> / <sub>2</sub>	3	3



De Luxe Series 101  
Fireplace openings from 30 to 36 ins. or larger  
Appropriate for living rooms, dining rooms, halls, libraries or offices. By selection of proper finish, it harmonizes well with most any character of decoration, especially Mission, Flemish and Old English



De Luxe Series 102  
Fireplace openings from 28 to 36 ins.  
Appropriate for living rooms, dining rooms, halls, parlors or large bedrooms, especially where the treatment is Colonial



De Luxe Series 103  
Fireplace openings from 22 to 30 ins.  
Appropriate for any room; recommended especially for bedrooms, and where decorations are plain

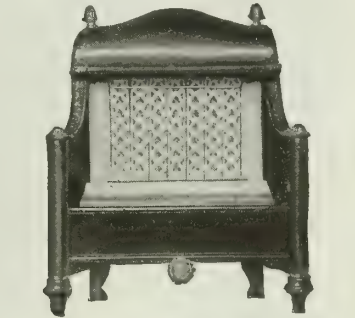
The three styles illustrated above are furnished in antique brass, antique steel or armor and antique bronze. Other finishes special on order



Rustic Series 40  
Fireplace openings from 22 to 30 ins.  
Furnished in verde antique finish only, a rich oxidized green and black treatment.  
Appropriate for use in rooms where hardware and lighting fixtures are of this popular finish



Rustic Series 41  
Fireplace openings from 22 to 30 ins.  
Furnished in verde antique only, as in Style 40. Appropriate for use in rooms where decorations and furnishings are less elaborate, and most suitable for offices



Bungalow Series 20  
For use in fireplaces and as a portable heater. Made of stamped steel and finished in black only.  
Embodies all advantages and qualities of larger types in convenient size and form for general use

# HUGO MANUFACTURING CO.

## Manufacturers of Ventilating Gas Radiators

### DULUTH, MINN.

#### Products.

A complete line of GAS HEATERS; HAWKS VENTILATING and NON-VENTED GAS RADIATORS.

Circulating Portable Spark Heaters, Hawks Boiler Stands, Drain Traps, etc.

#### Ventilating Gas Radiators.

**DESCRIPTION**—The Hawks gas heating and ventilating system consists of individual gas radiator units, each complete in itself and entirely independent in operation, distributed throughout building as needed. Each radiator is strong cast iron, resembling a steam radiator in shape and size. A simple gas cock and Bunsen mixer, with a plain burner entirely within radiator is the only mechanism. No water, steam, or anything requiring attention is used.

When gas is lighted at an opening in the end, foul air from the floor is drawn into radiator through round ports near the bottom. It passes up the outside columns, over the top and down center column again, to the middle of radiator, where it escapes through a vent pipe to the chimney, carrying with it all the products of combustion. In this long circuit of over 4 ft. within the radiator, fully 95% of the heat is radiated so that when the gases reach the outlet there is only enough left to maintain the draft.

Radiators are a heating and ventilating system combined, operating on the principle of circulation by natural draft. Ventilating is constant regardless of amount of fuel used, or amount of heat required. Radiators are furnished complete with outlet ell, ready to connect with gas system and vent piping. When more than 8 sections are needed in one unit, 2 radiators can be set together in tandem with vent outlet in center.

Gas used averages about 18 cu. ft. per hour for a 6-section radiator, representing a cost of about  $1\frac{1}{2}\phi$  per hour with gas at 80¢ a thousand.

**USES**—Adaptable to any place where an ordinary radiator can be used. Especially suitable for churches, theaters or lodge rooms where the intermittent service required makes the use of gas economical and convenient. The ideal system for apartments. Also useful in

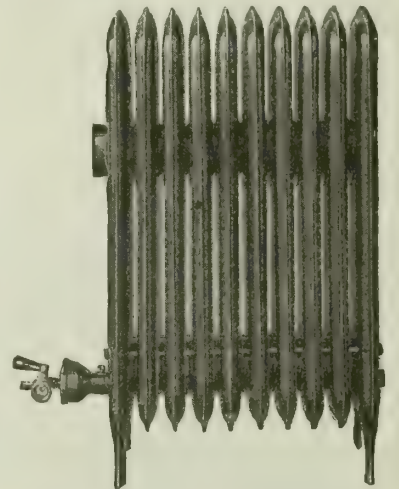
warehouse offices where the rest of the building does not need much heat, and where stoves or furnaces would occupy too much space.

Makes a good auxiliary heater for exposed rooms, bathrooms, sick rooms, attic rooms, or any place where heat is wanted on short notice.

**ADVANTAGES**—Gives quick, economical heat, just where and when it is wanted. Fresh air is constantly drawn into the room to replace air vented up the flue, insuring good ventilation.

#### Hawks No. 78 Presto Armco Iron Ventilating Gas Radiator.

Made of the best materials obtainable, heavy (No. 22 gage) Armco "rust resisting" iron. Furnished ready finished in two coats of best black enamel, baked on to withstand high temperature without discoloring or cracking. Built on the same principle as No. 52, but, because of its light weight, is much easier to handle and install. Responds quickly, giving "heat at the touch of a match." Installed with iron pipe vent, temporarily with stove pipe, or used without a flue where ventilation is not desired.



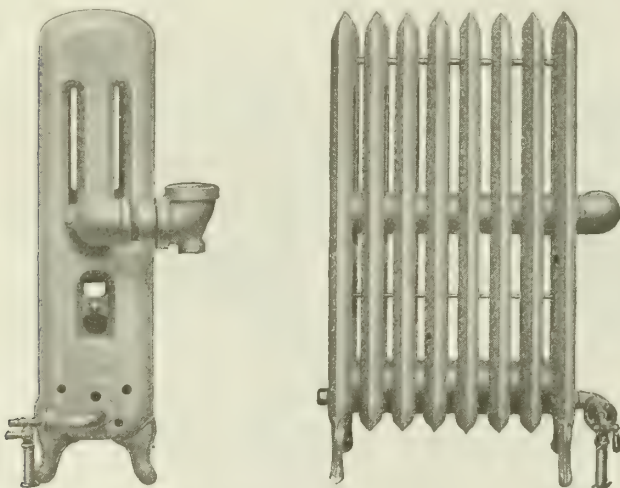
THE HAWKS NO. 78 VENTILATING GAS RADIATOR

#### Specifications.

Number of radiator.....	52	78
Number of sections per radiator....	4 to 8	4 to 10
Radiation per section.....	5 ft.	4 ft.
Approximate gas consumption per section, minimum.....	$\frac{1}{2}$ ft.	$\frac{1}{2}$ ft.
Approximate gas consumption per section, maximum.....	3 ft.	$2\frac{1}{2}$ ft.
Approximate weight per section....	30 lbs.	5 lbs.
Size outlet flue.....	2 and 3 ins.	2 and 3 ins
Height, center of outlet flue from floor .....	$20\frac{3}{4}$ ins.	19 ins.
Size gas connection.....	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.
Height, center of burner from floor	6 ins.	7 ins.
Height over all.....	38 ins.	28 ins.
Depth over all.....	9 ins.	9 ins.
Length over all (4-section).....	13 ins.	11 ins.
Additional length per section.....	$2\frac{1}{2}$ ins.	2 ins.

#### How Installed.

Figure radiation same as for steam. A flue extending to roof and giving a good dependable draft, regardless of wind direction, must be provided. Radiators should be located as near as possible to outlet flue to avoid long or horizontal runs of vent pipe. Use standard 2-in. iron pipe threaded for vent up to 8 sections,  $2\frac{1}{2}$ -in. up to 16 sections, 3-in. up to 24 sections, and  $3\frac{1}{2}$ -in. up to 32 sections. Use larger pipe for horizontal runs.



HAWKS NO. 52 CAST IRON VENTILATING GAS RADIATOR



THE JOHN E. MANNEN CO.

Manufacturers of Garage Heaters and Flour Boxes

2241-2255 St. Clair Avenue

CLEVELAND, OHIO

Products.

The "AGE-GAR" GARAGE HEATER, for use with natural or artificial gas.

"MANEST" TRIANGULAR FLOUR BOX, and the "MANEST" ECONOMIC FLOUR BOX, for residences and apartment houses.

For Gas Laundry Equipment, see page 1045.

"Age-Gar" Garage Heater.

A practical and efficient heater, using natural or artificial gas, designed and made by pioneers in the natural gas field of Ohio. A powerful heater; is practically gastight, and has a galvanized pan that gives double fire protection. Best by test.

Will provide supply of hot water when desired, by placing hot water coil in heater.

Will insure summer conditions in the garage during the cold months of winter, with absolute safety.

SIZE—Fig. 1—Width, 12 ins.; depth, 19 ins.; height, 42 ins.

Fig. 2—Width, 12 ins.; depth, 19 ins.; height, 29 ins. without hood.

"Manest" Triangular Flour Box.

The "Manest" triangular flour box is a most convenient and sanitary receptacle for apartment house use. Made in two sizes, and finished and decorated in japanned metal, as shown.

Not affected by mold, damp or dust.

Easy of access and takes up space that could not otherwise be occupied, fitting snugly in to any corner.

"Best by Test."



"MANEST" TRIANGULAR FLOUR BOX  
May be had in black or white enamel

DATA, "MANEST" TRIANGULAR FLOUR BOXES				
No.	High	Wide	Deep	Capacity
25	10 ins.	10 ins.	19½ ins.	¼ bbl. or 25 lbs.
50	12 ins.	12 ins.	22 ins.	½ bbl. or 50 lbs.

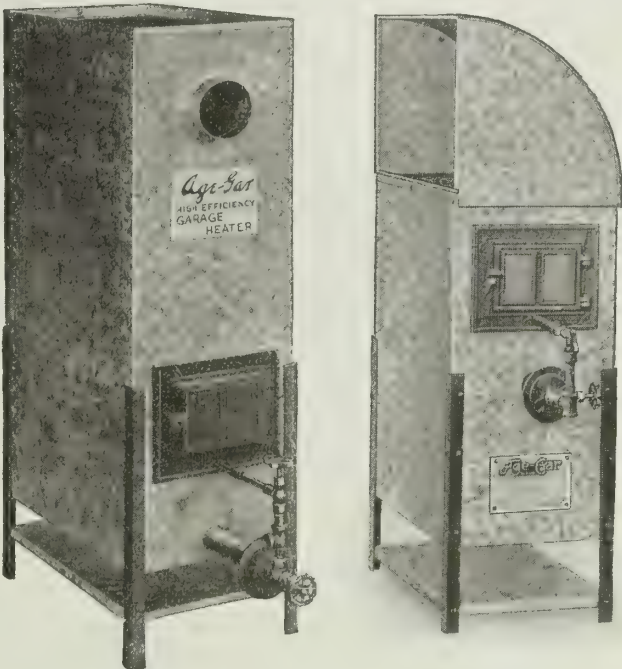


FIG. 1  
"AGE-GAR" HIGH EFFICIENCY GARAGE HEATER

FIG. 2

"Manest" Economic Flour Box.

Box made of tinned metal. Finished in glossy black and decorated as shown. Proof against vermin and mice. Not affected by mold, damp or dust.

Fastens against inside of cupboard door—out of the way when not wanted; easy of access when wanted.

Costs less and takes up less space than wood flour bins.

For residences and apartment houses.



"MANEST" ECONOMIC FLOUR BOX  
May be had in black or white enamel

DATA, "MANEST" ECONOMIC FLOUR BOXES			
High	Wide	Deep	Capacity
16 ins.	12 ins.	8 ins.	¼ bbl. or 25 lbs.
20 ins.	14 ins.	11 ins.	½ bbl. or 50 lbs.
25 ins.	18 ins.	14 ins.	¾ bbl. or 100 lbs.

# POWELL STEEL KITCHEN CO.

Manufacturers of Buffet Kitchens and Cabinets

175 West Jackson Boulevard  
CHICAGO, ILL.  
(Care of Building Material Exhibit)

101 Park Avenue  
NEW YORK, N. Y.  
(Care of Architects Samples Co.)

## Products.

POWELL'S BUFFET KITCHENS and  
POWELL'S STEEL KITCHEN CABINETS (Pat-  
ents Pending).

**Powell's**  
TRADE-MARK

trically welded, baked white enamel finish,  
containing large sanitary cupboards,  
drawers and provision bins.

Also, space is provided for refriger-  
ator and gas or electric stove. Two drain shelves to go  
over standard 18 by 24 in. sink (furnished by builder)  
are also supplied.

## Powell's Buffet Kitchen (Patents Pending).

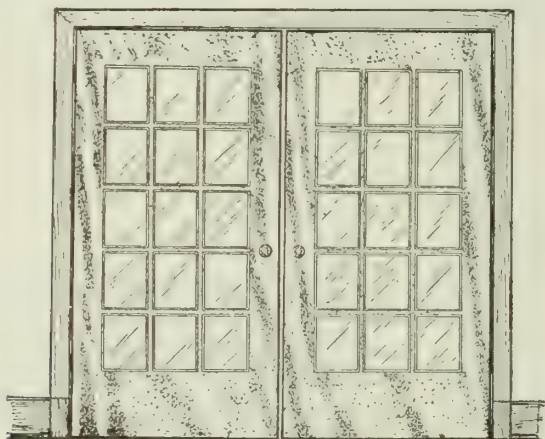
DESCRIPTION—This is a complete white enamel  
steel kitchen in a closet 18 ins. deep, 7 ft. wide, and 7 ft.  
high, designed for bungalows, butlers' pantries, diet  
kitchens, and apartments of 1, 2, 3, or 4 rooms.

CONSTRUCTION AND EQUIPMENT—The kitchen con-  
sists of steel cabinets, 18 ins. deep, 82 ins. high, elec-

The large folding doors are not furnished by this  
company, but these suggestions are offered as their  
application will vary according to the individual job.

The refrigerator has 5 insulating walls, 2 large  
provision chambers, and an ice capacity of 60 lbs.

The gas stove is a standard make with 3 burners

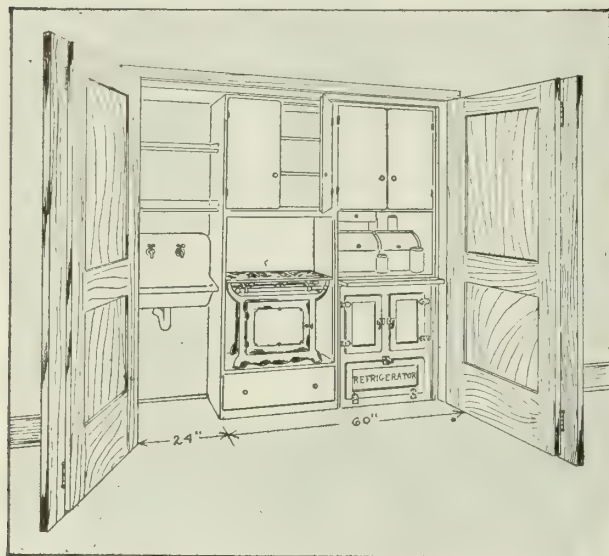


POWELL'S BUFFET KITCHEN CLOSED  
As it looks in the dining-room

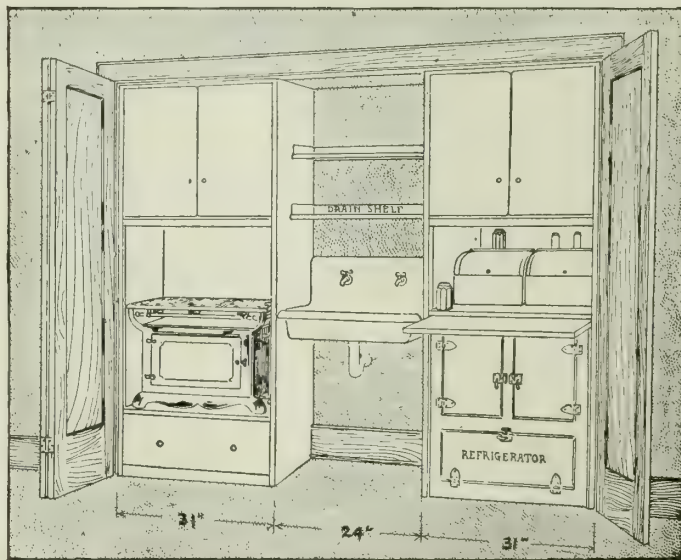


FOLDING DOORS

Showing how doors may be opened to form temporary screen in  
front of kitchen. As noted on plan of cabinet, 2, 3 or 4 folding doors  
may be used. Doors are not furnished by this company but are suggested  
in plans



No. 602-R



No. 2312-R

POWELL'S BUFFET KITCHEN



on top, a large baking oven with broiler pan and broiling burner in upper part.

The electric stove has 2 burners on cooking surface, oven 18 by 12 by 12 ins. with burner in bottom, broiler burner and pan in top. Three-heat switch on each burner, thermometer in oven door, connected load 4.14 kw.

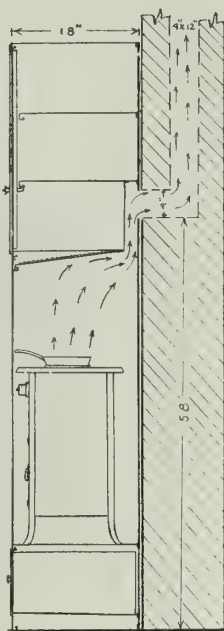
Over the refrigerator is a sliding nickeloid covered metal work table; metal roll top bins for bread, sugar and flour; glass jars for tea, coffee, pepper and salt.

**VENTILATION**—Too much stress can not be laid on the ventilation of a built-in kitchen. By means of Powell patent flues, all cooking odors and surplus heat are carried out of the apartment.

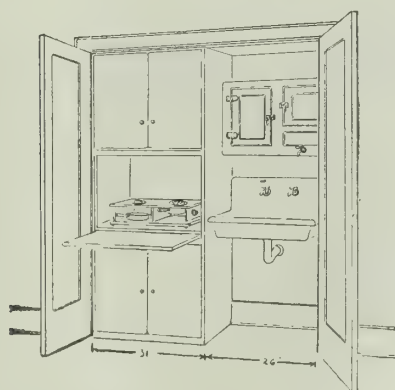
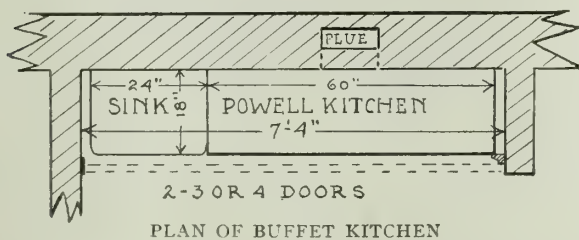
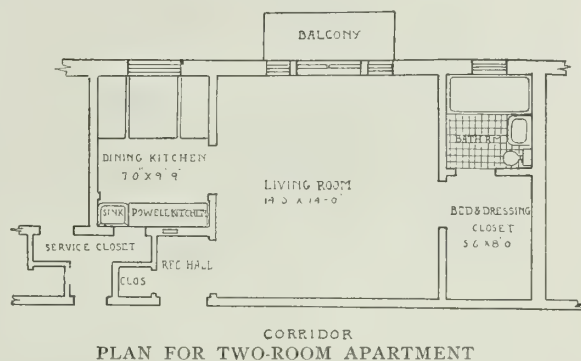
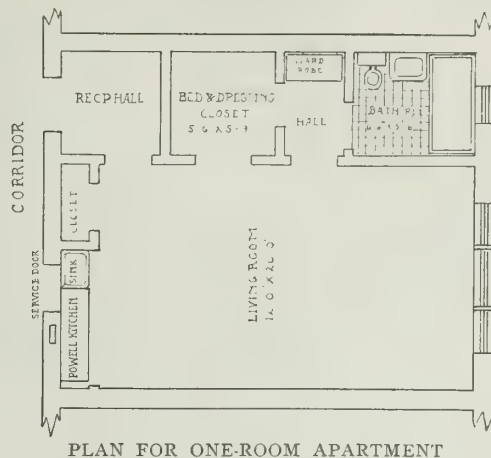
Note in the accompanying illustration how this is accomplished. Also note the inclined hood over the stove, which is insulated with air cell asbestos to protect the shelf above. The entire stove recess is also lined in this manner.

**ECONOMY**—The Powell buffet kitchen occupies only 10½ sq. ft. of floor space, and it is evident that this is the minimum space that a complete kitchen will require.

The space usually occupied by a kitchen or kitchenette can be turned into rentable rooms and thus increase the earnings of the property.



SECTION SHOWING VENTILATION OF STOVE COMPARTMENT



No. 313-W

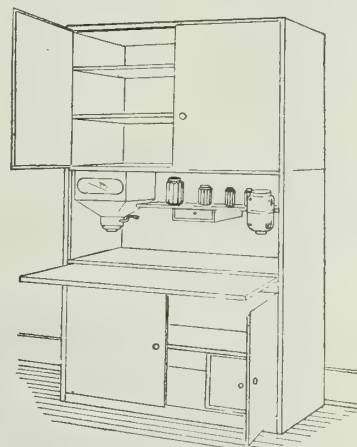
ONE OF THE SMALLER VENTILATED KITCHENS

For one-room apartment hotel. Occupies only 57 by 18 by 82 ins. 25-lb. wall refrigerator that drains into sink. 2-hole gas or electric stove with portable oven

### Powell's Steel Kitchen Cabinets.

Have either solid vitrolite or sliding nickeloid work tables. May be recessed or set out in the room.

Give more cupboard room in less floor space than any other cabinet.



No. 426

WHITE ENAMEL STEEL KITCHEN CABINET

### Service.

POWELL STEEL KITCHEN CO. furnish plans and suggestions and will be glad to forward blue prints showing layouts and floor plans, to anyone who is interested.

### Catalogue.

Many other styles of cabinets and complete kitchens are manufactured by this company and literature and prices will be mailed on application.

# FEARLESS DISHWASHER CO., INC.

175 Colvin Street  
ROCHESTER, N. Y.

## Products.

FEARLESS DISHWASHING MACHINES for hotels, restaurants, etc.

Barron Water Coolers for all public places.

## Fearless Dishwashers.

**CONSTRUCTION**—The construction of the Fearless dishwasher is unusually simple. It is composed principally of three parts: the tanks, the cradle and the hand lever or power attachment.

The tank is made from the highest grade heavy soft iron or from 48-oz. cold rolled copper plate as desired. Shape is rectangular, of convenient height, and is supported by substantial legs.

The cradle carrying the basket of submerged dishes is made of wrought and malleable iron. The four supporting arms are swung from bearings situated on the top ledge of the tank.

Each tank is provided with a combined overflow and drain pipe, each of which is screened and opens into one sewer connection, and is controlled by a simple lever conveniently located. In one position of the lever the drain is open; in the other, the drain is closed and the overflow is placed in operation.

Hot and cold water pipes are connected to the washer. If the hot water supply is obtained from a boiler, it is usually kept hot by means of steam coils in the bottom of both the wash and rinse tanks or by muffled live steam jets in the tanks, or it may be kept hot by gas or other burners placed under the tanks.

**CAPACITY**—Fearless machines will handle between 1,000 and 8,000 dishes per hour, depending upon the condition of the dishes, their size, the ability of the operator, and the size of the dishwasher.

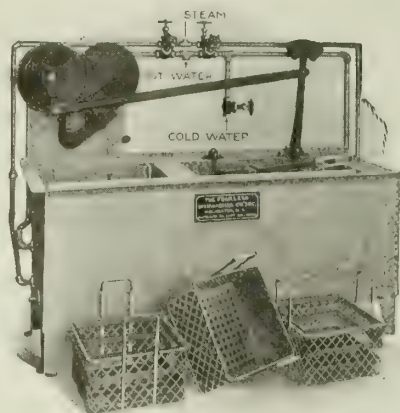
Their speed is slow. Power consumption the lowest. They run quietly and if necessary any power machine can be easily operated by hand.

DATA, B V FEARLESS RAPID DISHWASHER

Type	Floor space, ins.	Height, ins.	Wash tank, ins.	Rinse tank, ins.	Shipping weight, lbs.
No. 1 B V	62 x 30	28½	40 x 18 x 20*	20 x 18 x 20*	500
No. ½ B V	62 x 28	28½	40 x 16 x 20*	20 x 16 x 20*	475

\*Deep.

Also made as above with 3 tanks: 2 wash tanks with motor for each and 1 rinse tank



B E FEARLESS DISHWASHER

Hand power machines made in same sizes as above except width is 6 ins. less

Type	Floor space, ins.	Height, ins.	Wash tank, ins.	Rinse tank, ins.	Shipping weight, lbs.
No. 1 B E	62 x 30	28½	40 x 18 x 20*	20 x 18 x 20*	500
No. ½ B E	62 x 28	28½	40 x 16 x 20*	20 x 16 x 20*	475
No. 0 B E	50 x 28	27½	33 x 16 x 18*	15 x 16 x 18*	400
No. 00 B E	50 x 26	27½	33 x 14 x 18*	15 x 14 x 18*	375

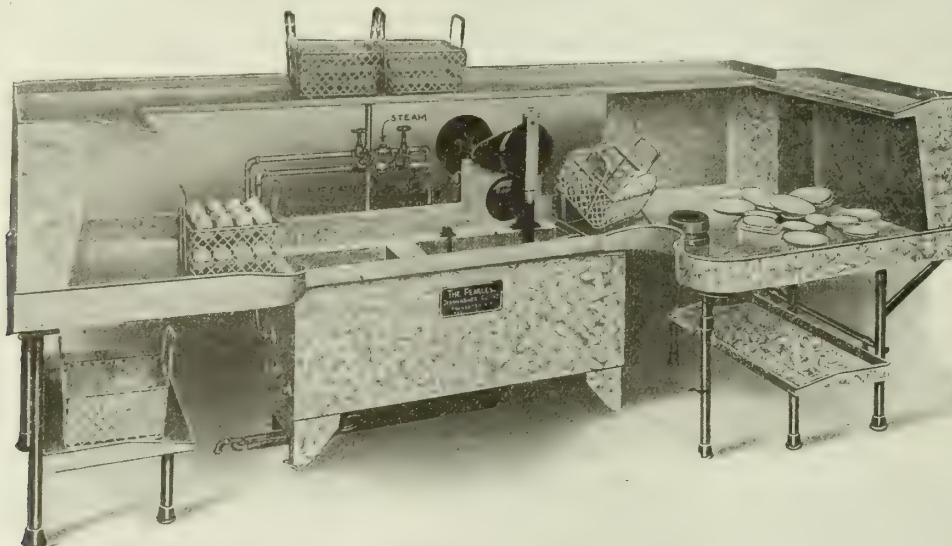
\*Deep.



B V MODEL, PLAN NO. 57S, FEARLESS DISHWASHER

Made in 4 sizes.

Floor space 80½x80 ins. and 80x90 ins. Height 27½ and 28½ ins. Weights, wood tables, 650 to 800 lbs.; metal tables, 800 to 950 lbs.



COMPLETE DISHWASHING OUTFIT, SHOWING FEARLESS TYPE B V WITH SPECIAL TABLES



# THE PFAUDLER CO.

## Sanitary and Non-corroding Glass Enameled Steel Products

### ROCHESTER, N. Y.

#### BRANCH OFFICES

NEW YORK, N. Y.  
BOSTON, MASS.  
PITTSBURGH, PA.

CHICAGO, ILL.  
ST. LOUIS, MO.

SAN FRANCISCO, CAL.  
MINNEAPOLIS, MINN.  
DETROIT, MICH.

### Products.

GLASS ENAMELED STEEL LAUNDRY CHUTE; GLASS ENAMELED STEEL TANKS for water storage and other purposes requiring the utmost cleanliness.

### Laundry Chute.

The peculiar advantages of this chute are: (1) its absolute sterility; (2) its economy of operation through practical elimination of upkeep expense and the inability of its smooth surface to tear linen; (3) its durability.

Originated by a hospital architect and a hospital executive, both eminent men, its functions are to provide an *isolated* route for infected linen, to handle this dangerous material quickly, cheaply and safely, and to be thoroughly cleansed by the turning of a valve.

Incidentally, it is fireproof and verminproof.

Chute is a substantial steel shaft lined with glass enamel which, thoroughly fused into the metal, is unusually durable. It extends from the top floor to the laundry; is equipped with plate glass and german silver doors at all floors, and with opening for ventilator at the top. The flushing ring in top section discharges a cleansing shower of hot water upon the enameled interior whenever desired, washing infections and foul deposits through drain connection at bottom.

### Installations.

Following are some recent installations:

- Columbia Hospital, Milwaukee, Wis., Richard E. Schmidt, Garden & Martin, Chicago, Architects
- St. Mary's Hospital, Minneapolis, Minn., John H. Wheeler, St. Paul, Architect
- Children's Mercy Hospital, Kansas City, Mo., Wight & Wight, Kansas City, Architects
- U. S. Immigration Station, Baltimore, Md., James A. Wetmore, U. S. Treasury Dept., Supervising Architect
- Mercy Hospital, Pittsburgh, Pa., Edward Stotz, Pittsburgh, Architect
- Women's Cottage, State Hospital for Insane, Norfolk, Nebr., James C. Stitt, Norfolk, Architect
- Misericordia Hospital, Philadelphia, Pa., E. F. Durang & Son, Philadelphia, Architects
- Boston City Hospital, West Roxbury Mass., Wells & Dana, Boston, Architects
- Lying-in Hospital, Chicago, Ill., Richard E. Schmidt, Garden & Martin, Chicago, Architects
- Mountain Hospital, Hamilton, Ont., Can., Stewart & Witton, Hamilton, Architects

### Sanitary Water Storage Tanks.

Lined with durable glass enamel, these substantial tanks are absolutely sanitary, rustproof, leakproof, and incapable of contaminating the water; they are non-absorptive and offer no breeding place for bacteria. They are giving remarkable satisfaction in many buildings, and are used by most of the large bottlers of mineral waters as storage and car tanks, with excellent results.

Diameters up to 10 ft. 6 ins. outside; any desired length.

### Specifications for Laundry Chute.

Provide and install laundry chute where shown. To be constructed of steel sections of suitable lengths, ...\* ins. inside diameter, not over ...\* ins. total outside diameter, properly flanged and bolted together, with joints suitably packed to make it watertight.

Interior of chute to be lined with Pfaudler Glass Enamel, which is to extend well beyond inner edges of gaskets and to outer edges of door throats and facings.

Top section to be provided with a 1½-in. nickel-plated brass pipe flushing ring, with standard bushing for connection to water service pipe. Top head to have suitable connection for 3-in. ventilator pipe.

Provide and set at each floor, where shown, a german silver door, with either plate glass or polished wire glass; door to close watertight against a pneumatic rubber cushion, and be secured by a german silver clamp of refrigerator type.

Throat to which door is attached to be integral with chute proper, 22 ins. inside diameter, and of length to bring its outer edge flush with face of finished wall.†

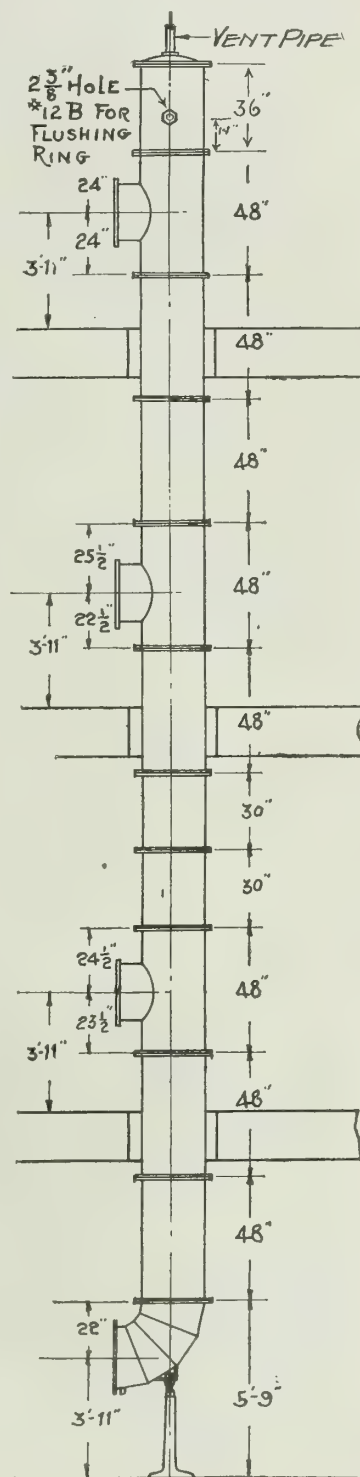
Bottom of chute to be an elbow, closed water-tight with an enameled, nickeled or other suitable door fitted with a firmly closing clamp; to be fitted with 2-in. standard pipe outlet for drain connection.

Chute to be supported by one cast iron leg at bottom and by three ⅝-in. tie rods at each floor, connected to angle irons set in steel work of floor construction.

Chute to be built complete and installed by THE PFAUDLER CO. of Rochester, N. Y.

\*Chutes furnished in two standard diameters, viz.: 24 ins. inside, 29 ins. outside; 30 ins. inside, 35 ins. inside.

†State dimensions from center of chute to face of finished wall.



DETAIL OF LAUNDRY CHUTE

# THE AMERICAN LAUNDRY MACHINERY CO.

EASTERN SALES DIVISION  
134 West 37th Street  
NEW YORK, N. Y.

SOUTHERN SALES DIVISION  
Norwood Station  
CINCINNATI, OHIO

WESTERN SALES DIVISION  
208 West Monroe Street  
CHICAGO, ILL.

PACIFIC SALES DIVISION  
416 Mission Street  
SAN FRANCISCO, CAL.

LOS ANGELES

SEATTLE

PHILADELPHIA

BOSTON

KANSAS CITY

ST. LOUIS

WASHINGTON

PITTSBURGH

BUFFALO

FOREIGN SALES DEPARTMENT, NORWOOD STATION, CINCINNATI, OHIO

CANADIAN FACTORY

THE CANADIAN LAUNDRY MACHINERY CO., LTD., TORONTO, ONT., 47-79 Sterling Road

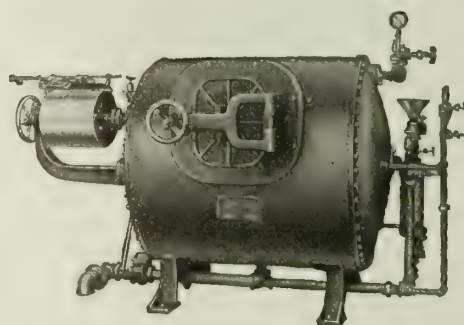
## Products.

A complete line of LAUNDRY MACHINERY of every description.

Complete Laundry Plants for hospitals, hotels, institutions and private residences, as well as for the commercial laundry; Sterilizing and Washing Machines, of various sizes, for handling contaminated and infected linen; Flat Work Ironers; Disinfecting Plants for hospitals and asylums; Tahara Automatic Silver Burnishing Machines for burnishing silverware, and a complete line of Machinery for Cleaners and Dyers.



TRADE-MARK



STERILIZING WASHER

For hospitals, etc. Destroys all germs, bacilli, etc. Sterilization carried on in connection with regular washing. No extra handling of goods. Cylinder, 36 by 54 ins. or 48 by 54 ins.

## Service.

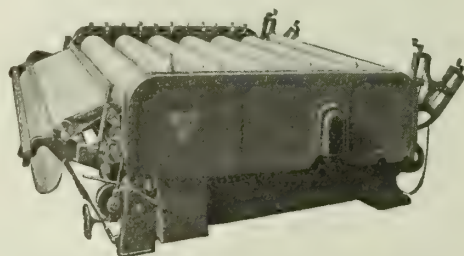
Our Engineering Department will furnish, promptly, complete plans, specifications and estimates. Catalogue, or a complete set of specifications covering all "American" laundry machinery, will be sent to any architect on request.

## Facilities.

Our experience in manufacturing laundry equipment extends over a period of more than 30 years and we have every facility for turning out high grade work, including the smaller as well as the larger equipment for the modern and efficient laundry.

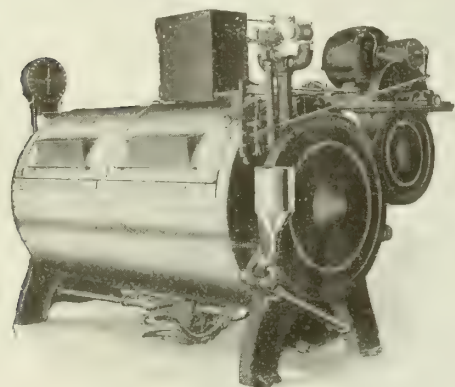
## References.

The booklet "References," giving a list of hundreds of "American" laundry installations, will be sent on request.



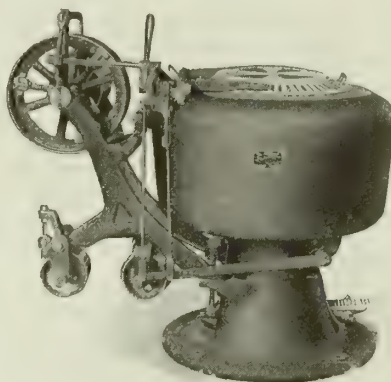
"AMERICAN" 6-ROLL FLAT WORK IRONER

The famous Hagen line, made in all convenient sizes, from 1-roll to 8-roll; equipped with all "American" features, such as ribbon feed, automatic finger guard, power pressure device, pressure indicator, etc. Made in 100-in., 110-in. and 120-in. lengths; also manufacture cylinder type Flat Work Ironers.



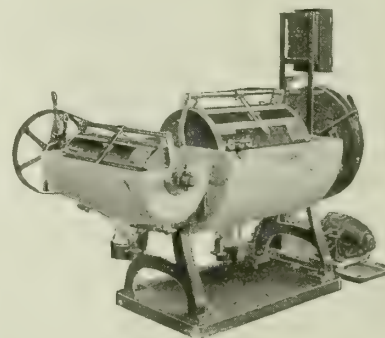
CASCADE WASHER

Made with brass cylinder, of either brass or galvanized iron outer case; cylinder 36 or 42 ins. in diameter, and either 64, 72 or 84 ins. in length; has capacity of 4 ordinary washers and particularly adapted for use in hotels and institutions



"AMERICAN" EXTRACTOR WITH AUTOMATIC SAFETY COVER

Inner basket revolving rapidly removes moisture by centrifugal force. Smooth running. Highly efficient. Made both underdriven and overdriven, with either belt or motor drive. Diameter 20 to 48 ins.



TAHARA AUTOMATIC SILVER BURNISHING MACHINE

A machine for burnishing or polishing silverware without the use of injurious abrasive methods. Keeps the silverware sanitary, in good condition, and does not remove the plating. Made in a number of sizes



# HILL CLOTHES DRYER COMPANY

WORCESTER, MASS.

BRANCH OFFICE, BOSTON, MASS., 113 State Street

## Products.

CLOTHES DRYING APPARATUS of every description.

## Description.

The Hill-Canton sanitary drying cabinets and the famous Hill dryers in other styles are the culmination of over 40 years of skill and experience.

**HEATING**—Dryers are manufactured to be heated by coal, steam and gas (artificial and natural), and electricity. Steam heat can be installed in combination with gas or coal heated cabinets.

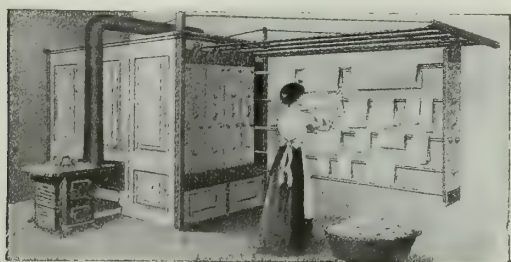
**CONSTRUCTION**—Framework of dryer is of 3 by 3 by  $\frac{3}{16}$ -in. and 2 by 2 by  $\frac{1}{8}$ -in. angle iron firmly bolted together.

Casing or body of dryer is of highest quality heavy galvanized sheet steel. Top of cabinet is reinforced with stiffening ribs or stays. Casing can be made double with air space intervening or double with asbestos lining.

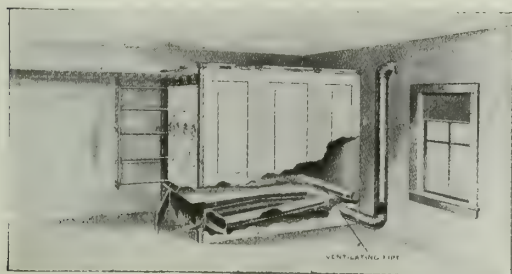
**RACKS**—Of heavy galvanized sheet steel, turned with 1-in. angle on each edge. Each rack is equipped with special galvanized ventilated hanging bars properly arranged to hold the wash. Racks are hung on metal rollers with antifriction ball bearings. The guide bar of each rack operates in, and is controlled by, Hill's patent adjustable ball bearing guide rollers—an exclusive feature of the Hill-Canton dryer—insuring easy and noiseless operation.

## Styles.

**COMBINATION DRYER AND LAUNDRY STOVE**—Stoves are especially constructed to heat and ventilate the cabinet, boil the clothes, heat the irons, etc. The Hill-



COMBINATION CLOTHES DRYER AND LAUNDRY STOVE



GAS HEATED CLOTHES DRYER

Canton sanitary dryer is the only one equipped with cast iron radiators.

**GAS HEATED DRYER**—In the gas heated cabinet without laundry stove, the gas flame is confined on the inside of the radiators, no open flame burners with deflecting pans being used.

## The Hill-Canton Heating and Ventilating System.

The lower part of the cabinet is divided into two sections by a separating plate. The fresh air, drawn into the cabinet at the grated opening above separating plate, is heated by coming in contact with the radiators, causing it to rise and expand, thereby forcing down the steam and moisture, which is at once removed, being drawn under the separating plate, then through the ventilating duct at bottom of cabinet, which is a part of the heating arrangement.

The chimney draft is utilized in this way to draw fresh air into, and impure air out of, the cabinet, causing a continuous circulation of heated fresh air during the entire time dryer is in use.

## Sizes.

The standard size of the drying cabinet is 7 ft. high and 7 ft. long, exclusive of the space where the racks pull out. This requires a floor space of 14 ft.—allowing the same amount of space in front of dryer as the length or depth of cabinet. Width varies according to the number of racks specified. Racks are 7, 9 and 12 ins. wide.

As all dryers are made to order, the height and length can be varied to fit any space.

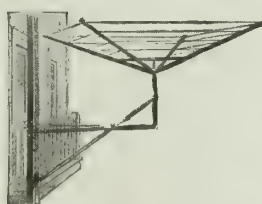
## WIDTH OF DRYERS, NUMBER OF RACKS AND DIMENSIONS

Width of racks, inches	Number of Racks or Draws							
	3	4	5	6	7	8	9	10
	Total width in inches							
7	27	34	41	48	55	62	69	76
9	33	42	51	60	69	78	87	96
12	42	54	66	78	100	112	124	136

Widths are exclusive of laundry stove, which is 27 ins. wide and 30 ins. deep, or if divided into compartments.

Measurements of wider racks and larger size cabinets will be furnished on request

## Hill Out-door Dryers.



BALCONY DRYERS FOR APARTMENT BUILDINGS



CHAMPION DRYER FOR THE YARD  
Made in three sizes

# CHICAGO DRYER COMPANY

## Laundry Room Equipment

TELEPHONE:  
HARRISON 3774

624-630 South Wabash Avenue  
CHICAGO, ILL.

### Products.

- "CHICAGO" LAUNDRY EQUIPMENTS.
- "CHICAGO" CLOTHES DRYERS.
- "CHICAGO-FRANCIS" DRYERS.
- "CHICAGO" ELECTRIC WASHERS.
- "CHICAGO" IRONING MACHINES.
- "CHICAGO" IRONING BOARDS.

Especially adapted for use in residences, apartment buildings and small institutions.

### Experience.

THE CHICAGO DRYER COMPANY has been building clothes dryers for the past thirty years.

Correspondence from architects and others interested is invited. Experience and an engineering department are at their service free. Persons making inquiry are in no way obligated.

### Catalogue.

Architects and others are requested to write for No. S 15 Catalogue, which contains full and complete information relative to these clothes dryers and equipments.

### General Construction.

Framework consists of heavy angle, channel and bar iron of suitable size, firmly and substantially bolted together. Casing of heavy galvanized sheet steel. Casing made double, with air space intervening, or double and insulated with asbestos, when so specified.

### Hanging Racks.

Panels of racks are of heavy galvanized sheet steel. Front panels are made double and heavily insulated with asbestos. Hanging bars are specially galvanized and ventilated. Bars are attached to panels by means of double flange arrangement. Interior flanges on bars galvanized. Can not rust or stain the finest fabrics. Overhead traveler bars also galvanized. Rollers or sheave wheels used in conjunction with racks are of noiseless type with steel or ball bearings. Wheels at base of front panels and arranged to roll on floor are provided with rubber tires.

### Ventilating System.

The successful drying of clothes by artificial method depends upon the speed with which the moisture emanating from the clothes can be removed. This, in conjunction with the heat secured in the drying cabinet, determines the rapidity with which the clothes can be dried. The principal feature is the removal of moisture without loss of heat in the drying cabinet.

The most successful and efficient system of ventilation on drying cabinets is that known as the "Chicago-Francis" patented heating and ventilating system, with which our dryers are provided. With this system of ventilation the air is admitted into the drying cabinet evenly, and preferably near the top. This is accomplished by various methods.

# CHICAGO

TRADE-MARK  
(Registered U. S. Pat. Off.)

The moisture emanating from the wet clothes is quickly and evenly drawn out, by natural circulation, without loss of heat, through vent system properly placed at or near base of drying cabinet, or along casing near bottom of drying cabinet, according to heating system used. Said vent system is connected to vent pipes in drying cabinet. These vent pipes are connected to main vent pipe, which connects with flue as provided.

A natural and constant circulation of air is maintained in the drying cabinet, with the result that the clothes dry quickly, and are as sanitary, pure, fresh and sweet as if dried in the open air or sunshine. Positively guaranteed against discoloration of garments.

### Efficiency.

With the "Chicago-Francis" patented heating and ventilating systems provided with our dryers, clothes dryers are produced, the efficiency of which is fully 100% to 200% above similar machines made by other manufacturers.

### Patents.

The "Chicago-Francis" patented heating and ventilating system is fully covered by United States and Foreign patent rights, and can not be used on drying cabinets except by ourselves.

None genuine without inscription on name plate, namely, "Chicago-Francis Dryer," manufactured by CHICAGO DRYER COMPANY, Chicago, U. S. A.

### Measurements and Sizes.

All dryers are built to order. Cabinets are generally built 7 ft. to 7 ft. 6 ins. high and 7 ft. long, but these measurements can be varied to suit conditions of the room in which the dryer is to be placed. The rack panels are made in different widths, viz.: 6, 7½, 9, 12, 16, 16¼ and 18 ins. Each rack is equipped with proper number of hanging bars for best service, or as may be specified.

The following table gives the width of dryers containing 3 to 9 racks, inclusive, with rack panels 6, 7½, 9 and 12 ins. wide each. Measurements of larger sizes furnished upon request.

No. of Racks or Draws	Type "W"	Type "A"	Type "B"	Type "C"
	Racks 6 ins. wide each	Racks 7½ ins. wide each	Racks 9 ins. wide each	Racks 12 ins. wide each
3	25 ins.	29½ ins.	34 ins.	43 ins.
4	31 ins.	37 ins.	43 ins.	55 ins.
5	37 ins.	44½ ins.	52 ins.	67 ins.
6	43 ins.	52 ins.	61 ins.	79 ins.
7	49 ins.	59½ ins.	70 ins.	91 ins.
8	55 ins.	67 ins.	79 ins.	104½ ins.
9	61 ins.	74½ ins.	88 ins.	118 ins.

The No. 10 Laundry Stove, as shown in Plate No. 4910, occupies a space of 27 x 30 inches. The gas laundry stove, as shown in Plate 3906, occupies a space of 22 x 22 ins. Stove as shown in Plate 6607, occupies a space of 22 x 28 ins.





PLATE NO. 3906. "CHICAGO-FRANCIS" COMBINED DRYER AND GAS LAUNDRY STOVE

Contains 3 racks, each 9 ins. wide, with No. 06 gas stove, adapted for artificial or natural gas, as may be ordered.

Suitable for use in residences, apartment buildings and small institutions. Stove boils clothes, heats flatirons and heats the dryer by waste heat. Cost of operating stove 2¢ to 3½¢, per hour, figuring cost of gas at \$1.00 per 1,000 cu. ft. Will dry dryer full of clothes in 10 to 30 mins. Built in various sizes ranging from 3 racks or draws, and up. For residences, dryer containing 3, 4 or 5 racks, each 9 in. wide, is recommended. When used in apartment buildings, it is customary to allot dryer containing 3 racks, each 9 in. wide, with each set of tubs

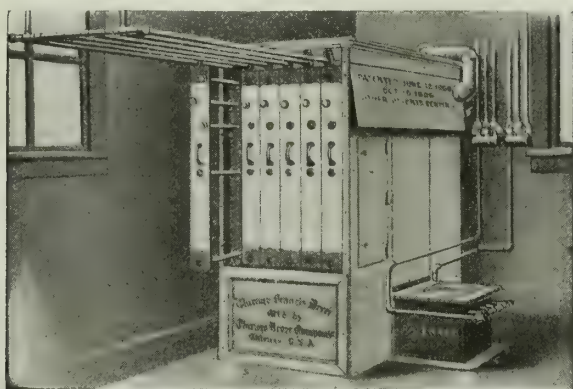
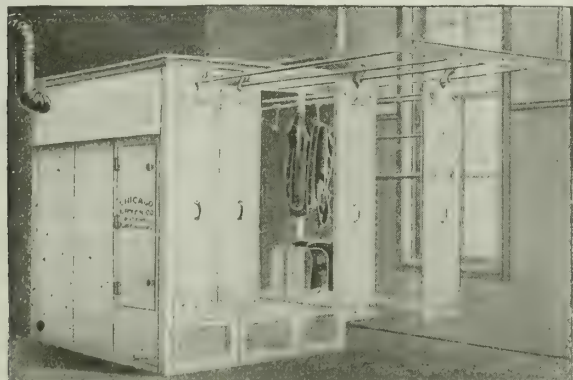


PLATE NO. 6607. "CHICAGO-FRANCIS" COMBINED DRYER AND DOUBLE GAS LAUNDRY STOVE

Contains 6 racks or draws, each 6 ins. wide, with No. 07 stove, suitable for artificial or natural gas, as may be ordered.

Adapted for use in laundry room of apartment building when desired to accommodate 2 tenants. Stove specially designed to accommodate 2 wash boilers at a time. Waste heat from both halves of stove is carried into drying cabinet. Each tenant is allowed the use of 3 racks or draws for drying clothes. Center of feed rail of stove is provided with valve, thus properly dividing the operating expense when used by 2 tenants at a time, providing piping so arranged that each tenant pays for own gas used in stove. Each half of stove can be operated at an expense of 2¢. to 3¢. per hour, figuring cost of gas at \$1.00 per 1,000 cu. ft.



"CHICAGO-FRANCIS" GARMENT DRYER WITH RACKS, EACH 16½ INS. WIDE

Equipped with No. 09 model gas heating system, same as shown in Plate 5909. Built in sizes ranging from 2 racks or draws, and up. Suitable for fire engine houses, police stations, etc.

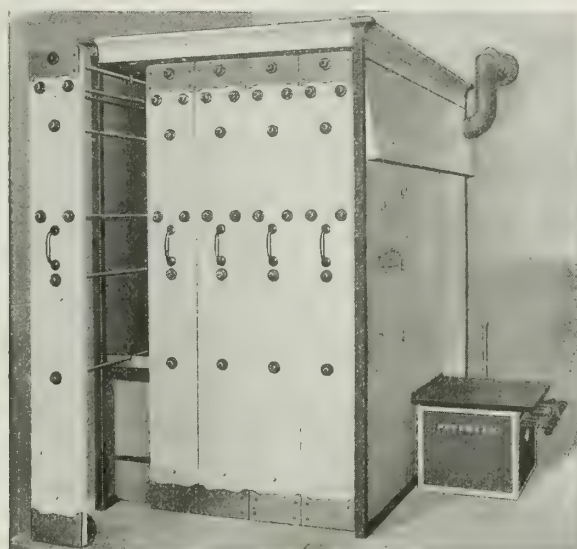


PLATE NO. J-5907. "CHICAGO-FRANCIS" COMBINED DRYER AND GAS LAUNDRY STOVE WITH FLOOR CARRIAGE RACKS

Contains 5 racks, each 9 ins. wide with No. 07 gas stove, suitable for artificial or natural gas, as may be ordered.

Built in sizes ranging from 3 racks or draws, and up. Front panels may be made flush, so that outside flanges of front panels are invisible, when so specified.

Front panels of racks reinforced to a thickness of 1 in. Base of front panels provided with rubber tired wheels which allow rack to be pushed into or pulled out of cabinet with the utmost ease. Rear panels of racks are provided with extension plates, so that, when racks are pulled out full length, the heat will not escape from cabinet.

When so specified, in lieu of gas stove, these dryers are furnished equipped with No. 10 laundry stove suitable for burning coal or wood; or can furnish dryer without laundry stove, and, in lieu thereof, equip with Model 09 direct gas heating system, same as that shown in Plate No. 5909

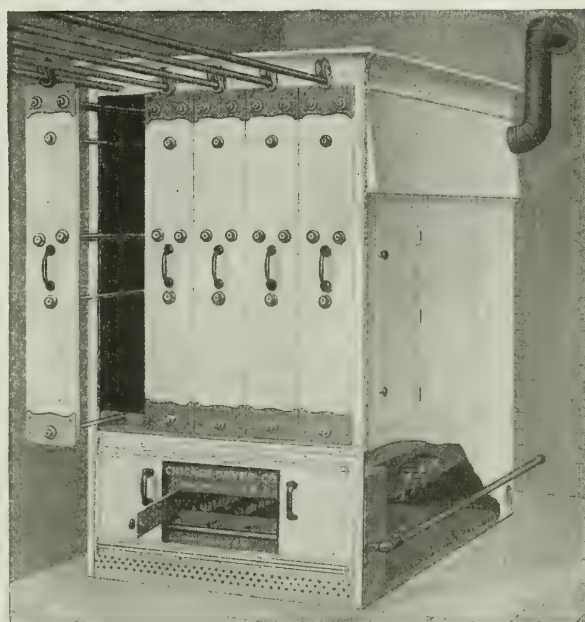


PLATE NO. 5909. "CHICAGO-FRANCIS" GAS HEATED DRYER WITH MODEL 09 GAS HEATING SYSTEM

Contains 5 racks or draws, each 9 ins. wide, suitable for artificial or natural gas. No flame exposed. Only pure and clean heat enters drying cabinet.

Built in various sizes ranging from 3 racks or draws, and up, with rack panels 6, 7½, 9 or 12 ins. wide, as may be specified. Adapted for use in residences, apartment buildings and institutions.

Gas burners are placed at base, in an interior heat retaining drum made of heavy galvanized sheet steel, so formed that the heat from the burners is retained therein, thus heating the drying cabinet with minimum gas consumption. Drum is provided with 1, 2 or more small pipe burners, depending upon the size of the dryer. Each burner provided with independent shut-off valve, so that the heat in the dryer may be regulated to suit conditions.

Base of drying cabinet provided with independent vent ducts, so that all moisture, etc., emanating from clothes while being dried, are carried away by natural air circulation without loss of heat in the drying cabinet. No possibility of accidents or explosions. Efficiency fully 100% to 200% over and above similar machines made by other manufacturers



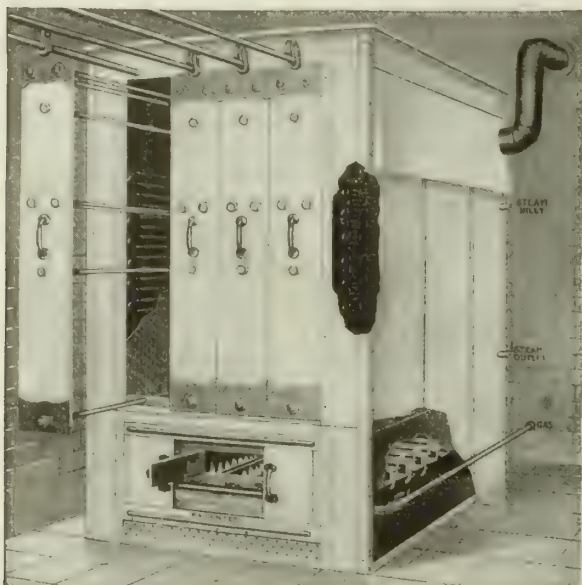


PLATE NO. 4919. "CHICAGO-FRANCIS" COMBINED GAS AND STEAM HEATED DRYER

Built in various sizes ranging from three 9-in. racks or draws, and up

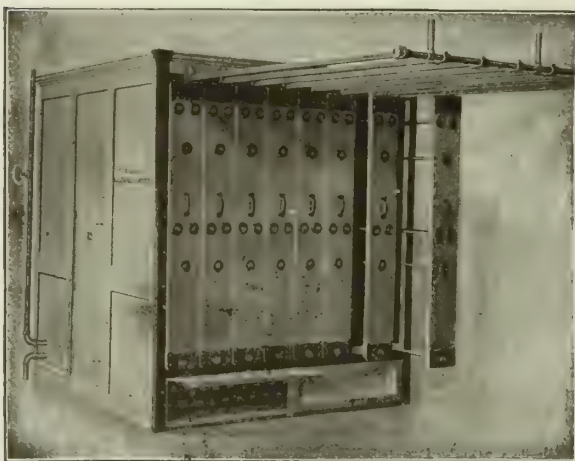


PLATE NO. 8990. "CHICAGO" STEAM HEATED DRYER

Contains 8 racks, each 9 ins. wide. Built in sizes ranging from 2 racks or draws, and up. Unlimited as to size. Also built with racks 6, 7½, 12, 16½ and 18 ins. wide

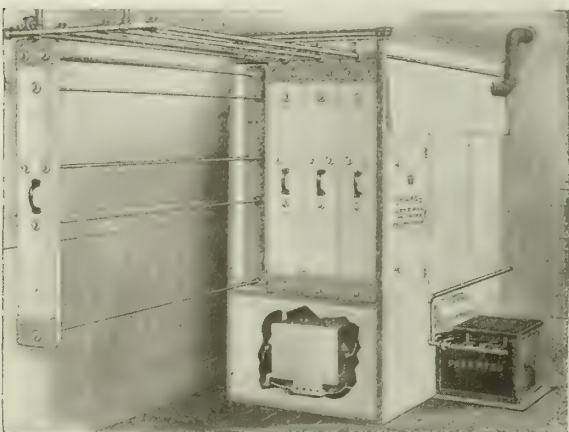


PLATE NO. 4916. "CHICAGO-FRANCIS" COMBINED DRYER WITH MODEL 16 GAS LAUNDRY STOVE

Suitable for artificial or natural gas. No fumes or odors can possibly come in contact with the clothes; only pure and clean heat enters drying cabinet. Moisture removed at base through independent vent ducts.

Cost of operating gas laundry stove 2 ¢. to 3½ ¢. per hour, figuring gas at \$1.00 per 1,000 cu. ft.

Built in various sizes ranging from 3 racks or draws, and up, with rack panels 6, 7½, 9 or 12 ins. wide, as may be specified



PLATE NO. 4910. "CHICAGO-FRANCIS" COMBINED DRYER AND NO. 10 COAL LAUNDRY STOVE

Contains 4 racks, each 9 ins. wide. Stove suitable for coal or wood. Stove furnished with or without waterback, as may be ordered.

Built in sizes ranging from 3 racks or draws, and up.

Suitable for residences, apartment buildings and institutions where purchasers desire to use coal or wood for fuel in laundry stove.

The base of drying cabinet below racks is provided with system of heating drums, through which products of combustion emanating from stove circulate before being carried to flue. Heat radiated from heating drums rises through clothes and dries them. Heating drums, made of heavy galvanized sheet steel, can not break or crack, and are practically indestructible. Drums built in size to conform with the dryers in which they are placed, with result that the maximum amount of radiation is secured.

No. 10 laundry stove, used in conjunction with this dryer, is of extra heavy construction, of cast iron throughout and weighs 400 lbs. Stove is provided with damper arrangement so that heat can be thrown into heating drums in dryer, or direct to flue. Moisture removed by means of independent vent ducts at base, without loss of heat in drying cabinet.

When so specified, stove may be equipped with our No. 2 waterback, capable of heating a 60-gal. tank

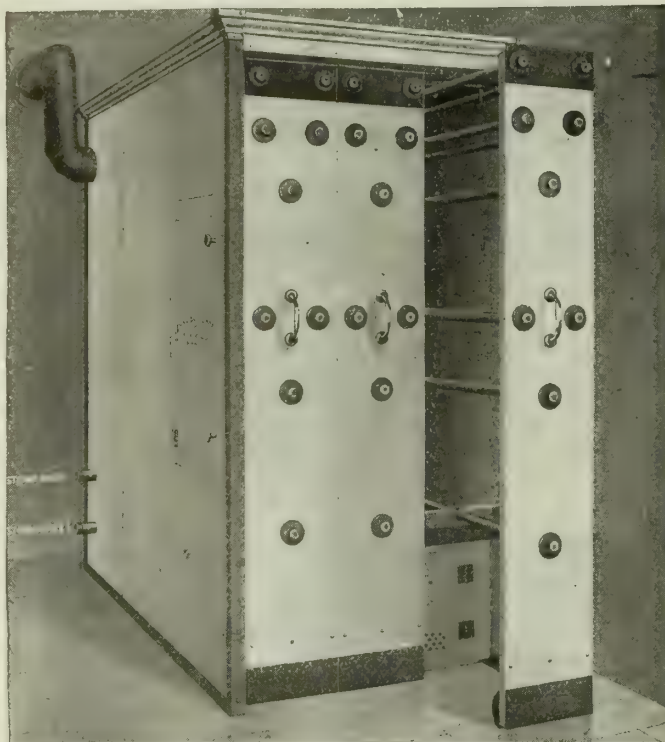


PLATE NO. J-31290 "CHICAGO" STEAM HEATED DRYER WITH FLOOR CARRIAGE RACKS

Each rack or draw measures 12 ins. wide.

Furnished in various sizes ranging from 2 racks or draws, and up, and of extra heavy construction. Front panels of racks are reinforced to a thickness of 1 in. Base of front panels provided with rubber tired wheels which allow the racks to be pushed into or pulled out of cabinet with utmost ease. Construction throughout the best that can be produced.

When specified, the lower part of racks may be provided with wire screen basket for drying of shoes, etc.

May be heated by means of coal, wood or gas stove attached; or by means of gas direct, when so specified, in lieu of the steam heat





"CHICAGO" ELECTRIC WASHER AND SAFETY WRINGER, MODEL "D"

Especially adapted for use in residences and small institutions.

Only machine on the market with wringer equipped with automatic conveyor, for conveying clothes into rolls, and automatic safety stop, which prevents tearing of clothes, and insures absolute protection against possible accidents to operator.

Washer tub made of copper with nickeloid plating on inside. Framework is of heavy iron. Provided with water inlet for stationary water and drain connections.

Will wash clothes thoroughly clean and without injury in 10 to 15 mins. The outside of washer tub including framework finished in white enamel.

Made in three sizes, viz.:

Number	Capacity	Size of Wringer	Size of Motor
D312	30 shirts	12 ins.	$\frac{1}{2}$ h.p.
D314	35 shirts	14 ins.	$\frac{1}{2}$ h.p.
D414	40 shirts	14 ins.	$\frac{1}{2}$ h.p.

Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine"

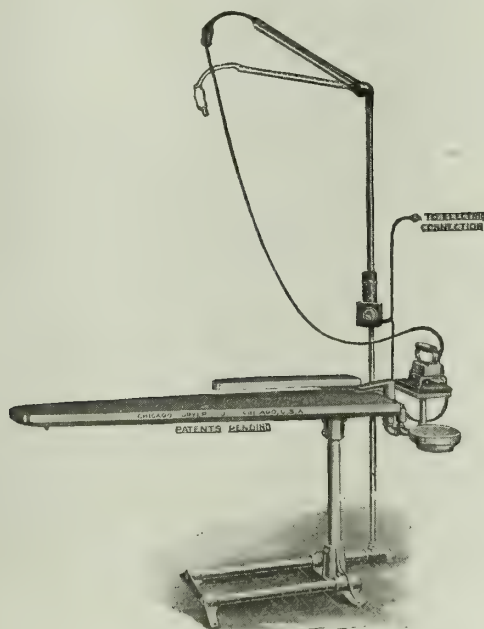
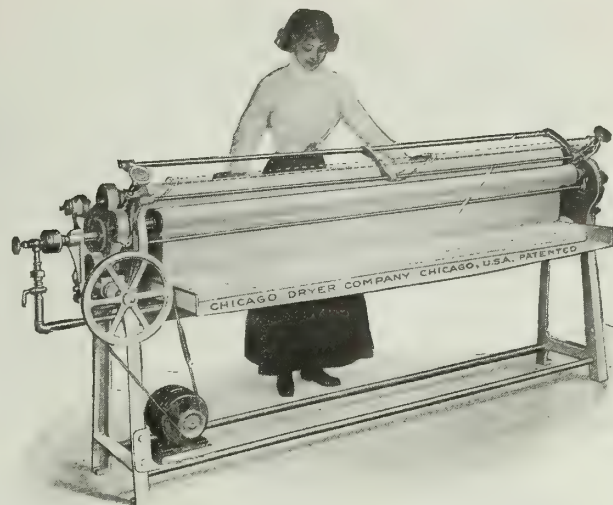


PLATE NO. 302. "CHICAGO" IRONING BOARD WITH PORTABLE STAND

Equipped with pipe standard, snap switch, pilot light, suspension arm and connector cord. Furnished either with or without electric iron as may be ordered.

Ironing board measures 59 ins. long by  $1\frac{1}{4}$  ins. thick. Large end measures  $18\frac{1}{2}$  ins. wide and tapers to 10 ins. at small end. Underside of board provided with patented attachment for holding padding. Base and stand finished in white enamel. Can furnish above equipment without electric attachments, in which event it is designated as No. 300 "Chicago" ironing board and stand.

Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine"



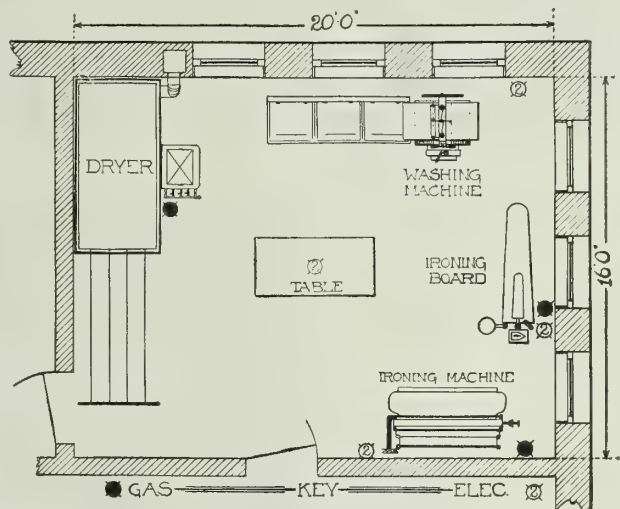
"CHICAGO" THREE-ROLL IRONING MACHINE WITH MOTOR ATTACHED

Heated by means of gas or gasoline. Suitable for ironing all kinds of flat work, such as sheets, pillow cases, napkins, towels, laces, embroideries, etc.

Equipped with 1 heated, and 2 compression rolls. All rolls revolve, which positively eliminates any possible wear on the linens during process of ironing.

Made in various sizes, with rolls 46, 50, 60 and 75 ins. long. Equipped with  $\frac{1}{2}$  h.p. electric motor, which may be connected to any lighting circuit. For residences the 50-in. size is recommended. Each machine is sold under absolute and positive guarantee to accomplish entirely satisfactory work. Framework of ironing machine finished in white enamel.

Tested and approved by the Good Housekeeping Institute conducted by the "Good Housekeeping Magazine"



Plan No. 3

Scale:  $\frac{1}{8}$  in. = 1 ft.

FLOOR PLAN OF MODERN AND UP-TO-DATE RESIDENCE LAUNDRY ROOM

Showing installation of "Chicago" Laundry Appliances

No. 314 Model "D" "Chicago" electric washer and safety wringer. "Chicago-Francis" combined dryer and laundry stove, containing 4 racks or draws, each 9 ins. wide. Dryer may be equipped with stove suitable for coal, wood, artificial or natural gas, as may be specified.

50-in. "Chicago" three-roll ironing machine with motor attached. No. 302 "Chicago" ironing board complete, including electrically heated flatiron.

Above appliances may be had in smaller or larger sizes, thus enabling us to provide suitable appliances from the smallest to the largest residence. Larger sizes are also adapted for small institutions

### Co-operative Service.

Individual machines or complete outfits furnished as may be desired. Send a plan of the laundry room and we shall be pleased to submit blue prints, showing how the various appliances may be installed and the space each device will occupy. All plans and blue prints, including estimate, furnished free without any obligations whatsoever.

# DOMESTIC LAUNDRY EQUIPMENT CORPORATION

SUCCEEDING "CHICAGO" CLOTHES DRYER WORKS OF NEW YORK, "AMERICAN" CLOTHES DRYER CO., SHANNON MFG. CO.

TELEPHONE:  
CHELSEA 8560

224-232 West 26th Street  
NEW YORK, N. Y.

## Products.

Every Device for the Domestic Laundry in Single Units or Complete Plants. COMPLETE LAUNDRY and "LAUNDRYETTE" EQUIPMENTS for the home, apartments, clubs and small institutions.

Chicago and Domestic Clothes Dryers constructed to fit any requirements. Chicago and Domestic Clothes

Washers. Chicago and Domestic Ironing Machines. Special made Laundry, Skirt and Valeting Tables with Electric or Gas Equipment.

Gas, Steam or Electric Heated Clothes Boilers, Soap Tanks and Starch Cookers.

Laundry Supply and Linen Cabinets.

DOMESTIC INCINERATORS (BORGE SYSTEM).



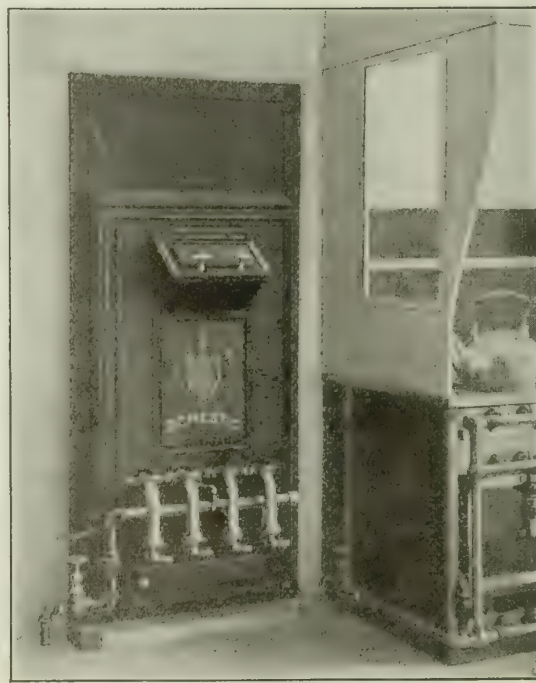
A MODERN LAUNDRY ROOM AND EQUIPMENT

## "Domestic" Incinerator (Borge System).

A garbage and refuse destructor that burns the refuse and not the machine. A domestic incinerator, of construction adapted from large community plants. Fire tile and fire clay construction, that insures long life, destroying within itself all noxious gases and eliminating all objectionable odors both at the machine and at the chimney top. Passes requirements of health authorities.



PORTABLE INCINERATOR



WALL TYPE INCINERATOR

DATA, PORTABLE INCINERATORS

Size	Cap., bushels	GAS			Gas	COAL		
		High	Wide	Deep		High	Wide	Deep
A	1	43 3/4"	21"	21 1/2"	3 1/4"	68 1/4"	21"	21 5/8"
B	2	53 3/4"	26"	28 3/4"	1 1/2"	71 1/2"	26"	28 3/4"
C	3 1/2	64 1/4"	31"	34"	1 1/4"	84"	31"	34"

SIZE OF RECESS FOR WALL TYPE INCINERATORS

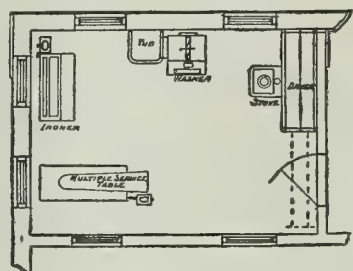
GAS				COAL			
High	Wide	Deep	Gas	High	Wide	Deep	Flue size all types
60"	23"	20"	1 1/4"	80"	23"	20"	6"
65"	28"	26"	1 1/4"	85"	28"	26"	8"
							10"



**Domestic "Laundryette" Equipment.**

Especially designed for the home of not more than 12 rooms. Larger equipment for the more extensive home.

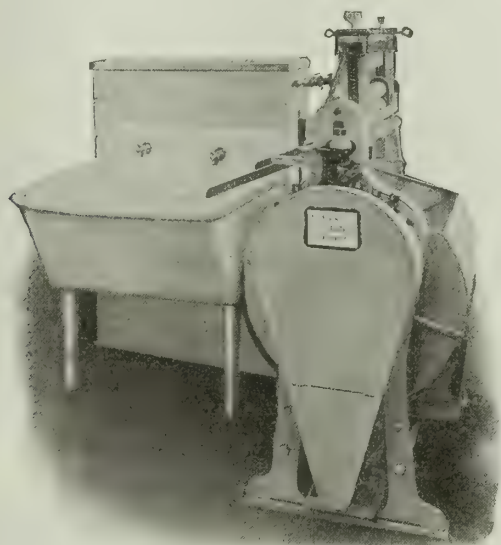
Write for price. Give electric voltage and current, whether gas is available or not.



DETAIL OF "LAUNDRYETTE" EQUIPMENT



"LAUNDRYETTE" EQUIPMENT  
Shipped f. o. b. factory, complete with full directions for installing

**DOMESTIC "LAUNDRYETTE" WASHER**

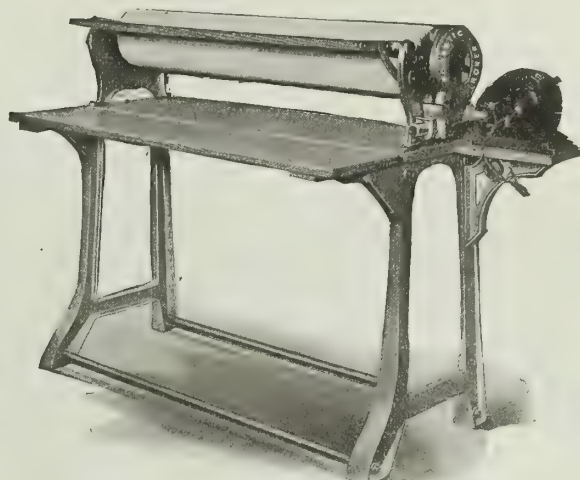
Floor space, 26 to 31 ins. Washer tub, 26 ins. wide, 18 ins. long. Wringer rolls, 12 ins.

Capacity, 7 sheets or equivalent.

Finished in white enamel. Framework malleable iron. Tub copper, nickeloid lined, making it rustproof.

Motor  $\frac{1}{8}$  h. p.—uses the smallest amount of current of any washer of like capacity.

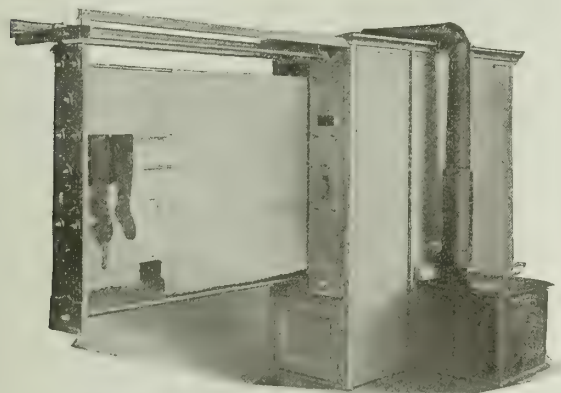
Weight, 400 lbs.

**DOMESTIC "LAUNDRYETTE" IRONER**

Floor space, 5 ft. 5 ins. by 1 ft. 9 ins. Capacity, pieces to  $2\frac{1}{4}$  yds. wide (folded once). Mounted on iron stand with holders for finished pieces.

Fuel consumption, gas, 23 cu. ft. per hour, gasoline,  $1\frac{1}{4}$  pts. per hour. Motor,  $\frac{1}{8}$  h. p. (less current consumption than electric iron). Can be electrically heated at additional cost of \$90.00—maximum current consumption 4 kw., 3 heats, high, medium and low.

Shipping weight, 355 lbs.

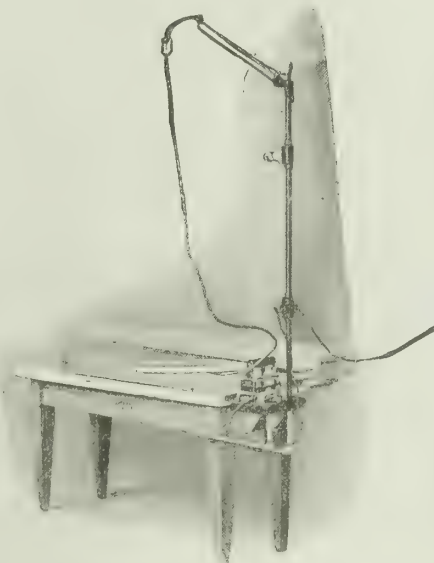
**THE DOMESTIC "DRYERETTE"**

Over all dimensions, 2 ft. wide, 6 ft. 6 ins. high, 6 ft. long. Racks fully extended, 11 ft. 6 ins.

Hanging capacity, 88 lin. ft. Construction, channel and T-iron frame with casing of heavy galvanized sheet steel. Heating system, stove 22 ins. square,  $21\frac{1}{2}$  ins. high, arranged so that heat may be thrown to the top of the stove for general laundry use, or waste heat directed into metal drum within the dryer as desired. Stove furnished either in coal burning (with 30-gal. waterback if desired) or gas burning as required; or the dryer can be heated by direct gas heating within the casing, if so ordered.

Smoke and vent pipe up to 10 ft. in length furnished with the dryer. Shipped with prime coat applied, and silver bronze paint supplied for finish coat.

Weight, approximately 1200 lbs.

**THE DOMESTIC MULTIPLE SERVICE "LAUNDRYETTE" TABLE**

Over all dimensions, length, 6 ft. 2 ins.; width, 2 ft. 6 ins.; height, 31 ins. Natural finish. Table top,  $1\frac{1}{4}$ -in. stock; legs, 4 ins., tapered.

Equipment, folding skirt board, swinging sleeve board, concealed starch board, zinc covered. Iron equipment, one 7-lb. hand iron with cord support, automatic regulator stand, snap switch and signal light; or gas iron heaters can be substituted.

Weight, approximately 150 lbs.

# W. W. McCAIN COMPANY

Manufacturers of Clothes Dryers and Radiator Shields

944-950 East Maryland Street  
INDIANAPOLIS, IND.

## Products.

"FAMILY" CLOTHES DRYERS, with COAL or GAS STOVE for residences, apartment buildings and institutions. "HAWKINS" RADIATOR SHIELDS in three styles for steam and water radiators.

## Construction.

The "Family" dryer is substantially made of galvanized sheets securely bolted together. The stoves are so constructed that the air passes over the sides and bottom of fire chamber into the dryer, thus supplying it with clean, warm air. Dryers can also be made with gas burners enclosed in heating drum placed in the bottom, without stove, and do not require flue connection.



FIG. 1. "FAMILY" CLOTHES DRYER, WITH GAS STOVE FOR NATURAL OR ARTIFICIAL GAS  
Showing 7 clothes bars to each rack. Highest bar only 5 ft. 9 ins. from floor

## Distinctive Features.

The gas stove dryer, as well as coal stove dryer, has an upright heating drum, so placed as to leave a clear floor space; the laundress can enter through sliding door. The gas fumes pass through the drum and not through the clothes. Dryer is thoroughly ventilated by drawing the heavy, damp air from the bottom. The cast iron, roller bearing wheel (Fig. 3) carries the racks on heavy tee-iron rails. A ventilated, U-shaped clothes bar (Fig. 4), with smooth, galvanized surface, is used.

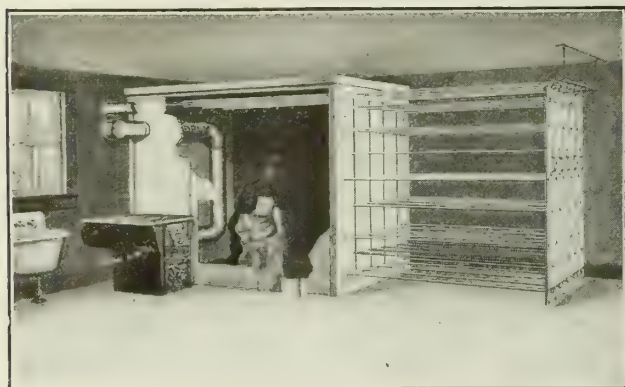


FIG. 2. SECTIONAL VIEW "FAMILY" CLOTHES DRYER WITH COAL STOVE  
Upright heating drum leaves clear floor space in dryer

DIMENSIONS OF STANDARD SIZE DRYERS

No. of racks	Closet		Full width over all with				Clothes bars total length, ft.
	Length, ft.	Width, ft. ins.	coal stove, ft. ins.		gas stove, ft. ins.		
3	7	2 4	4	4	4	8	115
4	7	3 .0	5	.0	5	4	153
5	7	3 7	5	7	5	11	192
6	7	4 3	6	3	6	7	230
7	7	4 10	6	10	7	2	269
8	7	5 6	7	6	7	10	307
9	7	6 2	8	2	8	6	345
10	7	6 10	8	10	9	2	384

Drying closet is 6 ft. 6 ins. high. When racks are extended, dryer occupies space 12 ft. 8 ins. long.

Stove can be connected to right or left side, rear or front of dryer. Stove and dryer can be placed in separate rooms, with connection through wall. Dryers can be made to fit any space. Sketch will be furnished if dimensions of room are given.

An 8-in. flue is sufficient, but 8 by 12 ins. is better for coal stove.

Insulated dryers are made with double casing, having asbestos between.

Ask for literature giving full description and list of users.

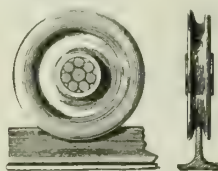


FIG. 3. CAST IRON ROLLER BEARING WHEEL

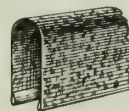


FIG. 4. VENTILATED U-SHAPED BAR

## "Hawkins" Radiator Shields.

Will fit any style or width of steam or water radiators.

These shields are made of heavy crimped sheet iron with cast iron ends and supports, and are bolted direct to radiator. A dust gutter catches the dust. The felt edge on apron makes a tight connection to the wall. Two other styles are made.

Circular with full details will be furnished on request.

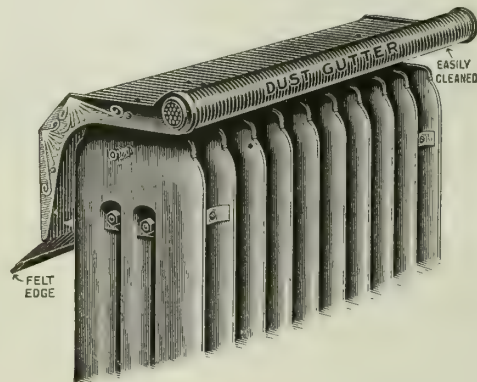


FIG. 5. "HAWKINS" STYLE C RADIATOR SHIELD



# THE JOHN E. MANNEN CO.

Manufacturers of Gas Laundry Dryers and Stoves

2241-2255 St. Clair Avenue

CLEVELAND, OHIO

## Products and Services.

"DRIRITE" GAS CLOTHES DRYERS, of various sizes, for residences, apartment buildings, institutions, hotels and special purposes; J. E. MANNEN ECONOMY GAS LAUNDRY STOVES.

Metal Ceilings, Roofing and Cornices; Skylights; Exhaust Systems; Galvanized Iron Pipe Work; Heavy Iron Work.

General Sheet Metal Contractors.

For Garage Heaters, see page 1031.

DIMENSIONS OF DRYING CABINET

No.	Racks	Height, ft.	Width, ins.	Length closed, ft.	Length with rack extended, ft.
3	3	7	24	7	14
4	4	7	31	7	14
5	5	7	39	7	14
6	6	7	46	7	14
7	7	7	54	7	14
8	8	7	61	7	14



"DRIRITE" DRYER, WITH GAS STOVE

## "Dririte" Gas Clothes Dryer.

**VENTILATING PROCESS**—The ventilating process used in the "Dririte" is the most sanitary, because the hot air rises and passes up through the clothes, and the steam arising therefrom, laden with impurities, is immediately withdrawn from the cabinet by means of a vent pipe of suitable size connected to a vacuum pipe at the chimney, and not brought down through the cabinet again, as is the case with other makes of dryers on the market. Hot air must rise. When it passes through clothes once, why not pass it out? Best by test.

**LOCATION OF BURNERS**—The burners are located at the base of the drying chamber underneath a spreader or baffle plate. This gives a more active and quicker heat than in passing it from the stove, as was done in the old way.

**FUEL USED**—The "Dririte" is a gas dryer. It can be operated with either artificial or natural gas.

**CO-OPERATIVE SERVICE**—Dryers of all descriptions are made by this company, and further information or assistance will be given on request.

**Dririte**  
TRADE-MARK

## J. E. Mannen Economy Gas Laundry Stove (Patented).

Air supply is so controlled that no more than the right amount to secure the most intense heat reaches the flame. The only stoves of the kind in which burners can be raised for artificial or lowered for natural gas. Enclosed burners retain and concentrate the heat; central and ring draft doubles the heat of the open flame. Absolutely odorless.



J. E. MANNEN ECONOMY GAS LAUNDRY STOVE

# THE SCIENTIFIC HEATER CO.

Manufacturers of Clothes Dryers

1065-1125 East 152nd Street  
CLEVELAND, OHIO

## SALES AGENCIES

BALTIMORE, CONSOLIDATED GAS & ELECTRIC Co.  
BOSTON, STACK HEATER Co., 112 Portland Street  
BUFFALO, MARTIN FISHER & SONS, 438-40 Pearl Street  
CHICAGO, EUREKA WATER HEATER Co., 37 West Lake Street  
CINCINNATI, RUEHRWEIN & LAWSON, 1228-30 Walnut Street  
DENVER, COLORADO RANGE Co., 1609 Court Place  
DETROIT, H. V. LOGAN, c/o Builders' Exchange, Penobscot Building  
MILWAUKEE, MILWAUKEE GAS LIGHT Co., 182 Wisconsin Avenue

MINNEAPOLIS, BEECHER-CUMMING Co., 918 Andrus Building  
NEW ORLEANS, HARTWELL & Co., 213 Barothe Street  
NEW YORK, BUERKLE SALES Co., 212 Livingston Street, Brooklyn  
PHILADELPHIA, C. H. EHRENZELLER, 13 South 7th Street  
PITTSBURGH, HECKLER BROTHERS, 828 Liberty Avenue  
SAN FRANCISCO, JACK MARTIN & Co., 309 13th Street, Oakland  
ST. LOUIS, PITTSBURGH-STEWART HEATER & FILTER Co., 1010 Olive Street  
TORONTO, CONSUMERS GAS Co., 36 Mutual Street

## Products.

CLOTHES DRYERS for operation with Gas, Electricity or Kerosene.

## Leading Advantages of Scientific Clothes Dryers.

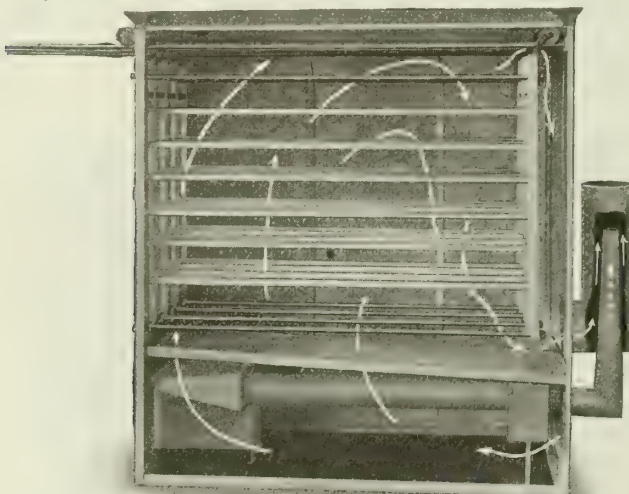
Scientific dryers are noted for drying clothes snow white, even whiter than sun dried clothes. The objection to which most other dryers are open—white clothes turned yellow—has been entirely overcome by the Scientific drying principle.

## Scientific Drying Principle.

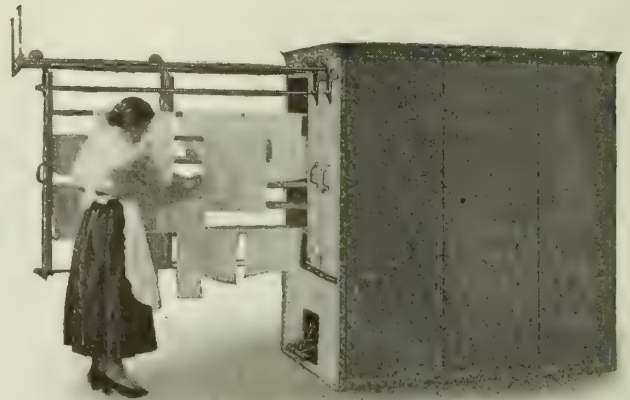
The principles used in other dryers (a high inside temperature and small air circulation) have been completely reversed. The Scientific dryer utilizes the lowest possible air temperature and the greatest possible number of air changes, so that the clothes are dried and not baked; ventilated and not sweated. This revolutionary change is accomplished by the Scientific air circulation.

## Scientific Air Circulation.

The course of the air is readily understood by following the arrows in the open view cut. The air enters at the rear into the air warming chamber. Here the air is moderately warmed and dried so that it has a powerful affinity for moisture. It rises through the screen by natural circulation and passes upward through the clothes. As it is cooled by the evaporation of the moisture from the clothes, it becomes heavier and settles downward at the rear of the drying chamber and passes to the exhaust pipe.



SECTIONAL VIEW OF NO. 1504 SCIENTIFIC DRYER  
Showing interior construction and system of warm air circulation as designated by arrows.



SHOWING METHOD OF HANGING CLOTHES ON RACKS

The burned gases from the heater are vented into the exhaust pipe, and this greatly accelerates the flow of the air through the dryer. The exhaust pipe at the rear is of much larger capacity than in any other dryers. This makes possible from 200 to 300 complete air changes per hour.

## Results.

Instead of having the clothes sweated and baked, they are scientifically ventilated and dried. Instead of having white clothes turned yellow, they come out snow white. Instead of being wrinkled and hard, they come out smooth and soft, easy to iron. Instead of the laundry odor, clothes are sweet and sanitary. Instead of delicate fabrics becoming brittle by the baking heat, they are absolutely uninjured by the summer warmth in Scientific dryers.

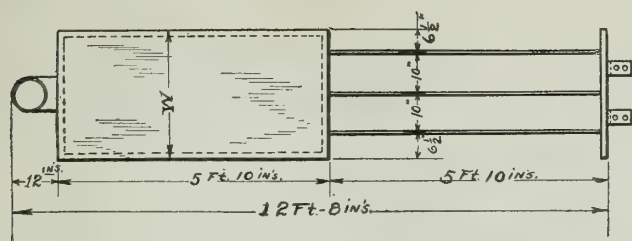
## Speed and Economy.

The Scientific ventilating and drying process is highly economical, as every single heat unit in the fuel is made to perform definite work, either in warming and drying the incoming air, or in speeding up the outgoing air and moisture. Light clothes are dried in from 20 to 40 minutes, which is as rapid as is possible, consistent with correct drying principles.

## Construction.

The cabinet is made up of No. 26-gage galvanized steel panels, assembled by an ingenious interlocking joint. This joint strongly braces the entire structure, making it staunch and rigid. There are no bolts projecting into the cabinet, and no raw metal edges to catch on or tear the clothes; no ungalvanized metal can come in contact with the clothes anywhere, so that there are no chances for rust spots.





PLAN OF SINGLE DRYER, NO. 1503

DATA, SINGLE DRYERS

Size number	Number of racks	Width of cabinet, W, ins.	Diameter of vent pipe, V, ins.	Price list
1502	2	23	7	\$108.00
1503	3	33	8	144.00
1504	4	43	9	180.00
1505	5	53	10	216.00
1506	6	63	two 8	252.00
1508	8	83	two 9	324.00
1510	10	103	two 10	390.00

Each drying rack has 6 drying rods 66 ins. long or a total of 33 ft. per rack. Each rack is 10 ins. wide.  
Standard length of cabinet is 5 ft. 10 ins.; height, 6 ft. 6 ins.  
Distance from back of cabinet to end of tracks is 11 ft. 8 ins.

Drying Racks.

These are unusually wide (10 ins. instead of the ordinary 6 ins.), so that they can be easily rolled in or out without the necessity of squeezing the clothes together first. The extra width also permits of more free air circulation through the clothes and more even drying.

Noiselessness.

The drying racks are hung on selected basswood rollers, running on 1/2-in. galvanized pipe rails. These rails pass through basswood supports and especial care is exercised that there is no metal-to-metal contact between the rail and the cabinet, or the rail and the drying racks. This arrangement causes the absorption of practically all vibration and noise. There are no ball bearings to rust and rattle. Friction has been reduced to a minimum and the racks roll in or out with velvet smoothness.

Basswood rollers are guaranteed not to split or warp. When rack is fully extended, rear panel of rack closes the opening, so that the drying and ventilating process goes on in the cabinet while the extended rack is being filled or unloaded.

Air Heater.

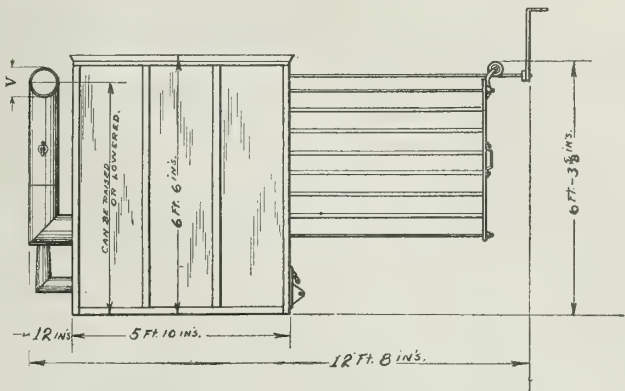
Made of No. 24-gage Armco iron, which resists rust indefinitely. All joints are double hand seamed and absolutely tight, without depending upon cement or similar makeshifts. There is no possibility of burned gas escaping into the clothes.

Electric Dryers.

In these dryers, the heat is supplied by a series of nickel chromium resistors. Two switches enable one-third, two-thirds or full current to be turned on. They can be arranged for any voltages from 110 to 250, alternating or direct current. The 110-volt outfit is sent unless otherwise specified. Switch and fuse box come with the dryer. A motor fan accelerates the air circulation. Special wiring arrangements must be made for electric dryers with the public service company furnishing the current. Maximum current consumption, 1 1/4 kw. per drying rack.

Kerosene Burners.

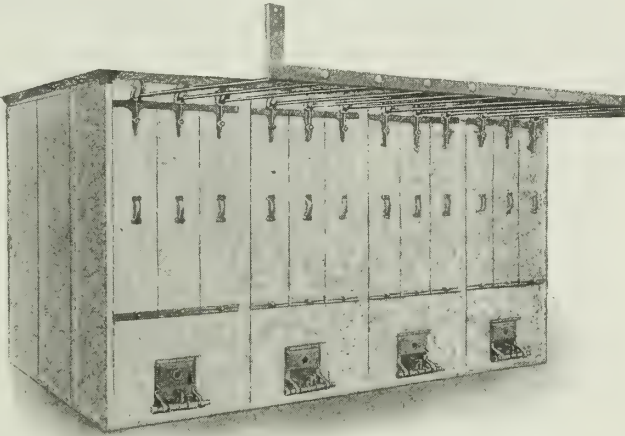
Where gas is not available, kerosene burners can be furnished. The kerosene is fed by gravity; sight feed. No smoke or kerosene smell can get into clothes except by gross carelessness.



SIDE ELEVATION OF ALL DRYERS

Scientific Apartment Dryers.

The apartment dryer is really two or more independent dryers all contained in one cabinet. By this arrangement, several tenants can wash and dry at the same time, and the clothes of each family will be dried in separate compartments. The gas pipes may be so arranged that each tenant uses gas from his own meter.



SCIENTIFIC APARTMENT DRYER

DATA, APARTMENT DRYERS

Size number	Number of racks per compartment	Number of compartments	Width of each compartment, ins.	Width of cabinet, ins.	Diameter of main vent pipe, ins.	Price list
1502-2	2	2	23	46	9	\$198.00
1502-3	2	3	23	69	11	288.00
1502-4	2	4	23	92	12	378.00
1502-5	2	5	23	115	14	468.00
1502-6	2	6	23	138	two 10	558.00
1502-8	2	8	23	184	two 11	738.00
1502-10	2	10	23	230	two 12	918.00
1503-2	3	2	33	66	11	270.00
1503-3	3	3	33	99	14	396.00
1503-4	3	4	33	132	15	522.00
1503-5	3	5	33	165	two 10	648.00
1503-6	3	6	33	198	two 12	774.00
1503-8	3	8	33	264	two 14	1,026.00
1503-10	3	10	33	330	two 16	1,278.00
1504-2	4	2	43	86	12	342.00
1504-3	4	3	43	129	15	504.00
1504-4	4	4	43	172	16	666.00
1504-5	4	5	43	215	two 12	828.00
1504-6	4	6	43	258	two 14	990.00
1504-8	4	8	43	344	two 16	1,314.00
1504-10	4	10	43	430	two 18	1,638.00
1505-2	5	2	53	106	14	414.00
1505-3	5	3	53	159	15	612.00
1505-4	5	4	53	212	two 12	810.00
1505-5	5	5	53	265	two 14	1,008.00
1505-6	5	6	53	318	two 16	1,206.00
1505-8	5	8	53	424	two 18	1,602.00
1505-10	5	10	53	530	two 20	1,998.00

Catalogue.

Catalogue giving full information on Scientific dryers will be sent to interested persons on request.

# THE AUTOMATIC REFRIGERATING COMPANY

## Automatically Controlled Refrigerating and Ice Making Plants

### HARTFORD, CONN.

#### BRANCH OFFICES

NEW YORK, N. Y.  
CLEVELAND, OHIO  
ROCHESTER, N. Y.

BOSTON, MASS.  
LOUISVILLE, KY.

CHICAGO, ILL.  
SEATTLE, WASH.  
LOS ANGELES, CAL.

ATLANTA, GA.  
SAN FRANCISCO, CAL.  
WASHINGTON, D. C.

### Products.

Manufacturers of complete AUTOMATICALLY CONTROLLED AMMONIA COMPRESSION REFRIGERATING and ICE MAKING PLANTS, including Compressors, Condensers, Coils, Piping and Traps, and Automatic Controlling and Safety Devices for Refrigerating Plants.

### "Automatic" Refrigerating Plants.

These plants (fully patented) are designed to provide mechanical refrigeration without the necessity of an operating engineer. Automatic features absolutely control starting and stopping of machine as temperature in boxes rises above, or falls below, predetermined points, and also control feed of ammonia to expansion coils, and feed of water to condenser. Safety devices immediately stop plant in case of trouble with water or electric power service. The Grand Prize was awarded to this company exclusively in refrigeration at Panama-Pacific International Exhibition.

**ECONOMY**—A table is appended as to cost of operation, with a 3¢ power rate, and based upon readings of an automatic time recorder. The compressor of this plant, during July, ran only 73.1% of the time. A compressor, during entire year, may average 60% of entire time.

**SIZES**—Single units have from ½ ton to 30 tons refrigerating capacity per

24 hours. Also "Baby Automatic," for household use, complete plant occupying floor space of 30 by 78 ins.

**POWER**—Any type of electric current.

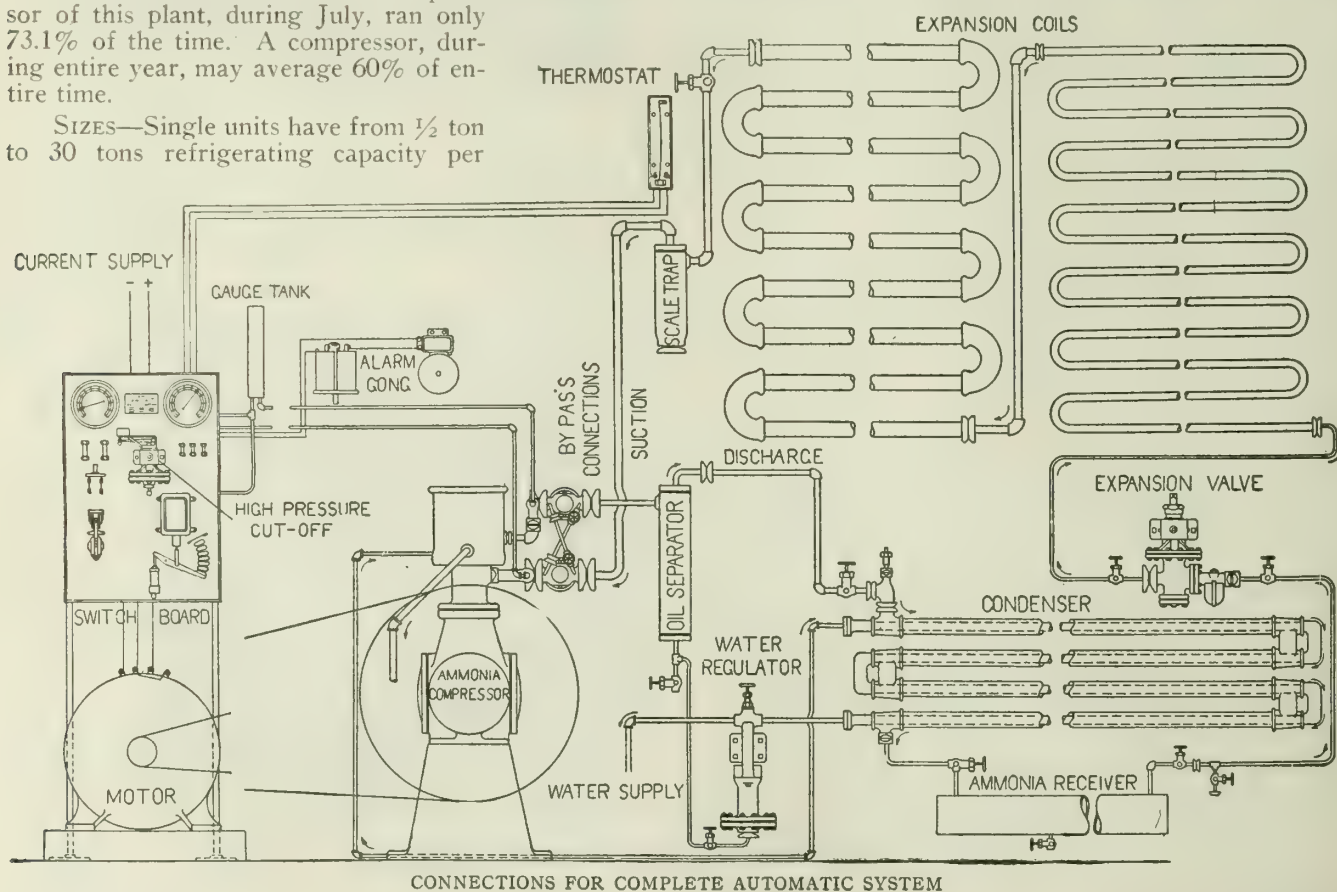
SIZES OF MOTORS REQUIRED FOR VARIOUS REFRIGERATING CAPACITIES FOR 24 HOURS

H. p. of motor....	1	2	3	5	7½	10	15	20	25	30	60
Capacity lbs. ....	1,000	2,000	3,000	5,000	7,000	10,000	15,000	20,000	25,000	32,000	60,000

TABLE SHOWING COST OF OPERATION OF A 10-H.P. PLANT

	July		August		September		Three Months	
	Per cent	Dollars	Per cent	Dollars	Per cent	Dollars	Per cent	Dollars
Power consumption, if run continuously.....	100.00	133.44	100.00	133.44	100.00	133.44	100.00	400.32
Actual power consumption with thermostatic control.....	73.1	97.54	67.9	90.60	66.1	80.20	69.0	269.34
Actual water consumption.....	Cu. ft. 44.250	26.55	Cu. ft. 41,050	24.63	Cu. ft. 36,400	21.84	Cu. ft. 121.70	73.02
Total cost of refrigeration:		124.09		115.23		102.04		341.36
Cost of ice to furnish equivalent refrigeration:								
At \$3 per ton.....	110	330.00	102	306.00	99	297.00	311	933.00
At \$4 per ton.....	110	440.00	102	408.00	99	396.00	311	1244.00

NOTE—Ratio between operating cost and ice is about 1 to 3 and 1 to 4.



CONNECTIONS FOR COMPLETE AUTOMATIC SYSTEM



### Compressors.

The compressors are vertical 2-cylinder, single acting, enclosed type; of rugged construction, built to accurate dimensions with parts interchangeable, and with patent "safety heads" to obviate danger to cylinder heads from non-gaseous substances getting into cylinder. Cylinders and pistons specially designed to prevent objectionable oil pumping into expansion piping. The construction is particularly rugged, and all parts and materials are thoroughly tested. Fitting and assembling carefully done by skilled mechanics.

### Condensers.

The condensers are of the double pipe type, with water and ammonia flowing in opposite directions. Atmospheric condensers are used where conditions make them more desirable.

### Coils.

Coils are continuously welded, or with screwed or flanged return bends, whichever type is best adapted to the specific installation. All screwed joints are thoroughly "sweated" and tested under high pressure.

### Automatic Parts.

The automatic parts economize power and water consumption, and at the approach of danger stop the machine.

### Thermostat.

The thermostat produces economy of power consumption by causing machine to run only when temperature of boxes requires it. It is of rugged construction, specially designed for its place and service.

### Automatic Expansion Valve.

The expansion valve (patented) automatically controls the feed of ammonia to the expansion coils, allowing just the proper amount to maintain the required suction or back pressure, and causing further economy of operation.

### Automatic Water Regulator.

The water regulator (patented) automatically controls the flow of water to the condenser, opening valve as head pressure rises, and closing valve as head pressure falls, a great economizer on water consumption.

### Safety High Pressure Cut-out.

The safety high pressure cut-out (patented) automatically stops the machine in case the head pressure approaches the danger line due to failure of water supply or any other accidental cause, and at same time rings an alarm bell to call attention to the trouble.

### Power Control.

The starting and stopping of the machine by the various automatic devices is through a special switch-board, which further holds automatic safety devices that shut machine down, and cut off all power in the event of trouble in the electric service, thus preventing danger of damage to motor. It is patented.

### Repair Parts.

All parts of the plants are of superior construction and are interchangeable. A stock of parts always carried, which can be shipped promptly. No delays or holding up of apparatus while a new part is being constructed.

### Prices and Estimates.

In dividing the work to be done in the erection of a building, architects should provide for a separate contract to cover the refrigerating system; and should not include this kind of special technical work as a part of any heating, lighting or plumbing contract.

In this connection, this company shall be glad to make estimates and quote prices on completely installed plants, depending on individual requirements and conditions.

DATA SHEET FOR ESTIMATING

	Room 1	Room 2		Room 1	Room 2
Length of room.....			Desired temperature..		
Width of room.....			Thickness of walls.....		
Height of room.....			Wall construction.....		
Used for.....			Is door often opened?..		
Lbs. cooled daily.....			Is any part exposed to		
From temperature of.....			direct rays of sun?..		
Outside temperature..					

Voltage.....	D. C. or A. C.....
Phase.....	Frequency.....
Source of water supply.....	
Summer temperature of same.....	
Maximum amount of ice now used.....	
Special data.....	

### Co-operation.

Architects and others are invited to consult the engineering department of this company regarding prospective refrigerating plant installations. Drawings and data supplied; no obligations entailed. Prompt attention is assured.

### Some Recent Installations.

Armour & Co. (Packers), Branch Houses  
 Cudahy Packing Co. (Packers), Branch Houses  
 Sulzberger & Sons Co. (Packers), Branch Houses  
 Kingan & Co. (Packers), Branch Houses  
 Keeley Brewing Co. (Brewers), Depots  
 Chatham Bars Inn, Chatham, Mass.  
 Hotel Garde, Hartford, Conn.  
 Bangor House, Bangor, Me.  
 Georgian Terrace Hotel, Atlanta, Ga.  
 Hotel Wentworth, Portsmouth, N. H.  
 Hartford Club, Hartford, Conn.  
 Providence Public Market, Providence, R. I.  
 J. B. Blood Co. (Market), Lynn, Mass.  
 C. N. Dodge (Market), Hartford, Conn.  
 Burke Bros. (Market), Chicago, Ill.  
 Astor Court Apartments, New York, N. Y.  
 Society of Oblate Fathers, Washington, D. C.  
 C. S. Mellen (Residence), Stockbridge, Mass.  
 Morton F. Plant (Residence, Dairy and Poultry Farm), Eastern Point, Groton, Conn.  
 F. A. Seiberling (Residence), Akron, Ohio  
 Snow & Palmer (Dairy), Bloomington, Ill.  
 Bryant & Chapman (Dairy), Hartford, Conn.  
 N. Y. State Cancer Laboratory, Buffalo, N. Y.  
 Robert Brigham Hospital, Boston, Mass.  
 Flower Hospital, New York, N. Y.  
 State Hospital for the Insane, Norwich, Conn.  
 State Hospital for the Insane, Danville, Pa.  
 Mendocino State Hospital, Talmadge, Cal.  
 Wise, Smith & Co. (Department Store), Hartford, Conn.  
 Palais Royal (Department Store), Washington, D. C.  
 Underwood Typewriter Co. (Factory), Hartford, Conn., Water Cooling  
 Colt's Patent Fire Arms Co. (Factory), Hartford, Conn., Water Cooling  
 American Hardware Co. (Factory), New Britain, Conn., Water Cooling  
 Bridgeport Brass Co. (Factory), Bridgeport, Conn., Water Cooling  
 Hartford Electric Light Co. (Offices), Hartford, Conn., Water Cooling  
 Aetna Life Insurance Co., Hartford, Conn., Water Cooling  
 Municipal Building, Hartford, Conn., Water Cooling  
 Phoenix Insurance Co., Hartford, Conn., Water Cooling  
 Metropolitan Life Insurance Co., New York, N. Y.  
 John Hancock Mutual Life Insurance Co., Boston, Mass.  
 New York Motion Picture Corporation (Ince Studios), Culver City, Cal.

# THE BRECHT COMPANY

ESTABLISHED 1853

## Packing House Machinery and Equipment

MAIN OFFICE AND FACTORIES

ST. LOUIS, MO.

NEW YORK, 176 Pearl Street

BRANCHES  
PARIS, FRANCE

BUENOS AIRES, SOUTH AMERICA

### Products.

ABATTOIR, PACKING HOUSE and SLAUGHTER HOUSE EQUIPMENT, including HOISTS, TRACKING and OPERATING APPLIANCES; FERTILIZER, LARD, OLEO and OIL, SAUSAGE MAKING, CANNING and GENERAL MEAT MACHINERY, TOOLS and SUPPLIES pertaining to the meat industry and its by-products. COOLING ROOMS, ICE MACHINES, and COLD-STORE DOORS.

Municipal Market House Equipment, Blocks and General Market Fixtures.

### Packing House Design.

GENERAL—About 75% of the money expended in converting the raw into a finished product in a packing house is for labor, the other 25% is for interest, insurance, administrative expenses, supplies, etc. Hence, a plant that is designed for operation in the most economical manner, and at the same time provides for economy of construction, is undoubtedly the acme of perfection. It is also important to plan so that departments may from time to time be enlarged as the growth of the business may require.

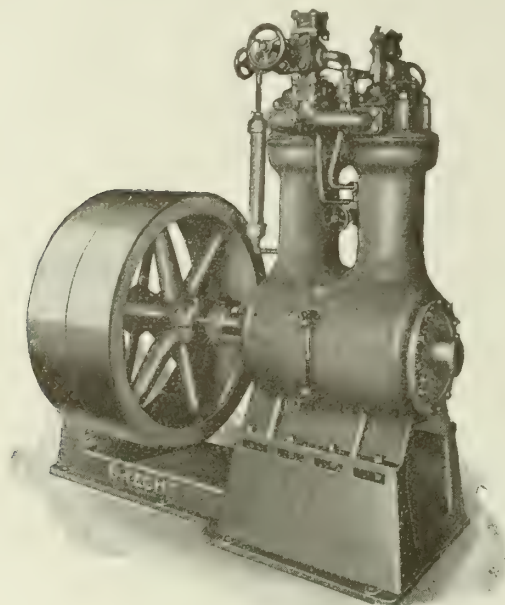
### Co-operation.

There has been such a large demand for expert

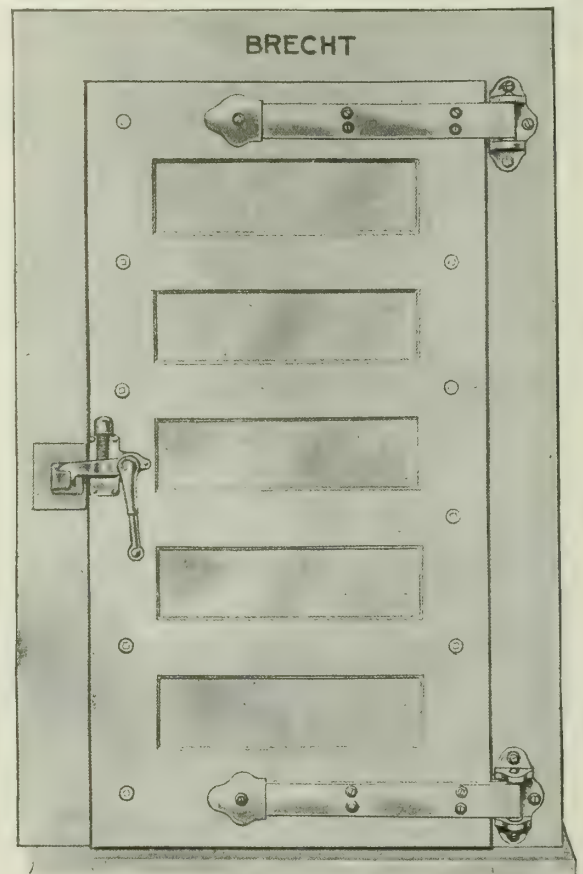
and reliable information in regard to the erection of abattoirs, packing houses, slaughter houses, lard refining plants, oleo and fertilizer plants and cold storages, that we have found it necessary to place these special independent departments under personal supervision of our experts with long practical experience.

Architects contemplating the erection of such plants, or the remodeling of old ones, will find it to their interest to consult with us. All necessary co-operative information and specifications for the proper location and installation of required machinery and appliances will be furnished.

Our 65 years' experience and familiarity with the requirements, and resulting expert knowledge on the subject, will prove beneficial both in the study of a given problem and in the final economical arrangement and equipment of the building.

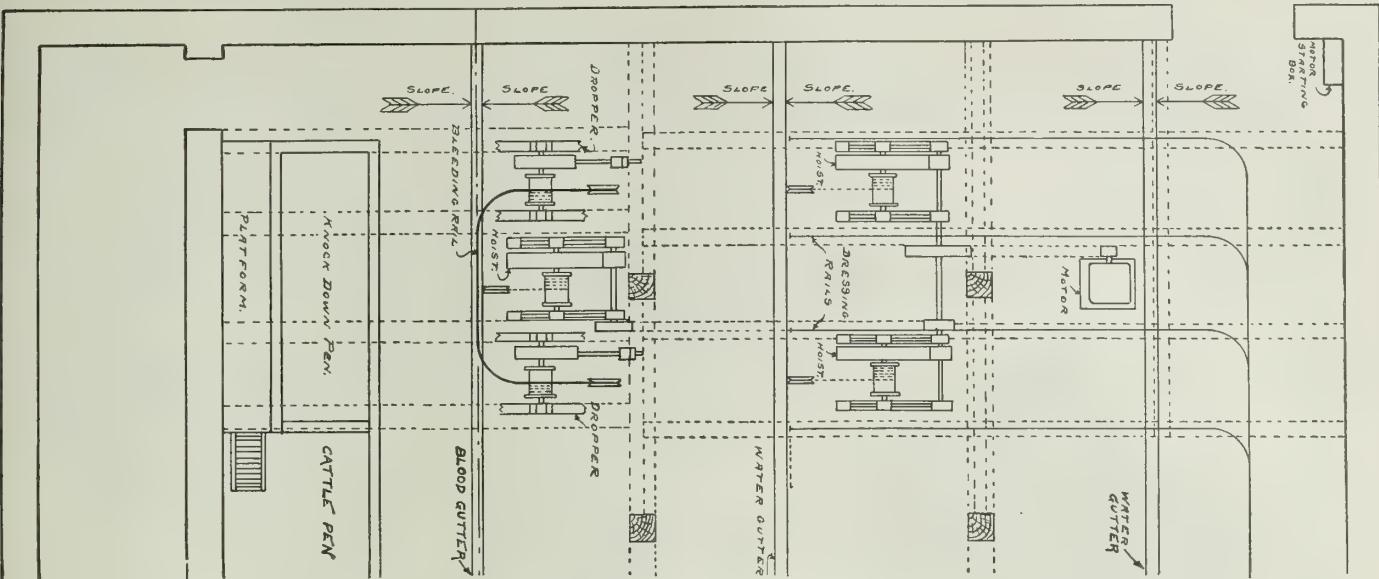


BRECHT REFRIGERATING MACHINES  
For every purpose

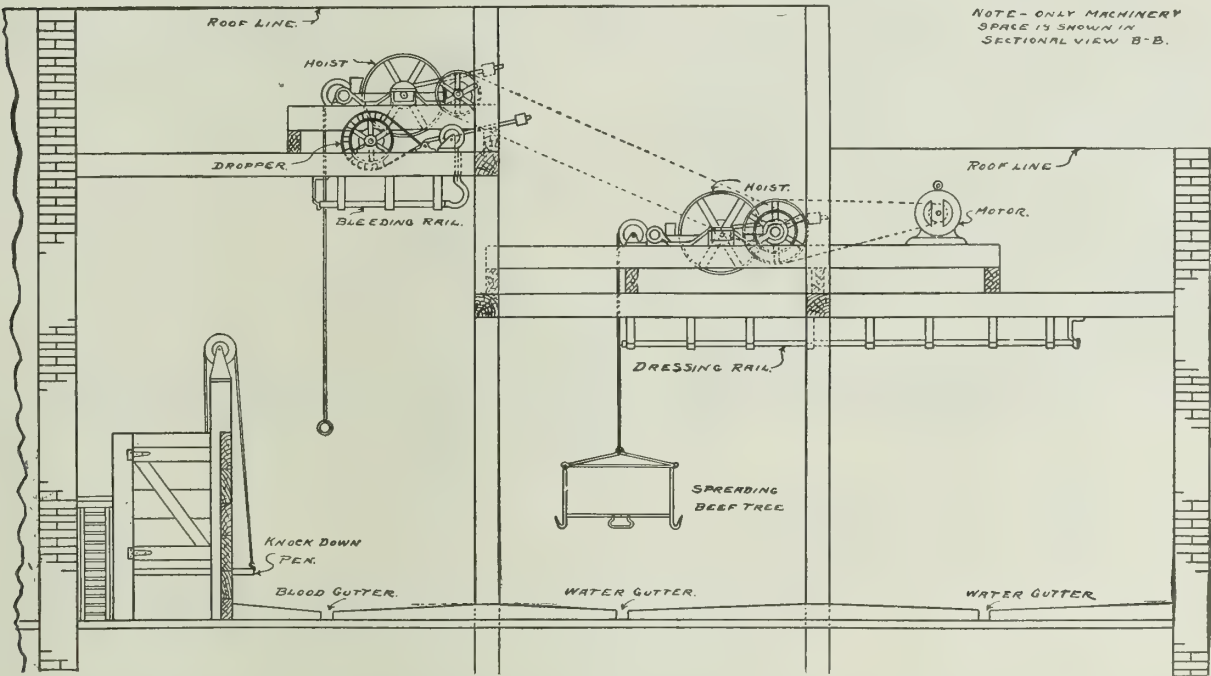


BRECHT COLD-STORE DOOR  
Ball bearing hinges and automatic self-locking fastener  
Also, automatic track shutter when used on rooms having overhead tracking





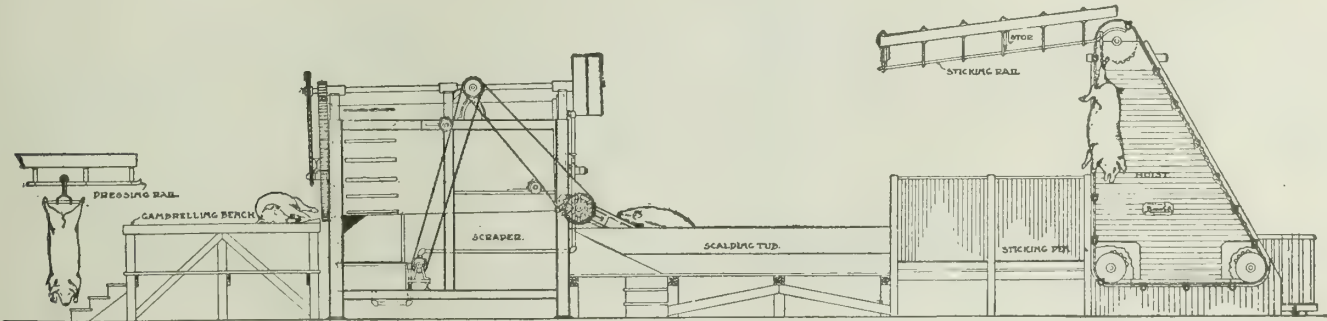
PLAN OF BRECHT'S BEEF KILLING EQUIPMENT



NOTE - ONLY MACHINERY SPACE IS SHOWN IN SECTIONAL VIEW B-B.

ELEVATION OF BRECHT'S BEEF KILLING EQUIPMENT

Plan and elevation showing Brecht's improved beef killing method of arrangement of knock down pens, bleeding rail, double hoist, droppers, dressing rails, etc.



BRECHT'S MODERN HOG KILLING EQUIPMENT





# CARBONDALE MACHINE COMPANY

Manufacturers of Exhaust Steam Ice Making and Refrigerating Machinery

CARBONDALE, PA.

## BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street  
BALTIMORE, MD., 304 Continental Building  
PHILADELPHIA, PA., 1009 Harrison Building

CHICAGO, ILL., 1325 Manhattan Building  
NEW ORLEANS, LA., 914 Title Guaranty Building  
PITTSBURGH, PA., 1122 Allegheny Avenue

## Products and Services.

ABSORPTION REFRIGERATING MACHINES; PARAFFIN WAX MACHINERY, consisting of Distillate Chilling Machines, Hydraulic Filter Presses, Pumping Equipment, Sweating Pans, etc.; ICE-MAKING PLANTS.

Steam and Power Aqua Ammonia Pumps; Ammonia Economizers; Brine Coolers; Gland Ammonia Fittings.

Complete Refrigerating, Ice Making and Paraffin Wax Plants designed, furnished and installed.

## Advantages of Absorption Refrigerating Machines.

- (1) Can run by exhaust steam.
- (2) No heavy moving parts.
- (3) Noiseless.
- (4) No heavy foundations.
- (5) Very little attention required.
- (6) Adapted for any floor space or headroom.
- (7) Most economical, with low cost of maintenance.

## Type of Machines.

The type of machine is determined by local conditions. These are, first, the atmospheric type, which is adapted to warm or muddy water; second, double pipe type, which is used in engine rooms where water conditions are favorable, and on account of having straight pipes is very accessible for repairs and cleaning; third, shell and coil type, adapted for water which is not corrosive.

## Ice Making.

Central stations, gas plants and steam users with a source of exhaust steam can operate a Carbondale ice machine to advantage. If a complete plant is desired with boiler equipment, the evaporator system is recommended, and we are prepared to guarantee fuel consumption.

## Refrigeration.

Carbondale exhaust steam machines are used, not only in ice making plants, but also for cold storage, packing houses, apple and fruit storages, fur storages, powder plants, chemical plants, cottonseed oil plants, paraffin wax plants, candy and ice cream manufactories, fish and poultry freezers, air and drinking water cooling plants.

Installations can be inspected in hotels, restaurants, office buildings, department stores, clubs, hospitals, public and educational institutions, creameries and dairies; also in railroad stations.



THE EQUITABLE BUILDING, NEW YORK, N. Y.

## General.

Both architects and engineers realize the many advantages of the absorption type of machine in all classes of refrigerating and ice making installations. A test plant at our works has brought about many results toward advancement in design of the different parts. As a result of many years' experience, our machines produce refrigeration at a minimum cost per ton.

## References.

The CARBONDALE MACHINE COMPANY's refrigerating plants are in operation throughout the United States and many foreign countries. Below is given one important installation in different classes of buildings:

Hotel Astor, New York, N. Y.  
University Club, New York, N. Y.  
Marshall Field & Co., Chicago, Ill.  
Western Pennsylvania Hospital, Pittsburgh, Pa.  
Filene Building, Boston, Mass.  
Apthorpe Apartments, New York, N. Y.  
Equitable Building, New York, N. Y.  
Harvard Medical College, Boston, Mass.  
Nunnally Co., Atlanta, Ga.  
Wilson & Co., Chicago, Ill.  
Miller & Hart, Chicago, Ill.  
Chicago & Northwestern R. R., Chicago, Ill.  
Masonic Temple, Philadelphia, Pa.  
Standard Oil Co., N. Y., N. J., Pa.  
E. I. Du Pont de Nemours Powder Co., Wilmington, Del.

# PEERLESS ICE MACHINE COMPANY

Manufacturers of Automatic, Self-contained Refrigerating Machinery

72 West Adams Street  
CHICAGO, ILL.

## Product.

PEERLESS AUTOMATIC SELF-CONTAINED REFRIGERATING MACHINES.

## Scope of Use.

Private houses, apartment houses, hotels, hospitals, asylums and other institutions, grocery and drug stores, meat markets, dairies, florists, etc.

## Description.

One objection offered by those who have wanted mechanical refrigeration is lack of space; but with the Peerless space does not enter into the proposition.

The machine is a self-contained unit of every essential refrigerating factor, outside of expansion coils. The compressor, oil trap, condenser and ammonia receiver are all on one base, assembled, connected and tested, under operating conditions, at the factory.

The automatic feature gives one of the strongest endorsements for installation. The thermostat is set at a predetermined point; machine operating only when temperature rises above that point and stopping when desired degree is reached.

CAPACITY—From  $\frac{1}{4}$  ton to 10 tons.

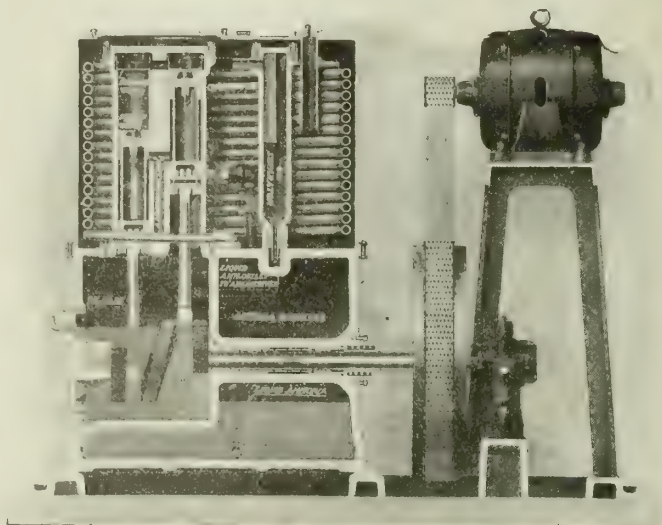
DETAILS OF PARTS—The compressor is vertical, single acting, self-oiling and perfectly balanced to run without vibration. The condenser coils, of extra heavy ammonia pipe, surround the cylinders and oil trap, and the whole is enclosed in a jacket and water cooled. The ammonia receiver is in the base of the machine.

Machines up to 3 tons capacity have motor mounted on top of water jacket; larger sizes have special motor stand inside of base dimensions. Equipped with a silent chain drive which has 98% efficiency.

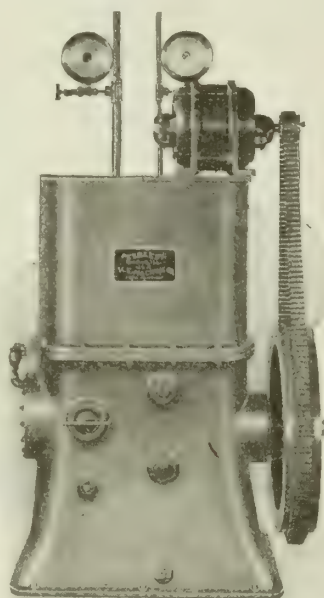
All working parts are easily accessible and interchangeable.

## Advantages.

Peerless machines now in operation have continu-



SECTIONAL VIEW OF COMPLETE 5-TON PEERLESS REFRIGERATING MACHINE  
Motor mounted on frame



PEERLESS AUTOMATIC REFRIGERATING MACHINE  
Two Tons Capacity

ously maintained the same temperature in the refrigerators, day and night, year in and year out—proof positive of the Peerless efficiency in the automatic feature.

The Peerless can be operated with push button control, where a constant, uniform temperature is not required.

No valves to be operated every time the machine is started or shut down, or to be adjusted from time to time, as in the instance of hand operated machines.

The high pressure side being submerged, the machine is not subject to annual official inspection—an assurance of the absolute safety of the Peerless.

Every part being perfectly balanced, no special foundation is required; it may be placed wherever convenient. Practically noiseless; all working parts enclosed; always neat and clean.

Two ammonia and two water connections only are necessary, thus requiring the minimum of time for making installation.

No FUMES—The Peerless is absolutely odorless. The high pressure piping is constructed in one continuous coil, eliminating the many joints and connections subject to leak, and enclosed in watertight jacket.

CAPACITIES AND DIMENSIONS PEERLESS REFRIGERATING MACHINE

No.	Capacity, lbs.	Size of base, ins.	Height, ins.	Weight, lbs.	Sizes crated for export, ins.	Weights for export, lbs.
2	500	18x14	24	360	24x20x36	500
3	1250	22x18	35	1185	30x24x40	1400
4	2000	32x26	50	1900	40x36x60	2300
5	4000	38x31	58	2700	50x40x70	3200
6	6000	36x32	50	3000	48x42x60	3500
7	10000	42x32	59	5875	50x40x66	6700
8	20000	98x44	69	8500	108x60x76	9300



# YORK MANUFACTURING CO.

## Ice Making and Refrigerating Machinery Exclusively

MAIN OFFICE AND WORKS

YORK, PA.

BRANCH OFFICES

BOSTON, MASS., 88 Broad Street  
 BROOKLYN, N. Y., Warren and Columbia Streets  
 PHILADELPHIA, PA., 2222-24 Arch Street  
 PITTSBURGH, PA., 47 Terminal Way, S. S.  
 ATLANTA, GA., 116-118 Central Avenue  
 CHICAGO, ILL., 26-28 North Clinton Street  
 ST. LOUIS, MO., 117-119 South 11th Street

OMAHA, NEBR., 1213-17 Jackson Street

HOUSTON, TEX., Franklin Avenue and Louisiana Street

LOS ANGELES, CAL., 308 Boyd Street  
 SAN FRANCISCO, CAL., 832 Folsom Street

SEATTLE, WASH., 508 Terry Avenue N.

TORONTO, CAN., CANADIAN ICE MACHINE CO., LTD.,  
 82 Chestnut Street

### Products.

COMPRESSION REFRIGERATING MACHINES, ABSORPTION REFRIGERATING MACHINES, ICE MAKING PLANTS, REFRIGERATING PLANTS, AMMONIA VALVES, AMMONIA FITTINGS, AMMONIA CONDENSERS, BRINE COOLERS, AQUA AMMONIA PUMPS, ICE CANS, and all parts needed to equip a complete ice making or refrigerating plant.

### Description.

We make, in our own factory, all the machinery and apparatus used in ice making and for general refrigeration, confining ourselves to the ammonia system, both compression and absorption types, and the CO<sub>2</sub> system.

### Sizes.

The enclosed machine is built in sizes from 1/8 ton refrigerating capacity upwards; the vertical single acting machines from 20 to 600 tons; the horizontal double acting machines from 10 to 600 tons—either belt or steam driven type. Ammonia absorption and carbonic anhydride (CO<sub>2</sub>) machinery of any capacity required by the trade.

### Application.

These machines can be used wherever ice making or refrigeration is required, the style of machine being determined, to a great extent, by local conditions.

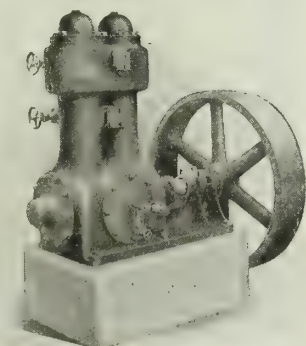
The enclosed machine is particularly adapted for residences, apartment houses, small hotels, creameries, ice cream factories, etc.

### Valves and Fittings.

York ammonia valves and fittings are guaranteed to give satisfaction under all usual working pressures.

### Service.

All our agencies carry in stock a complete line of ammonia valves and fittings, also a line of enclosed machines.



VERTICAL SINGLE ACTING  
 ENCLOSED REFRIGERATING  
 MACHINE



ENCLOSED SINGLE ACTING REFRIGERATING MACHINE  
 Direct connected to Uniflow poppet valve engine

What a service department is to the owner of an automobile, the York Sales Organization is to the user of ice making and refrigerating machinery.

Both *quality* and *service* can be secured by patronizing the York Organization.

### References.

A few installations are given below:

#### HOTELS

Hotel Adelpia, Philadelphia, Pa.  
 Hotel McAlpin, New York, N. Y.  
 Hotel Sherman, Chicago, Ill.  
 Copley-Plaza Hotel, Boston, Mass.  
 Hotel Traymore, Atlantic City, N. J.

#### STORES

Rosenbaum & Co., Pittsburgh, Pa.  
 Lord & Taylor, New York, N. Y.  
 B. Altman & Co., New York, N. Y.

#### HOSPITALS

Homeopathic Hospital, Pittsburgh, Pa.  
 Bellevue Hospital, New York, N. Y.  
 Government Hospital for the Insane, Washington, D. C.  
 Pennsylvania State Sanitarium for Tuberculosis, Hamburg, Pa.  
 Medico Chirurgical Hospital, Philadelphia, Pa.

#### SCHOOLS

Cornell University, Ithaca, N. Y.  
 University of Illinois, Urbana, Ill.

#### OFFICE BUILDINGS

Singer Building, New York, N. Y.  
 Metropolitan Life Building, New York, N. Y.  
 Whitehall Building, New York, N. Y.  
 Curtis Publishing Co., Philadelphia, Pa.  
 North American Building, Philadelphia, Pa.

#### CLUBS

New York Yacht Club, New York, N. Y.  
 Players' Club, New York, N. Y.  
 Army and Navy Club, Washington, D. C.  
 Union League Club, Philadelphia, Pa.  
 Chevy Chase Club, Chevy Chase, Md.

# GUARDIAN FRIGERATOR CO.

1274 12th Street  
DETROIT, MICH.

## Products.

MECHANICAL REFRIGERATORS for residential and apartment use.

Ice Machines, Ice Boxes, Water Coolers and Factory Drinking Water Systems.

## Description.

The Guardian Frigerator is a self-contained unit including refrigerator and machine complete, all insulated, ready to place in position in kitchen or pantry, the only installation required being running lines for water and power connection.

## Temperature Control.

The machine is controlled by a thermostat, which will maintain a temperature in the refrigerator that will never vary 2°.

The thermostat may be set for any temperature desired, but the usual temperature is 40° to 45°.

## Installation.

The Guardian Frigerator is a system adaptable to other boxes than those provided. Can be installed either in the basement or on the refrigerator itself, above or below.

## Architectural Requirements.

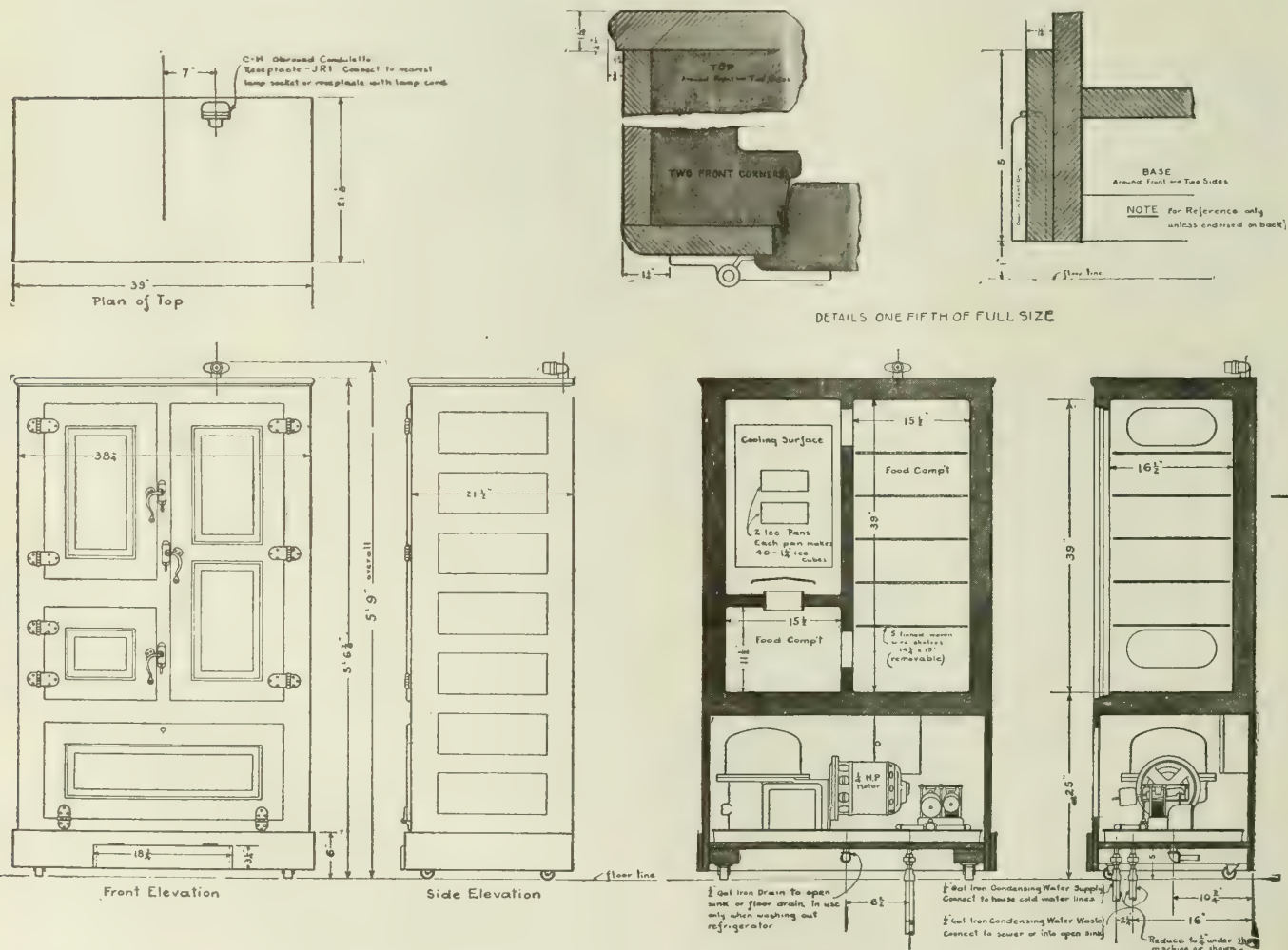
To provide for the Guardian Frigerator ½-in. galvanized iron water lines should be run from the house cold water supply and ½-in. galvanized waste line to sewer or sink.

## Wiring.

Special wiring is not necessary. A ¼-h. p. motor is used, and power is obtained from the regular house lighting circuit. Connection can be made to the nearest receptacle or chandelier.

## Sizes.

Our standard size box is recommended for a family of not to exceed 6 to 8 persons.



PLAN, ELEVATIONS AND SECTIONS OF THE GUARDIAN FRIGERATOR



# ISKO, INC.

## Manufacturers of Automatic Refrigerating Units

1735 Mt. Elliott Avenue  
DETROIT, MICH.

### Product.

ISKO AUTOMATIC REFRIGERATING UNIT.

### Description and Adaptability.

Isko is an electric home refrigerating unit which provides, for the first time, a simple, economical way of getting rid of the iceman and of keeping the family supply of food and water safe and wholesome. The lower illustration gives an idea of what Isko looks like and how it is installed. Installation is the work of an hour.

**OPERATION**—Isko is automatic—it literally runs itself. The action is controlled by a thermostat so sensitive that a rise of two or three degrees inside the refrigerator starts it working. Thermostat is adjusted to maintain the standard best temperature for keeping foods,



TRADE-MARK

are completely enclosed in a cage of endless copper tubing which is part of the cooling mechanism. Isko is self-lubricating, almost noiseless, and requires no more care to keep in order than the best electric fan.

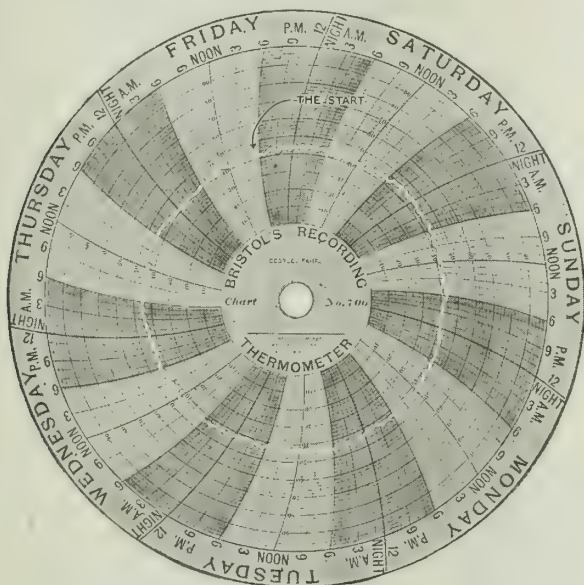
**COST**—The fact that *melting ice is an* undependable, insanitary, costly and often perilous source of cooling is generally rec-

ognized. Isko, on the other hand, offers an efficient refrigerating unit operating at extremely low pressures, with the fewest possible joints, no plumbing connections to be made, no chances of explosions or leaking ammonia fumes, and no losses of circulating fluid. In both initial cost and upkeep charges, Isko is the most economical domestic refrigerating machine built. The cost of current to operate it is much less than the cost of ice.

**CAPACITY**—Isko fits any refrigerator—old or new. It has a cooling capacity equal to 250 lbs. of ice. Removal of a panel 13 by 13 ins. from the top of the refrigerator above the ice chamber is the only change necessary to install it. No plumbing is required—the one outside connection is with the nearest electric light socket. The moment the thermostat control is adjusted and the current turned on, Isko begins its work of safeguarding the health and comfort of the household.

**CONVENIENCE**—To the home owner, Isko offers a convenience as indispensable now as city water and electric light. To the architect, in his planning, it affords an opportunity to round out the equipment of the home at a vital but long neglected point.

**BOOKLET**—More detailed information—and the manual "The New Refrigeration"—may be had from the manufacturers—ISKO, INC., Detroit, Mich.



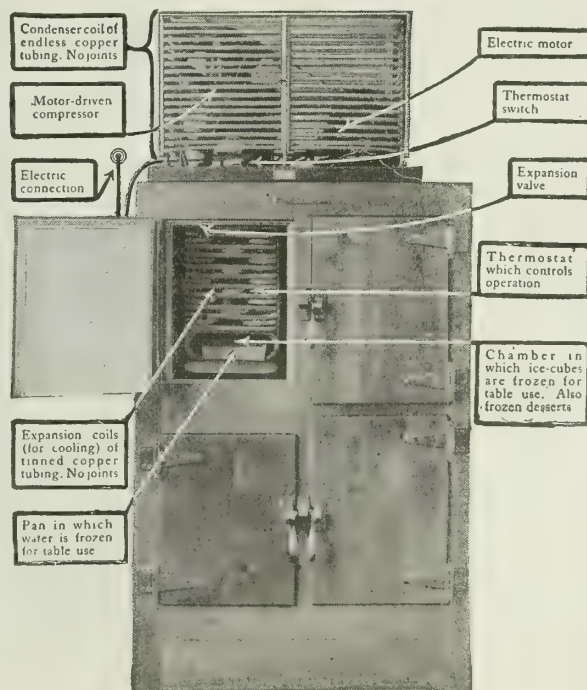
HOW ISKO REFRIGERATION ACTS

Above is one week's temperature record of an Isko cooled refrigerator in a laboratory test room kept at a uniform temperature of 95°, a longer and more severe test than any icebox ever undergoes in actual use. This refrigerator was opened and kept open at frequent intervals in order to duplicate average home conditions. Notice that the inside temperature never exceeds 47°.

about 46° Fahr. This is cold enough to render inactive the bacteria of decay which exist in all perishable foods. On the other hand, temperatures above 50° stimulate these bacteria to multiply by millions and manufacture food poisons as they multiply.

**ICE CUBES**—In addition to its food protecting function, Isko freezes a daily supply of pure ice cubes for table use. In the designing of houses and high grade apartments, therefore, it eliminates the need of providing icing facilities of any sort. It is no longer necessary to contrive a location for the refrigerator which will permit of outside icing in order that your client shall escape the invasion of the iceman and his sloppy trail across the kitchen floor. In the placing of the refrigerator, convenience and the wise use of service space are the only things to be considered.

**SIZE**—Isko takes up no extra room, since it rests on top of the refrigerator. Outside dimensions are: length, 32 $\frac{7}{8}$  ins.; width, 19 $\frac{3}{8}$  ins.; height, 20 ins. Its few moving parts, the electric motor and compressor,



ISKO REFRIGERATOR INSTALLED

Standard icebox of 200 lbs. capacity. Arrows indicate location of constituent parts. Expansion valve is hidden by the refrigerator casing. Price complete, ready to install, \$275, f. o. b. Detroit.

# GEO. SPALT & SONS, INC.

## Manufacturers of Refrigerating Machines

### ALBANY, N. Y.

#### Products.

SPALT REFRIGERATING MACHINES.

#### Description.

The Spalt system of mechanical refrigeration meets the exacting requirements for a safe, compact, positive acting machine ranging in capacity from  $\frac{1}{8}$  to 1 ton in 24 hours, and is particularly designed for soda fountains, delicatessen stores, butcher shops, grocers, hotels, restaurants, private homes, etc. It is absolutely safe as it operates on the compression principle using chloride of ethyl as the refrigerant and not ammonia.

#### Operation.

The operating parts of this machine are built on the cast iron condenser bed as shown in illustration. The rotary compressor is direct connected to the motor and is mounted on a combined base and the top of the condenser bed. The refrigerant ethyl chloride is first compressed by the machine and then liquefied by passing over a water coil located in the condenser base.

There are no valves or parts that require special adjustment or attention. As soon as power is connected, and the water regulating valve opened, the machine works automatically and requires no further attention.

These machines are either electrically driven with motor mounted on condenser bed, for either direct or alternating current, as given in the table of sizes and capacities, or gasoline motor driven by belt connection to the main shaft.

#### Advantages.

These machines are absolutely safe, are non-explosive and work under the extremely low pressure of from 10 to 15 lbs.

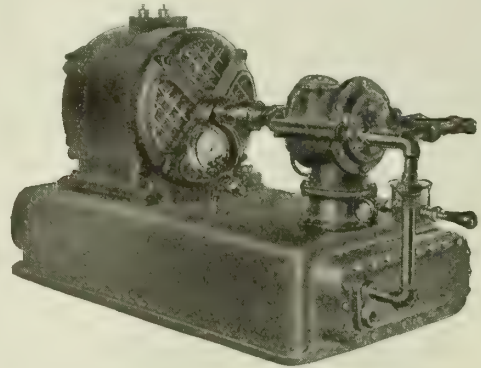
Require no engineer and are practically foolproof.

Chloride of ethyl (a combination of hydrochloric acid gas and absolute ethyl or alcohol) is non-poisonous, generates no overwhelming or explosive gases, and pressure is so low that explosion is impossible as in the case of ammonia, with its noxious deadly gases and explosive tendencies.

The initial charge of refrigerant supplied with each machine is sufficient under ordinary conditions if no leaks occur to last for two years, while additional renewal charges are very reasonable.

In usual practice 8 hours steady operation, or divided into 2 periods of 4 hours each is sufficient to maintain an average temperature for the entire 24 hours of the day. While in operation the machine stores sufficient reserve energy to continue the necessary refrigeration for that period.

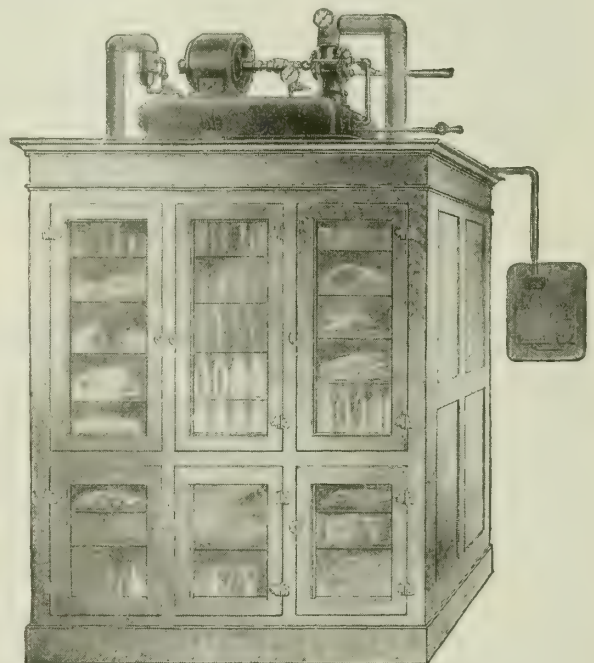
All of the Spalt refrigerating machines are self-lubricating. One of the chemicals used in connection with the refrigerant is glycerine, which acts as a lubricator and is automatically supplied to the various parts.



NO. 3,  $\frac{1}{2}$  TON SPALT REFRIGERATING MACHINE

The only valve used is the water regulating valve, which is of the best quality brass and will withstand any necessary service.

All fittings are of standard quality, of sufficient weight for the service required and are thoroughly tested before and after installation.



SPALT REFRIGERATING MACHINE MOUNTED ON TOP  
OF ICE BOX

SIZES, CAPACITIES AND POWER REQUIRED FOR SPALT MACHINES

Number of machine	Capacity of refrigeration in tons for 24 hours	Capacity of refrigeration in lbs. for 24 hours	Floor space required for machine complete, ins.	Horsepower required	Type of motor used	Shipping weight complete, lbs.	Net weight lbs.
1	$\frac{1}{8}$ to $\frac{1}{4}$	250 to 375	14 x 25	$\frac{1}{4}$ to $\frac{1}{2}$	Any current	200	150
2	$\frac{1}{4}$	500	18 x 33	$\frac{3}{4}$	Any current	600	525
3	$\frac{1}{2}$	1000	20 x 38	$1\frac{1}{2}$	{ 2- and 3-phase a.c. and direct c. single-phase.	900	800
3A	$\frac{1}{2}$	1000	24 x 43 $\frac{1}{2}$	$1\frac{1}{2}$		1000	875
4	1	2000	24 x 45	3	Any current	1250	1100



# FRITTS-GILBERT REFRIGERATOR CO.

55-57 Commercial Street

NEWARK, N. J.

## Products.

REFRIGERATORS for all purposes, in any style or finish, for ice or mechanical refrigeration.

COLD STORAGE SYSTEMS.

## Workmanship.

Scientific workmanship is employed on all Fritts-Gilbert refrigerators. Woodwork on the outside case is of selected oak, ash or birch, thoroughly kiln dried, filled and finished with a high grade varnish, or white enameled.

## Construction of Fritts-Gilbert Refrigerators.

Fritts-Gilbert refrigerators are built on scientific principles, with selected materials and first class workmanship, producing a low and uniform temperature, pure and dry atmosphere, perfect circulation, low consumption of ice and perfect drainage.

**INSULATION**—Walls, floors and ceilings thoroughly insulated. For this purpose, pure compressed cork-board is used—the best and most expensive material known for the purpose.

**CIRCULATION**—Fritts-Gilbert principles of construction are such as to give unrestricted circulation, which not only prevents the accumulation of moisture, but distributes the cold air throughout all food compartments.

**DRAINS**—Free from angles or elbows, and are accessible for cleaning, as are also the removable traps.

**ICE CHAMBER**—Lined throughout, including doors and jambs, with heavy galvanized iron, well nailed with tin nails and soldered watertight. It is fitted with neces-

sary iron racks and ventilated openings to secure proper circulation and low temperature.

**LININGS**—Lining of all provision compartments, including doors, consists of non-absorbent material, with as few joints as possible. This company uses  $\frac{3}{16}$  in. opal glass in large sheets, held in place by aluminum mouldings, set in waterproof cement.

**FLOORS**—Of small hexagon white vitrified tile laid in a bed of waterproof cement, with a sanitary base.

**SHELVES**—The ample supply of removable shelves are constructed of heavy steel wire, woven 1-in. mesh, securely formed over jointless frames of steel. Are heavily coated with pure tin and supported on heavy tinned corner cleats.

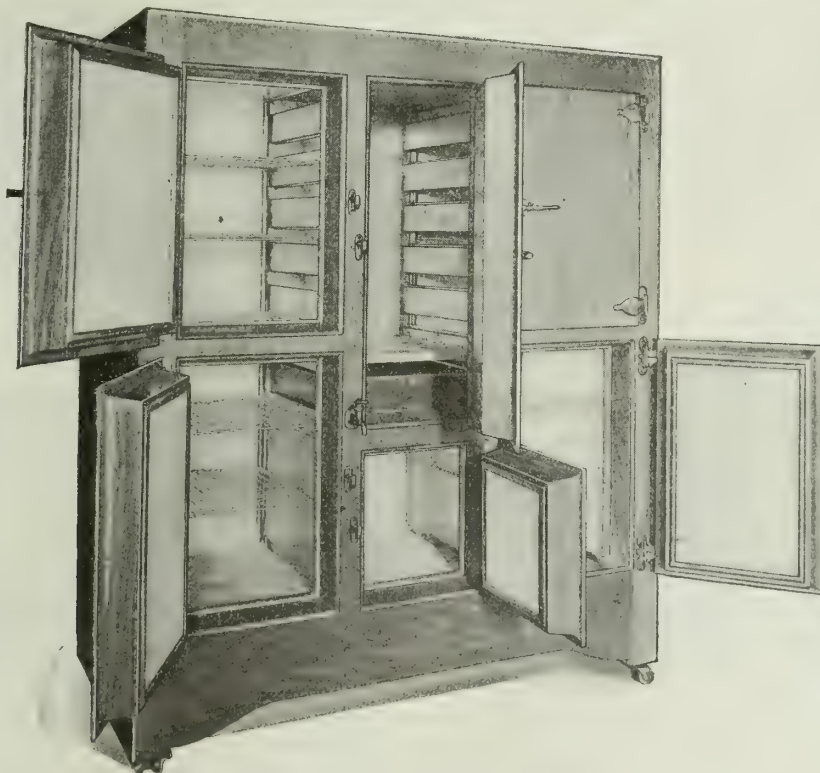
**DOOR AND HARDWARE**—Doors carefully fitted. Fittings are of solid brass, of this company's own design of extra heavy pattern, and an automatic, self-closing lever fastener.

## Co-operative Service.

This company's drafting and engineering department, equipped with a thorough knowledge and experience of designing and building refrigerators, is at the disposal of architects and others at all times.

On request, drawings and specifications will be submitted, giving complete information relative to arrangement, size and location of required openings, drains, etc., necessary to produce the best results.

The company is also prepared to meet requirements in larger work, such as cold storage rooms or boxes built of cork and cement, for hospitals, clubs, hotels, etc., also cut flower refrigerators.



KITCHEN REFRIGERATOR, STYLE D

Length, 5 ft. 6 ins.; depth, 2 ft. 3 ins.; height, 6 ft.

No. 70—Glass lined

No. 72—Wood lined

# HERRICK REFRIGERATOR COMPANY

## WATERLOO, IOWA

### Products.

HERRICK REFRIGERATORS; SPECIAL BUILT-IN RESIDENCE REFRIGERATORS with HERRICK OUTSIDE ICING ATTACHMENT.

Display Cases, Ice Chests, Ice Cream Cases and Soda Fountain Bases, and Water Cooler Attachments.

### There's a 22-Feature Herrick for Every Use.

That Herrick refrigerators have 22 features has been satisfactorily proved in thousand of homes, hotels, clubs, cafes, dining cars, etc. Every one of those features has a definite purpose and all combine to give the best service, the greatest economy, the longest wear and the biggest value. The finest residences and apartment houses are made so, by being Herrick equipped. Government, State and private institutions, hospitals, stores, even battleships use Herricks in preference to others.

### Proof of Perfect Insulation.

The makers of Herrick refrigerators advertise their willingness to bore clear through the walls of any Herrick to expose the inside construction and insulation, in competition with any other refrigerator.

Every wall and panel door is heavily packed with genuine mineral wool—material which has been sterilized by melting, then blown to small particles. In it no germ or form of animal life can exist. It is packed absolutely tight and makes walls which keep the refrigerator perfectly dry, cold and clean.

### Superior Dry Air Circulation System.

The cold air current from the ice in a Herrick refrigerator moves constantly and evenly down, across the bottom, and then to the top, promptly reaching the ice to be slightly reduced in temperature again. Here condensation takes out all the impurities and odors.

### Sanitary Non-metal Linings.

The Herrick line offers three classes of linings. The finest styles have white opal plate glass throughout. Some styles are lined with high quality, fine gloss, durable white enamel. Others in the medium priced class are lined with a sanitary, odorless white spruce lining that never gets damp and requires no scrubbing. In each class the ice chamber is lined exactly like the food chamber.

### Outside Icers for Saving.

During the summer the iceman need not enter the house to fill an outside icing Herrick. In the winter he need not come at all, for the outer door can be left open,

allowing the outside air to enter the ice chamber and circulate. See opposite page for stock sizes.

### Removable Part Drainage System.

The lower end of the drain pipe in a Herrick has a patented trap. This prevents the entrance of warm air through the tube and yet allows easy exit of water from the ice. It is heavily galvanized, will not rust, and every part of this drainage system is easily removable for cleaning without taking the ice from the chamber.

### Lifetime Cases.

All Herrick refrigerators of stock sizes are built of solid oak. Quarter sawed oak is used in opal plate glass lined cases. Special sizes built of solid mahogany, oak, birch, etc.

### Quality Trimmings.

All trimmings are nickelplated on heavy brass. Hinges have long bearings. Improved lever fasteners keep the doors practically airtight.

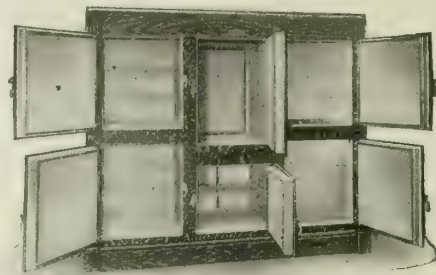
### Specifications.

Dimensions given are the sizes of the frame opening to be cut in the wall of the house. The casing on refrigerator around the outside icing door just fits into this opening.

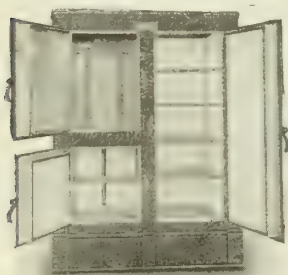
"G" in table of dimensions represents height from floor to bottom of opening in wall, which is computed without the casters under the refrigerator, except where marked; "E," the height of the opening; "A," the width of the opening; "K," the distance from the flush right end of refrigerator (facing the front) to edge of finished opening in wall of house.

For sizes up to and including second 4-door size (No. 411), if the refrigerator sets against left wall, finished edge of opening in wall of house for back icing is 1½ ins. from corner of room or from left end of refrigerator. In all sizes above this allow 3¾ ins. from corner of refrigerator to edge of opening, which does not include moulding on top, but does allow for ¾-in. base block and casing on lower part of refrigerator. If top moulding on end is desired, edge of opening should be 5¾ ins. from corner of room, on sizes No. 212 and larger.

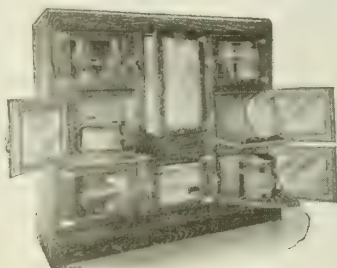
Back outside icing door is made regularly in back ice chamber. This can be reversed to other side if necessary, or refrigerator can be iced from left hand end (facing the front) if desired, and right hand end if found necessary to conform to space.



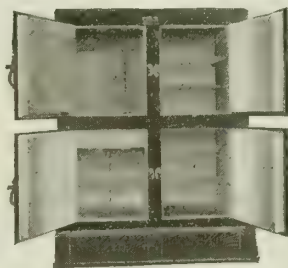
No. 428. Mesh Wire Shelves, Enamel Lined, Latest Design  
Width, 86 ins.; depth, 31 ins.; weight, 1050 lbs.  
List price, \$196.70



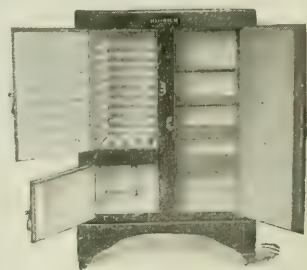
No. 55. Residence Model. White Opal Plate Glass Lined. Mesh Wire Shelves  
Width, 38 ins.; depth, 22¾ ins.; height, 54¾ ins.; weight, 550 lbs.



No. 766. Display Model. All Storage Doors Glass. French Plate Mirror on Ice Door  
Width, 86 ins.; depth, 31 ins.; height, 78½ ins.; weight, 1200 lbs.  
List price, \$199.50



No. 412. Residence Model. Mesh Wire Shelves. Enamel Lined  
Width, 52 ins.; depth, 30½ ins.; height, 66½ ins.; weight, 525 lbs.  
List price, \$109.20  
No. 512. Opal Glass Lined

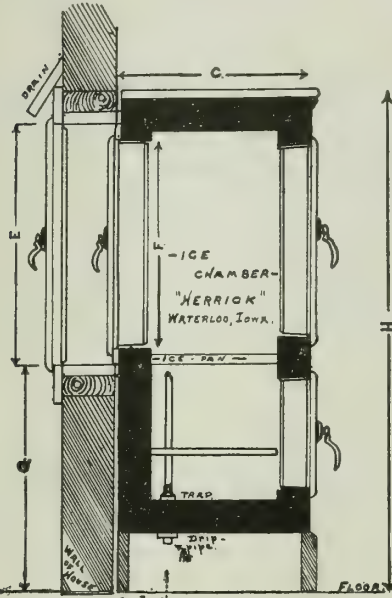


No. 220. Residence Model. Spruce Lined. Mesh Wire Shelves  
Width, 36 ins.; depth, 20¾ ins.; height, 48 ins.; weight, 220 lbs.  
List price, \$37.30  
Nos. 42 to 45 are same style as above, but all enamel lined

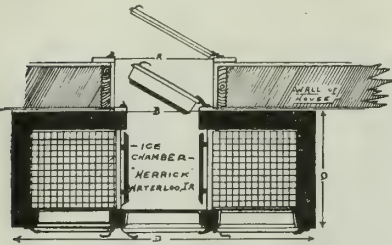
A FEW TYPES OF HERRICK REFRIGERATORS  
Write for discounts



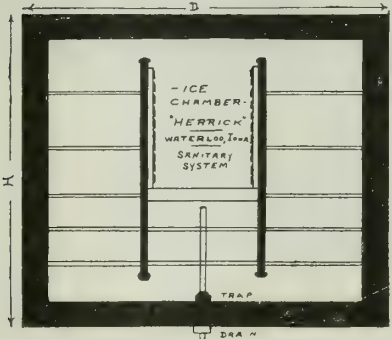
The outside icing door on back or end of refrigerator swings through opening in wall. The outside of the opening in the wall, as shown in the plan, should be finished with a small batten door.



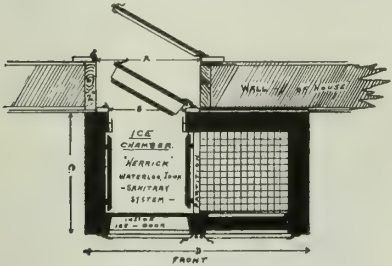
Elevation—Back Outside Icing—3-and 4-door Refrigerator



Plan—Back Outside Icing Refrigerator



Elevation—Back Outside Icing 6-Door Refrigerator



Plan—Back Outside Icing 6-Door Refrigerator

Numbers of refrigerators	*Size of refrigerators, outside, without moulding or casters			Opening in wall of house for outside icing		Refrigerator back icing door		Location of drain pipe under refrigerator, from end of refrigerator to center of hole		Edge of refrigerator to edge of opening in wall, not including moulding	
	Width	Depth	Height	Height from floor	Opening		Width	Height	From back	From end	K
					Width	Height					
	D	C	H	G	A	E	B	F	I	J	K
No. A, 200, 300.....	34	18	41	20 1/4	16 1/2	19 1/2	13	15 3/4	3 3/4	9	16
No. B, 210, 310, 41.....	34	19	44	22 1/4	16 1/2	20 1/2	13	16 3/4	3 3/4	9	16
No. 22, 32, 42, 220.....	36	20	46	20	18 1/2	23 1/4	14	19 1/2	4 1/4	9 5/8	16
No. 23, 43, 230.....	36	20	48	20 3/4	18 1/2	24 1/2	14	20 1/2	4 1/4	9 5/8	16
No. 44, 24, 54, 240.....	36	20	50	20 1/2	18	27 3/4	13 1/4	23	4 1/4	9 5/8	16 7/8
No. 45, 25, 55, 250.....	38	22	52	22 1/2	18 1/2	27 3/4	13 1/4	23	4 1/4	10 3/8	18 3/8
No. 43T, 23T, 230T, Texas.....	36	20	48	18 1/2	18	27 3/4	13 1/4	23	4 1/4	9 5/8	16 7/8
No. 215, 415.....	32	19	48	18 1/2	18	27 3/4	13 1/4	23	3 3/4	7 3/4	12 1/2
No. 9, 29, 39, 49, 59, 290.....	42	24	56	26 3/4	21 1/4	27 3/4	15 3/4	21 3/8	4 1/2	11	20 1/4
†No. 11, 211, 311, 411, 511.....	46	24	59	29 1/2	22 1/2	27 3/4	17 3/4	22 3/8	4 1/2	13	22 1/8
†No. 212, 312, 412, 512.....	50	28	64 1/2	29 1/2	23 3/4	32 1/4	19 3/4	28 1/4	4 3/4	14 1/2	24 3/4
†No. 214, 314, 414, 514.....	54 1/2	28	70	33	25 3/4	35	21 3/4	31	5	15 1/2	26 1/2
†No. 216, 316, 416, 516.....	60 1/2	30 1/4	73	34	28	36	24	32	5	16 1/2	29 3/4
†Chef, 228, 328, 428, 528.....	85 3/4	30 1/4	71	32 1/2	27	36 1/4	23	32 1/4	4 3/4	42 7/8	28
No. 766, 466.....	85 3/4	30 1/4	78	36	27	37 1/2	23	33 1/2	4 3/4	42 7/8	28
No. 580 1/2.....	64	26 1/4	68	27	22	38 1/2	16 1/4	33	5 1/2	33	21

HERRICK GRAND WITH CORNER BLOCKS

No. 50, Herrick Grand.....	41 1/2	26 1/2	55	24	19	28 1/2	15	24 1/2	5 1/2	13 1/2	20 1/4
No. 90, Herrick Grand.....	44 1/2	28	62	27 1/4	21	28 3/4	15 1/2	24	5 1/2	14	23

\*For "over all" dimensions, including mouldings, refer to catalogue. †With casters (1 1/8 ins. high), and end base 1/8 in. (Chef casters 1 in.). Texas style has long ice chamber for 22-in. artificial ice.

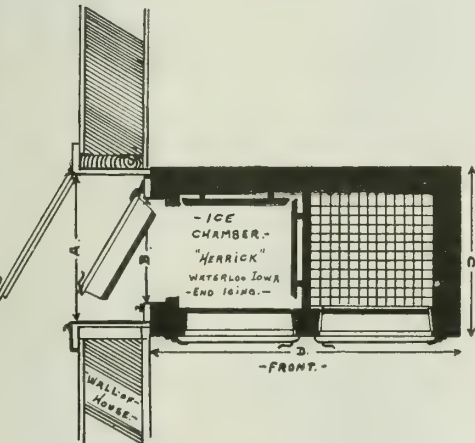
END ICING STYLE, DIMENSIONS IN INCHES

Number of refrigerators	*Size of refrigerators, outside, without moulding or casters			Opening in wall of house for outside icing		Refrigerator end icing door		Location of drain pipe under refrigerator, from end of refrigerator to center of hole		Edge of refrigerator to edge of opening in wall, not including moulding	
	Width	Depth	Height	Height from floor	Opening		Width	Height	From back	From end	L
					Width	Height					
	D	C	H	G	A	E	B	F	I	J	L
No. A, 200, 300.....	34	18	41	20 1/4	16 1/2	19 1/2	13	15 3/4	3 3/4	9	1 1/2
No. B, 310, 41, 210.....	34	19	44	22 1/4	16 1/2	20 1/2	13	16 3/4	3 3/4	9	2 1/8
No. 22, 32, 42, 220.....	36	20	46	20	18 1/2	23 1/4	14	19 1/2	4 1/4	9 5/8	3 3/4
No. 43, 23, 230.....	36	20	48	20 3/4	18 1/2	24 1/2	14	20 1/2	4 1/4	9 5/8	3 3/4
No. 44, 24, 54, 240.....	36	20	50	20 1/2	18	27 3/4	13 1/4	23	4 1/4	9 5/8	3 3/4
No. 45, 25, 55, 250.....	38	22	52	22 1/2	18 1/2	27 3/4	13 1/4	23	4 1/4	10 3/8	1 3/8
No. 43T, 23T, 230T, Texas.....	36	20	48	18 1/2	18	27 3/4	13 1/4	23	4 1/4	9 5/8	3 3/4
No. 215, 415.....	32	19	48	18 1/2	18	27 3/4	13 1/4	23	3 3/4	7 3/4	1 1/2
No. 29, 39, 49, 59, 290.....	42	24	55	26 3/4	21 1/4	27 3/4	15 3/4	19	4 1/2	11	1 3/8
No. 211, 311, 411, 511.....	46	24	59	29 1/2	22 1/2	27 3/4	16 3/4	20	4 1/2	13	1 7/8
†No. 212, 312, 412, 512.....	50	28	64 1/2	29 1/2	23 3/4	32 1/4	19 3/4	28 1/4	4 3/4	14 1/2	2 1/8
†No. 214, 314, 414, 514.....	54 1/2	28	70	33	25 3/4	35	21 3/4	31	5	15 1/2	1
No. 216, 316, 416, 516.....	60 1/2	30 1/4	73	34	28	36	24	32	5	16 1/2	1 1/4

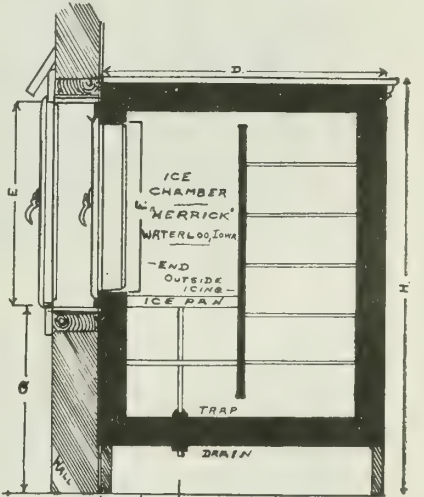
HERRICK GRAND WITH CORNER BLOCKS

†No. 50, White House.....	41 1/2	26 1/2	55	24	19	28 1/2	15	24 1/2	5 1/2	12 1/4	2 3/4
†No. 90, America.....	44 1/2	28	62	27 1/4	21	28 3/4	14 3/4	23 1/4	5 1/4	13 1/4	3

\*For "over all" dimensions, including mouldings, refer to catalogue. †With casters (1 1/8 ins. high), and end base 1/8 in. Texas style has long ice chamber for 22-in. artificial ice. Specify if Back or End Icing, and if Regular Left Hand ice chamber, as in illustrations, or the opposite Right Hand facing front of refrigerator.



Plan—End Outside Icing Refrigerator



Elevation—End Outside Icing 3-Door Refrigerator

SPECIFICATIONS AND DIMENSION DIAGRAMS FOR HERRICK OUTSIDE ICING REFRIGERATORS

# McCray Refrigerator Co.

GENERAL OFFICE AND FACTORY

855 Lake Street

KENDALLVILLE, IND.

SALESROOMS IN ALL PRINCIPAL CITIES

## Products.

McCray REFRIGERATORS and COOLERS for residences, hotels, restaurants, clubs, hospitals, institutions, florists, groceries, meat markets, steamships and dining cars.

Mortuary Coolers for morgues and hospitals.

Cold Storages built for all purposes, arranged for either ice or mechanical refrigeration.

## Interior Linings.

McCray refrigerators are lined with white opal glass, white enamel or odorless wood.

## Insulation.

The McCray REFRIGERATOR Co. is prepared to furnish mineral wool, cork, or any other dependable insulating material.

## Outside Icing.

Any McCray refrigerator or cooler can be arranged with rear or end door, so that ice can be supplied from the outside of building. Plans showing wall openings for outside icing will be sent on request.

See pages 33, 34 and 35 of McCray Catalogue No. 93.

## Special Built-to-order Refrigerators and Coolers.

The McCray REFRIGERATOR Co. maintains a special designing department for planning refrigerators and coolers for all purposes to fit any space.

This department is at your service without charge or obligation.

## Facilities.

Stock size residence refrigerators listed below are shipped upon receipt of order.

Orders for special refrigerators are executed promptly.

## Catalogues.

For the convenience of architects, the McCray REFRIGERATOR Co. issues 5 distinct catalogues, covering its different lines, any or all of which will be mailed on request.

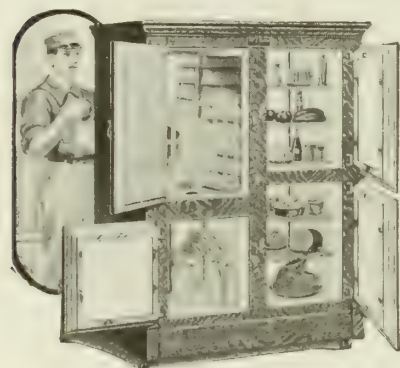
No. 93 Stock size refrigerators for residences.

No. 51 Refrigerators for hotels and institutions.

No. 71 Refrigerators for grocers.

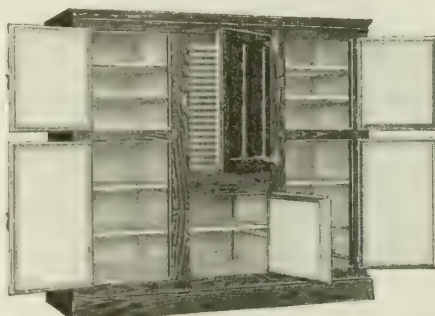
No. 62 Refrigerators and coolers for meat markets.

No. 74 Refrigerators for florists.



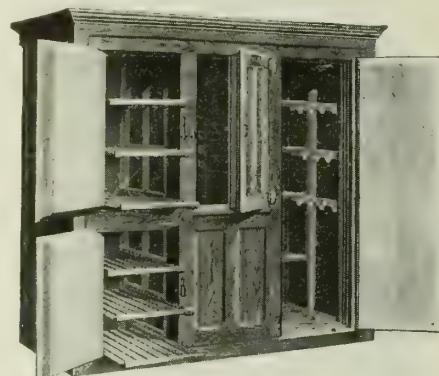
Four-door Type

Arranged with outside icing door  
Styles Nos. 50, 60, 65, 145, 155, 455,  
450 and 460. See specification below



Six-door Type

Styles 420, 120 and 132  
See specifications below.



No. 114

For Hotels and Institutions

## McCray REFRIGERATORS

### SUMMARY OF SPECIFICATIONS OF McCray RESIDENCE REFRIGERATORS

Catalogue number	Width, ins.	Depth, ins.	Height, ins.	Number shelves	Sq. ft. of shelf space	Ice capacity, lbs.	Shipping weight, lbs.	Exterior lining	Exterior case	Code word
28	28 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	3	81 <sup>1</sup> / <sub>2</sub>	65	275	Odorless wood	Plain oak	Waif
30	35 <sup>1</sup> / <sub>2</sub>	20	46 <sup>1</sup> / <sub>2</sub>	5	9 <sup>1</sup> / <sub>2</sub>	70	285	" "	" "	Walnut
40	37 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	5	12 <sup>1</sup> / <sub>2</sub>	120	350	" "	" "	Wax
50	42	26	56 <sup>1</sup> / <sub>2</sub>	5	16 <sup>1</sup> / <sub>2</sub>	180	450	" "	" "	West
60	46 <sup>1</sup> / <sub>2</sub>	28	63 <sup>1</sup> / <sub>2</sub>	6	23 <sup>1</sup> / <sub>2</sub>	255	570	" "	" "	Whale
65	50 <sup>1</sup> / <sub>2</sub>	29	66 <sup>1</sup> / <sub>2</sub>	6	27 <sup>1</sup> / <sub>2</sub>	325	620	" "	" "	Wheat
75	57 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>4</sub>	74	6	30 <sup>3</sup> / <sub>4</sub>	412	825	" "	" "	Whip
120	72 <sup>1</sup> / <sub>2</sub>	28 <sup>3</sup> / <sub>4</sub>	72	11	36	360	1065	" "	" "	Wind
132	87 <sup>1</sup> / <sub>2</sub>	31 <sup>1</sup> / <sub>4</sub>	75	11	52 <sup>3</sup> / <sub>4</sub>	475	1380	" "	" "	Witness
128	28 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	3	8	80	300	White enamel	" "	Eagerly
130	35 <sup>1</sup> / <sub>2</sub>	20	46 <sup>1</sup> / <sub>2</sub>	5	8 <sup>3</sup> / <sub>4</sub>	65	315	" "	" "	Eagle
140	37 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	5	12	115	400	" "	" "	Earnest
145	39 <sup>1</sup> / <sub>2</sub>	25	54 <sup>1</sup> / <sub>2</sub>	5	13 <sup>3</sup> / <sub>4</sub>	135	440	" "	" "	Ease
155	45 <sup>1</sup> / <sub>2</sub>	27	60 <sup>1</sup> / <sub>2</sub>	6	20 <sup>1</sup> / <sub>2</sub>	215	570	" "	" "	Edward
428	30	21 <sup>1</sup> / <sub>4</sub>	53	3	7	75	460	Opal glass	Quartered oak	Ode
438	32 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	68 <sup>1</sup> / <sub>2</sub>	3	10	115	650	" "	" "	Orion
445	38 <sup>1</sup> / <sub>2</sub>	24	53	5	9 <sup>1</sup> / <sub>2</sub>	105	660	" "	" "	Opera
450	42	26	56 <sup>1</sup> / <sub>2</sub>	5	12 <sup>1</sup> / <sub>2</sub>	145	775	" "	" "	Oracle
455	44 <sup>1</sup> / <sub>2</sub>	27	60 <sup>1</sup> / <sub>2</sub>	6	16 <sup>1</sup> / <sub>2</sub>	175	910	" "	" "	Onyx
460	46 <sup>1</sup> / <sub>2</sub>	28	63 <sup>1</sup> / <sub>2</sub>	6	18 <sup>1</sup> / <sub>2</sub>	200	1025	" "	" "	Orange
470	50 <sup>1</sup> / <sub>2</sub>	29	70	6	22	300	1200	" "	" "	Organ
475	57 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>4</sub>	74	6	27 <sup>1</sup> / <sub>2</sub>	370	1275	" "	" "	Orator
480	65 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>4</sub>	68 <sup>1</sup> / <sub>2</sub>	9	27 <sup>1</sup> / <sub>2</sub>	390	1275	" "	" "	Ornate
420	72 <sup>1</sup> / <sub>2</sub>	28 <sup>3</sup> / <sub>4</sub>	72	11	36	370	1750	" "	" "	Owl

These specifications are based on width over cornice, depth over cornice and baseboard and height over all



# SEEGER REFRIGERATOR CO.

ST. PAUL, MINN.

BOSTON, 82 Washington Street

LOS ANGELES, 803 South Hill Street

NEW YORK, 101 Park Avenue

REPRESENTATIVE IN ALL PRINCIPAL CITIES

## Products.

SEEGER SIPHON REFRIGERATORS of every type for residences, apartment houses, hotels, institutions, buffets, grocers, creameries, florists; for dining, buffet and refrigerator cars; Built-in Refrigerators for outside icing; Special Refrigerators designed to meet particular needs.

Display Cases, Ice Chests, Ice Cream Cabinets, Counter and Delicatessen Refrigerators.

## Service for Special Work.

A specialty is made of service for special work. Many large buildings—institutions, clubs, etc., such as shown below—require special plans and specifications for the installation of refrigerators that will meet the requirements to which they are put.

For just such cases as these, a completely equipped

Service Department is maintained by this company, which at all times is at the call of architects. It is considered a privilege to serve architects in the successful working out of the many intricate problems connected with the installation of refrigerators.

It is fully understood that this service does not obligate the architect in the slightest. If the architect will supply the problems and send specifications, an intelligent service will be rendered.

Fully equipped offices are maintained in the above listed cities. Call upon or write to the nearest office.

## Refrigeration Plants.

The SEEGER REFRIGERATOR CO. manufactures refrigerators only, but works with the refrigeration plant people, and its boxes can be used with either refrigeration plants or with ice.

## Prices, etc.

Prices and catalogue on application.



MINNEAPOLIS ATHLETIC CLUB  
Equipped with Seeger refrigerators



KENMORE HOTEL, BOSTON, MASS.  
Equipped with Seeger refrigerators



NEW OCEAN HOUSE, SWAMPSCOTT, MASS.  
Equipped with Seeger refrigerators



NUECES HOTEL, CORPUS CHRISTI, TEX.  
Equipped with Seeger refrigerators

J. V. JAMISON, PRESIDENT

T. B. SOUTH, VICE-PRESIDENT

J. V. JAMISON, JR., SECRETARY AND TREASURER

# JAMISON COLD STORAGE DOOR CO.

FORMERLY JONES COLD STORE DOOR CO.

HAGERSTOWN, MD.

## Products.

Manufacturers of the original "JONES" COLD STORAGE DOOR; also, the "NOEQUAL" COLD STORAGE DOOR.

The following are made from either type, SHARP FREEZER DOORS, COLD STORAGE WINDOWS, either fireproof or non-fireproof; ICE RECORDING DOORS, PLATFORMS and CHUTES for passing and recording blocks of ice.

Insulated Vertical Sliding Cold Storage Doors and a Revolving Freezer Door, with automatic unloading device, for passing ice cream to and from hardening room.

## Two Distinct Types, "Jones" and "Noequal."

The "Jones" cold storage door (Fig. 1) is built with two seals of contact between the door and frame, providing a confined air space entirely around the door,

making double protection against leakage at this usually weak point. The air space (k) prevents the door from swelling enough to stick fast in the frame.

The "Noequal" cold storage door (Fig. 2) is built with round jambs and three seals of contact and two air spaces (k) between the door and frame. The advantages of the round jambs are obvious—no sharp corners to get knocked off by the trucks.

**GASKET SEALS**—The seals of contact are formed with a special gasket or packing of our own make. The seals at the bottom are made by two rows of heavy hair felt and can be easily replaced when worn out.

**BRACING AND INSULATING**—The door has inserted a diagonal 2-in. by 4-in. brace and heavy angle irons in the corners to keep the door true and rigid and free from sagging. Will use any of the standard kinds of insulating material specified.

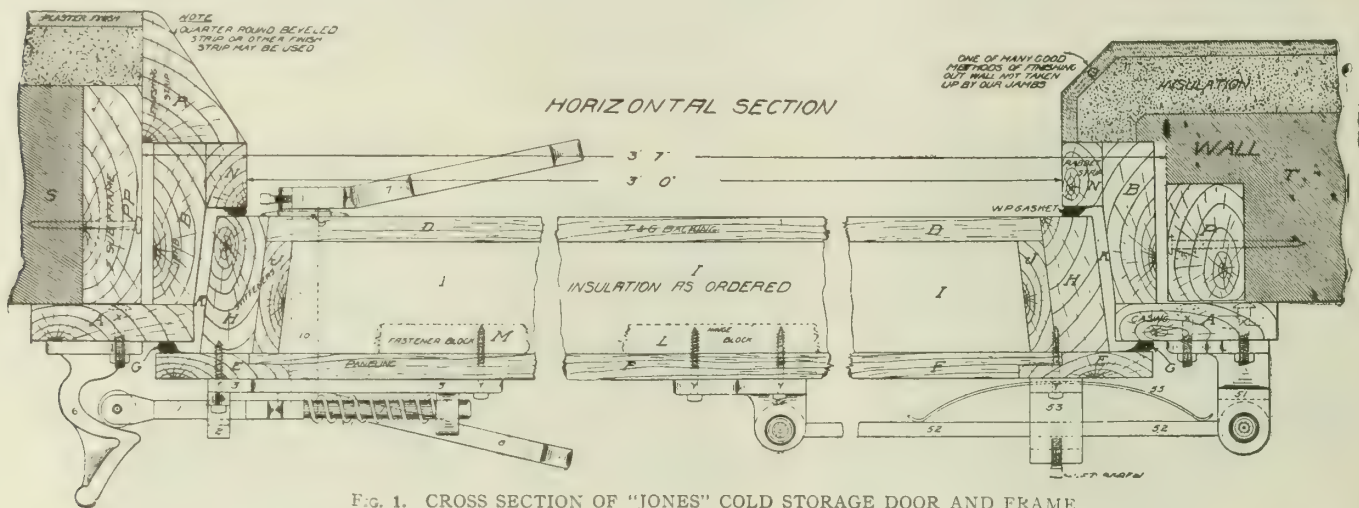


FIG. 1. CROSS SECTION OF "JONES" COLD STORAGE DOOR AND FRAME

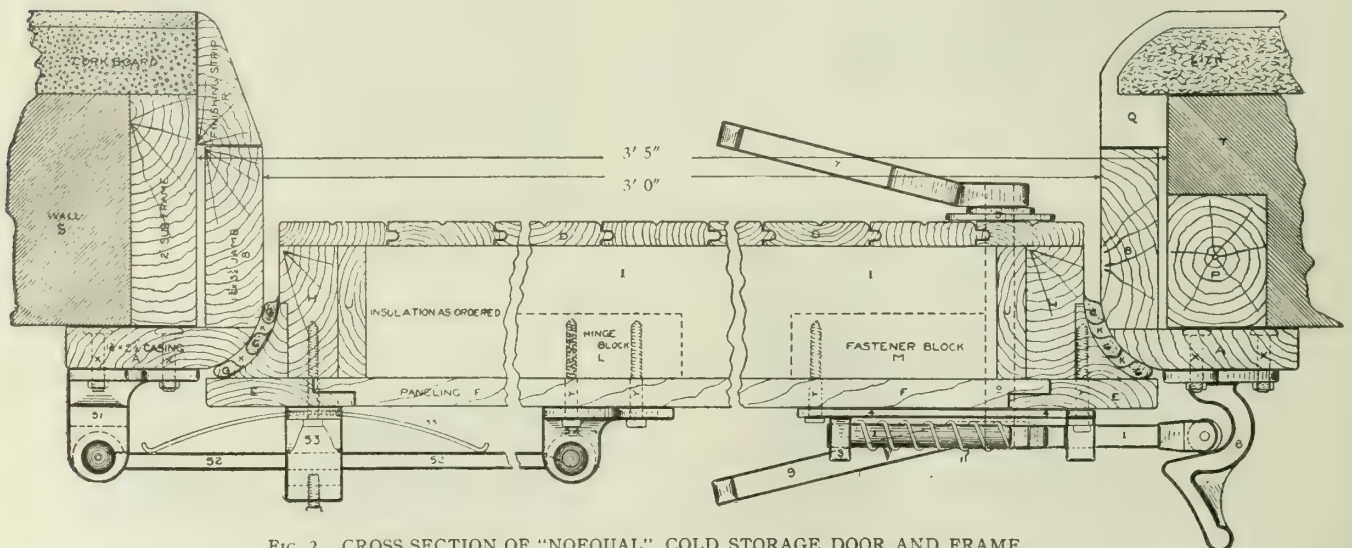


FIG. 2. CROSS SECTION OF "NOEQUAL" COLD STORAGE DOOR AND FRAME



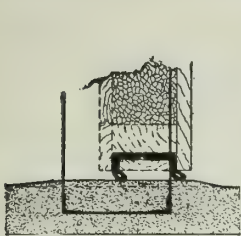


Fig. 3. Arrangement for Concrete Floor

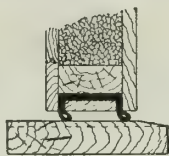


Fig. 4. Beveled Oak Sill

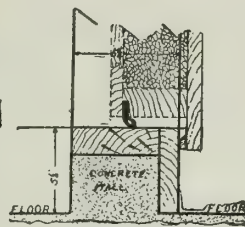


Fig. 5. High Sill

SILLS, VARIOUS KINDS

TABLE OF STANDARD SIZE DOORS

Dimensions inside of frames (Door in the clear)			Size of wall opening "Jones Door"			Size of wall opening "Noequal Door"		
Stock door No.	Width ft. ins.	Height ft. ins.	Width ft. ins.	Height ft. ins.	Width ft. ins.	Height ft. ins.	Width ft. ins.	Height ft. ins.
0	2	3	2	7	3	5	2	5
1	2	6	2	7	6	5	2	6
2	2	6	3	1	6	5	2	11
3	3	6	3	1	6	11	3	5
4	3	6	3	7	6	5	3	5
5	3	6	3	7	6	11	3	5
6	3	6	4	1	6	5	3	11
7	3	6	4	1	6	11	3	11
8	3	6	3	7	7	5	3	11
9	3	6	4	1	7	5	3	11
10	4	6	4	7	6	5	4	5
11	4	6	4	7	6	11	4	5
12	4	6	5	1	6	5	4	11
13	4	6	5	1	6	11	4	11
14	4	6	4	7	7	5	4	5
15	4	6	5	1	7	5	4	11

In ordering doors use stock numbers in first column of table. State whether "Jones" or "Noequal" is wanted

CONSTRUCTION, STANDARD DOORS—Doors are built of odorless and tasteless spruce on the inside; the exterior may be of any wood desired, either in plain ceiling boards or paneled; they may be solid doors or arranged for glass panels, the latter formed like windows, of several thicknesses of glass.



FIG. 6. "JONES STANDARD" DOOR  
Right hand, raised panel front

Track, Freezer, Fireproof and Ice Recording Doors.

Note the simplicity and durability of the automatic trap lift device for track doors. Freezer doors are of the same construction as the standard, but with better insulation. Fireproof doors (refrigerator and cold storage) are of Jamison regular wood construction, metal covered; carrying the same temperature as the standard door. Ice recording doors, platforms and chutes, of three distinct types, for passing and recording number of blocks passed. Made of wood or steel; strong and reliable in action.

Hardware.

The pressure of the powerful adjustable spring hinge is regulated by a set screw, by turning which a new seat is given the door from time to time, thus keeping it as tight as when new. The automatic self-tightening fastener is a spring projected slide bolt worked by a lever; a strong, reliable device that draws the door up

tight. The same hardware (60 lbs. per set) is used upon doors of both types. The automatic trap lift for doors with overhead rail is a simple, reliable mechanical device that will not get out of order.



FIG. 7. TRACK DOOR WITH GLASS OPENING

Cold Storage Windows.

Built either fireproof or non-fireproof and of general construction, like the doors. (Fig. 8.) From 4 to 6 thicknesses of glass are nested in one sash, 5½ ins. thick with air spaces between them. Ask for list of stock sizes, but they should always be made as small as practical to suit conditions, usually about half the size of doors used.

To Specify.

In specifying these products do not fail to say "Jones" doors and "Noequal" doors, made by the JAMISON COLD STORAGE DOOR CO., Hagerstown, Md., U. S. A., to insure getting the original.

Write for new catalogue No. 8.



FIG. 8. COLD STORAGE WINDOW

# STEVENSON COLD STORAGE DOOR CO.

Manufacturers of Cold Storage and Freezer Doors

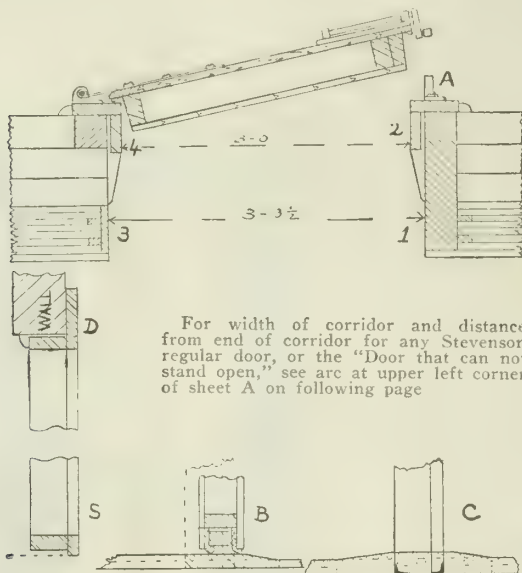
CHESTER, PA.

## Products.

COLD STORAGE and FREEZER DOORS:  
Stevenson's Standard Cold Storage Door.  
Stevenson's "Door that can not stand open."  
OVERHEAD TRACK DOORS—with positive Motion  
Shutters.  
Special Freezer Doors for Icy Doorways.  
Vertical Sliding Counterbalanced Doors.  
Combined Self-acting Ice Doors and Chutes.  
Fireproof Cold Storage Doors.  
Little 1912 Platform Ice Doors.  
Revolving Ice Cream Doors—Metal, non-swelling.  
Cold Storage Windows.  
All furnished either plain or fireproof.

## Advantages.

Straight, clean, sanitary jambs. No frail rebate strips in doorway. Adjustable, flexible door frames, set to conform to door, not to wall. Hinges are self-adjusting, spring tempered steel, galvanized, with big generous bearings, three times their former size. A powerful hinge guard on lower hinge protects the hinge from excessive strains, and insures tight sealing at that point. Door swings off to one side entirely out of the way of injury, hence doorway can be 6 ins. less in width than with other doors, an important economy in refrigeration.



INSTALLATION DIAGRAMS COLD STORAGE DOOR

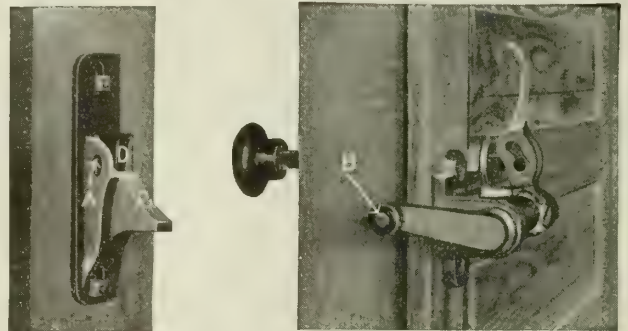
FIG. A shows how flat closure is secured; also, how Stevenson door frame sets in wall. Opening in wall should be  $3\frac{1}{2}$ " wider and  $4\frac{1}{2}$ " higher than clear size of doorway. (Follow construction Nos. 1 and 2.) Overhead track doors require rough opening extending 11" above upper edge of track; the overhead track "door that can not stand open," 12" above. Door frames are secured with lag screws  $\frac{3}{8}$ " x 4", inserted through front casing at A. Set door frame to conform to door, not to conform to wall.

FIG. D shows head of door frame used on all sizes of Stevenson regular doors, and indicates method of setting in wall.

FIG. S shows door frame with full standard sill; not suited for trucking.

FIG. B shows wooden beveled threshold, which connects lower ends of door frame and forms part of it. Let down into floor. No featheredge, no splinters, no jolt; ideal for trucking or sliding ice.

FIG. C shows Stevenson patented construction for concrete floors. Lower ends of door frame connected by angle irons extending across doorway and embedded in floor 3" below surface



AUTOMATIC ROLLER FASTENER

Roller latch (B) passes over knuckle of keeper (C), drops into pocket (D) before door strikes face of door frame, and reaches its locked position at the instant gasket is most tightly compressed. No bending of latch. No lost motion to be taken up. No slackening as it latches. No walking around edge of door to enter. A padlock shackle, through hole (A), prevents roller from lifting out. Door can be unlatched, opened, closed and latched again 40 times per minute.

## STOCK SIZES, STEVENSON'S STANDARD COLD STORAGE DOORS

List number	Size of doorway in clear	Size of wall opening to receive door frames	Estimated weight, crated
Ice doors.....	2' 3" x 2' 0"	2' 6 $\frac{1}{2}$ " x 2' 4 $\frac{1}{2}$ "	100 lbs.
1.....	2' 0" x 4' 0"	2' 3 $\frac{1}{2}$ " x 4' 4 $\frac{1}{2}$ "	140 "
2.....	2' 0" x 5' 0"	2' 3 $\frac{1}{2}$ " x 5' 4 $\frac{1}{2}$ "	170 "
3.....	2' 0" x 5' 6"	2' 3 $\frac{1}{2}$ " x 5' 10 $\frac{1}{2}$ "	185 "
4.....	2' 0" x 6' 0"	2' 3 $\frac{1}{2}$ " x 6' 4 $\frac{1}{2}$ "	200 "
5.....	2' 6" x 6' 0"	2' 9 $\frac{1}{2}$ " x 6' 4 $\frac{1}{2}$ "	250 "
6.....	3' 0" x 6' 0"	3' 3 $\frac{1}{2}$ " x 6' 4 $\frac{1}{2}$ "	300 "
7.....	3' 6" x 6' 0"	3' 9 $\frac{1}{2}$ " x 6' 4 $\frac{1}{2}$ "	350 "
8.....	4' 0" x 6' 0"	4' 3 $\frac{1}{2}$ " x 6' 4 $\frac{1}{2}$ "	400 "
9.....	3' 0" x 6' 6"	3' 3 $\frac{1}{2}$ " x 6' 10 $\frac{1}{2}$ "	325 "
10.....	3' 6" x 6' 6"	3' 9 $\frac{1}{2}$ " x 6' 10 $\frac{1}{2}$ "	380 "
11.....	4' 0" x 6' 6"	4' 3 $\frac{1}{2}$ " x 6' 10 $\frac{1}{2}$ "	440 "

Regular overhead track doors require openings in wall to extend 11" above upper edge of track bar (see sheet "A," next page, left end). Overhead track "door that can not stand open," to extend 12" above.

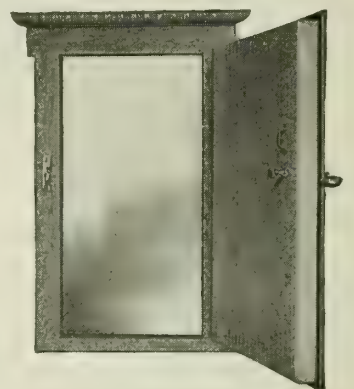
FORM OF SPECIFICATION  
FOR ARCHITECTS—Doors for refrigerators, hardening rooms, cold storage and ice rooms to be Stevenson's overlapping, non-binding doors, manufactured by STEVENSON COLD STORAGE DOOR CO., Chester, Pa., fitted with Stevenson's automatic roller fastener, and hung with Stevenson's elastic clamping hinges—Stevenson's 1911 hinge guard to be used on lower hinge of all doors sealing against floors.

Frames to be of Stevenson standard type for kind of floor on which they are used and to be set strictly in accordance with the Stevenson Co.'s instructions.

NOTE—Where door frame is set in concrete floors specify "Lower ends of door frame connected by angle irons extending across doorway below surface of floor."

## Shipping Note.

All Stevenson doors and windows are shipped ready to set in the wall, Stevenson adjustable door frame and required hardware being included.

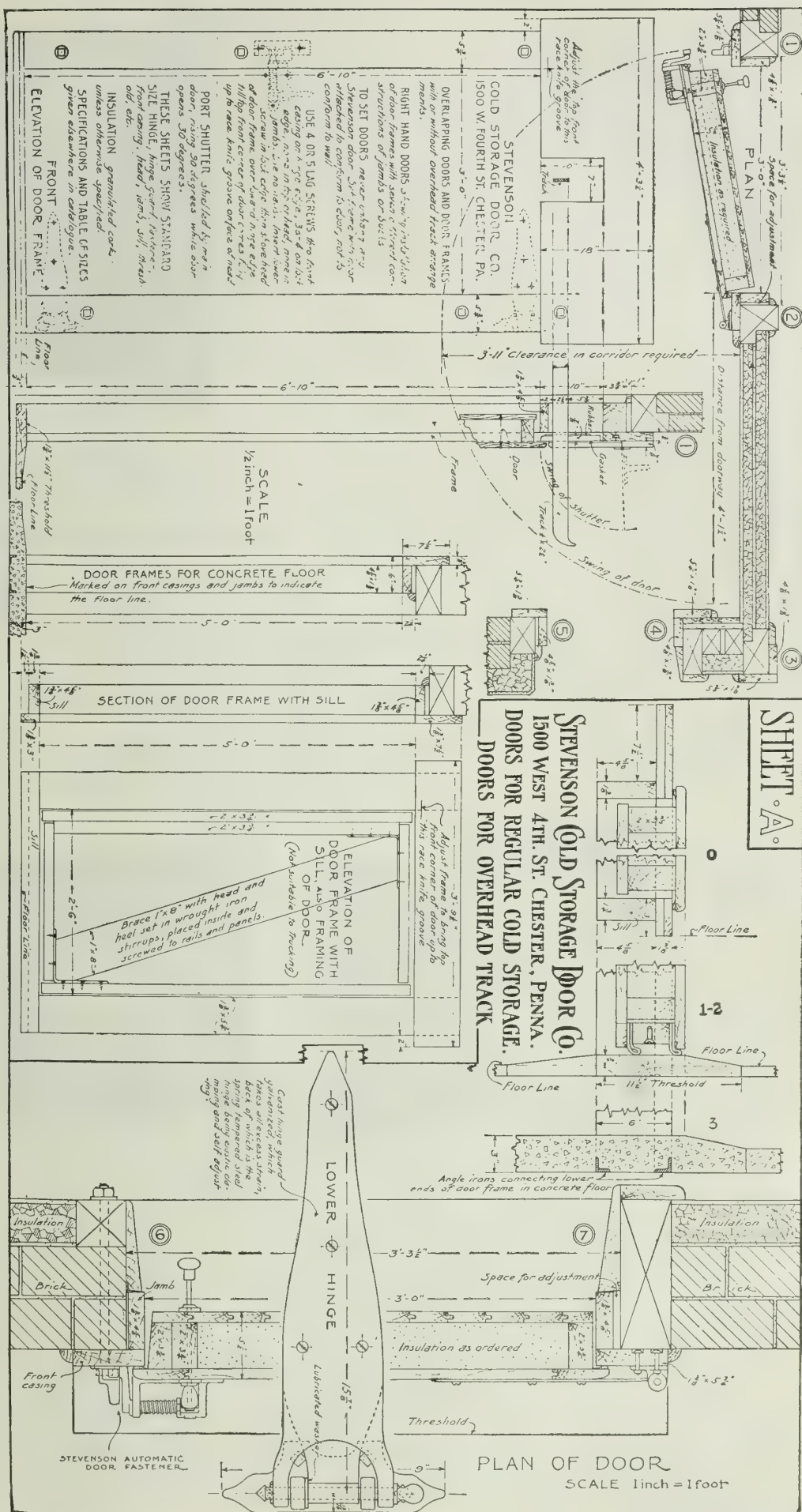


STEVENSON'S STANDARD COLD STORAGE DOOR  
Door Frame with Sill

Most users prefer the patented beveled threshold or patent angle iron arrangement for concrete floors. See following page, Figs. 0, 1-2, 3.



At this end of the sheet are shown an enlarged section of regular door, and details of fastener, hinge and hinge guard.



## Stevenson's Latest—The "Door that can not stand open."

### The Ideal Freezer Door.

Ends the losses due to operation and neglect of cold storage doors. Always shut unless filled with passing goods or man. Can not stand anywhere except in closed position. Just "butt" into it and go on. In two seconds the main door has been unlatched, thrown open, you're through and gone, and the double swing doors are closed again behind you.

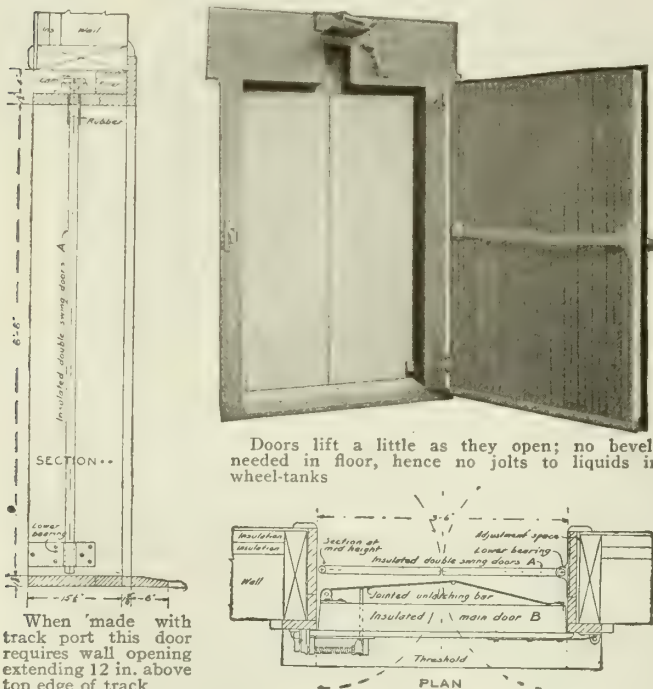
Makes sharp freezers and hardening rooms just as easily, quickly and surely accessible as high temperature rooms. Rids itself of ice.

Stand 'round any regular door—open 60 seconds for a truck to pass, often four times that. Note the ice loaded pipes, the mould-spotted rooms and goods.

The Stevenson "Door that can not stand open" stops that ruinous inrush of warm moisture-laden air. Brings in just the touch to make a success of old plants; to make thousands of successful new users out of those who have been afraid; to revolutionize cold storage.

Compare losses. Any regular door, to pass a 3-ft. truck, stands widely open 1 to 4 minutes. For example, a door 4 ft. by 6 ft. 6 ins. equals 26 sq. ft. area. Multiplied by 60 seconds (but a single minute) gives 1560 ft.-seconds minimum flow; four minutes equal 6240 ft.-seconds.

Same size Stevenson "Door that can not stand open" starts at nothing, comes back to nothing. Average opening 3 sq. ft. for 2 seconds. Multiplied, gives 6 ft.-seconds flow. Less than  $\frac{1}{2}$  of 1% of the smallest loss possible with any regular door. Area is required to permit flow; time to establish speed. Through so small an opening, flow is impossible in so short a time. Actually there's no flow; just a flutter. Does it appeal to your good judgment? How many days can any plant afford to do without it?



STEVENSON'S "DOOR THAT CAN NOT STAND OPEN"  
With—or without—port for overhead track

Double swing doors "A" strike the jointed unlatching bar on rear of main door "B," releasing fastener and throwing that door open. Trucks go through without a halt.

No frail spring hinge nuisance to renew every little while, each time put off till the old set has wasted enough refrigeration to pay for this door. A 2-way cam at top, operating in an oil reservoir, carries weight of door and is the actuating device. Unequaled fire stop—metal covered double door always closed



SPECIAL FREEZER DOOR FOR ICY DOORWAYS

Beveled threshold (as in Fig. 3, sheet B). Perfectly tight and perfectly free regardless of temperature, moisture, or accumulation of ice. No portion fits within the opening. Fastens itself. Has latest Stevenson hinge, hinge guard and roller fastener

## Stevenson's Vertical Sliding Doors.

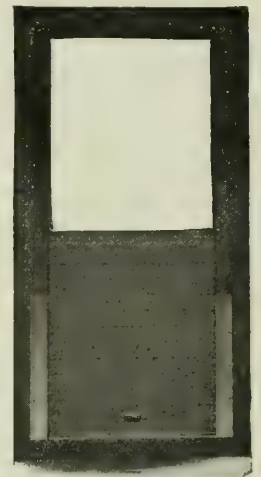
Especially adapted for use in breweries, milk depots, etc.

They are perfectly insulated and counterbalanced; windproof, but free.

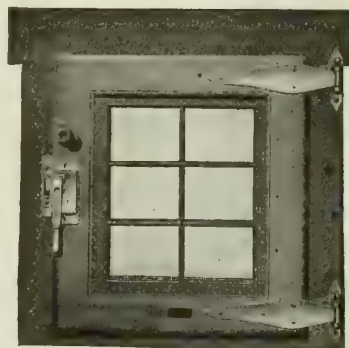
Equipped with wire rope and roller sheaves.

They can have rounded galvanized corner guards on exposed corners.

When installed in bottling houses, a 4-in. gap in the conveyor allows door to rise and fall.



STEVENSON'S VERTICAL SLIDING DOOR

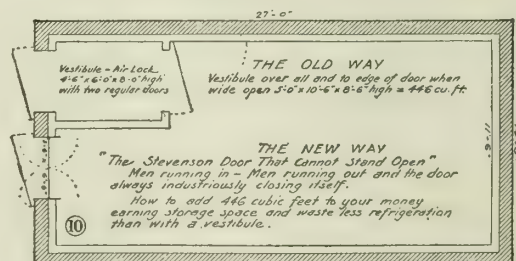


STEVENSON'S COLD STORAGE WINDOW

Frame made same as door frame. Have two or more thicknesses of glass, as required, with dead air space between



CROSS SECTION OF VERTICAL SLIDING DOOR



SPECIMEN OF STEVENSON'S SERVICE SHEETS

Sent on request to any architect. Show various arrangements to minimize corridor space and refrigeration loss



### Sheet B—Details of Stevenson's Special Freezer Doors, Etc.

At the top of the illustration are shown the details of the special freezer door for icy doorways, made with threshold for trucking, also with sill to step over.

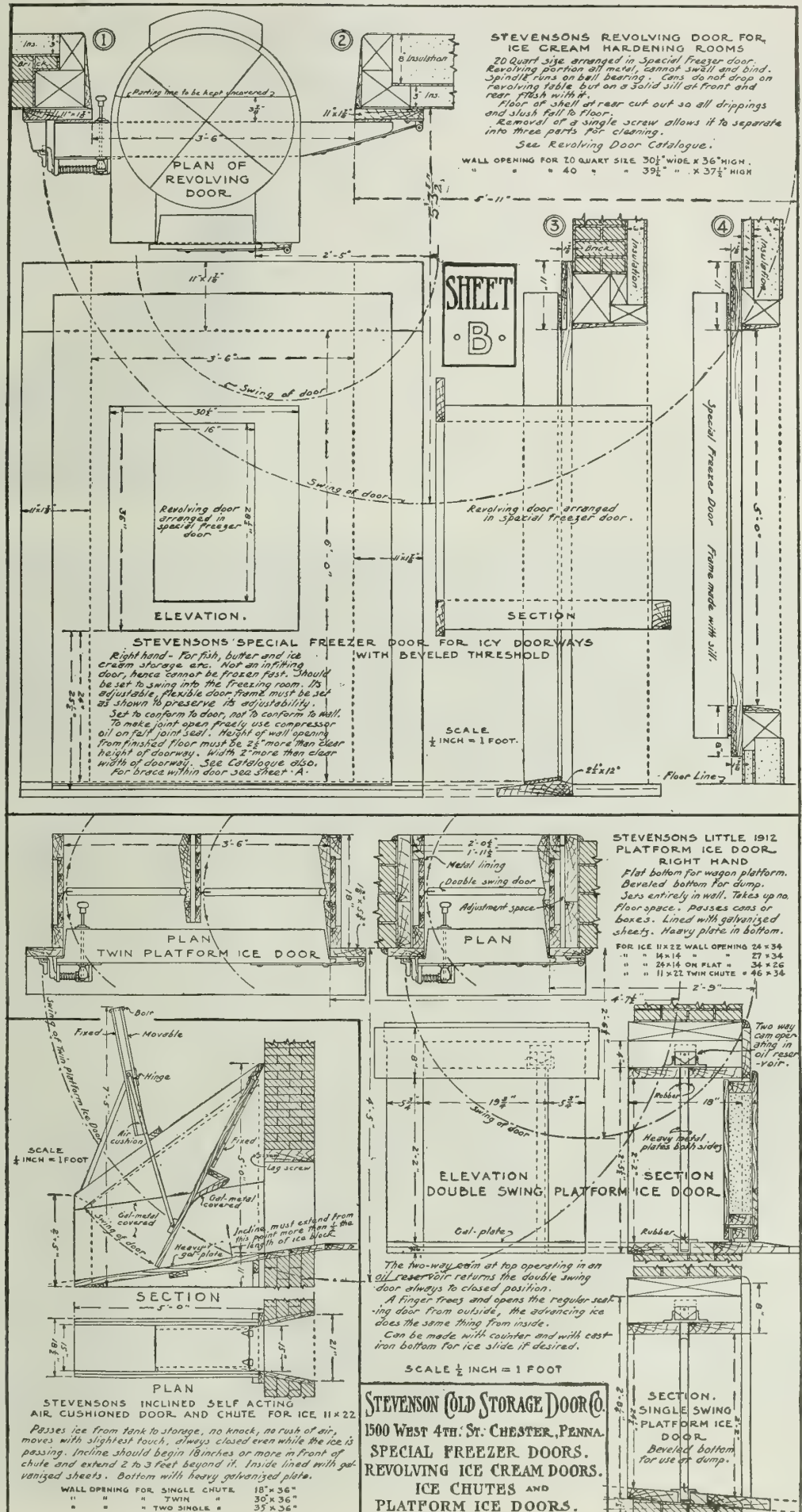
Arcs on plan show least width of corridor, and distance from doorway to end of corridor.

On plan, elevation and section is shown revolving door as installed in special freezer door.

Note the four methods, shown by numerals enclosed in circles, of forming jambs or bucks to provide for the door frames of Stevenson special freezer doors for icy doorways.

In the center, and at the lower right of the illustration are shown the details of the little platform ice door, single or twin, both flat bottom and inclined.

At the lower left of the illustration are shown the details of the inclined self-acting air cushioned door and chute for ice 11x22.





# HERMAN SOELLNER

## Hexagonal Shelving for Bottles

TELEPHONE:  
PLAZA 5728

309-311 East 56th Street  
NEW YORK, N. Y.

### Products.

"HONEYCOMB" (HEXAGONAL) BOTTLE RACKS or  
SHELVING.

Wine Bins and Wine Vault Construction.

### "Honeycomb" (Hexagonal) Shelves for Bottles.

Made up to design and measure, to fit into icebox compartments, buffets, closets, between walls or in frames.

Shipped knocked down, nested, in wooden boxes of about one-eighth of the space occupied by the bottle rack when set up.

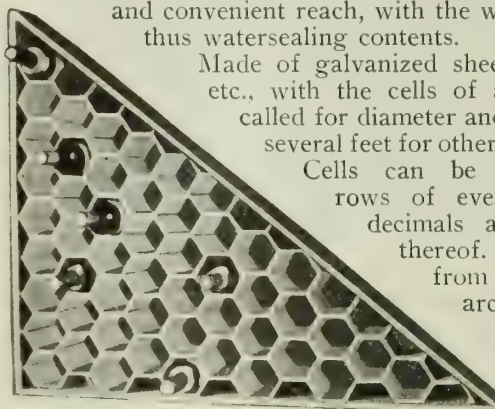
Can be reassembled by any handy man without the aid of tools.

Save floor space and practically double the use of all the available wall space.

Store each bottle absolutely safe, within plain sight and convenient reach, with the wet cork tight, thus watersealing contents.

Made of galvanized sheet, aluminum, etc., with the cells of any given or called for diameter and depth, up to several feet for other merchandise.

Cells can be grouped in rows of even dozens, decimals and multiples thereof. References from leading architects, contractors, hotels and private men.



FRAME FOR UNDER STAIRS



"HONEYCOMB" (HEXAGONAL) SHELVES



# THE AMERICAN BRASS COMPANY

BENEDICT & BURNHAM BRANCH

Manufacturers of Benedict Nickel

WATERBURY, CONN.

NEW YORK, N. Y., 195 Broadway

CHICAGO, ILL., 29 East Madison Street  
BOSTON, MASS., 172 High Street

## Products.

Manufacturers of BENEDICT NICKEL in the form of Seamless Tubes, Steel Lined Seamless Tubes, Sheets, Wire, Rods, Architectural Mouldings, Angles, Channels, and Ingot Metal.

For Extruded Metal Mouldings, see pages 492-93.

## Benedict Nickel.

**COLOR**—Benedict Nickel is a white metal which compares favorably with sterling silver in appearance and permanency of color. Like sterling silver, it requires cleaning occasionally. With ordinary care Benedict Nickel will *always* remain bright.

**STRENGTH**—Benedict Nickel is stronger and more durable for wear than brass or red metal; therefore, in addition to its attractive color, these high physical qualities make the use of this material especially desirable. Common grades of white metals, composed chiefly of zinc or other cheap materials, should not be compared with Benedict Nickel.

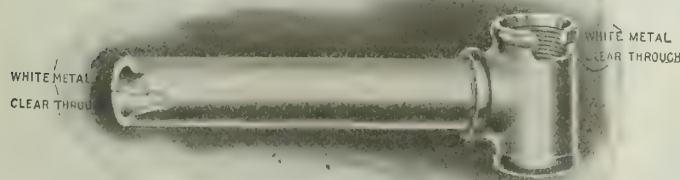
**USES**—For exposed plumbing in fine residences, offices and public buildings; for ornamental work, railings, hardware, and, in fact, for all purposes where nickelplated brass or bronze has been used, Benedict Nickel has become the standard. It is superior to all other metals for such uses because it combines elegance, durability, non-corrosiveness and sanitation. When the luster and finish of a once nicely appointed nickelplated job is worn off, the brassy spots look very unsightly; but where Benedict Nickel is used its distinctive white color is as permanent and lasting as the metal itself.

## Tubing.

Benedict Nickel seamless tubing is made in all the ordinary commercial, iron pipe and plumbers' sizes. In addition to supply and waste pipes, it is applicable to standards, railings and all construction which requires hollow cylindrical forms.

## Sheets.

Benedict Nickel sheet can be furnished in all the widths and gauges commonly made in brass or bronze. In sheet form, it is used for linings, flashings, kick plates, etc.; also, for coverings and trimmings on pantry sinks, soda fountains and bars.



BENEDICT NICKEL SEAMLESS TUBE AND CAST TEE  
Sample as above and descriptive booklet sent on request

## Rods, Wire, etc.

Benedict Nickel rods, wire, angles, channels, and architectural mouldings are manufactured to match the sheet or tubing in color.

## Ingot.

Benedict Nickel ingot is a thoroughly mixed alloy of uniform composition, and can be melted at a comparatively low heat. It can be cast into faucets, valves, traps, hinges and all kinds of plumbing fittings or ornamental pieces, soda fountain and bar fixtures, grilles, and a large variety of architectural work which has hitherto been made of brass or bronze. Castings made of this material drill, tap and cut freely.



EQUITABLE BUILDING, NEW YORK, N. Y.

ALBERT L. WEBSTER, Consulting Engineer, New York, N. Y.  
THOMPSON-STARRETT Co., Builders, New York, N. Y.  
J. N. KNIGHT & SON, Plumbers, New York, N. Y.  
PECK BROS. & Co., Plumbing Fixtures, New Haven, Conn.  
ERNEST R. GRAHAM, Architect, Chicago, Ill.

This building is representative of the many prominent buildings in which Benedict Nickel has been successfully used for plumbing fixtures, ornamental work and interior hardware

# UNITED LINED TUBE & VALVE COMPANY

Acidproof Lined Pipe, Valves and Special Apparatus

BOSTON, MASS.

## GENERAL SELLING AGENTS

NEW YORK, N. Y., UNITED LEAD CO., 111 Broadway  
CHICAGO, ILL., RAYMOND LEAD CO.  
ST. LOUIS, MO., HOYT METAL CO.  
CLEVELAND, OHIO, GIBSON-PRICE CO.

BALTIMORE, MD., JAMES ROBERTSON LEAD CO.  
PHILADELPHIA, PA., UNITED LEAD COMPANY OF PENNSYLVANIA (Tatham & Bros. Works)  
BOSTON, MASS., CHADWICK-BOSTON LEAD CO.

### Products.

CORROSIONPROOF and ACIDPROOF PIPE, PIPE BENDS and PIPE FITTINGS: Iron, Steel, Brass or Copper, lined or covered with lead or tin.

CORROSIONPROOF IRON PIPE, lined with brass or copper.

CORROSIONPROOF and ACIDPROOF FLANGES and FLANGED FITTINGS, lined with lead or tin.

CORROSIONPROOF and ACIDPROOF VALVES, lined with lead or tin.

Centrifugal Acid Pumps; Diaphragm Acid Pumps.

### "United" Lined Pipe.

"United" lined pipe is a seamless drawn tube of either lead, pure block tin, brass or copper, thoroughly and *inseparably united* throughout its entire length to an outer tube of wrought iron, steel, etc.

The lining is so *perfectly united* to the outer pipe that it is impossible to separate except by melting. It has a smooth interior surface and is free from any porous or defective spots.

It is lined by our modern process, which produces a pipe greatly superior to that lined by the old method.

"United" lead lined and tin lined pipe, tested before lining to 750 lbs. per sq. in., is additionally reinforced by the "United" bonded lining, making it the strongest water pipe on the market, capable of withstanding enormous stress and strain.

A saving of 50% is assured by the use of "United" lined pipe, the cheapest non-corrosive pipe on the market.

"United" lined pipe is absolutely guaranteed, and it enables the architect to afford his client a service for many years to come.

### "United" Flanged Lead Lined Iron Pipe.

Particularly adapted for use in contact with any liquid which has a corrosive action. Serviceable in connection with acidiferous mine water, salt water, or any water having a corrosive action on plain or galvanized iron or steel pipe.

The acidproof lining is protected by the outer iron pipe from pressure; the bond would prevent sagging or collapse. The lead lining, which is *inseparably united* to outer pipe, is turned over the face of the recessed flange in a most thorough manner, making a perfectly tight lead-to-lead joint at each flange, thus eliminating any danger of leakage.

The distinctive features of this pipe are its strength and acid resisting and non-corrosive qualities.

Furnished in accordance with client's specifications or designs.

"United" flanged lead lined pipe and fittings are recommended as of the highest quality, and are used in the largest chemical plants in the world.

FITTINGS—All types and sizes of lined flanged fittings can be furnished in any standard dimensions. Regular standard flanges faced and drilled according to the A. S. M. E. standard unless otherwise specified.

### "United" Tin Lined Pipe.

A pure block tin lined iron, steel, brass or copper pipe, adapted for installation in canning and food product factories, etc. Adopted by the largest food product manufacturers in this country.

Fittings of all kinds, lined or covered with pure block tin, furnished for use with this pipe.

### "United" Brass or Copper Lined Iron Pipe.

Particularly adapted for use as range and boiler connections, as well as supply and waste pipes.

The brass or copper tubing is *united* to the outer tube of iron by the "United" process.

Made with galvanized finish, unless otherwise ordered.

"United" special finish brass fittings are recommended and furnished for use with this pipe.

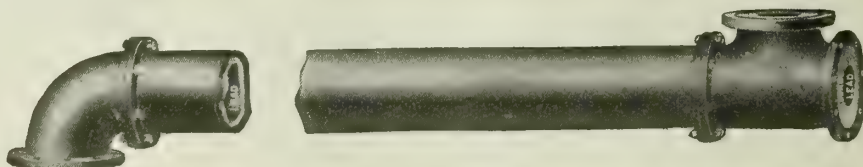
This pipe has been installed in some of the finest and most modern buildings, and the demand is increasing rapidly.



FLANGED LEAD LINED ELBOW



SECTION OF "UNITED" LINED PIPE CUT OPEN AND DOUBLE TWISTED TO SHOW INSEPARABILITY OF THE LINING

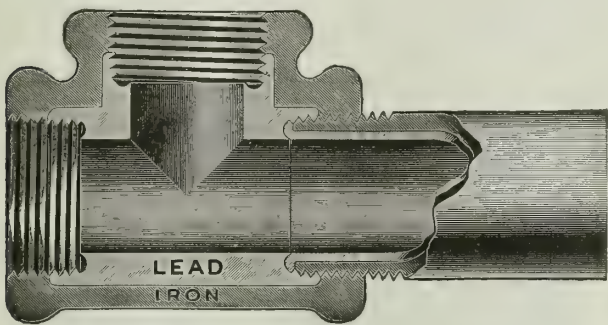


"UNITED" FLANGED LEAD LINED PIPE AND FITTINGS



“United” Lined Standard Screw Fittings.

All of our lined fittings, such as couplings, elbows, tees, unions, etc., are made with grooved or recessed shoulder joint, etc., by which the end of the pipe when made up into the fitting is completely surrounded by the lead or tin, thus preventing corrosion at this point, as well as insuring tight joints.



“UNITED” LINED STANDARD SCREW FITTING  
Note recessed shoulder

“United” Acidproof Valves.

Recommended for use in connection with “United” lined pipe.

Heavily lined throughout with a special acid resisting alloy. Seats are made of a composition which, being harder than lead, is better adapted to withstand the cutting or wear likely to occur at this point.

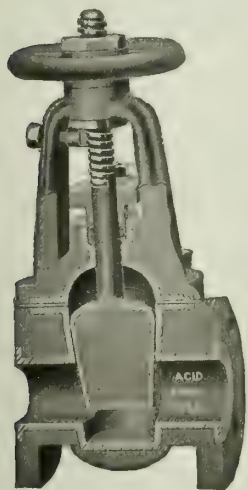
They are the strongest acid valves on the market and are not liable to be broken in transportation, during installation, or in actual use, as is the case with valves made wholly of lead composition metal, which is brittle and easily broken, particularly at the flanges.

Flanges of “United” valves are made extra strong and will last indefinitely.

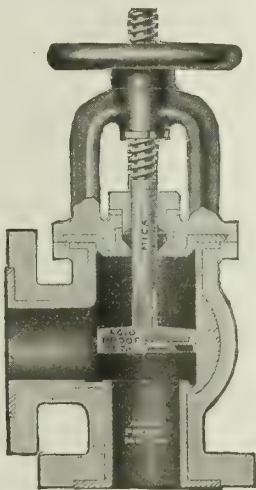
Made in all required sizes and styles: Y-pattern and angle (as illustrated), straightway gate pattern and diaphragm pattern.

“United” valves can also be lined with a heavy lining of pure block tin for handling acetic acid, citric acid, acid gases, food products, fruit juices and distilled or hot water.

Special valves of every description made and lined in accordance with client’s specifications or designs.

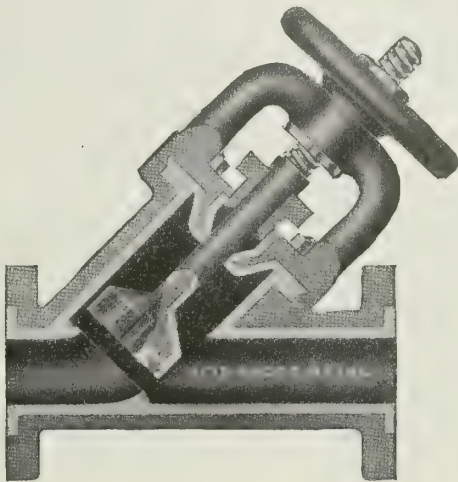


GATE VALVE



ANGLE VALVE

“UNITED” Y-PATTERN OR FREE FLOW ACID VALVE —Heavily lined throughout with special acid resisting alloy. Recommended as very superior where a full-way valve is desired. Clean unobstructed passage gives maximum capacity with minimum amount of friction. Very strongly constructed, of simple and durable design. Has been used with great success in acid and chemical plants, pulp and paper mills, etc., and adapted for use in any place where a perfectly acidproof valve is required.



Y-PATTERN OR FREE FLOW VALVE

Note the heavy lining of body and covering of stem. This acidproof metal is also turned over the face of the recessed flanges.

DATA “UNITED” CORROSIONPROOF AND ACIDPROOF VALVES  
GATE VALVES

Size, ins. ....	¾	1	1¼	1½	2	2½	3	4	5	6
Face to face, ins. ....	5½	5½	6	6½	6¾	7½	8	9	10	10½

ANGLE VALVES

Size, ins. ....	¾	1	1¼	1½	2	2½	3	4	5	6
Centre to face, ins. ....	2¾	2¾	3	3¼	4¼	4¼	4¾	5¾	6½	8

Y-PATTERN VALVES

Size, ins. ....	¾	1	1¼	1½	2	2½	3	4	5	6
Face to face, ins. ....	6	6¾	7½	7½	10¾	11¾	12¼	14	19	21

Guarantee.

All “United” products are absolutely guaranteed.

Co-operative Service.

Architects and others, having problems to solve incident to this line, are requested to submit them to the engineering department of the company, and a satisfactory solution is assured.

Prominent Installations.

Below is given a partial list of buildings equipped with “United” lined products.  
U. S. Post Offices, Augusta, Me.; Muskogee, Okla.; Newport, R. I.; Neenah, Wis.  
Wrentham State School, Wrentham, Mass.  
Practical Arts High School, Boston, Mass.  
Long Island College Hospital, Brooklyn, N. Y.  
Administration Building, N. J., State Agricultural Experiment Station, New Brunswick, N. J.  
Mt. Vernon High School, Mt. Vernon, N. Y.  
U. S. Naval Academy (Bancroft and Isherwood Halls), Annapolis, Md.

# THE YOUNGSTOWN SHEET & TUBE COMPANY

GENERAL OFFICE AND WORKS

YOUNGSTOWN, OHIO

DISTRICT SALES OFFICES

NEW YORK, N. Y., 30 Church Street  
 PHILADELPHIA, PA., 1615-16 Pennsylvania Building  
 BOSTON, MASS., 120 Franklin Street  
 CHICAGO, ILL., 1563 McCormick Building  
 PITTSBURGH, PA., 1626 Oliver Building  
 WASHINGTON, D. C., 718-19 Munsey Building  
 DETROIT, MICH., 1032 Dime Savings Bank Building

DENVER, COLO., 725 First National Bank Building  
 DALLAS, TEX., 915 Busch Building  
 SAN FRANCISCO, CAL., 604 Mission Street  
 ST. LOUIS, MO., 902 Third National Bank Building  
 SEATTLE, WASH., 535 Central Building  
 ATLANTA, GA., 1514 Healey Building  
 CLEVELAND, OHIO, 526 Leader-News Building

## Products.

"YOUNGSTOWN" STEAM, GAS and WATER PIPE;  
 "YOUNGSTOWN" STEEL,  $\frac{1}{8}$ -in. up to and including  
 20-in. outside diameter; "YOUNGSTOWN" STAR BRAND  
 IRON (Genuine Wrought Iron),  $\frac{3}{8}$ -in. up to and in-  
 cluding 12-in. nominal inside diameter, black and gal-  
 vanized; EXTRA STRONG and DOUBLE EXTRA STRONG  
 "YOUNGSTOWN" STEEL and "YOUNGSTOWN" STAR  
 BRAND IRON.

Line Pipe for oil and gas, fitted with recessed extra  
 heavy taper sockets; Tubing and Drive Pipe; Rotary  
 Drill Pipe; Casing; Screw and Socket and Inserted  
 Joint.

Dry Kiln Pipe; Signal Pipe; Ammonia Pipe; and  
 Pipe for various other purposes, such as Pipe Water  
 Lines fitted with flanges, etc.; Asphalted Pipe.

Pig Iron; Bessemer and Open Hearth Steel Billets,  
 Slabs and Sheet Bar; Puddled Iron Muck Bar; Double  
 Refined Puddled Iron Sheet Bars; Iron and Steel Plates  
 and Skelp.

Bars and Shapes: rounds and squares,  $\frac{1}{4}$  in. to 2  
 ins.; flats up to  $4\frac{1}{2}$  ins. wide; angles up to 3 ins. wide.

"Youngstown" Iron and Steel Sheets, Black and  
 "New Process" galvanized.

"Youngstown" Iron and Steel Roofing, painted  
 and "New Process" galvanized (corrugated, V-crimp,  
 roll and standing seam).

Barbed Wire, painted and galvanized; Wire Rods;  
 Plain Wire, black and galvanized; Wire Nails, Staples  
 and Hoops; "Youngstown" and "Buckeye" Woven  
 Wire Field Fence.

For Electrical Conduits and Armored Cables, see  
 pages 1180-81.

*"Ore to Finished Product."*

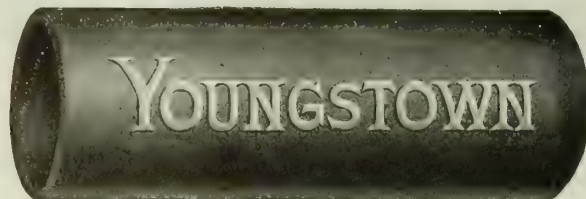
## "Youngstown" Pipe.

Like all of our products, "Youngstown" pipe is  
 made by us straight through from the ore in one plant  
 by one organization. With such manufacturing facili-  
 ties the utmost in quality and service is assured. The  
 works cover an area of 500 acres, entirely devoted to  
 the manufacture of our products.

Half a million tons of tubular products are made  
 annually. This includes both "Youngstown" steel and  
 "Youngstown" Star Brand genuine old-fashioned hand  
 puddled iron pipe, both of which meet every demand of  
 architect and engineer for high grade tubular products.

## Marking of Steel Pipe.

"Youngstown" steel pipe is distinguished by the  
 word "Youngstown" in raised letters on every length  
 of pipe. See illustration.



YOUNGSTOWN STEEL PIPE

## Specifications for "Youngstown" Steel Pipe.

For the convenience of architects and engineers the  
 following specifications for steel pipe are submitted:

**MATERIAL**—All "Youngstown" steel pipe will be made of  
 soft weldable steel of uniformly good quality. This steel to be  
 particularly adaptable to the requirements for wrought pipe,  
 and sufficient crop shall be cut from the top of each ingot to  
 secure solid metal in the skelp.

**PROPERTIES**—The steel from which the pipe is made shall  
 have approximately the following physical properties:

Tensile strength, not less than 50,000 lbs.

Elastic limit, not less than one-half tensile strength.

Elongation in 8 ins., not less than 20%.

Reduction in area, not less than 50%.

**TEST SPECIMENS**—Test specimens for determining physical  
 properties shall be cut from skelp or finished pipe.

**CRUSHING TEST**—When required, cross sections cut from  
 any pipe shall stand crushing down until the inside walls are  
 three times the thickness of the wall from each other without  
 showing cracks on the outside of the bend; except that, in the  
 case of butt-welded pipe, any fracture at the weld must give  
 evidence of having been firmly welded.

**BEND TEST**—When required, a test specimen cut lengthwise  
 from skelp or finished pipe and filed smooth on the edges shall  
 bend through an angle of 180°, with an inner diameter equal  
 to the thickness of the material, without fracture.

**HYDROSTATIC TEST**—All sizes shall be tested at mill to an  
 internal pressure, as shown in the following table:

$\frac{1}{8}$  to 2 ins., butt-weld, 700 lbs.

2½ and 3 ins., butt-weld, 800 lbs.

Up to 8 ins., lap-weld, 1,000 lbs.

9 and 10 ins., lap-weld, 900 lbs.

11 and 12 ins., lap-weld, 800 lbs.

On the 8-in., 10-in. and 12-in. sizes, which have more than  
 one weight as standard, the test pressure for the heaviest weight  
 has been shown.

**LENGTHS**—Unless otherwise specified, standard pipe will be  
 furnished in random lengths with threads and couplings; extra  
 strong pipe will be furnished plain ends.

**THREADING**—Pipe and couplings shall be threaded and  
 tapped according to Briggs' Standard. Thread must be a good  
 commercial thread and must not leak under the specified pres-  
 sure (paragraph 5). The thread must not vary more than one  
 and one-half turns, either way, when tested with a Pratt and  
 Whitney Briggs' Standard Gauge. All burrs at the ends shall  
 be removed.

**COUPLINGS**—Chamfered or slightly beveled couplings will  
 be furnished on all steam pipe, and shall be of soft puddled  
 iron, thoroughly welded and free from all blisters, pits or  
 other defects that would break the continuity of the thread.

**TOLERANCE**—The pipe shall not vary more than 1% either  
 way from being perfectly round and true to the standard outside  
 diameter, and shall not vary more than 5% either way from  
 weight as listed.

**TESTS**—All tests shall be made at the mill.



**"Youngstown" Star Brand Pipe.**

Genuine old-fashioned hand puddled iron pipe, guaranteed full weight.

We own and control extensive iron ore properties. From properly selected ore our own pig iron is manufactured. This pig iron is in turn worked by hand in our puddle furnaces into *genuine wrought iron*. This high grade hand puddled iron is then rolled into skelp. The skelp is made into "Youngstown" Star Brand iron pipe.

Those who prefer iron pipe to steel will find in "Youngstown" Star Brand an honestly made, full weight product that will meet their every requirement.

**Marking of Iron Pipe.**

"Youngstown" Star Brand iron pipe is marked with the name, "Youngstown," followed by a star. When the pipe is made by the butt-weld process these marks are rolled in the skelp. When it is made by the lap-weld process (usually employed for sizes exceeding 2 ins. outside diameter) only the name is rolled in the skelp, the star being stencilled on in white paint.

**Specifications for "Youngstown" Star Brand Pipe.**

For "Youngstown" Star Brand genuine old-fashioned hand puddled iron pipe (black and galvanized) the following specifications are submitted:

**MATERIAL**—All "Youngstown" Star Brand pipe to be made of strictly genuine wrought iron, free from injurious flaws, seams and surface defects, and finished in a workmanlike manner.

**PROPERTIES**—The iron from which the pipe is made shall have approximately the following chemical and physical properties:

**CHEMICAL PROPERTIES**

Carbon,	not over .06
Manganese,	not over .12
Sulphur,	.04 and under
Phosphorus,	.10 to .25
Silicon,	.10 to .25

**PHYSICAL PROPERTIES**

Tensile strength, 40,000 to 48,000 lbs. per sq. in.  
Elastic limit, not less than one-half tensile strength.  
Elongation in 8 ins., not less than 12%.  
Reduction in area, not less than 25%.

**CRUSHING TEST**—When required, cross sections cut from any pipe shall be crushed down until the inside walls are three times the thickness of the wall from each other. It is not expected that iron pipe will stand this test without fracture; but this fracture should show a clean fibrous structure. In case of butt-weld pipe, the fracture at the weld must give evidence of having been firmly welded.

**HYDROSTATIC TEST**—All sizes shall be tested at the mill to an internal pressure, as shown in the following table:

1/8 to 2 1/2 ins., butt-weld, 700 lbs.  
2 1/2 and 3 ins., butt-weld, 800 lbs.  
Up to 8 ins., lap-weld, 1,000 lbs.  
9 and 10 ins., lap-weld, 900 lbs.  
12 ins., lap-weld, 800 lbs.

On the 8-in., 10-in. and 12-in. sizes, which have more than one weight as standard, the test pressure for the heaviest weight has been shown.

**LENGTHS**—Unless otherwise specified, standard pipe will be furnished in random lengths with threads and couplings. Extra strong pipe will be furnished plain ends.

**THREADING**—Pipe and couplings shall be threaded and tapped according to Briggs' Standard. Threads must not leak under the specified pressure (paragraph 4). The thread must not vary more than one and one-half turns, either way, when tested with a Pratt and Whitney Briggs' Standard Gage. All burrs at the ends shall be removed.

**COUPLINGS**—Chamfered or slightly beveled couplings will be furnished on all steam pipe, and shall be of soft puddled iron, thoroughly welded and free from all blisters, pits or other defects that would break the continuity of the thread.

**TOLERANCE**—The pipe shall not vary more than 1% either way from being perfectly round and true to the standard outside diameter, and shall not vary more than 5% either way from weight as listed.

**TESTS**—All tests shall be made at the mill.

**"YOUNGSTOWN" STEEL AND "YOUNGSTOWN" STAR BRAND IRON PIPE**

FULL STANDARD WEIGHT—BLACK AND GALVANIZED  
All Weights and Dimensions Are Nominal

Size, ins.	List price per foot	Diameters		Thickness	Weight per foot		
		External	Internal		Plain ends	Threads and couplings	Threads per inch
1/8	\$ .05 1/2	.405	.269	.068	.244	.245	27
1/4	.06	.540	.364	.088	.424	.425	18
3/8	.06	.675	.493	.091	.567	.568	18
1/2	.08 1/2	.840	.622	.109	.850	.852	14
3/4	.11 1/2	1.050	.824	.113	1.130	1.134	14
1	.17	1.315	1.049	.133	1.678	1.684	11 1/2
1 1/4	.23	1.660	1.380	.140	2.272	2.281	11 1/2
1 1/2	.27 1/2	1.900	1.610	.145	2.717	2.731	11 1/2
2	.37	2.375	2.067	.154	3.652	3.678	11 1/2
2 1/2	.58 1/2	2.875	2.469	.203	5.793	5.819	8
3	.76 1/2	3.500	3.068	.216	7.575	7.616	8
3 1/2	.92	4.000	3.548	.226	9.109	9.202	8
4	1.09	4.500	4.026	.237	10.790	10.889	8
4 1/2	1.27	5.000	4.506	.247	12.538	12.642	8
5	1.48	5.563	5.047	.258	14.617	14.810	8
6	1.92	6.625	6.065	.280	18.974	19.185	8
7	2.38	7.625	7.023	.301	23.544	23.769	8
8	2.50	8.625	8.071	.322	24.696	25.000	8
8	2.88	8.625	7.981	.322	28.554	28.809	8
9	3.45	9.625	8.941	.342	33.907	34.188	8
10	3.20	10.750	10.192	.279	31.201	32.000	8
10	3.50	10.750	10.136	.307	34.240	35.000	8
10	4.12	10.750	10.020	.365	40.483	41.132	8
11	4.63	11.750	11.000	.375	45.557	46.247	8
12	4.50	12.750	12.090	.330	43.773	45.000	8
12	5.07	12.750	12.000	.375	49.562	50.706	8
13	5.60	14.000	13.250	.375	54.568	55.824	8
14	6.10	15.000	14.250	.375	58.573	60.375	8
15	6.50	16.000	15.250	.375	62.579	64.500	8

The permissible variation in weight is 5% above and 5% below.

Furnished with threads and couplings and in random lengths unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

For cut lengths, an extra charge will be made above random lengths.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge will be made above standard pipe.

For Galvanized, or Coated pipe, an extra charge will be made above Black.

**EXTRA STRONG PIPE—BLACK AND GALVANIZED  
All Weights and Dimensions Are Nominal**

Size, ins.	List price per foot	Diameters		Thickness	Weight per foot, plain ends
		External	Internal		
1/8	\$ .12	.405	.215	.095	.314
1/4	.07 1/2	.540	.302	.119	.535
3/8	.07 1/2	.675	.423	.126	.738
1/2	.11	.840	.546	.147	1.087
3/4	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
1 1/4	.30	1.660	1.278	.191	2.996
1 1/2	.36 1/2	1.900	1.500	.200	3.631
2	.50 1/2	2.375	1.939	.218	5.022
2 1/2	.77	2.875	2.323	.276	7.661
3	1.03	3.500	2.900	.300	10.252
3 1/2	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
4 1/2	1.80	5.000	4.290	.355	17.611
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
7	3.81	7.625	6.625	.500	38.048
8	4.34	8.625	7.625	.500	43.388
9	4.90	9.625	8.625	.500	48.728
10	5.48	10.750	9.750	.500	54.735
11	6.10	11.750	10.750	.500	60.075
12	6.55	12.750	11.750	.500	65.415

The permissible variation in weight is 5% above and 5% below.

**DOUBLE EXTRA STRONG PIPE—BLACK AND GALVANIZED  
All Weights and Dimensions Are Nominal**

Size, ins.	List price per foot	Diameters		Thickness	Weight per foot, plain ends
		External	Internal		
1/2	\$ .32	.840	.252	.294	1.714
3/4	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.659
1 1/4	.52 1/2	1.660	.896	.382	5.214
1 1/2	.65	1.900	1.100	.400	6.408
2	.91	2.375	1.503	.436	9.029
2 1/2	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
3 1/2	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
4 1/2	3.26	5.000	3.580	.710	32.530
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160
7	6.35	7.625	5.875	.875	63.079
8	7.25	8.625	6.875	.875	72.424

The permissible variation in weight is 10% above and 10% below.

The following notes apply to both tables:

Furnished with plain ends and in random lengths, unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

Random length of Extra Strong and Double Extra Strong pipe is considered to be 12 to 22 ft., we to have the privilege, however, of supplying not exceeding 5% of total order in lengths of from 6 to 12 ft.

For pipe fitted with threads and couplings, an extra charge will be made above plain ends.

For cut lengths, an extra charge will be made above random.

For Galvanized or Coated pipe, an extra charge will be made above Black.

# H. W. JOHNS-MANVILLE CO.

## Pipe and Boiler Insulation Service

NEW YORK AND EVERY LARGE CITY

For Branch Addresses, see Page 910.

### Products.

#### JOHNS-MANVILLE PIPE INSULATION:

ASBESTO-SPONGE FELTED SECTIONAL PIPE INSULATION.

85% MAGNESIA SECTIONAL PIPE INSULATION.

ASBESTOCEL SECTIONAL PIPE INSULATION.

ZERO SECTIONAL PIPE INSULATION.

BUILT-UP HAIR FELT COMBINATION INSULATION.

ANTI-SWEAT SECTIONAL PIPE INSULATION.

BUILT-UP BRINE AND AMMONIA PIPE INSULATION.

#### INSULATING CEMENTS:

ASBESTOS INSULATING CEMENT, Nos. 302 and 400.

85% MAGNESIA INSULATING CEMENT.

#### INSULATING SHEETS AND BLOCKS:

ASBESTO-SPONGE FELTED SHEETS AND BLOCKS.

85% MAGNESIA BLOCKS.

ASBESTOCEL SHEETS AND BLOCKS.

VITRIBESTOS SHEETS AND BLOCKS.

Thermo and Vitro Fire-felt Sheets and Blocks.

For Acoustical Service and Waterproofing Materials, see page 36; for Asphalt Mastic Flooring, see page 331; for Roofing Material, see pages 402-05; for Asbestos Shingles, see pages 386-87; for Radiator and Steam Traps, see page 930; for Underground System of Pipe Insulation, see page 910.

### Johns-Manville Insulation Service.

At each Johns-Manville branch office is maintained a force of competent engineers and mechanics for the application of insulation materials. All information relative to this service can be obtained from the nearest branch office without obligation.

#### JOHNS-MANVILLE INSULATING MATERIALS

Service	Type of insulation	Insulation recommended
Steam at all pressures	Sectional pipe	Asbesto-Sponge Felted 85% Magnesia
Medium and low pressure	Sectional pipe	Asbestocel
Low pressure and hot water	Sectional pipe	Asbestocel
Antifreezing	Sectional pipe Built-up	Zero Built-up Hair Felt
Cold water and ammonia	Sectional pipe Built-up	Anti-sweat Brine and Ammonia
Boiler insulation	Cement	Nos. 302, 400, 85% Magnesia
	Block and sheet	Asbesto-Sponge Felted 85% Magnesia Asbestocel
Stack and flues	Sheet Blocks	Vitribestos
Underground	.....	See page 910

### Johns-Manville Insulation for Pipe Flanges.

Sectional removable flange coverings can be fur-



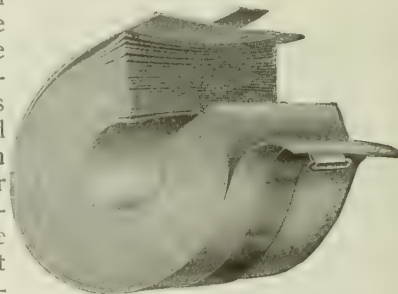
nished for all standard sizes of flanges; also all the standard forms of block coverings with wire and cement for constructing non-removable flange coverings. Made in various sizes and thicknesses.

SIZES AND APPROXIMATE WEIGHTS IN POUNDS PER SECTION OF JOHNS-MANVILLE PIPE INSULATION  
(3-ft. Sections only)

Pipe size, ins.	Asbesto-Sponge 1 in. thick	85% Magnesia standard thickness	Asbestocel 1 in. thick
1/2	4.35	1.62	3.8
3/4	4.7	1.85	4.02
1	5.26	2.02	4.4
1 1/4	6.	2.39	4.82
1 1/2	6.42	2.74	5.1
2	7.38	3.77	5.68
2 1/2	8.31	4.3	6.3
3	9.52	5.	7.08
3 1/2	10.6	5.57	7.78
4	11.6	6.83	8.37
4 1/2	12.5	7.42	9.
5	13.8	8.05	9.8
6	15.7	9.35	11.
7	17.7	11.9	12.2
8	19.7	13.2	13.4
9	21.7	14.5	14.6
10	23.8	16.1	16.1
12	27.8	23.	18.6

### Asbesto-Sponge Felted Sectional Pipe Insulation.

For superheated and high pressure steam pipes. Made from a thin felt, composed of asbestos fiber and finely ground sponge, forming an extremely cellular fabric. Made in laminated form like leaves of a book, it confines a large number of small particles of dead air between

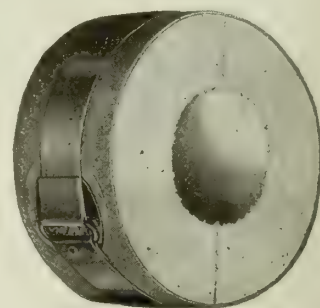


ASBESTO-SPONGE FELTED SECTIONAL PIPE INSULATION

the layers, thus securing the maximum insulating efficiency. It is tough, flexible and practically indestructible. Made in sectional form, in thicknesses of 1/2 to 3 ins. to fit all standard pipe sizes.

### 85% Magnesia Sectional Pipe Insulation.

Johns-Manville 85% Magnesia insulation combines the high non-conducting qualities of carbonate of magnesia and asbestos in a light, highly efficient insulation. Recommended for high pressure steam surfaces. Furnished in various thicknesses from 1 to 3 ins., in sectional forms, canvased and with bands to fit standard pipes 1/2 to 12 ins. For larger pipes, curved segments or blocks are supplied.



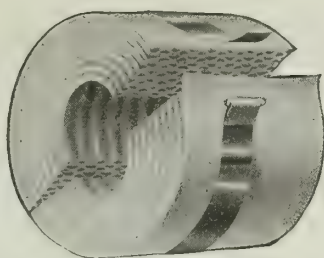
85% MAGNESIA SECTIONAL PIPE INSULATION



### Asbestocel Sectional Pipe Insulation.

For medium steam pressure and heating pipes. Asbestocel insulation is built on the arch principle, the channels running around the pipe instead of lengthwise, which prevents longitudinal circulation of air, the great objection to ordinary air cell coverings. It will not crush down or lose its strength, and successfully withstands vibration and hard usage.

Made in thicknesses of  $\frac{1}{2}$  to 3 ins. to fit standard pipes.

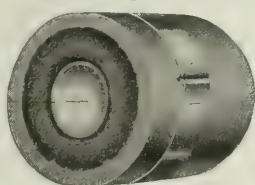


ASBESTOCEL SECTIONAL  
PIPE INSULATION

### Zero Sectional Pipe Insulation.

Johns-Manville Zero pipe insulation designed to protect pipes subjected to temperatures slightly below the freezing point or where temperatures drop for only a short time, and where conditions are not sufficiently severe to warrant the application of Johns-Manville Built-up insulation.

Made of several layers of insulating felts lined with hair felt, with a layer of asphalt saturated felt between the hair and the pipe surface. Also made up in a variety of forms to fit standard screw fittings.



ZERO SECTIONAL  
PIPE INSULATION

### Built-up Hair Felt Insulation.

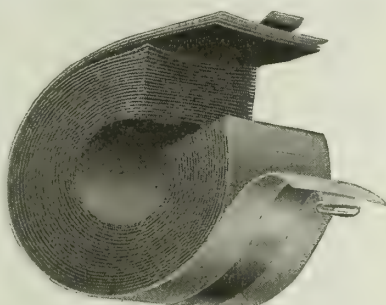
Johns-Manville Built-up Hair Felt insulation consists of layers of hair felt, built up on the pipe, according to our specifications. This material gives the best insulation for cold water pipes exposed to extreme temperatures.

A continuous insulation and not affected by expansion and contraction.

### Anti-sweat Insulation.

Used as an insulating material for cold and ice water pipe lines, preventing condensation on pipes by insulating the pipe from the warm air. Made of waterproof insulating felt and wool felt, securely wire stitched together, so that the insulation does not depend on paste or glue to hold it in shape.

Made in 3-ft. sections,  $\frac{1}{2}$ -,  $\frac{3}{4}$ - and 1-in. thicknesses, to fit all standard size pipes. For insulating cold water pipes at temperatures between 50° and 70° Fahr., use 1-in. thickness; for temperatures between 32° and 50°, use  $1\frac{1}{2}$ -in. thickness; for ice water lines running through room where humidity of air is high, use 2-in. thickness. For more severe conditions consult with nearest Johns-Manville Branch.



ANTI-SWEAT INSULATION

### Built-up Brine and Ammonia Insulation.

Johns-Manville Built-up Brine and Ammonia insu-

lation, applied by Johns-Manville for maintaining extremely low temperature in brine or ammonia pipes, consists of several layers of insulating felts, each layer practically hermetically sealed by an asphaltic, waterproofing membrane between pipe and felt and each successive layer of felt. Will withstand contraction and expansion without cracking or breaking open.

Applied by Johns-Manville Construction Department.

### Johns-Manville Asbestos Cement No. 302.

For insulating irregular surfaces, such as pipe fittings, etc.; and for finishing over block or sheet forms of insulation.

Made of asbestos fiber and binding materials, so combined that when mixed with water and changed to plastic form, it has all the desirable qualities required of a highly efficient insulating cement.

Covers approximately 30 sq. ft. 1 in. thick per 120 lbs., and finishes with a hard durable attractive surface.

### Johns-Manville Asbestos Cement No. 400.

An ideal cement for general service. Finishes well; is high in insulating quality, and has a covering capacity of approximately 25 sq. ft. 1 in. thick per 100 lbs. Furnished in 100-lb. bags.

### 85% Magnesia Insulating Cement.

Made of 85% carbonate of magnesia and asbestos fiber. Is a good insulator and may be protected with a surface finish of No. 302 or No. 400 cement described above, which gives a smooth, hard finish.

One 60-lb. bag will cover approximately 30 sq. ft. of surface 1 in. thick.

### Asbesto-Sponge Felted Sheets and Blocks.

For insulating any surface to which they may be fitted, providing the temperature of the surface to which they are applied does not exceed 700° Fahr.

Similar in composition to Asbesto-Sponge Felted pipe insulation described on opposite page, and consist of a number of sheets of Asbesto-Sponge Felt built up to required thickness.

Furnished in sheets 2 by 3 ft., from  $\frac{1}{2}$  to 4 ins. in thickness.

### 85% Magnesia Blocks.

Composed of 85% magnesia and asbestos fiber moulded in block form, 3 by 18 ins. and 6 by 36 ins., from  $\frac{1}{2}$  to 4 ins. thick.

### Asbestocel Sheets and Blocks.

Made of plain and corrugated asbestos felts combined to form a cellular structure, with channel shaped cells of one layer running at right angles to those in adjacent layer. Furnished in sheets 36 by 36 ins., or blocks 6 by 36 ins. from  $\frac{1}{2}$  to 4 ins. thick.

### Vitribestos Sheets and Blocks.

For lining stacks, flues, etc., and all plane or curved surfaces where a hard, non-corrosive sheet insulation of great structural strength is required. Made of alternate layers of plain and corrugated sheets of asbestos felt, hardened or vitrified by a special process. In sheets 3 by 6 ft.,  $\frac{1}{4}$  to 4 ins. thick.



# MAGNESIA ASSOCIATION OF AMERICA

THE PHILIP CAREY CO., CINCINNATI, OHIO  
EHRET MAGNESIA MFG. CO., VALLEY FORGE, PA.

THE FRANKLIN MFG. CO., FRANKLIN, PA.  
KEASBEY & MATTISON CO., AMBLER, PA.

## Manufacturers of 85% Magnesia Insulation for Power and Heating Systems

### Products.

85% CARBONATE OF MAGNESIA NON-CONDUCTING COVERINGS for Power, Heating and Ventilating Systems, including 85% MAGNESIA BLOCKS, 85% MAGNESIA PLASTIC, and 85% MAGNESIA SECTIONAL PIPE COVERING.

### Magnesia Insulation for Power and Heating Systems.

In 1883 the non-conductivity of magnesia was discovered. Until then no insulation had been satisfactory. When the insulating property of magnesia was announced, it was at once submitted to most searching tests by technical authorities and leading engineers. These demonstrated that this insulation was able, in ordinary work, to make one ton of coal do approximately the work of two.

The latest tests by the same class of authorities coincide almost exactly with those earliest tests as to its non-conductivity.

Several other kinds of insulation, which were tested years ago in company with 85% Magnesia and were fairly well considered at that time, have now dropped from the market; but 85% Magnesia, after a generation of trial, remains today where it was established at the beginning, the most satisfactory in its efficiency, as well as the most economical in its final cost.

In other words, 85% Magnesia is the standard insulation for power and heating systems. It was officially adopted by the United States Navy years ago, and it still remains its standard covering.

For the convenience of engineers and architects, we present herewith an 85% Magnesia Specification which represents 30 years' cumulative and technical experience of eminent engineers throughout the world.

### Magnesia Association Specification.

For 85% Carbonate of Magnesia Non-conducting Coverings for Power, Heating and Ventilating Systems.

**NON-CONDUCTING COVERING MATERIAL**—Non-conducting covering material for all heated surfaces shall be 85% Carbonate of Magnesia Covering, consisting of Hydrated Carbonate of Magnesia, manufactured under the standard formula ( $4\text{MgCO}_3 \cdot \text{MgO} \cdot 2\text{H}_2\text{O}$ ) and Asbestos Fiber. The mixture shall contain in combination not less than 95% of said Magnesia and Fiber, of which at least 85% of the whole shall be said Magnesia.

Pipe covering sections shall be 3 ft. in length, made in halves, cut lengthwise for sizes up to and including 10 ins. in diameter, and in segments for larger sizes.

The standard thickness of covering for the various sizes of pipes shall be as follows:

Pipe size	1/2 to 1 1/2 ins.	Wall of covering shall be	7/8 ins. thick
" 2 to 3 1/2 "	" "	" "	1 1/8 "
" 4 to 6 "	" "	" "	1 3/8 "
" 7 to 10 "	" "	" "	1 1/2 "
" 12 ins. and larger	" "	" "	1 1/2 "

All block coverings shall be of same composition as the pipe coverings and shall be furnished in blocks 3 by 18 ins., 3 by 36 ins., 6 by 18 ins., or 6 by 36 ins., in the thicknesses specified.

Thickness of all pipe covering sections and blocks shall be uniform throughout each individual piece.

**WORKMANSHIP**—Mechanics employed in the application of non-conducting covering shall be skilled pipe coverers.

**BOILERS—Boiler Tops**—All exposed boiler tops or tops of

drums shall be covered with 85% Magnesia Blocks, 2 ins. thick, finished with 1 in. of 85% Magnesia Plastic. Finishing coat shall be a hard finishing cement.

Total thickness of finished covering shall be 3 ins. and covering shall be extended over top surface of brick setting on either side of and in between, boiler tops and drums, and over top of combustion chamber.

**Ends of Drums**—Ends of boiler drums, both heads and rings, shall be covered with 85% Magnesia Blocks and Plastic, or all Plastic, securely wired in place, followed with smooth finishing coat to total thickness of 3 ins., finished with a canvas jacket, to match the sectional covering. Covering of drum ends shall be beveled around manholes.

**BOILER WALLS**—Side brick walls of boiler setting shall be covered with 85% Magnesia Plastic, or Blocks and Plastic, to total thickness of 2 ins.

This covering shall be laid on expanded metal lathing, or V-rib netting, neatly fastened to brickwork by means of bolts, set in by the brick mason, and protruding therefrom, at regular intervals, on which the wire lathing or expanded metal can be securely laced.

Covering shall be neatly beveled about all openings in side of setting, and for a distance of 4 ft. from boiler room floor it shall be protected by some form of sheet metal casing which shall be provided by sheet iron contractor.

**SMOKE BREECHING**—On connections from boiler to main smokestack, including portions running to economizer, there shall be applied, first, 1/2-in. mesh black iron wire cloth with 1-in. V-iron attached, to form air space, and fastened directly to the iron.

Block and Plastic material shall follow, as specified for boiler tops.

**SUPERHEATED STEAM PIPING**—Superheated steam piping shall be covered with double 1 1/2-in. thick 85% Magnesia Sectional Covering, applied by broken joint method. First layer of sectional or segmental covering shall be thoroughly wired in place with No. 18 annealed iron wire; second layer shall be applied so as to break both butt and lateral joints, and secured in place in same manner as first layer. Any cracks on the surface between sections or segments shall be carefully filled with 85% Magnesia Plastic.

Over second layer of sectional or segmental covering there shall be applied 85% Magnesia Plastic, 1/2 in. thick. Pipe covering shall be finished with 8-oz. canvas jacket neatly applied over heavy rosin-sized sheathing paper and well sewed on—approximately three stitches to the inch.

**Fittings**—Fittings of superheated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all 85% Magnesia Plastic, to thickness not less than 2 1/2 ins. Finishing coat shall be smoothly troweled, finished with a canvas jacket to match the sectional covering.

**Flanges**—Flanges of superheated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all Plastic, to thickness of 2 ins., made up on framework of 1/2-in. mesh iron wire netting, in two sections, so as to be easily removable and replaceable. Flange covers shall be finished with a canvas jacket to match sectional covering.

Covering on pipes at flange bolts shall be cut back and neatly beveled to allow sufficient space for removal of bolts without injury to covering.

**SUPERHEATED STEAM DRIPS**—All superheated steam drips shall be covered with 85% Magnesia Sectional Covering 1 1/2-in. thick wall, securely wired in place with No. 18 annealed iron wire, followed with 1/2 in. of 85% Magnesia Plastic, and over all an 8-oz. canvas jacket sewed on over sheathing paper, in same manner as specified for superheated steam pipes.

**Fittings**—Fittings of superheated steam drips shall be covered with 85% Magnesia Plastic or 85% Magnesia Blocks and Plastic, to thickness of 2 ins., finished with a canvas jacket to match the sectional covering.

**Flanges**—Flange covers of superheated steam drips shall be solid and made of 85% Magnesia Blocks and Plastic, to thick-



ness of 2 ins., securely wired in place, and finished with a canvas jacket to match sectional covering.

**SATURATED STEAM PIPING (STEAM PRESSURES OVER 150 LBS.)**—All high pressure saturated steam piping shall be covered with double 1½-in. thick 85% Magnesia Sectional Covering, applied by broken joint method. First layer of sectional or segmental covering shall be thoroughly wired in place with No. 18 annealed iron wire. Second layer shall be applied so as to break both butt and lateral joints, and secured in place in same manner as first layer. Any cracks on surface between sections or segments shall be carefully filled with 85% Magnesia Plastic.

All drip pipes shall be covered with 1½-in. thick 85% Magnesia Sectional Covering.

Covering shall be finished with 8-oz. canvas jacket, neatly applied over heavy rosin-sized sheathing paper and well sewed on—approximately three stitches to the inch.

**Fittings**—Fittings of saturated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all 85% Magnesia Plastic, to thickness not less than 2½ ins. Finishing coat shall be smoothly troweled, finished with a canvas jacket to match the sectional covering.

**Flanges**—Flanges of saturated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all Plastic, to thickness of 2 ins., made up on framework of ½-in. mesh iron wire netting, in two sections, so as to be easily removable and replaceable.

Coverings on pipes at flange bolts shall be cut back and neatly beveled to allow sufficient space for removal of bolts without injury to covering.

**SATURATED STEAM PIPING (PRESSURES FROM 100 TO 150 LBS.)**—All high pressure saturated steam piping shall be covered with double standard thick 85% Magnesia Sectional Covering, applied and finished in same manner as described for coverings for saturated steam lines carrying pressures over 150 lbs.

Drip pipes shall be covered in same manner as described for pipes carrying steam pressures over 150 lbs.

**Fittings**—Fittings of saturated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all 85% Magnesia Plastic, to thickness not less than 2 ins. Finishing coat shall be smoothly troweled, finished with a canvas jacket to match the sectional covering.

**Flanges**—Flanges of saturated steam piping shall be covered with 85% Magnesia Blocks and Plastic, or all Plastic, to thickness of 2 ins., made up on framework of ½-in. mesh iron wire netting, in two sections, so as to be easily removable and replaceable.

Flange covers shall be finished with a canvas jacket to match the sectional covering.

Covering on pipes at flange bolts shall be cut back and neatly beveled to allow sufficient space for removal of bolts without injury to covering.

**SATURATED STEAM PIPING (STEAM PRESSURES LESS THAN 100 LBS.)**—All saturated steam piping and drip piping shall be covered with standard thick 85% Magnesia Sectional Covering, finished with canvas jacket pasted on and black japanned bands applied not over 18 ins. apart.

(Where pipe is so located that coverings may be damaged, or where particularly fine finish is desired, there should be applied over standard canvas jacket rosin-sized sheathing paper, followed by extra 8-oz. canvas jacket sewed on in manner specified under superheated steam piping.)

**Fittings**—All fittings of saturated steam piping shall be covered with 85% Magnesia Blocks or Plastic, applied to same thickness as sectional covering, well wired on and finished with canvas jacket to match the sectional covering.

**Flanges**—Flange covering for saturated steam piping shall be solid and made up of 85% Magnesia Blocks and Plastic, to same thickness as sectional covering, securely wired in place and finished with a canvas jacket to match the sectional covering.

**BOILER FEED PIPING**—All boiler feed piping shall be covered with standard thick 85% Magnesia Sectional Covering. Pipe covering, fitting covers and flange covers of boiler feed lines shall be applied in same manner as specified for saturated steam piping (steam pressures under 100 lbs.).

**EXHAUST PIPING, RETURN PIPING, DRIPS, ETC.**—Exhaust piping shall be covered with standard thick 85% Magnesia Sectional Covering, finished with canvas jacket pasted on and black japanned bands applied not over 18 ins. apart.

Large exhaust mains shall be covered with 85% Magnesia Plastic, or Blocks and Plastic, not less than 1½ ins. thick, finished with coat of hard-finish cement.

(Where exhaust piping is so located that covering may be damaged, or where particularly fine finish is desired, there should be applied, over standard canvas jacket, sheathing paper, followed by extra 8-oz. canvas jacket, sewed on in manner specified under superheated steam piping.)

**Fittings**—Fittings (including flanges) on exhaust lines and mains shall be covered with 85% Magnesia Plastic, or Blocks and Plastic, applied to same thickness as sectional covering, and finished with a canvas jacket to match the sectional covering.

**HEATING SYSTEM**—All mains, supply and return pipes of heating system, together with all branches (when not installed in tunnels), risers or radiator connections, which are not required for radiating service, shall be covered with standard thick 85% Magnesia Sectional Covering, carefully applied and finished with canvas jacket and black japanned bands applied not over 18 ins. apart.

On all heating mains in tunnels there shall be applied 85% Magnesia Covering, 1½ ins. thick, in place of standard thickness.

Where pipe is run in tunnels or exposed in finished rooms or corridors, there shall be applied sheathing paper, followed by 8-oz. canvas jacket, as specified for superheated steam piping.

**Fittings**—Fittings on these lines shall be covered with 85% Magnesia Plastic, applied to same thickness as sectional covering and finished with a canvas jacket to match the sectional covering.

**Flanges**—Flanges on all above lines shall be solid and made of 85% Magnesia Blocks and Plastic, securely wired in place and finished with a canvas jacket to match the sectional covering.

**OUTDOOR PIPING**—All pipes running outdoors or exposed to extremely low temperatures, whether steam, exhaust or heating main, shall be covered with double standard thick 85% Magnesia Covering, applied as provided under specification for saturated steam piping (steam pressures from 100 to 150 lbs.), but finished with 3-ply waterproof roofing (in place of canvas), applied with lapped joints and secured with No. 16 copper wire, spaced not over 8 ins. on centers.

**HEATERS, RECEIVERS, RETURN TANKS, TRAPS**—All above appurtenances shall be covered with 85% Magnesia Blocks and Plastic, to minimum thickness of 1½ ins., and maximum thickness dependent upon service required. (Steam pressure or water temperature should govern thickness of coverings specified, and in every case thickness of covering should correspond to thickness of pipe covering where similar conditions of heat and steam pressure are found.)

**DUCTS AND STACKS**—All hot and temperate air and cold air ducts and flues, and all exposed surfaces of fan casings, tempering coils, etc., shall be covered with 85% Magnesia Blocks, 1 in. in thickness, firmly secured with No. 18 galvanized iron wire, with all block joints pointed up with 85% Magnesia Plastic, and edges of all exposed ducts protected with a light metal formed to an "L."

All said insulation (except that concealed in walls, ceilings, etc.) shall be finished in rosin-sized paper and 8-oz. canvas jacket, well stretched and neatly sewed, not less than three stitches to the inch.

**PAINTING**—On exposed insulation, canvas jacket shall be thoroughly sized and painted two coats of standard lead and oil paint, of such colors as may be selected by supervising engineer.

### Special Note to Architects and Engineers.

Occasionally when an architect or engineer is writing his specifications, he finds that brevity is so necessary that he can not enter into fullest details. When such is the case on the subject of Non-conducting Pipe Coverings, the use of the following abridged Magnesia Association Specification will amply insure application of correct insulation:

**"NON-CONDUCTING COVERING**—All exposed boiler surfaces, all pipes, fittings, or appurtenances carrying steam, hot water or hot gases, where radiation would cause condensation or drop in temperature, or result in loss of B. T. U. which could be utilized, shall be thoroughly insulated as specified in Magnesia Association Specification for 85% Carbonate of Magnesia Non-conducting Coverings."

### Copies of Specification.

Copies of the Magnesia Association Specification, herein referred to, will be mailed to architects and engineers on request addressed to any of the members of the MAGNESIA ASSOCIATION OF AMERICA, or their branch houses.

*Should any insulating condition arise in practice not fully covered in this Specification, please send details of problem to one of the members of the MAGNESIA ASSOCIATION OF AMERICA, and it will have expert consideration and prompt reply.*

# THE CHAPMAN VALVE MANUFACTURING CO.

CABLE ADDRESS:  
"VALVE, INDIAN ORCHARD"

GENERAL OFFICE AND WORKS  
INDIAN ORCHARD, MASS.

## BRANCH OFFICES

BOSTON, MASS., 141 High Street  
CHICAGO, ILL., Conway Building

NEW YORK, N. Y., 180 Lafayette Street  
PHILADELPHIA, PA., 1011 Filbert Street

## REPRESENTATIVES

ATLANTA, GA., W. J. NEVILLE, 702 Candler Building  
SAN FRANCISCO, CAL., H. L. DICKINSON, First Street, corner Market Street

DETROIT, MICH., H. J. CLEMENS, 1323 Majestic Building  
First Street, corner Market Street

## Products.

BRONZE, IRON and STEEL GATE  
and CHECK VALVES.

Fire Hydrants and Indicator  
Posts; Sluice Gates and Operating Equipments.



## Recommendations.

Some general recommendations as to the use of Chapman valves are given below for convenience when specifying or selecting valves for various purposes:

### CHAPMAN BRONZE VALVES

Service	List Nos.
For Fire Protection Systems	1, 4, 7, 8, 20, 22, 24 and 59½
For Steam or Hot Water Heating and Ventilating	1, 4, 20, 21, 24 and 59½

## Facilities and Quality.

This company is the oldest and largest manufacturer of solid wedge gate valves in the United States. The shops are thoroughly equipped with up-to-date machines for rapidly turning out complete and accurately finished products.

Chapman valves and other products are recognized as standard for excellence of design, material and workmanship, and are not excelled in quality, finish or durability.

## List 1, Bronze Gate Valves.

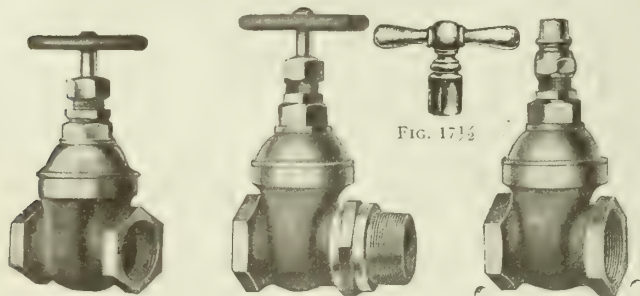


FIG. 1A. Screw End

FIG. 2A. Union End

FIG. 3A. Screw End Lock Shield

### BRONZE GATE VALVES

125 lbs. working pressure, 300 lbs. test

Size, ins.	¼	¾	1½	3¼	1	1¼	1½	2	2½	3
Fig. 1A, end to end, ins.	1¾	1¾	2	2¼	2¾	3	3½	4	4½	5
Fig. 2A, end to end, including nipple, ins.			3¾	3¾	4 1/8	4 1/8	5 1/8	5 7/8		

## List 4, Bronze Gate Valves.

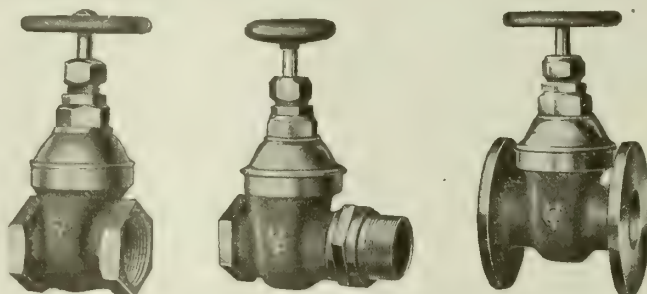


FIG. 1

FIG. 2

FIG. 3

### BRONZE GATE VALVES

¼ in. to 2½ ins., 175 lbs. working pressure, 350 lbs. test  
3 to 4 ins., 125 lbs. working pressure, 300 lbs. test

Size, ins.	¼	¾	1½	3¼	1	1¼	1½	2	2½	3	3½	4
Fig. 1, end to end, ins.	2¼	2¼	2 5/8	2¾	3¾	3 1/4	4 1/8	4¾	5 3/8	6 5/8	8 3/8	8 1/8
Fig. 3, face to face, ins.	2½	2½	2 5/8	3	3 1/8	3 1/8	4 1/8	5 1/4	5 3/4	7	8 1/4	8 7/8
Fig. 3, fig. diam., ins.	2½	2½	3	3½	4	4½	5	6	7	7½	8½	9



FIG. 6

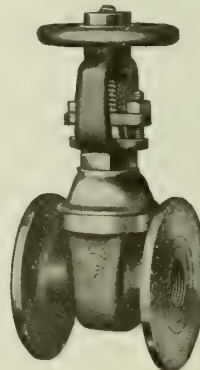


FIG. 7

### BRONZE GATE VALVES

Figs. 6 and 7, 175 lbs. working pressure, 350 lbs. test

Size, ins.	¼	¾	1½	3¼	1	1¼	1½	2	2½
Fig. 6, end to end, ins.	2¼	2¼	2 5/8	2¾	3¾	3 1/4	4 1/8	4¾	5 3/8
Fig. 7, face to face, ins.	2½	2½	2 5/8	3	3 1/8	3 1/8	4 1/8	5 1/4	5 3/4

Bronze gate valves furnished in any size desired

## List 7 and 8, Bronze Hose Gate Valves.

FIG. 18  
(List 7)

FIG. 24

FIG. 26  
(List 8)

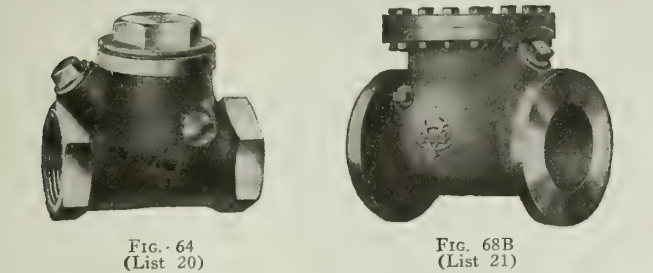
### BRONZE HOSE GATE VALVES

Fig. 18, solid bronze seats, 150 lbs. working pressure, 300 lbs. test  
Fig. 26, with babbitt seats, 175 lbs. working pressure, 350 lbs. test



List 20 and 21, Regrinding Bronze Swing Check Valves.

List 24, Iron Body Gate Valves.



REGRINDING SWING BRONZE CHECK VALVES, WITH ROTATING DISC

Fig. 64, (List 20), 150 lbs. working pressure, 350 lbs. test  
Fig. 65, Flanged end (not illustrated)  
Fig. 66B, Screw end (not illustrated)  
Fig. 67B, Screw end (not illustrated)  
Fig. 68B, (List 21), 400 lbs. working pressure, 800 lbs. test

Chapman regrinding swing check valves are straightway and have area fully equal to that of connecting pipes. All parts machined to jigs and interchangeable, facilitating repairs. Valve can be reground by removing angle plug and cap. A grinding mixture of oil and fine sand, or oil and ground glass should be applied to seat. Disc can then be revolved on seat until a perfect bearing is formed. Grinding material should then be wiped away to prevent further cutting

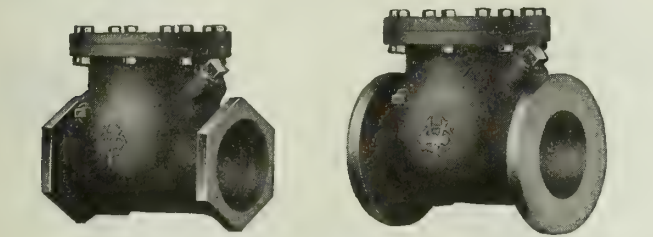
DATA, LIST 20					
Size, ins.	1/4	3/8	1/2	3/4	1
Fig. 64, end to end, ins.	2 1/8	2 1/2	2 1/2	3	3 3/8
Fig. 65, face to face, ins.					4 3/4
Fig. 65, fig. diam., ins.					4

Size, ins.	1 1/4	1 1/2	2	2 1/2	3
Fig. 64, end to end, ins.	3 7/8	4 1/4	5 1/8	6 3/4	7 1/2
Fig. 65, face to face, ins.	5 1/4	5 3/4	6 3/4	8 1/4	9
Fig. 65, fig. diam., ins.	4 1/2	5	6	7	7 1/2

DATA, LIST 21										
Fig. 66B, Size, ins.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Screw end, end to end, ins.	2 3/4	2 3/4	2 3/4	3 1/4	3 3/4	4 1/4	4 1/2	5 1/2	6 3/4	7 3/4

Size, ins.	2	2 1/2	3	3 1/2	4
Fig. 67B, screw end to end, ins.	6 1/2	9 1/2	10 1/4	11	12 3/4
Fig. 68B, flange end, face to face, ins.	8 3/4	9 1/2	10 1/2	11 1/2	12 1/2
Fig. 68B, fig. diam., ins.	6 1/2	7 1/2	8 1/4	9	10

List 22, Single Disc Check Valve.

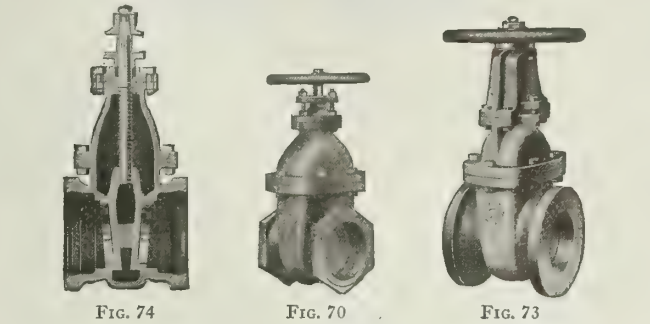


IRON BODY BRASS MOUNTED SINGLE DISC CHECK VALVES  
150 lbs. working pressure, 300 lbs. test. Similar in appearance to Fig. 68B.

Size, ins.	2	2 1/2	3	3 1/2	4	5	6	7
Fig. 69, end to end, ins.	6 1/2	9 1/2	10 1/4	11	12 7/8	13 7/8	15 1/2	17
Fig. 69A, face to face, ins.	8 3/4	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	15	16 1/2
Fig. 69A, fig. diam., ins.	6	7	7 1/2	8 1/2	9	10	11	12 1/2

Size, ins.	8	10	12	14	16	18	20	24
Fig. 69, end to end, ins.	20	21	24 1/2	28	30	33	32 1/2	38
Fig. 69A, face to face, ins.	18 3/4	21 3/4	25 1/2	28	30	33	32 1/2	38
Fig. 69A, fig. diam., ins.	13 1/2	16	19	21	23 1/2	25	27 1/2	32

This company also manufactures multiple disc valves in all regular sizes from 20 ins. to 60 ins., inclusive.



IRON BODY BRONZE MOUNTED SOLID WEDGE GATE VALVES FOR WATER

Made in sizes from 2 to 48 ins.

Fig. 71, Rising spindle, flanged end; Fig. 72, Rising Spindle, screw end—not illustrated

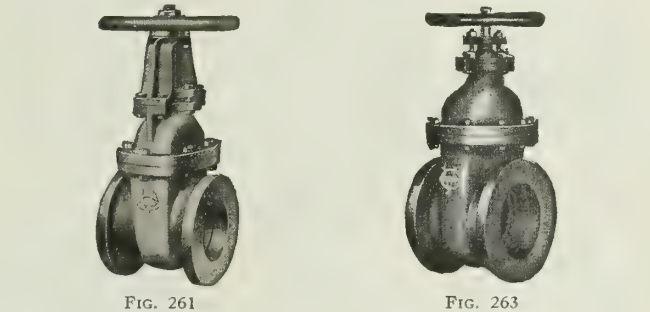
Sizes 2 to 16 ins.—150 lbs. working pressure, 300 lbs. test  
Sizes 18 to 30 ins.—100 lbs. working pressure, 250 lbs. test  
Sizes above 30 ins.—80 lbs. working pressure, 200 lbs. test

Size, ins.	2	2 1/2	3	3 1/2	4	4 1/2	5
Fig. 70, Fig. 72, end to end, ins.	5 3/4	6 3/8	6 3/8	6 7/8	7 1/2	8	8 1/2
Fig. 71, Fig. 73, face to face, ins.	5 7/8	7 7/8	8 1/2	8 3/4	9 1/4	9 1/2	9 5/8
Fig. 71, Fig. 73, fig. diam., ins.	6	7	7 1/2	8 1/2	9	9 1/4	10

Size, ins.	6	7	8	9	10	12
Fig. 70, Fig. 72, end to end, ins.	9	9 1/2	10	10 3/4	11 1/2	12 3/4
Fig. 71, Fig. 73, face to face, ins.	10 1/8	10 3/8	10 3/4	11 1/2	12 1/8	12 1/2
Fig. 71, Fig. 73, fig. diam., ins.	11	12 1/2	13 1/2	15	16	19

Size, ins.	14	15	16	18	20	22	24
Fig. 71, Fig. 73, face to face, ins.	14	15 3/4	16 3/8	18	21	22	24
Fig. 71, Fig. 73, fig. diam., ins.	21	22 1/4	23 1/2	25	27 1/2	29 1/2	32

List 59 1/2, Iron Body Double Disc Gate Valves.



IRON BODY BRONZE MOUNTED DOUBLE DISC GATE VALVES

Sizes 2 to 12 ins.—125 lbs. working pressure, 300 lbs. test  
Sizes 14 to 24 ins.—75 lbs. working pressure, 175 lbs. test  
Sizes 26 ins. and above—60 lbs. working pressure, 150 lbs. test

These valves are also made with screw ends from 2 ins. to 8 ins., inclusive, and with bell ends in all sizes shown in table

Size, ins.	2	2 1/2	3	3 1/2	4	4 1/2	5
Fig. 261, Fig. 263, face to face, ins.	7	7 1/2	8	8 1/2	9	9 1/2	10
Fig. 261, Fig. 263, fig. diam., ins.	6	7	7 1/2	8 1/2	9	9 1/4	10

Size, ins.	6	7	8	9	10	12	14	16
Fig. 261, Fig. 263, face to face, ins.	10 1/2	11	11 1/2	12	13	14	14	14 3/4
Fig. 261, Fig. 263, fig. diam., ins.	11	12 1/2	13 1/2	15	16	19	21	23 1/2

Size, ins.	18	20	22	24	30	36	42	48
Fig. 261, Fig. 263, face to face, ins.	15 1/2	17	18	18 1/2	21 1/2	24 1/2	27 1/2	30 1/2
Fig. 261, Fig. 263, fig. diam., ins.	25	27 1/2	29 1/2	32	38 3/4	46	53	59 1/2

# COMMONWEALTH BRASS CORPORATION

FORMERLY THE LAVIGNE MANUFACTURING COMPANY

## Radiator Valves

625-651 Commonwealth Avenue  
DETROIT, MICH.

### Products.

Manufacturers of a line of PACKLESS STEAM RADIATOR VALVES in many styles, including Round Wheel Handle, Graduated Dial with Lever Handle, Plain Lever Handle, Extension Handle and Lock Shield, either plain or graduated; a full line of STANDARD TYPE STEAM RADIATOR VALVES.

Quick Opening Hot Water Radiator Valves; Union Elbows; Gas Engine Trimmings; Automobile Specialties; Mechanical Oilers; and a kindred line of Brass and Aluminum Goods.

### Scope of Use, Lavigne Packless Steam Valves.

Can be used on vapor or vacuum installations, and to advantage on any low pressure steam heating systems, because the packless arrangement prevents leakage due to use of ordinary valves. The easy regulation renders them *economical* for use on central station steam plants.

Extension handle packless steam radiator valves are operated behind wood or rattan grilles, and an overhead device permits operation of valves by means of a chain pull when radiators are placed beyond easy access.

### The "Packless" Feature.

The Lavigne construction dispenses with the ordinary method of packing around stem, and substitutes therefor a permanent packing arrangement which illustrates the push and pull principle and *absolutely prevents leakage of steam, air or water*. Valve has double washers of non-deteriorating composition; is independent of metal joints, and always stays tight.

### Lavigne Graduated Packless Valve.

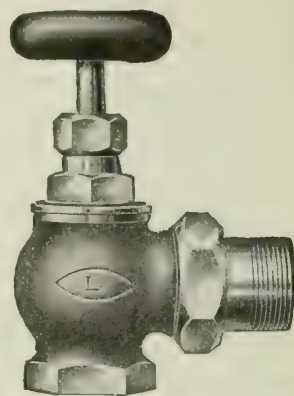
By reason of such construction, this valve opens quickly, closes quickly; and a seven-eighths turn of the handle completely opens or closes it, and locks it closed—whether handle be graduated, wood wheel, lever or extension.

Extra large handle remains cool, prevents hand from coming in contact with heated metal parts, and is fastened with one accessible screw to cast lugs (part of valve itself). Valve not injured by standing on handle, by side thrusts, etc., and is of normal dimensions and neat appearance.

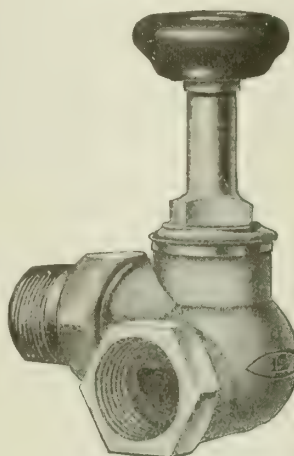
INSTALLATION—Each valve can be accurately adjusted by any steamfitter to a wide range of sizes of radiators, thus enabling jobbers and heating contractors to carry these valves in stock. Any one of 4 shells (furnished with valves), with appropriate number of upright slots, may be attached to disk holder below disk. Shell with 1 slot is used with valve when connected to a small radiator; and shells with 2, 3 or 4 slots are, respectively, employed on medium or large size radiators; radiator being heated entirely, three-fourths,

one-half or one-fourth, etc., as desired.

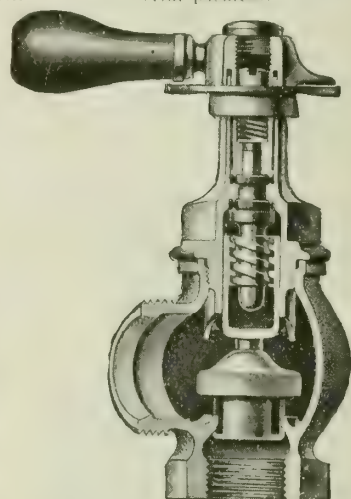
ADVANTAGES OF PACKLESS VALVES—(1) A non-leaking, permanent tight joint, (2) A quick opening and closing feature—by a seven-eighths turn; also permitting valve to remain partly open at any desired position. (3) Valve is fool-proof, all working parts being protected by valve bonnet from outside kicks, etc. (4) Comfort and economy of heat regulation are obtained.



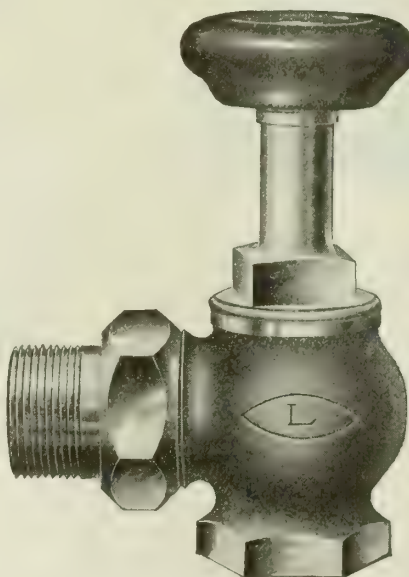
STANDARD STEAM VALVE  
(Not packless)



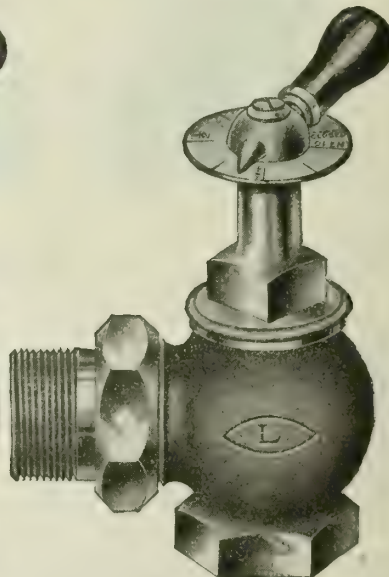
PACKLESS CORNER VALVE



SECTIONAL VIEW OF GRADUATED PACKLESS VALVE



WOOD WHEEL PACKLESS VALVE



GRADUATED PACKLESS VALVE



GORTON & LIDGERWOOD CO.

Quarter Turn Valves

96 Liberty Street

NEW YORK, N. Y.

BRANCH OFFICE: Fisher Building, CHICAGO, ILL.

Product.

GORTON QUARTER TURN RADIATOR and STRAIGHTWAY VALVES for steam, vapor, vacuum and hot water heating.

Gorton Quarter Turn Valve.

Made in both radiator and straight way patterns, for use on all systems of steam, vapor, vacuum and hot water heating. It is made of steam metal, of heavy pattern, and finely finished. Costs no more than other high grade valves which do not have the *packing lock* or *quarter turn* features.

The sectional view of valve shows that its design successfully incorporates the *packing lock* and *quarter turn* features so desirable in radiator valves.

The valve has two distinct packing features. The first is a ground ball shoulder in the stem seating on the underside of the bonnet, making an absolutely tight seat; the second is a groove in the stem located about  $\frac{1}{8}$  in. above the bottom of the packing box, in which groove a special packing ring is forced by means of a gland pushed down by the packing box nut. This combination makes the valve permanently leakless.

The inside of valve body is cone shaped, accurately bored and reamed to receive the cone shaped disk, in which there is a full size horizontal opening, so that the steam of water will pass through the valve without coming in contact with the valve seat. A quarter turn of the handle in either direction completely opens or closes the valve.

The disk is the important part of the valve. It is made of a mineral composition that is not affected by high steam temperatures, nor by hot or cold water. It will not stick or corrode, and under ordinary conditions will last as long as the valve body itself. The disk is ground to exact gage so that it will fit valve body without lapping or grinding it to the valve seat; it is therefore interchangeable.

The disk seats itself upon the inner surface of valve body, and is held in place during transportation by a bronze spring; neither grit nor dirt can come in contact with valve seat.

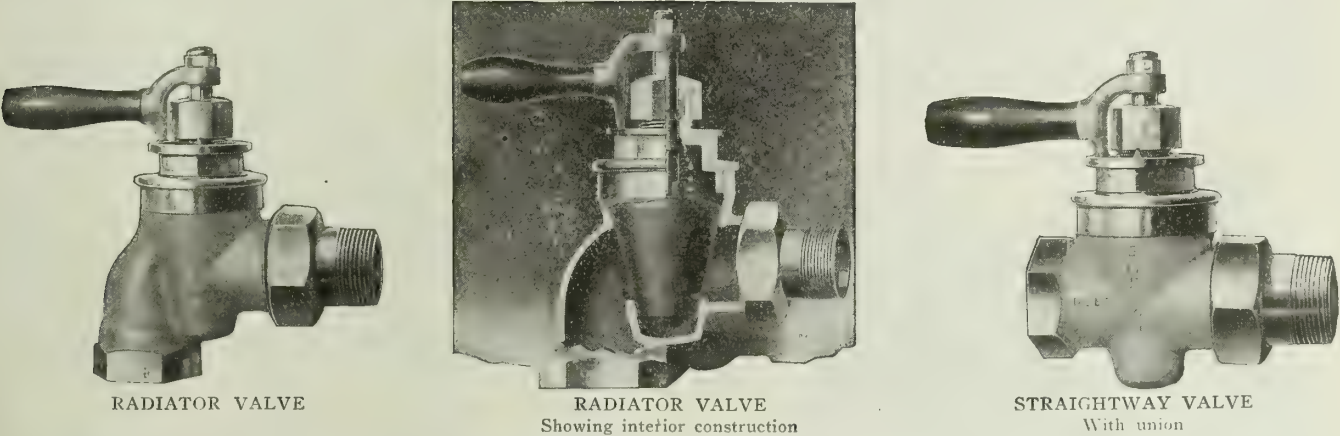
The disk and valve stem are connected by a loose joint, which makes it impossible to throw the disk out of its seat.

The ordinary radiator valve has a full pipe area, but the disk forms an obstruction which prevents the free flow of steam and water through the valve. The Gorton quarter turn valve has a full size, free, unobstructed horizontal passageway, allowing steam and water to pass through the valve without coming in contact with the seat. This feature enables one to use a size smaller valve than can be used of the ordinary radiator valve. See schedule below.

The quarter turn quick opening feature makes it easy to open and close the valve. A turn of the wrist or a touch of the foot operates the valve. It is not necessary to stoop and make repeated turns of a wheel, as with the ordinary valve. With this valve radiators are shut off when a room becomes overheated, in place of opening windows and wasting heat, as is usually done when ordinary radiator valves are used.

Specification Data.

Quarter turn radiator valve, with lever handle, rough body, nickelplated with union. Disk of valve to be cone shaped and made of a mineral composition, with full sized unobstructed horizontal opening through it, so steam or water will pass through disk and not come in contact with valve seat. Valve to be constructed so it can be fully opened or closed with one-quarter turn of the handle.



SCHEDULE OF VALVE SIZES FOR STEAM HEATING		
For 1-pipe work	For 2-pipe work	For vapor heating
Radiators up to 25 ft. .... $\frac{3}{4}$ -in. valve	Radiators up to 50 ft. .... $\frac{3}{4}$ x $\frac{1}{2}$ -in. valve	Radiators up to 75 ft. .... $\frac{1}{2}$ -in. valve
Radiators from 25 to 60 ft. .... 1 -in. valve	Radiators from 50 to 100 ft. .... 1 x $\frac{1}{2}$ -in. valve	Radiators from 75 to 150 ft. .... $\frac{3}{4}$ -in. valve
Radiators from 60 to 100 ft. .... $1\frac{1}{4}$ -in. valve	Radiators from 100 to 150 ft. .... $1\frac{1}{4}$ x $\frac{3}{4}$ -in. valve	Radiators from 150 to 300 ft. .... 1 -in. valve
Radiators from 100 to 150 ft. .... $1\frac{1}{2}$ -in. valve		

Reduction in size of pipe to be made only at elbow below valve

For hot water heating use regular size valves according to system installed.

NOTE—Gorton quarter turn steam valve can be used one size smaller than ordinary radiator valve.

FOUNDED 1855

## CRANE CO.

Valves, Fittings, Railings, Steam Specialties and Plumbing Supplies

836 South Michigan Avenue  
CHICAGO, ILL.FACTORIES:  
CHICAGO, ILL.  
BRIDGEPORT, CONN.

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BUFFALO	FARGO	MEMPHIS	OMAHA	SEATTLE	TERRE HAUTE
VANCOUVER, B. C.	WASHINGTON	WATERTOWN	WICHITA	WINNIPEG, MAN.	

## Products.

A complete line of CRANE RADIATOR VALVES; BRASS, CAST IRON, FERROSTEEL, CAST STEEL and FORGED STEEL VALVES; CAST IRON, MALLEABLE IRON, BRASS, STEEL, SCREWED and FLANGED PIPE FITTINGS; DRAINAGE FITTINGS; RAILING FITTINGS; UNIONS; PLUMBING SUPPLIES, etc.

Pipe Hangers, Steam Specialties and Complete Piping Equipment.

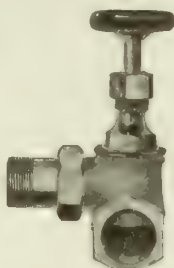
## Government Pattern Heavy Radiator Valves.

Heavier than standard pattern radiator valve and especially adapted for use in large buildings, and where a heavier type valve is necessary.

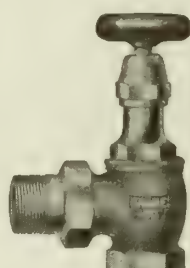
Made in rough body, plated all over, finished all over, and finished and plated all over.



No. 67G. GOVERNMENT PATTERN HEAVY RADIATOR VALVE  
Wood wheel, with union



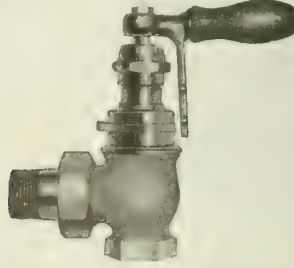
No. 147G. LEFT-HAND GOVERNMENT PATTERN HEAVY CORNER RADIATOR VALVE  
Jenkins standard disk. Wood wheel. Made right and left hand.  
Sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and 2 ins.



No. 220. STANDARD SELF-ADJUSTED PACKED STEAM OR VACUUM SYSTEM RADIATOR VALVE  
Jenkins disk; rising stem; Crane patent stop and disk spring. Rough body plated all over.  
Sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and 2 ins.



No. 222. CRANE STANDARD SELF-ADJUSTED PACKED STEAM OR VACUUM SYSTEM RADIATOR CORNER VALVE  
Jenkins disk; rising stem; Crane patent stop and disk spring. Right or left hand with union. Rough body plated all over.  
Sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and 2 ins.



No. 231. MODULATING BRASS RADIATOR VALVE  
Self-adjusting packed stuffing box. Controls steam flow to each radiator of a heating plant. Amount of steam passing through valve depends on area of opening. Seat of valve is not exposed to action of steam; is self-cleaning, insuring complete shut-off and longer life.  
Sizes,  $\frac{3}{4}$ , 1 and  $1\frac{1}{4}$  ins.

## Identification Marks.

The name is the adopted marking which distinguishes nearly all goods made by this company. Exceptions are as follows:

Brass goods, such as steam, gas and water cocks, are marked **cc**.

Standard lines of malleable and cast iron screwed fittings and forged steel screwed fittings are marked **c**.

Cast steel valves and cast steel flanged fittings are

marked **CRANE STEEL**

Cast steel screwed fittings are marked with **CRANE** or **c** on one side and on the other.

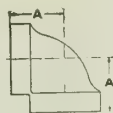
Forged steel valves have **CRANE** on the center piece and **c** on the body.

## Drainage Fittings.

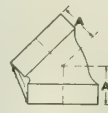
These fittings are made with a shoulder, and are the same size inside diameter as wrought pipe. The pipe screws in up to the shoulder, making a continuous passage, leaving no pockets for the solid matter to lodge in, thus preventing the choking of pipe. They are heavy and strong enough safely to withstand the strain of settling.

These fittings also are recommended for vacuum systems and should be galvanized.

MALLEABLE IRON DRAINAGE FITTINGS—Fittings are also furnished in malleable iron from regular patterns, and orders can be filled in any quantity on short notice at a special discount.



No. 1000, 90°



No. 1003, 45°



No. 1002, 60°

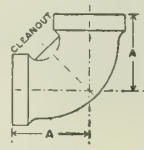
No. 1006,  $11\frac{1}{2}^\circ$ 

## CRANE CAST IRON DRAINAGE FITTING ELBOWS

Screwed for wrought pipe. 90° elbows are tapped, pitched  $\frac{1}{4}$  in. to the foot  
Sizes, from  $1\frac{1}{4}$  to 14 ins.



No. 1001, 90°



No. 1047 Without Base, with Cleanout



No. 1057, 90°

LONG TURN ELBOWS

STREET ELBOW

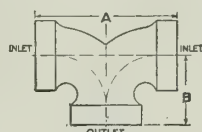




No. 1008  
90°, with Side  
Outlet



No. 1009  
90°, with Heel  
Outlet

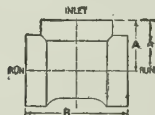


No. 1010  
3-way

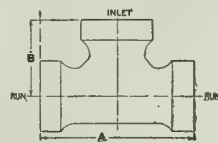
#### SPECIAL ELBOWS



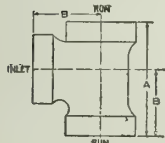
No. 1016  
CLOSET FLANGE



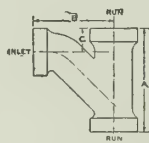
No. 1017  
TEE



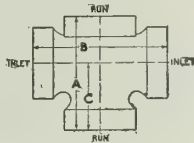
No. 1018  
BASIN TEE



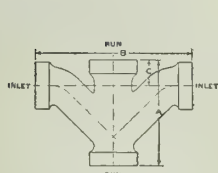
No. 1020  
90° Y-BRANCH



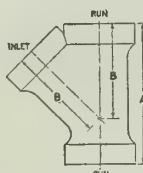
No. 1022  
90° LONG TURN  
Y-BRANCH



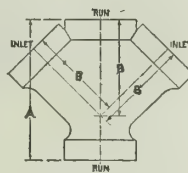
No. 1024. TEE  
PATTERN DOUBLE  
REDUCING 90°  
Y-BRANCH



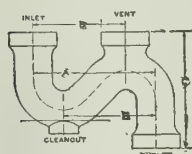
No. 1026. TEE  
PATTERN DOUBLE  
90° LONG TURN  
Y-BRANCH



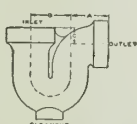
No. 1028. 45°  
Y-BRANCH



No. 1030. 45°  
CAST IRON  
DOUBLE  
Y-BRANCH



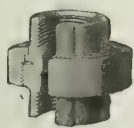
No. 1036. S TRAPS



No. 1059. "P" TRAP

#### Unions and Union Fittings.

This line is unusually complete and selections can be readily made for any requirement. The "brass to iron" seat unions and fittings are positively leakproof and can be taken apart easily. They have been examined and tested by the Underwriters' Laboratories and listed by the Consulting Engineers of the National Board of Fire Underwriters.

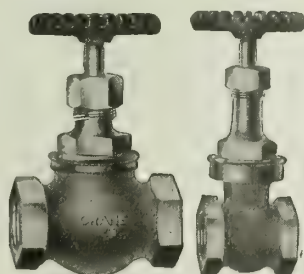


CRANE UNION

#### Standard Crane Valves.

These valves are well proportioned, of good weight and sufficiently strong to stand more than their designated steam working pressures. They are thoroughly tested under steam pressures before leaving the factory.

The construction of Crane standard valves is such that they may be packed when open without steam escaping.



No. 12. BRASS  
GLOBE VALVE  
No. 440. STD  
BRASS GATE  
VALVE

#### Crane Flush Joint Railing Fittings.

Used principally for schools and public buildings and are made with an extension, or connector, over which pipe is tightly driven up to the face of the fitting, forming a flush smooth joint.

A large variety of patterns enables the CRANE Co. to furnish railing fittings that will cover all requirements and specifications.

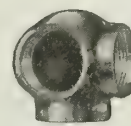


FLUSH JOINT RAILING  
FITTING

Furnished in any angle  
between 27½° and 47½°



No. 1 Brass



No. 2 Brass



No. 3 Brass

#### BALL PATTERN BRASS RAILING FITTINGS

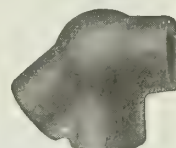
Pipe sizes, ½, ¾, 1, 1¼, 1½ and 2 ins.



No. 61



No. 62



No. 63

#### FLUSH JOINT MALLEABLE IRON RAILING FITTINGS

Pipe sizes, 1, 1¼, 1½ and 2 ins.



#### PLAIN PATTERN MALLEABLE IRON RAILING FITTINGS

Pipe sizes, ¾, 1, 1¼, 1½, 2, 2½ and 3 ins.

This company also makes a complete line of adjustable railing fittings.

#### Everything for Any Pipe Line.

Inquiries may be forwarded to CRANE Co. for any material that may be used for any purpose on any pipe line. In most instances information is available at any branch house, and the engineering department is at the disposal of architects and engineers for consultation and advice.

#### Crane Plumbing Fixtures.

A complete line of plumbing and bathroom fixtures of the highest quality is manufactured or handled by this company and is carried in stock at all of its branch offices.

It is an advantage to be able to buy direct from the nearest branch office and is very much appreciated by the trade.



CRANE PLUMBING FIXTURES

# JENKINS BROS.

Manufacturers of Valves

80 White Street NEW YORK, N. Y.    524 Atlantic Avenue BOSTON, MASS.    133 North 7th Street PHILADELPHIA, PA.    300 West Lake Street CHICAGO, ILL.

JENKINS BROS., LIMITED: CANADIAN WORKS AND HEAD OFFICE, MONTREAL, QUE., 103 St. Remi Street

JENKINS BROS., LIMITED: LONDON OFFICE, 95 Queen Victoria Street, E. C.

JENKINS RUBBER CO.: WORKS AND HEAD OFFICE, ELIZABETH, N. J.

## Products.

JENKINS BROS. VALVES: GLOBE, ANGLE, CROSS, CHECK, HOSE, BLOW-OFF and SAFETY VALVES; RADIATOR VALVES, in a variety of types; AIR VALVES; FRACTIONAL and VACUUM VALVES, for heating systems; EXTRA HEAVY VALVES, specially designed for high pressures and severe conditions, in Globe, Angle, Cross, Check, Blow-off, Automatic Equalizing Stop and Check, and other patterns; GATE VALVES, in Standard, Medium and Extra Heavy patterns. VALVES in Brass, Iron Body and Cast Steel, for all pressures and purposes.

Back Pressure or Exhaust Valves; Steam Traps; Water Gages, Gage Cocks and Injectors; Mechanical Rubber Goods: Jenkins '96 and Jenarco Sheet Packing and Gaskets, Gasket Tubing, Pump Valves, Jenkins Composition Valve Discs, and the like.



are unusually heavy and durable. Finished valves take a rich bronze color when polished, making them particularly desirable for the finer grades of work.

Regularly furnished with black hard-wood wheels; or, if desired, with brass, wire or iron wheels. Lock shield valves, to be operated with key (as Figs. 170 and

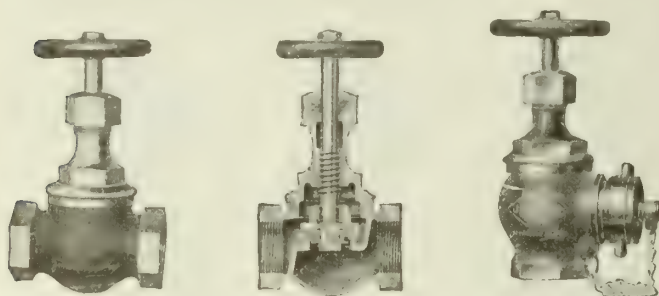


FIG. 106  
Globe, Screwed

FIG. 105  
Sectional View

FIG. 114  
Angle, Hose End

BRASS VALVES, STANDARD PATTERN

## Brass and Iron Body Valves, Standard Pattern.

Jenkins Bros. valves, standard pattern, all have the feature of renewable disc and disc-holder as shown in the sectional cut (Fig. 105). The renewable disc, first introduced by JENKINS BROS. many years ago, assures absolute tightness. The flexibility of the Jenkins disc secures perfect seat contact and is a most important improvement in valve construction. For steam use, the discs are made of hard composition, which becomes pliable under the action of steam; for water, gas and air service, somewhat softer compounds are furnished.

If grit or scale lodges on the seat it does not seriously injure the valve body, but it becomes embedded in the composition disc, thus saving the valve seat. Discs worn out in service can be replaced easily and quickly at very little expense. A new disc makes practically a new valve. All other parts are standardized and perfectly interchangeable. The valves seldom wear out completely.

## Radiator Valves.

Jenkins Bros. globe and angle radiator valves are of the same pattern and construction as the standard pattern valves, previously described. These are carefully made of a superior grade of metal, and

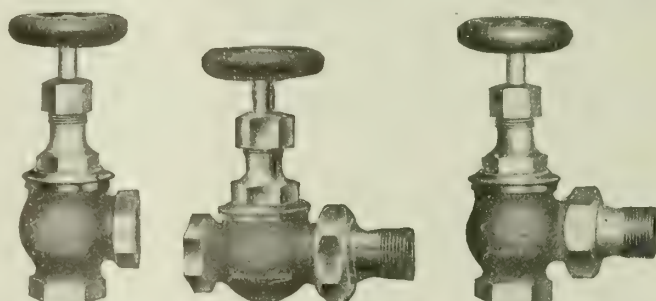


FIG. 166  
W. W. Angle,  
Screwed

FIG. 167  
W. W. Globe, with  
Union

FIG. 168  
W. W. Angle, with  
Union

RADIATOR VALVES

171), designed to circumvent annoyance of tampering, can be supplied in all the different patterns. Corner valves are made in two patterns—regular and offset. Offset globe and corner valves (Figs. 173A and 180) have the inlet at the lowest point, to avoid trapping of water and hammering on first admission of steam.

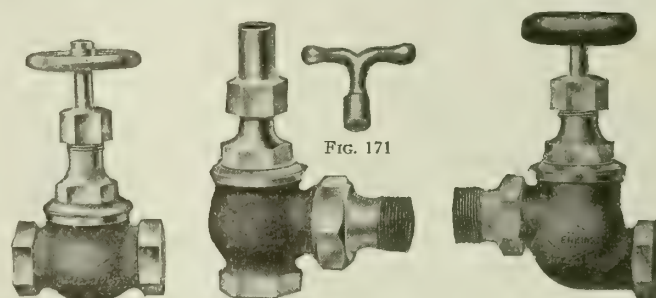


FIG. 310  
Brass Wheel Globe

FIG. 170  
Lock Shield Angle  
RADIATOR VALVES

FIG. 173A  
Offset Globe

For hot water heating, valves may be had, without extra charge, with a small hole drilled through diaphragm to permit slight circulation of water through radiator. When specified for hot water heating systems using forced circulation, valves are specially fitted for the service.

Regular styles of finish follow:

Rough body, finished trimmings, No. 1 screwed, No. 6 with union  
Finished and polished all over, No. 2 screwed, No. 7 with union  
Rough body, nickelplated trimmings, No. 3 screwed, No. 8 with union  
Rough body, nickelplated all over, No. 4 screwed, No. 9 with union  
Finished and nickelplated all over, No. 5 screwed, No. 10 with union



Jenkins improved automatic air valves (Figs. 190 to 193) are used to automatically remove air from radiators and heating coils, all finished and nickelplated.

Regular sizes,  $\frac{1}{8}$  and  $\frac{1}{4}$  in.; also,  $\frac{3}{8}$ -in. size for long runs or large stacks, and the Jenkins Diamond traps, sizes  $\frac{1}{2}$  and  $\frac{3}{4}$  in.

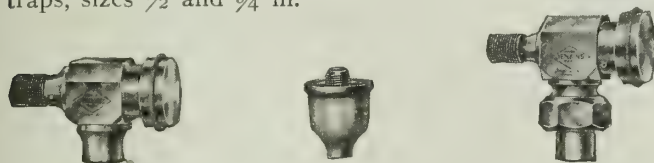
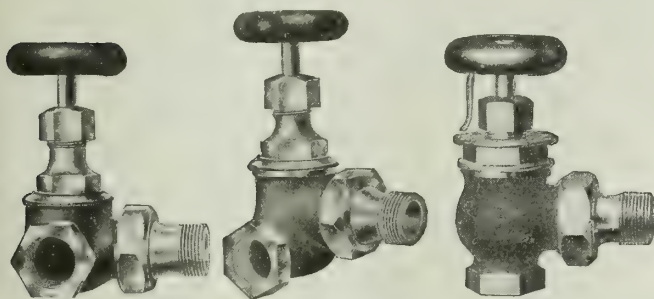


FIG. 190

FIG. 191

FIG. 193

IMPROVED AUTOMATIC AIR VALVES

FIG. 176  
Regular CornerFIG. 180  
Offset CornerFIG. 300  
Fractional

RADIATOR VALVES

Recent developments in the manufacture of valves for steam heating apparatus have enabled us to place upon the market a line of devices suitable for all classes of steam circulation in connection with atmospheric, vacuum return line and vapor systems. This includes differential and automatic impulse check valves, also the Jenkins Bros. fractional radiator valves (as Fig. 300). The fractional valve has dial indicator, and opens wide in five-sixths of a turn. The opening is correctly graduated and partial heating of the radiator is easily controlled.

### Extra Heavy Valves.

Jenkins Bros. extra heavy valves are a distinct line, especially designed for use under high pressure and severe conditions. These are of representative Jenkins Bros.' quality. They are carefully designed, well proportioned and handsomely finished.

The brass globe, angle, cross, check and Y valves are made either screwed or flanged. They are guaranteed for working steam pressures up to 300 lbs., or hydraulic and air pressures up to 800 lbs.

The iron body valves are made in globe, angle, cross, check, automatic equalizing stop and check, and Y patterns, either screwed or flanged. The larger sizes can be supplied with by-passes, which are cast integral with the body.

The bodies, yokes and disc holders are made of high grade cast iron; the spindles, renewable seat rings and discs, of durable steam metal composition. Flanges have raised faces inside of bolt holes; and are made in accordance with the new American Extra Heavy Standard, unless otherwise specified.

Before leaving the factory they are carefully tested under 800 lbs. hydraulic pressure, and guaranteed for working steam pressures up to 250 lbs.

Jenkins Bros. automatic equalizing stop and check valves are especially adapted to preventing boiler room accidents and to equalize the pressure between the dif-

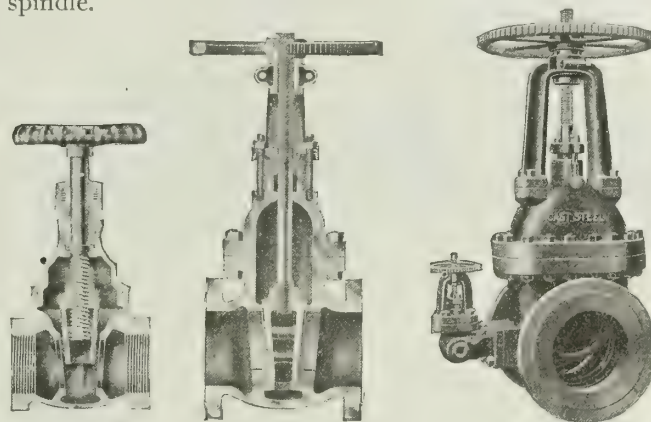
ferent boilers in a battery. This type is made in extra heavy globe or angle patterns, with iron or cast steel bodies.

### Gate Valves.

Jenkins Bros. gate valves are made in brass or iron body in three patterns: Standard, for 125 lbs. working steam pressure or 175 lbs. water; medium, for 175 lbs. steam or 250 lbs. water; extra heavy for 250 lbs. steam or 400 water.

They are of the solid wedge, double face type. One of the important features of these valves is the improved globe shaped body. This new design is used because it secures the greatest possible strength, good proportion, and neat appearance.

They are made with inside screw, stationary spindle; or, with outside screw and yoke, traveling spindle.

FIG. 270  
Brass Gate,  
with Inside ScrewFIG. 245  
Extra Heavy Iron  
Body Gate, with Out-  
side Screw and Yoke  
GATE VALVESFIG. 389  
Cast Steel Gate, Out-  
side Screw and Yoke,  
with By-pass

### Cast Steel Valves.

Jenkins Bros. cast steel valves are made in globe, angle, gate, check, and automatic equalizing stop and check patterns. They are well adapted to the severe conditions incident to high pressure superheated steam service.

The valves are suitable for working steam pressures up to 350 lbs., and 360° superheat, making a total temperature of 800° Fahr.

### Quality and Guarantee.

Behind the Diamond trade-mark on all *genuine* Jenkins Bros. valves stands the famous guarantee which has been adequately maintained for a period of 53 years:

"If you will put a *genuine* Jenkins Bros. valve on the worst place you can find, where you cannot keep other valves tight, and if it is not perfectly tight, or does not hold steam, acids, water or other fluids longer than any other valve, you may return it and your money will be refunded."

### Specification.

"All valves to be Jenkins Bros." For convenience, and to avoid possible mistakes, it is suggested that figure numbers also be specified.

### Catalogue.

A catalogue of all the Jenkins Bros. products, giving sizes, styles and list prices, mailed on request.

# THE KENNEDY VALVE MFG. CO.

GENERAL OFFICES AND WORKS

ELMIRA, N. Y.

BRANCH OFFICES AND WAREHOUSES

NEW YORK, 81 John Street—Telephone, John 1430

AGENCIES

BOSTON

PHILADELPHIA

CHICAGO

SAN FRANCISCO

NEW ORLEANS

## Products.

VALVES, for Power Heating, Fire Protection, Water Supply, Plumbing, etc., in Bronze and Iron Body, and in Gate, Globe, Angle, Check and Radiator types.

FIRE HYDRANTS.

## Guarantee.

All Kennedy goods are thoroughly tested before leaving the works. Should any defects develop in proper use of goods in the service for which they are manufactured and sold, such goods will be replaced.

### "Standard" Bronze Gate Valves—Solid Wedge Gate Valves.

Solid wedge disks are used in sizes up to 3 ins., and double disk parallel seats  $3\frac{1}{2}$  ins. and larger. Stem is stationary.

Sizes  $\frac{1}{4}$  to 3 ins. are for working pressures up to 150 lbs. water, or 125 lbs. steam;  $3\frac{1}{2}$  ins. to 6 ins. for working pressures up to 125 lbs. water, or 100 lbs. steam, and made with bolted bonnet. With or without gland in stuffing box.



FIG. 27  
"STANDARD"  
BRONZE  
GATE VALVE,  
SCREWED

"STANDARD" BRONZE GATE VALVES (SCREWED), FIG. 27

Size, ins. ....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
End to end....	2	2	2	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$4\frac{3}{8}$	$4\frac{11}{16}$	$5\frac{3}{4}$
Center to top of wheel....	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{8}$	$5\frac{1}{8}$	$5\frac{1}{4}$	$6\frac{3}{8}$	$7\frac{1}{8}$	9	$10\frac{1}{8}$	$11\frac{1}{2}$

"STANDARD" BRONZE GATE VALVES (FLANGED)

Size, ins. ....	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Face to face fld....	$4\frac{3}{4}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	7	8	9
Diam. flgs.....	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11

### Medium and Extra Heavy Bronze Gate Valves.

Made with iron wheel, solid wedge disk and stationary stem. Gland followers in stuffing box.

Fig. 37, medium pressure for 250 lbs. water; 200 lbs. steam.

Fig. 40, for working pressures up to 300 lbs. water, or up to 250 lbs. extra heavy working steam pressures.

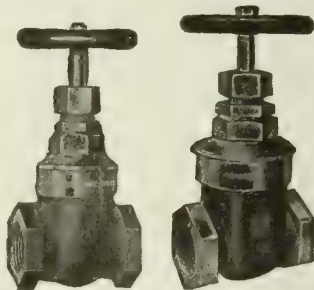


FIG. 37 FIG. 40  
MEDIUM AND EXTRA HEAVY  
BRONZE GATE VALVES

MEDIUM PRESSURE BRONZE GATE VALVE, FIG. 37

Size, ins. ....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
End to end.....	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{1}{8}$	4	$4\frac{3}{8}$	$5\frac{1}{8}$
Center to top of wheel....	$4\frac{1}{16}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$6\frac{3}{8}$	$7\frac{3}{8}$	$8\frac{1}{2}$	$10\frac{3}{8}$	$12\frac{1}{2}$

EXTRA HEAVY BRONZE SCREWED GATE VALVE, FIG. 40

Size, ins. ....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
End to end.....	$2\frac{5}{8}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{7}{8}$	$4\frac{3}{8}$	$5\frac{3}{8}$	$6\frac{1}{8}$	$6\frac{3}{4}$	$6\frac{3}{4}$
Center of opening to top of stem.....	5	6	7	$7\frac{7}{8}$	$8\frac{3}{4}$	$10\frac{1}{2}$	$12\frac{3}{4}$	14	

### Iron Body Gate Valves.

These are bronze mounted, or all-iron with steel stems and are equipped with double disks. Valves for lighter pressures than the "Standard" line are tested to 30 lbs.; and if heavier construction is needed, the bodies are reinforced with heavy ribs.

Furnished with flanges of any practicable diameter and drilling.

Stems on inside screw valves are of manganese bronze of at least 50,000 lbs. tensile strength. On outside rising stem and yoke valves they are of steel, unless otherwise specified.

Dimensions of low pressure and standard valves on application.



FIG. 48  
LOW PRESSURE  
IRON BODY  
GATE VALVE

Outside rising stem and yoke. 30 lbs. test pressure



FIG. 57  
Screwed  
"STANDARD" IRON BODY,  
BRONZE MOUNTED GATE VALVES

With double disks, parallel seats, inside stationary stem of bronze of 50,000 lbs. tensile strength



FIG. 58  
Flanged

WORKING PRESSURES IN POUNDS PER SQUARE INCH, FOR "STANDARD" IRON BODY, BRONZE MOUNTED GATE VALVES

Sizes	Figs. 57 and 58		Fig. 59
	Water	Steam	Water
8 ins. and smaller.....	150	125	125
9, 10 and 12 ins.....	125	100	125
14 ins. and larger.....	100	...	100
Ribbed, 14 ins. and larger.....	150	...	150

Size, ins.,  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24 (geared), 30, 36 (42 and 48 with by-pass).



“National Standard” (“Underwriters’ Approved”) Iron Body, Bronze Mounted Gate Valves.

Double disks with parallel seats. Outside rising stem and yoke. This form of stem makes a positive indicator as to whether valve is partly or wholly open or closed.

Sizes 8 ins. and smaller for working pressures up to 150 lbs. water, or 125 lbs. steam. Sizes 9 ins. and larger for working pressures up to 125 lbs. water, or 100 lbs. steam.

Sizes, 2½, 3, 3½, 4, 5, 6, 7, 8, 10, 12 and 14 ins.

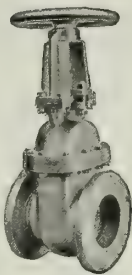


FIG. 68  
“NATIONAL  
STANDARD”  
IRON BODY,  
BRONZE  
MOUNTED  
GATE  
VALVE

“Medium Heavy” Iron Body, Bronze Mounted Gate Valves.

With double disks and taper seats. Heavier than standard valves and designed for higher pressures, being suitable for working steam pressures up to 175 lbs. Stems of all sizes of Fig. 74 and 5 ins. and smaller of Fig. 75 made of bronze of at least 50,000 lbs. tensile strength; and of steel, 6 ins. and larger of Fig. 75, although they can be furnished of bronze at a reasonable extra price.

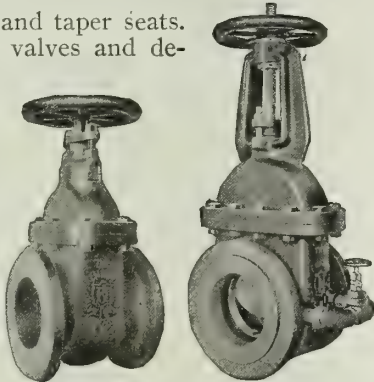


FIG. 74  
“MEDIUM HEAVY”  
IRON BODY, BRONZE MOUNTED  
GATE VALVES

FIG. 75  
“MEDIUM HEAVY”  
IRON BODY, BRONZE MOUNTED  
GATE VALVES

Attention is called to the selfpacking feature, both in the inside screw and outside screw and yoke styles. Sizes, 2½, 3, 3½, 4, 4½, 5, 6, 7, 8, 10 and 12 ins.

Kennedy Renewable Disk, Heavy Bronze Globe Valves (Figs. 91 and 92).

Iron wheel. For working pressures up to 175 lbs. water, or 150 lbs. steam. Made in globe (Fig. 91) and angle (Fig. 92) types. Sizes, ¼, ⅜, ½, ¾, 1, 1½, 2, 2½ and 3 ins. Specify if to be used for cold water, air or other services requiring special soft disks.

Kennedy Renewable Disk, Heavy Bronze Radiator Valves (Fig. 95).

Wood wheel. For working pressures up to 175 lbs. water, or 150 lbs. steam, with hexagonal packing recess in stuffing box. Made in right hand and left hand corner types also, with male unions.

Sizes, ¼, ⅜, ½, ¾, 1, 1¼, 1½ and 2 ins.

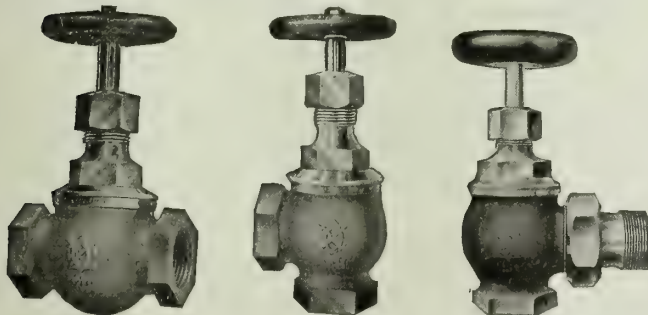


FIG. 91. Globe. FIG. 92. Angle FIG. 95. Radiator  
KENNEDY RENEWABLE DISK, HEAVY BRONZE VALVES

Kennedy Heavy Iron Body, Bronze Mounted Renewable Disk Globe and Angle Valves.

For working pressures up to 150 lbs. water, or 125 lbs. steam. Made in globe and angle types. Sizes, 2, 2½, 3, 3½, 4, 4½, 5, 6, 7, 8 and 10 ins. Screwed and flanged.

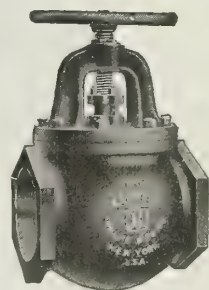


FIG. 100. Screwed  
KENNEDY HEAVY  
IRON BODY,  
BRONZE MOUNTED  
RENEWABLE DISK  
GLOBE VALVE

Swing Check Valves.

Fig. 103. A heavy bronze valve for 125 lbs. steam or 150 lbs. water pressure. Screwed ends: sizes, ⅜, ½, ¾, 1, 1¼, 1½, 2, 2½ and 3 ins. Flange and bell ends: sizes 2½ to 12 ins.

Figs. 105 and 106. Iron body, bronze mounted valves for 100 lbs. steam, or 150 lbs. water pressure. Sizes, 2½, 3, 3½, 4, 4½, 5, 6, 7, 8, 10 and 12 ins.

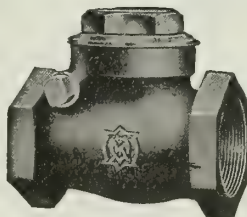


FIG. 103. Screwed  
BRONZE SWING  
CHECK VALVE



FIG. 105. Screwed  
IRON BODY, BRONZE MOUNTED  
SWING CHECK VALVES

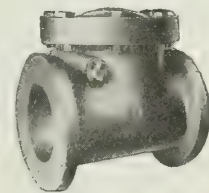
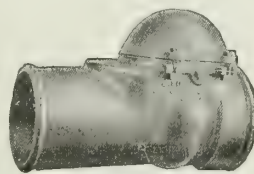


FIG. 106. Flanged  
IRON BODY, BRONZE MOUNTED  
SWING CHECK VALVES

Pennie Back Water Valve.

A perfect seal against back water, gas and vermin. Absolutely perfect in operation and will operate in any position. Will stand smoke and other tests in every case and fit either standard or extra heavy soil pipe. Disk, seats, axle pivots, screws, cover bolts and nuts are made of non-corrosive brass. Used by street railways and gas companies to keep manholes dry.

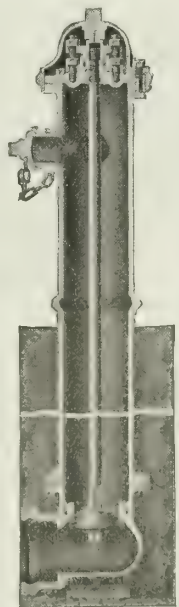
Sizes, 2, 3, 4, 5, 6, 8, 10 and 12 ins.



PENNIE BACK WATER  
VALVE

“New Type” Fire Hydrants.

These hydrants are of the compression type. They are constructed so that, in closing, the inlet valve operates in the same direction as the pressure from the main, and thus, when closed, this pressure aids the action of the stem in keeping the valve tight. In case of accident of any kind to the upper part of hydrant, such as breakage of standpipe by collision of passing vehicles, etc., resulting in the relaxing of the tension of the stem on the valve, the pressure from the main will retain the valve in its closed position, thus preventing inconvenience or damage from loss of water, flooded streets or cellars, etc. No special mechanism is required to accomplish this, as in the case of some other types.



“NEW TYPE”  
COMPRESSION  
FIRE HYDRANT

DATA, SIZES AND DIMENSIONS

Size of hydrant, ins. ....	4	5	6
Diam. inlet valve, ins. ....	4¼	5¼	6¼
Diam. of standpipe, ins. ....	6	7	8¼
Ground line to center of nozzle (a), ins. ....	17	18	18
Center of nozzle to top of hydrant (b), ins. ....	12½	13¾	15
Ground line to top of hydrant (c), ins. ....	29½	31¾	33



# PRATT & CADY COMPANY, INCORPORATED

Manufacturers of Valves, Cocks, Steam Traps, and Hydrants

HARTFORD, CONN.

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CHICAGO, ILL., 604-606 West Lake Street

PITTSBURGH, PA., 321 Third Avenue  
DETROIT, MICH., 85 Jefferson Avenue  
NEW YORK, N. Y., 259 Canal Street

## SELLING AGENTS

BALTIMORE, MD., McARDLE & COONEY, 8 East Lombard Street  
CLEVELAND, OHIO, THE TOMLINSON STEAM SPECIALTY CO.,  
Wade Building  
HOUSTON, TEX., J. A. BYNUM, First National Bank Building  
MILWAUKEE, WIS., THE ROBERT ROM CO., 1023 St. Paul Avenue

PHILADELPHIA, PA., McARDLE & COONEY, 519 Arch Street  
ROCHESTER, N. Y., W. R. HANCOCK, 98 Pierrepont Street  
SAN FRANCISCO, CAL., PAINE & Co., 549 Howard Street  
ST. LOUIS, MO., J. R. BROCKMAN MFG. CO., 617 North Second Street

LONDON, ENGL., EDW. LE BAS & Co.

## CANADIAN AGENTS

MONTREAL, TORONTO, ST. JOHN, WINNIPEG, THE CANADIAN FAIRBANKS-MORSE CO., LTD.

## Products.

BRONZE RENEWABLE DISC VALVES and RENEWABLE SEAT GATE VALVES; BRONZE SWING CHECK VALVES for steam and hydraulic service; IRON ASBESTOS PACKED COCKS, GROOVE PACKED and BUSHING PATTERNS; "PRATT" RETURN STEAM TRAPS.

Cast Steel Gate and Globe Valves; Fire Hydrants; Indicator Posts; Floor Stands; Valve Boxes.

## Bronze Renewable Disc Valves.

Equipped with asbestos, bronze, or special metal discs that are quickly removable and replaceable.



FIG. 1. Globe Valve, Screwed, Asbestos Disc



FIG. 8. Angle, with Union for Radiator

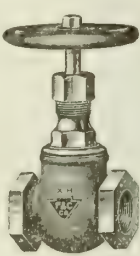


FIG. 31. Extra Heavy Globe Screwed, Brass Disc

### BRONZE GLOBE AND ANGLE RENEWABLE DISC VALVES

FIG. 1. ASBESTOS DISC, GLOBE, SCRD. FIG. 3. ASBESTOS DISC, ANGLE, SCRD.  
FIG. 2. ASBESTOS DISC, GLOBE, FLGD. FIG. 4. ASBESTOS DISC, ANGLE, FLGD.

For 150 lbs. working steam pressure

Size, ins.	1 1/8	1 1/4	3/4	1 1/2	2	2 1/2	3
End to end, globe, scrd.	1 1/2	1 1/4	2	2 1/8	3 1/8	4 1/8	5 1/8
Face to face, globe, flgd.	1 1/8	1 1/4	2	2 1/8	3 1/8	4 1/8	5 1/8
Center to end, angle, scrd.	1 1/8	1 1/4	1 1/2	1 3/4	2 1/4	2 3/4	3 1/4
Center to face, angle, flgd.	1 1/8	1 1/4	1 1/2	1 3/4	2 1/4	2 3/4	3 1/4
Diam. of flanges	1 1/8	1 1/4	3/4	1 1/2	2	2 1/2	3

FIG. 5. ASBESTOS DISC, RADIATOR GLOBE, NO UNION. FIG. 7. ASBESTOS DISC, UNION, RADIATOR GLOBE.  
FIG. 6. ASBESTOS DISC, RADIATOR ANGLE, NO UNION. FIG. 8. ASBESTOS DISC, UNION, RADIATOR ANGLE.

Size, ins.	1 1/2	3/4	1	1 1/4	1 1/2	2
End to end, globe, no union	2 1/8	3 1/8	3 1/4	4 1/4	4 1/8	5 1/8
Center to end, angle, no union	1 1/8	1 1/4	1 1/2	1 3/4	2 1/4	2 3/4
End to end, globe, inc. union nipple	4 1/8	4 7/8	5 1/8	6 1/4	6 7/8	8 1/8
Center to inlet, angle	1 3/8	1 1/4	1 1/2	1 3/4	2 1/4	2 3/4
Center to end of union nipple	2 5/8	2 1/4	3 1/4	3 1/8	4 1/8	4 3/4

FIG. 31. EXTRA HEAVY GLOBE, FIG. 33. EXTRA HEAVY ANGLE, SCRD., BRONZE DISC. FIG. 32. EXTRA HEAVY GLOBE, FIG. 34. EXTRA HEAVY ANGLE, FLGD., BRONZE DISC.

For 250 lbs. working steam pressure

Size, ins.	1 1/4	3/4	1 1/2	2	2 1/2	3
End to end, globe, scrd.	3 1/4	3 1/4	3 1/2	4 1/8	4 5/8	5 1/8
Face to face, globe, flgd.	3 1/4	3 1/4	3 1/2	4 1/8	4 5/8	5 1/8
Center to end, angle, scrd.	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8
Center to face, angle, flgd.	1 5/8	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8
Diam. of flanges	1 1/4	3/4	1 1/2	2	2 1/2	3

Made also in iron body, in sizes from 2 to 12 ins. for all steam pressures.

## Bronze, Renewable Seat Gate Valves.

In these valves the seats are separate rings, made of asbestos, bronze or special metal. These seat rings are held in the body of the valve by retaining rings that screw into the body.

This construction makes it simple to renew the seat rings, when they become worn or scored, *without having to remove the valve from the pipe line.*



FIG. 101. Screwed 150 lbs. pressure

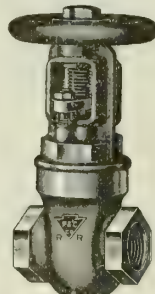


FIG. 114. Screwed Rising Spindle 150 lbs. pressure



FIG. 118. Extra Heavy Screwed 250 lbs. pressure

### BRONZE GATE VALVES, WITH RENEWABLE SEAT RINGS

FIG. 101. INSIDE SCREW, SCRD. FIG. 114. RISING SPINDLE, SCRD.  
FIG. 102. INSIDE SCREW, FLGD. FIG. 115. RISING SPINDLE, FLGD.

Made in sizes 1/4 to 6 ins.

Made in sizes 1/2 to 2 ins.

FIG. 112. QUICK OPENING WITH SLIDING STEM, AND LEVER, SCRD.  
FIG. 113. QUICK OPENING WITH SLIDING STEM, AND LEVER, FLGD.

Made in sizes 3/8 to 3 ins.

All for 150 lbs. working steam pressure

Size, ins.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
End to end, scrd.	2 1/2	2 3/8	2 1/2	2 7/8	3 1/8	3 3/4	4 1/8	4 7/8	5 3/4	6 1/4	6 3/4	7 1/4
Face to face, flgd.	2 1/2	2 3/8	2 1/2	2 7/8	3 1/8	3 3/4	4 1/8	4 7/8	5 3/4	6 1/4	6 3/4	7 1/4
Diam. of flanges	3	3 1/8	3 1/4	3 3/4	4 1/8	4 1/2	4 5/8	5 3/8	6 1/8	6 3/4	7 1/8	8 1/8

FIG. 118. EXTRA HEAVY INSIDE SCREW, SCRD. FIG. 118A. EXTRA HEAVY RISING SPINDLE, SCRD.  
FIG. 119. EXTRA HEAVY INSIDE SCREW, FLGD. FIG. 118B. EXTRA HEAVY RISING SPINDLE, FLGD.

Made in sizes 1/2 to 3 ins.

Made in sizes 1/2 to 2 ins.

All for 250 lbs. working steam pressure

Size, ins.	1 1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
End to end, scrd.	2 5/8	3	3 1/4	4	4 5/8	5 1/4	6	6 1/2
Face to face, flgd.	2 5/8	3	3 1/4	4	4 5/8	5 1/4	6	6 1/2
Diam. of flanges	4 1/2	4 1/2	4 1/2	5	5 1/2	6 1/2	7 1/2	8 1/4

FIG. 120. HYDRAULIC, INSIDE SCREW, SCRD. FIG. 121. HYDRAULIC, INSIDE SCREW, FLGD.

For 800 lbs. working water pressure

Size, ins.	1 1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
End to end, scrd.	3 5/8	3 3/4	4 1/2	5	5 1/2	6	6 1/2	6 1/2
Face to face, flgd.	3 5/8	3 3/4	4 1/2	5	5 1/2	6	6 1/2	6 1/2
Diam. of flanges	3 1/2	3 1/2	4 1/2	5	5 1/2	6 1/2	7 1/2	7 1/2

Made also in iron body, in sizes from 2 to 24 ins. for all pressures.



Bronze Swing Check Valves with Renewable, Rotating Bronze Discs and Regrindable Seats.

A valve of this type is easily reground. By removing the cap and inserting a screwdriver blade into the slot in the disc head, the disc may be rotated on the seat until the damaged surface of the latter is restored to perfect shape.

Should the disc become badly worn, it is the work of an instant to substitute a new one by unscrewing the side plugs and removing the interior parts.

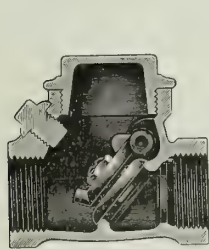


FIG. 201. Horizontal or Vertical Pattern, Screwed 150 lbs. pressure

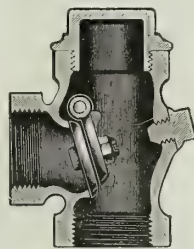


FIG. 203. Angle Pattern, Screwed 150 lbs. pressure

BRONZE SWING CHECK VALVES

FIG. 201. HORIZONTAL OR VERTICAL PATTERN, SCRD. FIG. 203. ANGLE PATTERN, SCRD.  
FIG. 202. HORIZONTAL OR VERTICAL PATTERN, FLGD. FIG. 204. ANGLE PATTERN, FLGD.  
For 150 lbs. working steam pressure

Size, ins.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
End to end } horizontal or } scrd.....	2 1/8	2 1/2	2 3/4	2 7/8	3 3/8	3 1/2	4 1/4	5 1/8	6 7/8	7 1/2
Face to face } vertical pattern } flgd.....				5	5 5/8	6 1/2	6 5/8	8 1/4	9 1/4	
Center to end } angle } scrd.....		1 1/2	1 3/4	1 5/8	1 7/8	2 1/8	2 3/8	3 3/8	3 5/8	3 3/4
Center to face } pattern } flgd.....		2	2 1/4	2 1/2	2 3/4	3	3 3/8	4 1/4	4 1/2	
Diam. of flanges.....	3	3 1/2	4	4 1/2	5	6	7	7 1/2		

FIG. 205. HORIZONTAL OR VERTICAL PATTERN, SCRD. WITH ROTATING ASBESTOS RING DISC  
For 150 lbs. working steam pressure

Size, ins.....	1/2	3/4	1	1 1/4	1 1/2	2
End to end.....	2 7/8	3 1/4	3 3/4	4 1/4	4 7/8	5 1/2

FIG. 212. EXTRA HEAVY HORIZONTAL OR VERTICAL PATTERN, SCRD.  
For 250 lbs. working steam pressure

Size, ins.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
End to end.....	2 5/8	2 3/4	2 7/8	3 1/8	3 3/8	4	4 3/8	5 3/8	6 5/8	7 3/4

FIG. 217. HYDRAULIC, HORIZONTAL OR VERTICAL PATTERN, SCRD.  
For 800 lbs. working water pressure

Size, ins.....	1/2	3/4	1	1 1/4	1 1/2	2
End to end.....	4	4 3/4	5 1/2	6	6 3/4	7 1/4

FIG. 213. EXTRA HEAVY HORIZONTAL OR VERTICAL PATTERN, SCRD. FIG. 215. EXTRA HEAVY ANGLE PATTERN, SCRD.  
FIG. 214. EXTRA HEAVY HORIZONTAL OR VERTICAL PATTERN, FLGD. FIG. 216. EXTRA HEAVY ANGLE PATTERN, FLGD.  
These four styles have bolted caps  
For 250 lbs. working steam pressure

Size, ins.....	2 1/2	3	3 1/2	4
End to end, scrd.....	7 3/8	8	9 3/4	10
Face to face, flgd.....	9 1/2	10 1/4	12	12 1/2
Center to end, scrd.....	3 3/4	4	4 7/8	5
Center to face, flgd.....	4 1/8	4	4 3/4	5 1/4
Diam. of flanges.....	7 1/2	8 1/4	9	10

Iron Asbestos Packed Cocks, Bushing Pattern.

In this style of asbestos packed cock, the body is packed with a moulded asbestos bushing, and an asbestos ring rests on top of this to form the top packing. Because of this construction, the plug comes in contact only with asbestos, the elasticity of which compensates the different expansion of body and plug.

These cocks are recommended where pressures do not exceed 100 lbs.

Iron Asbestos Packed Cocks, Groove Packed Pattern.

Instead of having a removable asbestos bushing, cocks of this design are packed with loose asbestos in U-shaped grooves in the body. This packing is done by hand, and afterwards the entire cock is subjected to a special vulcanizing process. This vulcanizing process makes the cock more serviceable and better able to withstand higher pressure and temperature. These cocks give unexcelled service as blow-off valves on boilers where no other type of valve has given satisfaction.

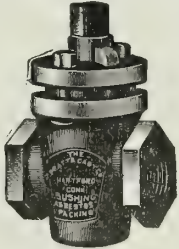


FIG. 247. Screwed 125 lbs. pressure

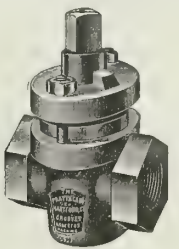


FIG. 255. Screwed 250 lbs. pressure

IRON ASBESTOS PACKED COCKS

FIG. 247. STRAIGHTWAY, SCRD. FIG. 249. STRAIGHTWAY, FLGD.  
For 125 lbs. working steam pressure

Size, ins.....	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
End to end.....	2 5/8	2 3/4	2 7/8	3	3 3/4	4	4 5/8	5 1/8	6	7	8 1/8	8 3/4	9 1/2	11 1/2	14 3/4

FLANGED

Size, ins.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
Face to face.....	5 1/2	5 3/4	5 7/8	7 1/8	8 1/4	9 1/4	10 1/4	11 1/2	13 3/4	16
Diam. of flanges.....	4	4 1/2	5	6	7	7 1/2	8 1/2	9	10	11

FIG. 251. HEAVY, STRAIGHTWAY, SCRD. FIG. 253. HEAVY, STRAIGHTWAY, FLGD.  
For 150 lbs. working steam pressure

Size, ins.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
End to end.....	3 1/4	3 3/4	3 3/4	4 1/8	4 3/4	5 3/8	5 7/8	6 7/8	7 3/4	10	10 1/2	13 3/8

FLANGED

Size, ins.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Face to face.....	5 1/8	5 5/8	6 1/4	7 1/8	8 3/4	10 1/8	11 1/4	12 1/4
Diam. of flanges.....	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10

FIG. 255. EXTRA HEAVY STRAIGHTWAY, SCRD. FIG. 257. EXTRA HEAVY STRAIGHTWAY, FLGD.  
For 250 lbs. working steam pressure

Size, ins.....	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
End to end.....	3 3/4	4 1/8	4 3/4	5 3/8	5 7/8	6 7/8	8 3/8	10 7/8	12	15

FLANGED

Size, ins.....	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Face to face.....	5 1/8	5 5/8	6 3/4	8	10	11 1/2	12 3/4	15
Diam. of flanges.....	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10

"Pratt" Return Steam Traps.

For use on boilers carrying steam pressures up to 175 lbs.

This trap will automatically return water of condensation from the receiver of a steam heating system, steam separator or any such source, from which water of condensation is obtained, and deliver it into boiler or boilers at the highest attainable temperature.

In using the return steam trap, there is no outlet for steam used in heat, etc., except into the boiler from which it comes, therefore, there can be no loss of heat, except by radiation.

These traps have been in use 38 years, during which time a great quantity of them has been sold and all have given perfect satisfaction.

N. F. HARRIS, PRESIDENT

J. W. ALGEO, SEC. and TREAS.

H. V. HARRIS, GEN. MGR. and ASST. TREAS.

**ARTESIAN WELL AND SUPPLY CO.**

NEW YORK OFFICE  
103 Park Avenue  
Telephone, Murray Hill 4730

PROVIDENCE, R. I.  
TELEPHONE, EAST PROVIDENCE 198

BOSTON OFFICE  
170 Summer Street  
Telephone, Main 1255

**Products and Services.**

ARTESIAN WELL DRILLING and INSTALLATION OF WATER WORKS.

TEST BORINGS for Foundations; PROSPECTING for Minerals; DRIVING PIPE or DRILLING HOLES for Elevator Shafts.

**Facilities and Territory.**

The men engaged in these drilling and boring operations and installations of water works, etc., are thoroughly experienced in the work, practical and competent.

The equipment in these lines is complete, to meet all conditions and requirements; especially for drilling wells in rock, and for drilling or washing in pipe through clay and sand to beds of water bearing gravel. Wells will be dug any depth up to 5,000 ft.

The territory of the operations of this company includes New England, the Middle Atlantic and Southern States and Cuba.

**Artesian Wells.**

The earth being a natural filter, artesian water is usually of splendid quality. It is a constant, unfailing supply. A deep well will meet all requirements, for water drawn from the never failing water strata, and where the surface water is properly cased off, is free from impurities and at the most healthful temperature (40° to 60° Fahr.) for drinking purposes. It has been filtered and purified and made ready for man's use by Nature's best process.

The ARTESIAN WELL AND SUPPLY Co. has, during many years, drilled and driven artesian wells as a source of water supply for cities, towns, manufacturing plants of all kinds, such as tanneries, bleacheries, knitting mills, fabric mills, rubber plants, paper plants; for hotels, hospitals, sanatoriums and other public institutions; for country and suburban residences; for breweries, food packing plants and chemical works; also, for supplying water generally for domestic use, for spraying and sprinkling, for greenhouses and for fire protection.

**Water Supply Systems.**

The company is prepared also to furnish and install pneumatic water supply systems, and will gladly lend assistance in solving any difficulties, and prepare specifications on equipments best suited to fulfill the requirements.

**Estimates and Further Information.**

Estimates for all kinds of artesian well operations will be furnished.

Write for further information, general prices, etc.

Any desired assistance will be given by correspondence or personal care of the representative.

**Partial List of References.****INDUSTRIAL PLANTS**

American Optical Company	Southbridge, Mass.
Cliquot Club Ginger Ale Company	Millis, Mass.
Cluett-Peabody Company	Troy, N. Y.
Comstock & Company	Providence, R. I.
Crompton & Knowles Loom Works	Providence, R. I.
Diamond Match Company	Oswego, N. Y.
Fisk Rubber Company	Chicopee Falls, Mass.
Lowney Chocolate Company	Mansfield, Mass.
New Departure Manufacturing Co.	Bristol, Conn.
New Haven Clock Company	New Haven, Conn.
Nicholson File Company	Providence, R. I.
Revere Rubber Company	Providence, R. I.
L. S. Starrett Company	Athol, Mass.
Underwood Typewriter Company	Hartford, Conn.
Anheuser-Busch Agency	164th Street, New York, N. Y.
James Everard Breweries	New York, N. Y.
Enterprise Brewing Company	Fall River, Mass.
Fenway Breweries	Boston, Mass.
Frank Jones Brewing Company	Portsmouth, N. H.
Narragansett Brewing Company	Providence, R. I.
Sheffield Farms-Slawson Decker Co.	524 West 57th Street, New York, N. Y.

**RESIDENCES**

Alfred G. Vanderbilt	Newport, R. I.
Rupert Hughes	Bedford Hills, N. Y.
Blanche Bates	Ossining, N. Y.
J. Stuart Blackton	Oyster Bay, L. I., N. Y.
William DuPont	Orange, Va.
Howard C. Brokaw	Nanuet, N. Y.
C. D. Huyler	Greenwich, Conn.
Otto H. Kahn	Woodbury, L. I., N. Y.
Robert Gair	Westhampton, L. I., N. Y.
Arthur Curtis James	Newport, R. I.

**RAILROADS**

Maine Central R. R. Co.	Brunswick, Me.
New York, New Haven & Hartford R. R. Co.	Providence, R. I.

**HOSPITALS**

Foxborough State Hospital	Foxborough, Mass.
Jewish Agricultural and Industrial Aid Society	Kings Park, L. I.
Monson State Hospital	Palmer, Mass.
Norwich State Hospital for Insane	Norwich, Conn.
Otilie Orphan Asylum	Jamaica, N. Y.
State Colony for Insane	Gardner, Mass.
Worcester Hospital for Insane	Worcester, Mass.

**SCHOOLS AND COLLEGES**

Harvard Medical School	Brookline, Mass.
New Hampshire College	Durham, N. H.

**Y. M. C. A. BUILDINGS**

Brooklyn, N. Y.	Newport, R. I.
Gloucester, Mass.	Providence, R. I.
New Britain, Conn.	

**UNITED STATES GOVERNMENT**

Fort Adams	Newport, R. I.
Fort Ethan Allen	Burlington, Vt.
Fort McKinley	Fort McKinley, Me.
Fort Terry	New London, Conn.
Navy Yard	Portsmouth, N. H.
Aviation Fields	

**TOWN AND CITY SUPPLIES**

Adams, Mass.	Fernandina, Fla.
Bloomington, N. Y.	Great Barrington, Mass.
Darien, Ga.	Jamestown, N. Y.
Dover, N. H.	Newburyport, Mass.
Eastman, Ga.	Orange, Va.
Essex Junction, Vt.	Warrenton, Va.
Reading, Mass.	Hudson Falls, N. Y.

**CUBA**

Hormiguero Central Corporation	Hormiguero, Cuba
Soledad Sugar Co.	Cienfuegos, Cuba



# W. E. CALDWELL CO., INC.

## Manufacturers of Tanks and Tank Towers

2290 Brook Street  
LOUISVILLE, KY.

### Products.

WOOD, STEEL and GALVANIZED IRON TANKS; TUBULAR, ANGLE, or CHANNEL COLUMN and WOOD TOWERS.

Tank Agitators; Water Supply Systems; Friction Clutch Pulleys, Gearing and General Power Transmission Machinery.

### Cypress Tanks.

This company specializes in cypress, as it is the best wood for tanks for most purposes. It has great durability with minimum shrinking and swelling, and gives no taste or coloring.

For some acids, yellow pine is recommended. Poplar, white pine, cedar and fir are also used.

Made round, elliptical and rectangular.



CYPRESS TANK

#### SPECIFICATIONS—Lumber

—Thoroughly dry Louisiana red gulf cypress without loose or unsound knots, splits, shake, peck, worm holes or other defects. All heart on inside, sound sap on outside only, and not to exceed one-half the thickness.

**Thickness**—2 ins. for 10,000 gals. and smaller; 2½ ins. up to 20,000 gals.; 3 ins. for larger sizes. The finished thicknesses are 1¾, 2¼ and 2¾ ins. respectively.

**Standard Inside Diameter**—Every 6 ins. from 3 ft. to 9 ft.; every foot to 16 ft., and every 2 ft. above 16 ft.

**Standard Inside Depth**—1 ft. 5 ins.; 2 ft.; 2 ft. 5 ins.; 3 ft.; 3 ft. 5 ins.; 4 ft.; 4 ft. 5 ins.; 5 ft. 5 ins.; 6 ft. 5 ins.; 7 ft. 5 ins.; 9 ft. 5 ins.; 11 ft. 5 ins.; 13 ft. 5 ins.; 15 ft. 4 ins.; 17 ft. 4 ins.; 19 ft. 4 ins.; 21 ft. 4 ins.; 23 ft. 4 ins.

**Finish**—Staves dressed both sides, and edges machine jointed to proper level. Bottom dressed on top side only. Machine jointed straight and square, and well dowelled.

**Hoops**—Round hoops of wrought iron (not steel), with malleable iron draw lugs; sizes and spacing to give a safety factor of 4 to 1.

### DIMENSIONS AND CAPACITIES OF STANDARD TOWER TANKS

Class towers	Capacity, gals.	Standard wood tanks		Standard steel or galvanized tanks	
		Diameter ft. ins.	Depth ft. ins.	Diameter ft. ins.	Depth ft. ins.
O tubular.....	1,000	6 6	4 5	6 0	5 0
or CC angle.....	1,500	6 6	6 5	6 6	6 6
A tubular.....	2,800	8 0	7 5		
or FF angle.....	3,000	8 0	8 5	8 0	8 0
B tubular.....	5,000	10 0	9 5		
or HH angle.....	6,000	10 0	11 5	10 0	10 0
C tubular.....	10,000	12 6	11 5	12 0	12 0
or JJ angle.....	12,000	12 6	13 5		
D tubular.....	15,000	14 0	13 5	14 0	14 0
or KK angle or LD latticed.	17,000	14 0	15 5		
E tubular.....	20,000	16 0	13 5	16 0	14 0
or LL angle or LE latticed.	22,000	16 0	15 5		
ES tubular or LES latticed.	25,000	16 0	17 4	16 0	18 0
F tubular.....	30,000	18 0	15 4	18 0	16 0
or LF latticed.....	33,000	18 0	17 4		
FS tubular or LFS latticed.	35,000	18 0	19 4	18 0	20 0
G tubular.....	36,000	19 6	17 4		
or LG latticed.....	40,000	19 6	19 4	20 0	18 0
LH latticed.....	50,000	22 0	17 4	22 0	18 0
	55,000	22 0	19 4	22 0	20 0

Hemispherical bottom steel tanks and towers are regularly made in capacities from 10,000 gals. up. Any of the above towers can be made to suit special conditions.

THE TANK WITH  
A REPUTATION  
**Caldwell**  
TANKS  
AND  
TOWERS  
TRADE-MARK

### Tank Covers.

Standard wood covers are supported by trusses and rafters and are covered with 1-in. sheathing and rubberoid roofing.

Flat wood covers are also furnished for frost protection when specified.

### Steel Tanks.

Thin galvanized tanks are recommended only in the small sizes, and for temporary use. Heavy steel tanks are made in diameter and depths of 11 ft. Standard thicknesses are: ⅝ in. up to and including 10 ft.; ¾ in. up to 16 ft.; ⅞ in. up to 24 ft.; and 1 in. and 5/16 in. above 24 ft. All seams thoroughly riveted.

### Foundations.

Foundations for tanks are very important. Poor foundations are very often the cause of leakage. Plans for foundations on the ground for any standard size will be furnished, which will give full strength with greatest economy. Tank foundations on buildings require skill and care in designing, as the load is great and concentrated. Designs of, and prices on, foundations for special conditions will be submitted on receipt of a sketch with full dimensions.



TANK AND FOUNDATION, COLONIAL HOTEL, YORK, PA.

### Tank Towers.

Standard steel towers are of the following types: tubular column and angle column for flat bottom wood and steel tanks; latticed channel column for wood and hemispherical bottom steel tanks.

**STANDARD HEIGHTS—Tubular**—Every 12 ft. from 15 ft. to 100 ft.

**Angle**—Every 10 ft. from 12 ft. up.

**Latticed**—Every 5 ft. from 20 ft. up.

Erected anywhere.

### Standard Specifications.

Standard specifications for steel tanks and towers furnished on application.

### References.

Ernest W. Bowditch, Boston, Mass.  
Ernest Flagg, New York, N. Y.  
D. H. Burnham & Co., Chicago, Ill.  
J. G. White & Co., New York, N. Y.  
Muhlenburg Bros., Reading, Pa.  
Brennecke & Fay, St. Louis, Mo.  
Heyl & Patterson, Pittsburgh, Pa.  
Westinghouse, Church, Kerr & Co., New York, N. Y.  
Selden-Breck Construction Co., St. Louis, Mo.  
Stone & Webster, Boston, Mass.



150,000-GAL. TANK,  
205 FT. TOWER  
STUDEBAKER BROS.  
MFG. CO.  
SOUTH BEND, IND.

# CHATTANOOGA BOILER & TANK CO.

Manufacturers of Steel Tanks and Towers

CHATTANOOGA, TENN.

## Products.

Specialists in STEEL TANKS and TOWERS, of all types for any service, including TANKS for Storage of Water, Oil, or any Liquid or Substance; STANDPIPES for the same service; STEEL and IRON SMOKESTACKS.

Pressure and Gravity Tanks; Tanks for Elevator Pits; Structural Steel for Buildings including Steel Girders and Columns, Roof Trusses, Lintels, Anchors and Fire Escapes; Steel Flues; Smoke Breechings; Coal Bins and Chutes; Bins for any storage; Boilers.

## Advantages of Steel Tanks.

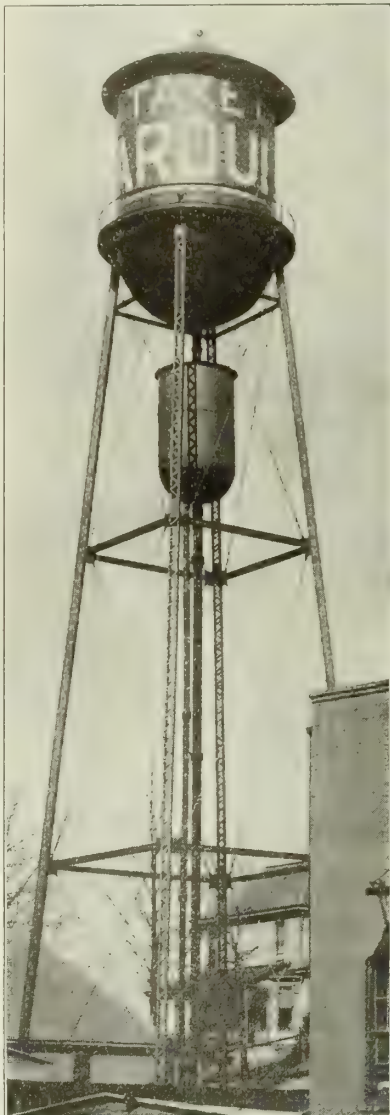
Steel tanks are superior to wooden tanks in that they will last for an indefinite period if kept thoroughly painted inside and out, whereas it is usually necessary to replace a wooden tank in about 15 years.

Steel tanks remain tight when properly erected and cared for, whereas a wooden tank will shrink and leak if water gets low.

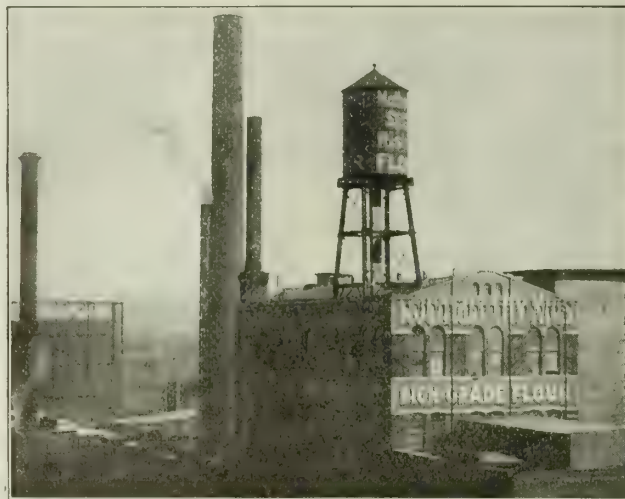
Steel tanks are not likely to burst suddenly (if designed with proper factor of safety), even if painting is neglected, for experience shows that a few spots will first rust through showing weak condition by small leaks, whereas a wooden tank (the strength of which depends chiefly on the hoops, on which a slight amount of rust has a weakening effect), if neglected, may burst its hoops suddenly, causing serious damage.

## Data Required for Quotations.

The following information should be given when making inquiries for estimates: Drawings should accompany inquiries.



STEEL TOWER AND TANK ERECTED FOR CHATTANOOGA MEDICINE CO., CHATTANOOGA, TENN.



STEEL TANK AND SMOKESTACK ERECTED FOR MOUNTAIN CITY MILLS, CHATTANOOGA, TENN.

STEEL TANKS—(1) Capacity in gallons; (2) diameter; (3) city or district where tank is to be built, and if to be built according to Underwriters' Specifications; (4) kind of service tank is intended for; (5) whether top is to be open or closed; (6) whether tank is to be erected on ground, concrete foundation or steel tower; (7) height of tower to be given from top of foundation to lowest point of the bottom of the tank; (8) number and size of openings, fittings, etc.

STANDPIPES—(1) Capacity in gallons; (2) diameter; (3) height; (4) sizes of inlets, outlets, etc.; (5) description of roof and indicator.

## Specifications.

This company will make any of its products in accordance with special specifications, or its standard specifications will be submitted.

## Facilities and Prices.

The company's facilities enable it to promptly serve any section of the country. Prices will be quoted on requirements being made known.

## Co-operative Services.

The engineering department of this company will furnish data to suit any special proposition or service under consideration.



STANDPIPE ERECTED FOR CRYSTAL SPRINGS BLEACHERY, CHICKAMAUGA, GA.



CHICAGO BRIDGE & IRON WORKS

Designers, Manufacturers and Constructors of Elevated Steel Water Tanks, Storage Tanks, Self-supporting Steel Stacks

OFFICES

CHICAGO, ILL., 1318 West 105th Street  
NEW YORK, N. Y., 3135 Hudson Terminal Building  
DALLAS, TEX., 1622 Pretorian Building  
JACKSONVILLE, FLA., 805 Florida Life Building  
DETROIT, MICH., 326 Ford Building  
CHARLOTTE, N. C., 501 Realty Building

GREENVILLE, PA., 122 Pine Street  
LOS ANGELES, CAL., 309 Union Oil Building  
SAN FRANCISCO, CAL., 753 Monadnock Building  
SEATTLE, WASH., L. C. Smith Building  
SALT LAKE CITY, UTAH, 1026 Kearns Building  
BRIDGEBURG, ONT., CAN., 127 Janet Street

EASTERN PLANT  
GREENVILLE, PA. (Pittsburgh District)

CENTRAL PLANT  
CHICAGO, ILL.

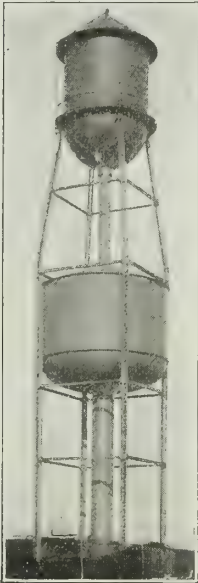
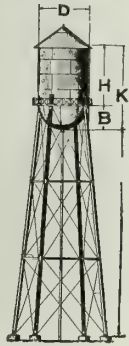
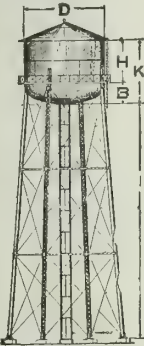
CANADIAN PLANT  
BRIDGEBURG, ONT., CAN.

Products.

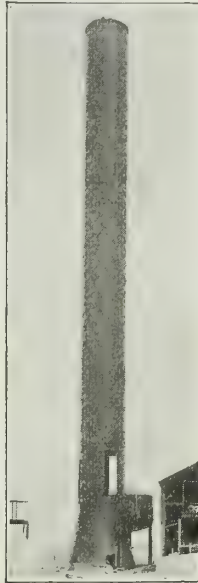
ELEVATED STEEL WATER TANKS, STORAGE TANKS. Standpipes, Steel Railway Tanks, Self-supporting Steel Stacks, Acid Tanks, Paper and Sugar Plantation Equipment, Coaling Stations and all classes of Heavy Plate Metal Work.

DATA, ELLIPTICAL AND HEMISPHERICAL TANKS

Capacity, thousand gallons	Elliptical bottom, feet and inches			Hemispherical bottom, feet and inches		
	D	H	K	D	H	K
5	10-0	7-0	9-6	8-0	12-0	16-0
10	13-0	8-0	11-3	10-0	14-0	19-0
15	15-0	9-0	12-9	12-0	14-0	20-0
20	16-0	11-0	15-0	12-9	17-3	23-7
25	17-6	11-0	15-4	14-1	17-3	24-3
30	18-6	12-0	16-7	15-3	17-3	24-10
35	19-0	13-4	18-1	16-4	17-3	25-5
40	20-0	13-9	18-9	17-4	17-3	25-11
45	22-0	12-4	17-10	18-3	17-3	26-4
50	22-0	14-0	19-6	19-0	17-6	27-0
60	24-0	14-0	20-0	19-0	22-3	31-9
65	24-0	15-6	21-6	20-0	21-3	31-3
70	25-0	15-0	21-3	21-0	20-3	30-9
75	25-0	15-0	21-6	22-0	19-4	30-4
80	25-0	16-0	22-6	22-0	21-1	32-1
90	23-8	14-0	21-2	22-0	24-6	35-6
100	28-8	16-0	23-2	22-0	28-0	39-0
120	32-0	14-8	22-8	24-0	28-0	40-0
125	32-0	15-6	23-6	24-0	29-0	41-0
150	34-0	16-6	25-0	26-0	29-3	42-3
175	36-0	17-6	26-6	26-0	35-0	48-0
200	38-0	17-6	27-0	28-0	35-0	49-0
250	40-0	20-0	30-0	30-0	37-0	52-0
300	41-0	23-9	34-0	32-0	40-0	56-0
400	47-0	23-0	34-9	35-0	44-0	61-6
500	51-0	24-3	37-0	38-0	46-6	65-6



TANK OF PROCTER & GAMBLE, HAMILTON, ONT.  
Capacities, 50,000 and 100,000 gals.  
Heights, 100 and 50 ft. to bottom



LARGEST STEEL STACK, UNITED VERDE COPPER CO., JEROME, ARIZ.  
Diameter, 31 ft.; height, 400 ft.

Dimensions of our Standard Tanks:  
Elliptical. Depth of bottom  $B = \frac{D}{4}$   
Square of base  $= .71D + .118(T + B)$   
Hemispherical. Depth of bottom  $B = \frac{D}{2}$   
Square of base  $= .71D + .162(T + B)$

Information Required in Making Quotations on Elevated Water Tanks.

- (1) Capacity of tank required in gallons.
- (2) Height of tower, which should be given to the lowest point of bottom of tank above top of foundations.
- (3) If tank is used for sprinkler service, state whether Stock Company or Mutual.
- (4) Which, if any, of the following accessories manufacturer is to furnish: Riser pipe, frost casing, overflow, indicator, pressure gage tank heater, heater house, foot elbow, gate valve, float valve. None of these accessories are included in quotations except when expressly so stated.

STANDARD SIZES CYLINDRICAL VERTICAL STORAGE TANKS

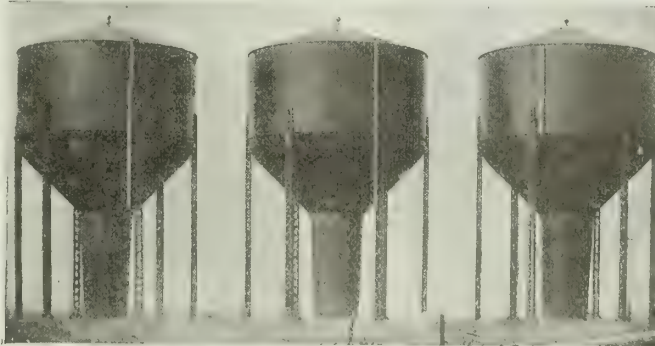
Capacity, gals.	Diam.	Height	Capacity, gals.	Diam.	Height	Capacity, gals.	Diam.	Height
10,000	12' 0"	11' 10"	75,000	27' 3"	17' 6"	225,000	36' 6"	29' 0"
15,000	15' 0"	11' 10"	85,000	28' 8"	17' 6"	250,000	38' 6"	29' 0"
20,000	17' 0"	11' 10"	100,000	27' 3"	23' 3"	300,000	42' 0"	29' 0"
25,000	19' 0"	11' 10"	120,000	30' 0"	23' 3"	400,000	49' 0"	29' 0"
30,000	21' 0"	11' 10"	125,000	30' 6"	23' 3"	500,000	54' 3"	29' 0"
40,000	20' 0"	17' 6"	150,000	30' 0"	29' 0"	600,000	60' 0"	29' 0"
50,000	22' 3"	17' 6"	175,000	32' 0"	29' 0"	750,000	66' 3"	29' 0"
60,000	24' 6"	17' 6"	200,000	34' 6"	29' 0"	1,000,000	77' 0"	29' 0"

Catalogue.

Catalogue No. 50 mailed on request.



TWO MOLASSES TANKS, GREAT WESTERN SUGAR CO., GERING, NEBR.  
Diameter, 35 ft.; height, 23 ft.



THREE 150,000-GAL. CONICAL BOTTOM TANKS, CHICAGO & NORTH WESTERN RY., CHICAGO TERMINAL

# THE WALSH & WEIDNER BOILER CO.

CHATTANOOGA, TENN.

## Products.

STORAGE TANKS, STEEL BUILDINGS and STRUCTURAL MATERIAL; STEEL CASINGS for BOILERS; SUGAR CRYSTALLIZERS.

Horizontal Return Tubular Boilers, Horizontal Water Tube Boilers; Vertical Water Tube Boilers, Internal Furnace Boilers, Locomotive Type Portable Boilers, Brine Tanks, House Tanks, Elevator Tanks, Sugarhouse Tanks, Railway Supply Tanks, Air Receivers, Pressure Tanks, Steel Riveted Pipe, Feed Water Heaters, Plate and Sheet Iron Work.

## Facilities.

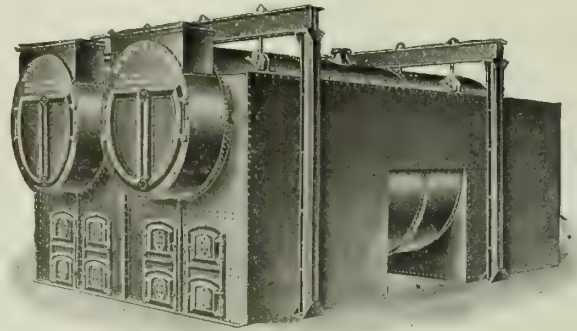
The plant is located in the heart of the Southern iron and steel territory where material can be purchased to advantage, where the best of skilled mechanics are available and where favorable freight rates prevail.

We have one of the largest shops in the country for doing all classes of boiler and plate iron work, and are in a position to handle jobs of almost any size. The shop is well equipped with the most modern machinery, and an efficient corps of engineers capable of designing and preparing plans for all classes of work in our line is employed.

We are especially well prepared to build special plate iron work, tanks and structural work required in industrial plants. A large, experienced erection force is prepared to erect material in any part of the country. A large stock of materials is always carried on hand,

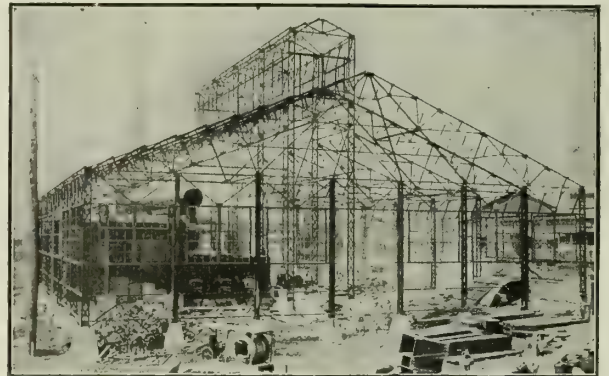
and prices will be quoted for prompt shipment from stock.

Catalogues covering the line will be gladly furnished on application.



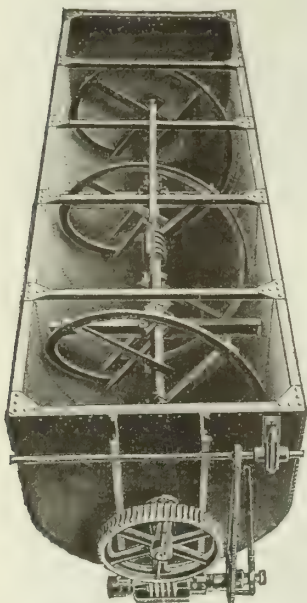
STEEL CASING SETTING

For burning coal. Casings also furnished with Dutch ovens for burning sawdust and special furnaces for bagasse and other refuse material



STRUCTURAL MATERIAL

This company makes a specialty of steel buildings and structural work of all kinds



SUGAR CRYSTALLIZER

Both open and closed types of crystallizers in all sizes are built



TOWER AND TANK

All sizes and types of elevated tanks on towers for fire protection and also water storage



LARGE VERTICAL CREOSOTE OIL TANKS BUILT FOR BRUNSWICK CREOSOTING CO., BRUNSWICK, GA.

All kinds of storage and pressure tanks built by the company



# CHICAGO PUMP COMPANY

## Electric Pumping Machinery

918 West Lake Street  
CHICAGO, ILL.

### Products.

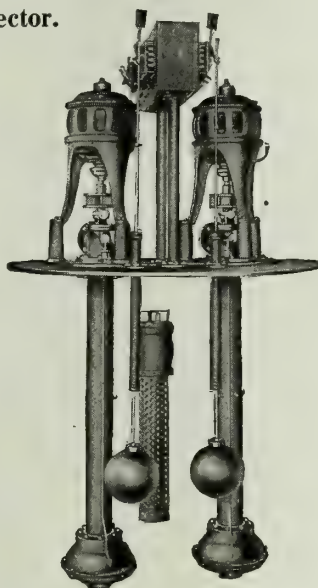
DUPLEX ELECTRIC SEWAGE EJECTORS.  
AUTOMATIC ELECTRIC BILGE PUMPS.  
MULTISTAGE TURBINE HOUSE PUMPS.  
AUTOMATIC CONDENSATION PUMPS and RECEIVERS.  
VACUUM PUMPS for Vacuum Heating.  
AIR LINE VACUUM PUMPS.

Little Giant Electric Cellar Drainers; Pneumatic Water Systems; Hot and Cold Water Circulating Pumps.

### Duplex Electric Sewage Ejector.

This is expressly designed to raise large quantities of sewage into the sewer, from basements that are located below sewer level.

Write for catalogue describing their qualities and superiorities over other ejectors.



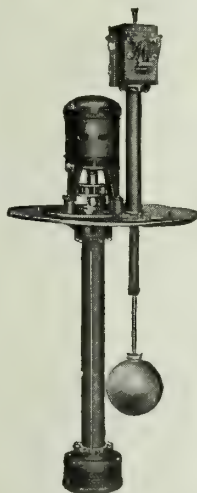
TYPE S.E. DUPLEX ELECTRIC SEWAGE EJECTOR

DATA		
Type and size of discharge, ins.	Capacity in g.p.m. per pump	Horsepower per ft. head
S.E. 2½	50	.050
S.E. 2½	75	.065
S.E. 3	100	.1
S.E. 3	125	.12
S.E. 3	150	.15
S.E. 3½	200	.2
S.E. 4	250	.25
S.E. 4	350	.33

Diameter of basin accommodating Type S.E. duplex sewage ejector is 5 ft. Depth of basin should be 4 ft. deeper than lowest inlet entering it.

### Automatic Electric Bilge Pump.

For pumping water out of basements that are below the sewer level, this pump represents the acme of perfection and contains everything that a high class automatic bilge pump can possibly be equipped with.



TYPE S.L.G. AUTOMATIC ELECTRIC BILGE PUMP

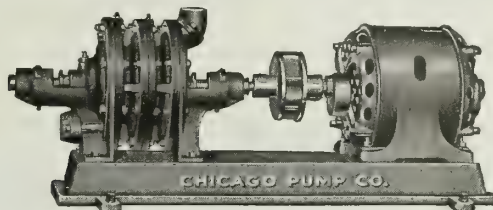
DATA			
Type and number of pump	Size of discharge, ins.	Capacity in g.p.m. per pump	Horsepower per ft. head
S.L.G. 1	1	10-15	.016
S.L.G. 2	1½	25-30	.025
S.L.G. 3	1½	50-55	.045
S.L.G. 4	2	70-75	.065
S.L.G. 5	2½	100	.085
S.L.G. 6	2½	125	.1
S.L.G. 7	3	150	.13
S.L.G. 8	4	200	.16
S.L.G. 9	4	250	.2
S.L.G. 10	4	300	.25

Diameter of basin accommodating Type S.L.G. duplex bilge pumps is 4 ft. Single bilge pump is 3 ft. Depth of basin should be 3 ft. deeper than lowest inlet entering it.

### Multistage Turbine House Pump.

Enclosed type balanced impellers, outboard ring oiled bearings and careful workmanship make these very efficient and quiet running pumps, and they are therefore best adapted for hotels, office buildings, schools, hospitals and such other buildings where quiet

running pumps are essential. Write for Pump Catalogue giving data to determine pump capacities for various buildings.



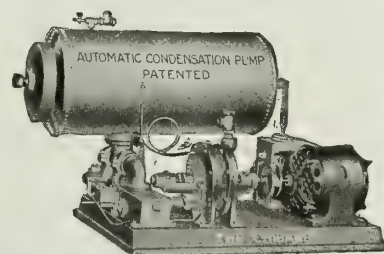
TYPE S.C. MULTISTAGE TURBINE HOUSE PUMP WITH OUTBOARD RING OILED BEARINGS

Type, and size of suction and discharge, ins.	Capacity in g.p.m. per pump	Head in ft. per stage at 1750 r.p.m.	Horsepower per stage at 1750 r.p.m.
S.B. ¾	5	15	.1666
S.B. 1	10	30	.33
S.B. 1	15	27	.37
S.B. 1¼	25	20	.5
S.C. 1¼	35	50	1.3
S.C. 1½	50	40	1.5
S.C. 2	75	40	2.25
S.H.S. 2½	100	100	h.p. per ft. head
S.H.S. 3	150	80	
S.H.S. 3	200	70	
S.H.S. 3	250	50	

NOTE—To determine number of stages required to pump a given quantity against a given head, use that number of stages that will develop a head nearest to that required. If head developed by the number of stages selected is less than that required, capacity will be somewhat decreased; if head developed is greater, capacity will be somewhat increased.

### Automatic Condensation Pump and Receiver.

Saves digging a boiler pit; pumps the heating returns into boiler from radiation, heating coils, cooking kettles, etc., that may be located below boiler level. Operates automatically; improves the heating plant, and saves coal.



"CHICAGO" TYPE CONDENSATION PUMP AND RECEIVER

Write for Catalogue S33, which fully describes it.

DATA							
Number of pump	Maximum sq. ft. direct radiation	Horsepower motor	Approximate shipping weight, lbs.	Boiler pressure pumps will discharge against at 1750 r. p. m.	Size of discharge, ins.	Approximate floor space required, ins.	Highest water level in receiver from floor line, ins.
1	1500	⅙	300	7	¾	28x52	19
1A	2000	¼	350	10	¾	28x52	19
2	3000	⅓	400	10	¾	30x53	21
3	6000	½	600	10	1	32x53	30
3A	10000	½	650	10	1	32x53	30
4	10000	¾	700	15	1	32x64	30
4A	15000	¾	700	10	1	32x70	34
5	15000	1	800	20	1¼	32x70	34
5A	20000	1	800	10	1¼	32x70	34
6	25000	2	900	20	1½	36x76	37
6A	35000	2	900	10	1½	36x76	37

### Vacuum and Air Line Pumps.

Write for catalogue describing the Chicago turbine vacuum and air line pumps for heating systems. They have no gears, belts, pulleys, valves or pistons, and are direct connected to motor. They are simple and positive.

# THE BURNETT-LARSH MANUFACTURING CO.

Manufacturers of "Duro" Guaranteed Residence Water Systems

DAYTON, OHIO

## BRANCH OFFICES

BAY CITY, MICH., Ridotto Building  
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LOS ANGELES, CAL., FRANK MURPHY

## Products.

"DURO" Guaranteed RESIDENCE WATER SYSTEMS for automatic water service in residences; ELECTRIC and other kinds of HOUSE PUMPS; TANKS.

## "Duro" Residence Water Systems.

ADAPTABILITY—"Duro" residence water systems will supply any city, suburban or country home with water under pressure for bathroom, kitchen or laundry uses, for irrigating lawn or garden, watering stock and other general purposes. The source of water supply may be a shallow or deep well, cistern, lake or stream.

POWER—The power for operating these outfits may be any kind of electric current, engine, hand or belt drive.

COST OF OPERATING—At ordinary electric current rate of 10¢ per kw., cost of operating amounts to about 7¢ per 1000 gals. for shallow well systems and about 12¢ for deep well systems.

FRESH WATER VALVE—By installing a "Duro" fresh water valve in discharge pipe between pump and tank, fresh cool water may be had at cold water faucet direct from well for drinking and cooking purposes.

## "Duro" Style 2000 System (Automatic) for Cistern Service.

Capacity of pump, 80 to 90 gals. per hour; pump operates automatically under 22 to 35 lbs. pressure. Two sizes: No. 2001-A, with a 42-gal. tank, for 1 bath and fixtures in



TRADE-MARK

kitchen and laundry; No. 2001-B, with an 80-gal. tank, for 2 baths and usual fixtures.

LOCATION OF SYSTEM—In basement, as close to cistern as possible.

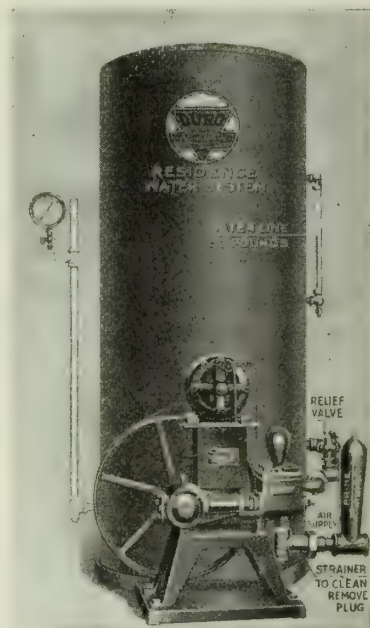
## "Duro" Style 300 System (Automatic) for Shallow Wells, Lakes or Streams.

Pump operates under 30 to 50 lbs. pressure. Two sizes: (1) capacity, 160 gals. per

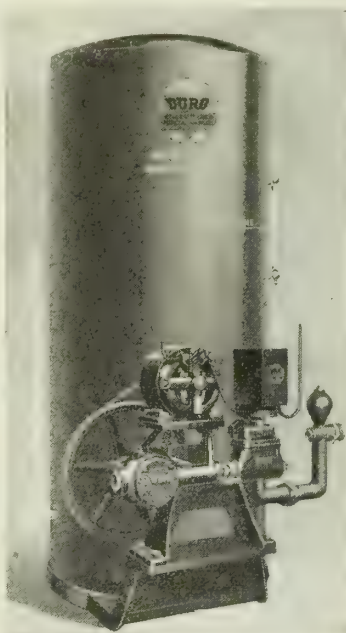
hour, with small tanks, for household requirements, sprinkling, etc.; (2) capacity, 320 gals. per hour, with large tanks, for household needs and generous quantities of water for sprinkling and other purposes.

USES—For furnishing city water service to suburban and country homes having the electric current; also, to homes in small towns not having a city water plant.

LOCATION OF SYSTEM—In basement or garage where temperature does not fall below freezing.



STYLE 300 AUTOMATIC ELECTRIC WATER SYSTEM



STYLE 2000 AUTOMATIC ELECTRIC WATER SYSTEM

## TANKS USED WITH EITHER SHALLOW OR DEEP WELL SYSTEMS

Size of tanks	Capacity, gals.	Dimensions, ins.		Kind
		Diameter	Height	
A	42	16	48	Black or Galvanized
B	80	20	60	Black or Galvanized
C	120	24	60	Black or Galvanized
D	220	30	72	Black only
E	315	36	72	Black only
F	295	30	96	Black only
G	420	36	96	Black only
H	525	36	120	Black only

Container base for pump and tank on all shallow well outfits where tank is 120 gals. or less capacity only. All tanks furnished vertical except when ordered special



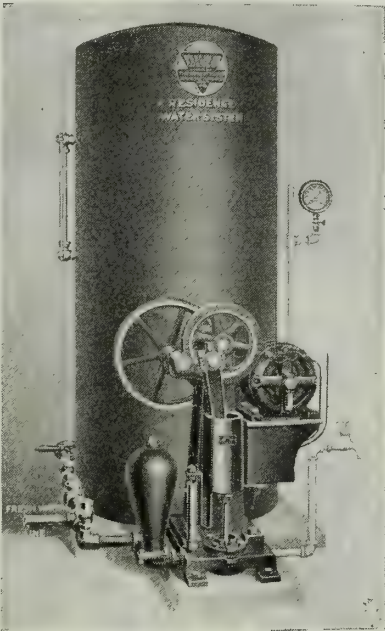
“Duro” Style 700 Automatic Electric System for Deep Wells.

Designed for use in suburban or country homes for supplying water from wells, 22 to 150 ft. deep to water level. Capacities of pump, 125, 130 and 225 gals. per hour.

FROSTPROOF—Pump can be equipped so that power head works in a pump house on top of ground, discharge being below frost line.

DEEF WELL OUTFIT—Installed in frostproof pump pits, 4 by 4 ft. and 5 or 6 ft. deep. Full directions sent.

SPECIAL FEATURES—Crank shaft and counter shaft operate in phosphor bronze ring oiling bearings. Automatic lubrication of crosshead. Reliable air compressor. Special differential plunger furnished to correspond with size of cylinder. No stuffing box. Combined air chamber and discharge check valve. Endless belt drive. Well cylinder furnished. All parts accessible. Machine cut gears entirely enclosed. Automatic switch; motor and air compressor connections complete. Automatic switch enclosed under motor base. Universal discharge connections. Operating pressures 25 to 40 lbs.



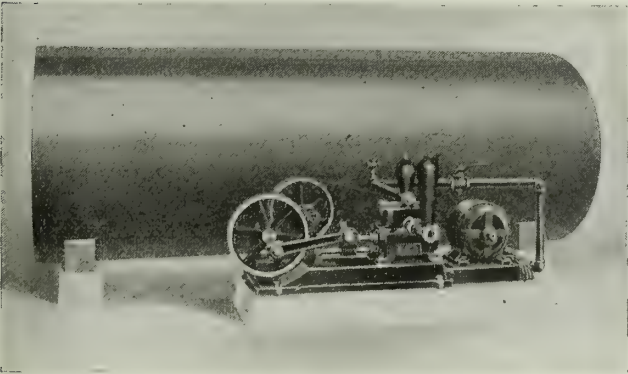
STYLE 700 WATER SYSTEM

DATA, “DURO” STYLE 700 WATER SYSTEMS

Size No.	Capacity per hour, gals.	Inside diam. of well, ins.	Vertical depth to water, ft.	Size of well cyl., ins.	Sucker rod		Inside diam. drop pipe, ins.	Size disch. pipe, ins.
					Size, ins.	Kind		
610	125	2	or larger	22-40	1 3/4	Gal. st. rd.	1	1
620	125	2	or larger	40-100	1 3/4	Gal. st. rd.	1	1
630	130	3	or larger	22-75	1 1/2	Wood	2	1
640	130	3	or larger	75-150	1 1/2	Wood	2	1
650	225	3 1/2	or larger	22-40	2 1/4	Wood	2 1/2	1
660	225	3 1/2	or larger	40-75	2 1/4	Wood	2 1/2	1

“Duro” Style 2100 Automatic Electric System for Shallow Wells.

Capacity of pump, 600 to 700 gals. per hour. Sys-

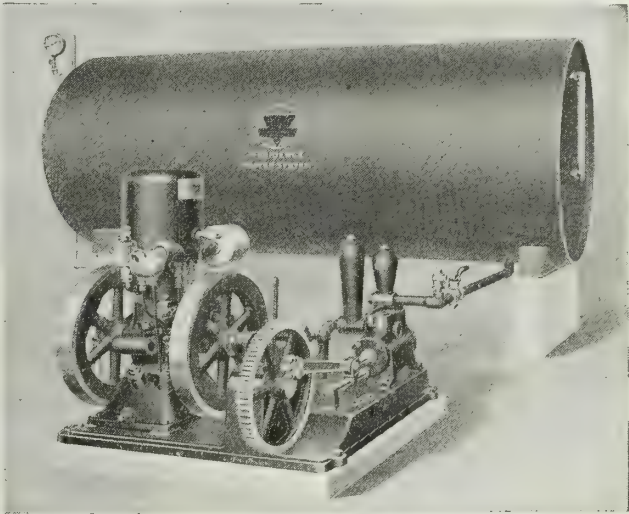


STYLE 2100 WATER SYSTEM

tem is adapted for largest suburban and country homes where electric current is available; also, for supplying water to small truck farms, greenhouses, factories, office buildings, country clubs, schools, etc. See table on tanks on preceding page.

“Duro” Style 1000 Engine Driven System for Shallow Wells.

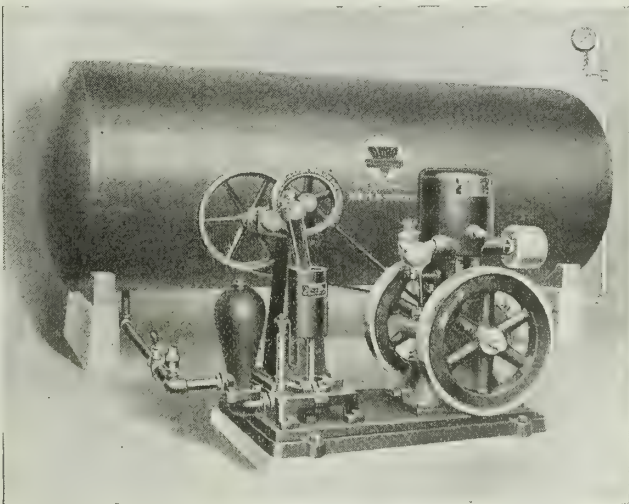
Construction is similar to system Style 2100, except that Style 1000 is equipped with a 1 1/2-h.p. Novo gasoline engine for operation where electric current is unavailable; special carbureter furnished extra for operating with kerosene; also, a high tension magneto, on special order; and a circuit breaker will stop engine when pressure reaches 50 lbs.



STYLE 1000 WATER SYSTEM

“Duro” Style 1300 Engine Driven System for Deep Wells.

Designed for suburban and country homes and clubs, where electric current is unavailable. Equipped with a Novo 1 1/2-h.p. gasoline or kerosene engine; also, with a circuit breaker to stop engine when pressure in tank reaches 50 lbs.



STYLE 1300 WATER SYSTEM

Prices, Catalogues and Further Information.

Sent on application. Write to head office or to nearest distributor for full information as to style or size of system required to meet local conditions.



# STEPHEN B. CHURCH

Engineer and Manufacturer of Pumping Machinery, Tanks and Towers

SEYMOUR, CONN.

BRANCH STORE: BOSTON, MASS., 64-66 Pearl Street

## Products and Services.

ENGINEER and CONTRACTOR for SUBURBAN WATER WORKS and ARTESIAN WELLS.

Manufacturer and jobber of "THE CHURCH" CENTER LIFT DEEP WELL PUMP HEADS; WOOD and STEEL WATER TANKS and TOWERS; WIND-MILLS; ENGINES.

Pneumatic, Electric and Special Pumping Machinery.

## Artesian Wells.

Artesian wells are sunk in a scientifically approved manner and completely equipped with pumping machinery and storage tanks for all kinds of country homes, estates and institutions.

Numerous references can be supplied from over 25 years' experience in this line of work.

Write for estimates and information, describing requirements.



SECTIONAL  
DIAGRAM OF  
CHURCH FLOW-  
ING ARTESIAN  
WELL



WOODEN STORAGE TANK  
All sizes up to 100,000 gals.

## Automatic Windmill.

This is the cheapest power for raising water, and is so arranged that it stops and starts as water rises or falls in the tank.

Outfit illustrated is suitable for a summer cottage or farm. Complete outfits cost \$300.00 and up, according to size and conditions. Estimates gladly given on request. Send for full information.



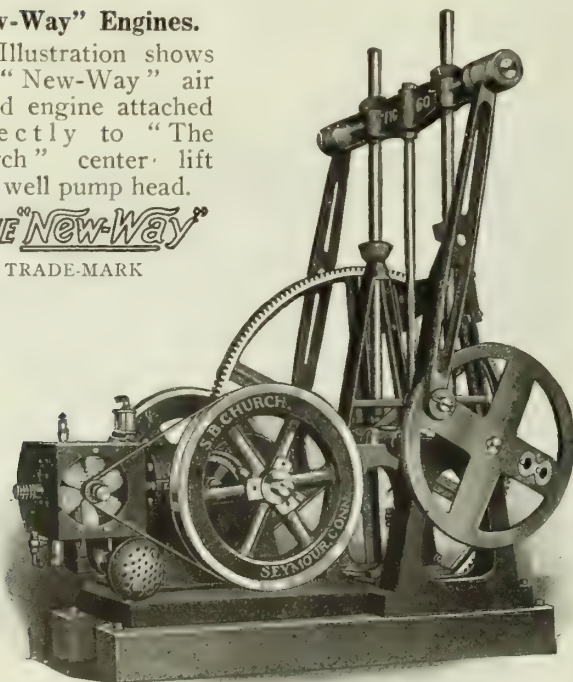
AUTOMATIC WINDMILL PUMP-  
ING AND STORAGE OUTFIT

## "New-Way" Engines.

Illustration shows the "New-Way" air cooled engine attached directly to "The Church" center lift deep well pump head.

**THE "New-Way"**

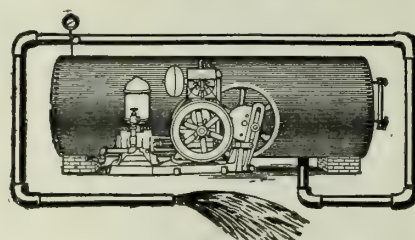
TRADE-MARK



THE "NEW-WAY" JEWELL AIR COOLED ENGINE DIRECT  
CONNECTED TO CHURCH DEEP WELL PUMP HEAD

## Direct and Belt Connected Pumping Outfits.

Various types are made for both shallow and deep well service, driven by electric motor, gasoline or kerosene engines, windmills, etc.



CHURCH STEEL PNEUMATIC STORAGE  
TANK  
All sizes and capacities

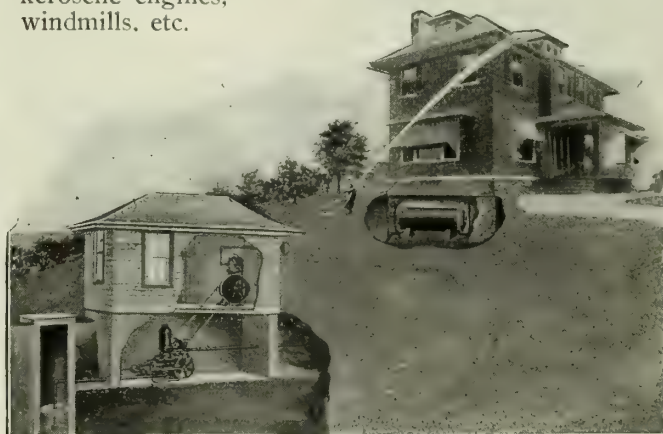


DIAGRAM OF A COMPLETE CHURCH SYSTEM  
BELT CONNECTED



ECONOMY PUMPING MACHINERY CO.

116-118 North Carpenter Street  
CHICAGO, ILL.

Products.

Manufacturers of SEWAGE EJECTORS, BILGE PUMPS, ELECTRIC CELLAR DRAINERS, CONDENSATION PUMPS and RECEIVERS, RETURN LINE and AIR LINE VACUUM PUMPS.

Also, Automatic Water Systems, electrically operated.

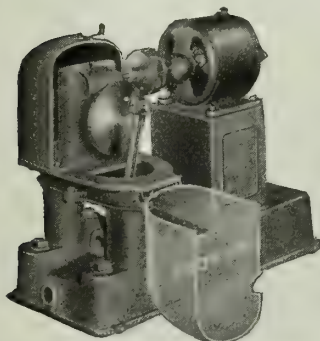


FIG. 2150. AIR LINE VACUUM PUMP

DATA, FIG. 2150

Unit No.	Max. cap., sq. ft.	Suction, ins.
1	4000	¾
2	7500	1
3	12000	1¼
4	17000	2
5	25000	2½

DATA, FIG. 2150 (CONTINUED)

Unit No.	Discharge, ins.	H. p.
1	¾	¼
2	1	½
3	1¼	¾
4	2	1
5	2½	2

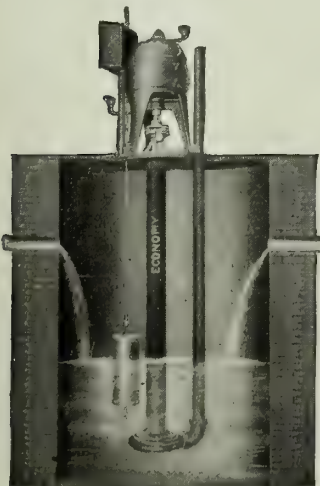


FIG. 2104. TYPES B AND C ECONOMY SUBMERGED BILGE AND SEWAGE PUMP

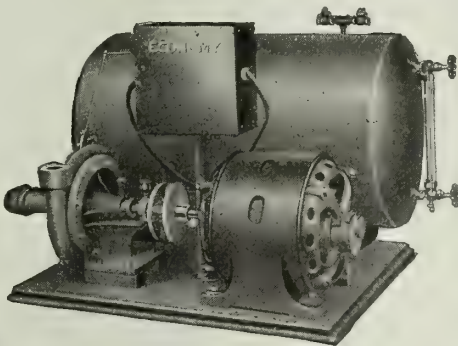


FIG. 2176. CONDENSATION PUMP AND RECEIVER

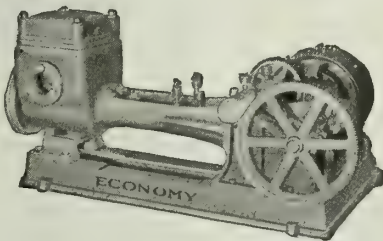


FIG. 2149. ECONOMY MOTOR DRIVEN RETURN LINE VACUUM PUMP, DOUBLE ACTING TYPE

DATA, FIG. 2149

Unit No.	Diam. cyl., ins.	Length stroke, ins.	R. p. m.	Cap. sq. ft. direct radiation	Suction, ins.	Dis-charge, ins.	H. p.
3	3	5	50	2500	1½	1¼	1
4	4	6	45	4000	2	1½	1½
5	5	6	45	6000	2	1½	1½
6	6	6	45	8000	2½	2	2
7	5	10	40	10000	2½	2	2
8	6	10	40	20000	3	2½	3
9	7	10	40	30000	3	2½	3
10	8	12	30	40000	4	3	5
11	9	12	30	47500	5	3½	5
12	10	12	30	55000	6	4	7½

DIMENSIONS FIG. 2104, TYPES B AND C

Gals. per min. per pump	7 to 12	10 to 15	15 to 20	20 to 30	35 to 50	60 to 75	80 to 100	125 to 150	200 to 250	300 to 400	500 to 725	800 to 1200
To pump against ft. head	8 to 12	10 to 14	12 to 20	15 to 30	15 to 30	15 to 35	15 to 35	15 to 35	15 to 40	15 to 40	15 to 40	15 to 40
H. p.	¼	¼	½	¾ to 1	¾ to 1	1 to 1½	1 to 2	2 to 3	3 to 5	5 to 7½	7½ to 10	7½ to 15
Discharge pipe, ins.	¾	1	1	1½	1½	1½	2	2 to 2½	2½ to 3	3½ to 4	5 to 6	7 to 8
Diam., ins., of basin, either B or C	20, 24, 30	20, 24, 30	20, 24, 30	24, 30, 42	24, 30, 48	24, 30, 42	24, 30, 42	36, 42, 48	36, 42, 48	48, 54, 60	48, 54, 60	54, 60, 72
Depth of basin	Optional to suit requirements											

NOTE—Type B, duplex. Type C, single pump  
Speed of all units up to 100 g.p.m., 1750 r.p.m.  
Speed of all units above 100 g.p.m., 1200 r.p.m.



FIG. 2175. UNDERGROUND CONDENSATION PUMP AND RECEIVER

DATA, FIGS. 2175 AND 2176

Unit No.	Sq. ft. direct radiation will drain
5	1000
6	2000
6½	3500
7	5000
7½	7500
8	10000
9	25000
10	35000 to 50000 as specified

DATA FIGS. 2175 AND 2176 (CONTINUED)

Unit No.	Boiler pressure, lbs.	H. p.
5	5	¼
6	10	½
6½	10	¾
7	10	1
7½	10	1½
8	15	2
9	15	3
10	15 to 30	3 to 5

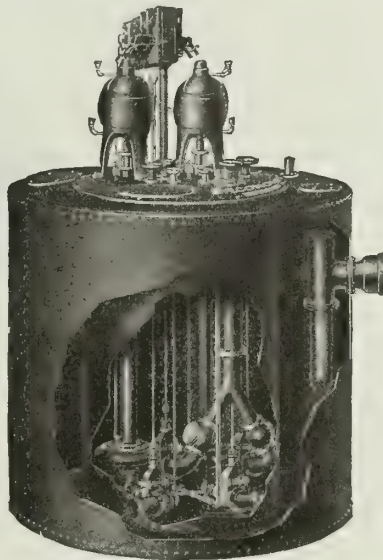


FIG. 2119. TYPE A ECONOMY DRY PUMP CHAMBER AUTOMATIC SEWAGE EJECTOR

Unit No.	4	5	6	7	8	9
Cap. each pump, gals.	50 to 75	100 to 125	150 to 175	200 to 250	300 to 400	450 to 600
H. p.	1 to 1½	1½ to 2	2 to 3	3 to 4	4 to 5	5 to 10
Standard speeds	1000 to 1200	1000 to 1200	850 to 1200	850 to 1200	550 to 1000	550 to 1000
Discharge pipe, ins.	3	4	4	5	6	8
Diam. pump chamber, ins.	48	48	48	54	54	60
Diam. sewage recept., ins.	78	78	78	84	84	90
Ejector depth, ft.	As conditions require					
Size sewer inlets	No. and size required					

# THE CONNERSVILLE BLOWER CO.

Builders of Valveless Rotary Vacuum Pumps  
CONNERSVILLE, IND.

BRANCH OFFICES

CHICAGO, ILL., 929 Monadnock Block

NEW YORK, N. Y., 114 Liberty Street

## Products.

VALVELESS ROTARY VACUUM PUMPS, for Vacuum Heating.

Rotary Blowers, for moving air under pressure or vacuum. Connersville Vacuum Cleaning System. Valveless Rotary Pumps for handling tar, oil, lard, soap-stock, etc.

## Connersville Rotary Vacuum Pumps.

The pump which is shown and described herein has been on the market since 1908, and in that time has clearly demonstrated its position in the vacuum heating field. Its chief characteristics are reliability, high efficiency, simple design.

Fig. 1 shows the design and principle of operation of this pump. There are no valves, valve ports, cams, springs, leathers, or other troublesome parts. Instead there are only two moving parts, called impellers. These impellers are exactly alike, each having three lobes, or what look like large teeth in a gear.

There is no contact whatever between the rotating impellers as they are separated by a small and accurately gaged clearance, and are driven by wide face gears in the housing shown near the pulley end in Fig. 2. The impellers are also separated from the pump case by the same small clearance. This design eliminates friction and wear and insures a high efficiency.

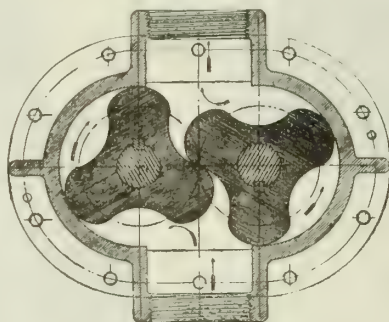


FIG. 1. SECTION THROUGH IMPELLERS AND CASE

Obviously with these clearances the pump is not a tight fit and it is necessary to seal the clearances with a small amount of water. In a vacuum heating system the condensation is usually sufficient for this purpose. To obtain the best results it is imperative that the pump be placed at the lowest point in the system so that the condensate will run by gravity into the pump cylinder.

There are six ring oiling bearings, all lined with genuine Babbitt, and mounted on a heavy base. The bearings have a large oil space reducing the care of oiling to a minimum.

## Advantages.

The advantages of the vacuum heating system and Connersville valveless vacuum pump are, briefly:

(1) Greater thermal efficiency at the lower steam pressures. (2) Use of low and safe boiler pressures. (3) Non-necessity of a licensed attendant to boiler. (4) May be automatically controlled. (5) Positive circulation of the heat so long as any fire is under the boiler. (6) Extreme simplicity of the heating system, pump acts as boiler feeder and vacuum pump. (7) Remarkable simplicity of pump which has no valves, valve

ports, cams, springs, or delicate parts. (8) Accurate balance of moving parts; light foundations are sufficient. (9) Proved worth as evidenced by the long list of modern buildings in all parts of the country in which these pumps are in constant use.

## Types.

Fig. 2 shows the belt driven type which is recommended as standard practice. Pumps of this type are usually in stock for prompt shipment.

A direct gear driven type is also made (Fig. 6).

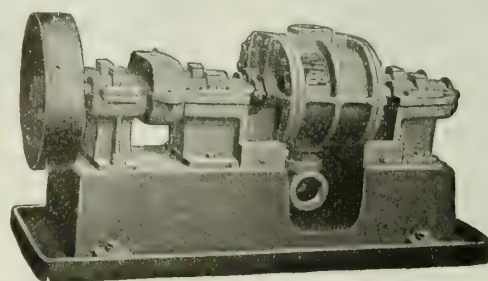


FIG. 2. VALVELESS VACUUM PUMP  
Belt driven type

## Typical Installations.

Figures No. 3, No. 4 and No. 5, show three typical installations which are intended to suggest proper general methods of piping. The free vent to atmosphere 9 (Fig. 3), should be extended at least 28 ft. above the water level in the boiler. That shown at 7 (Fig. 5), is governed by an automatic air vent. In Fig. 4, the pump discharges into an open hot well, requiring no vent. If a closed hot well is used a vent pipe should be provided.

These pumps are designed to maintain a vacuum of 10 ins. of mercury at the same time discharging the water of condensation back into the low pressure boiler whose pressure should not exceed 10 lbs. per sq. in. (With no discharge pressure the pumps will operate on 20- to 26-in. vacuum.)

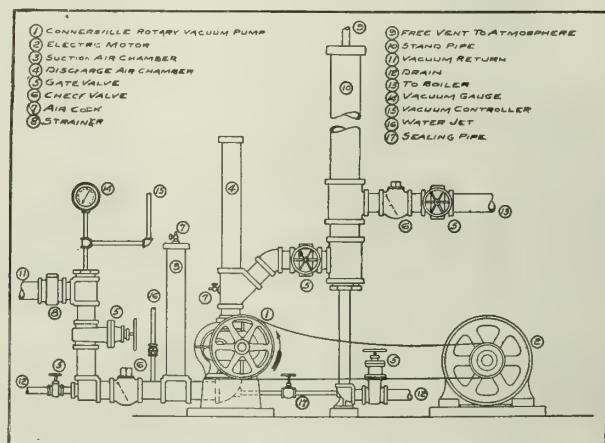


FIG. 3. STANDARD METHOD OF INSTALLATION  
Pump at lowest point in system. Belt drive



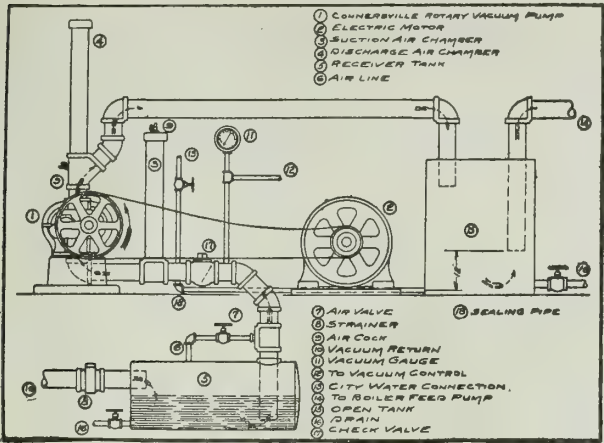


Fig. 4. SYSTEM USING RETURN TANK

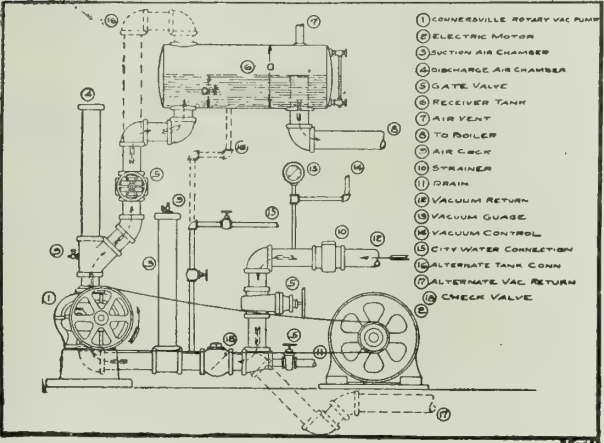


Fig. 5. SYSTEM USING RECEIVER TANK

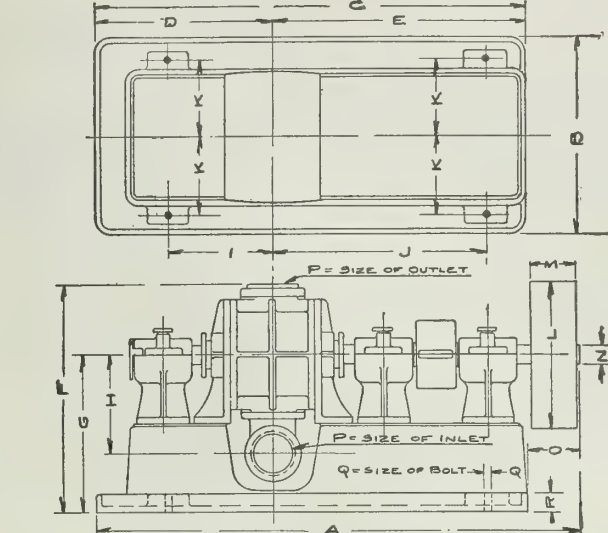


Fig. 7. DIMENSIONS, BELT DRIVEN VACUUM PUMPS

Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
3x3 1/2	33	15	29 1/2	11 1/2	17 1/2	15	11	7 1/2	7	13	5 1/2	10	2 1/2	1 1/2	3 1/2	2	1 1/2	1 1/2
4x4	38 1/2	16 1/2	34 1/2	14 1/2	20 1/2	19 1/2	14 1/2	9 1/2	9	16 1/2	6 1/2	12	3	1 1/2	4	2 1/2	1 1/2	1 1/2
4x6	40 1/2	16 1/2	35 1/2	15 1/2	20 1/2	19 1/2	14 1/2	9 1/2	9	16 1/2	6 1/2	12	3	1 1/2	4	2 1/2	1 1/2	1 1/2
5x8	46 1/2	19	41 1/2	17	24 1/2	22	15 1/2	9 1/2	10	20 1/2	7 1/2	14	4 1/2	1 1/2	5 1/2	3 1/2	1 1/2	1 1/2
6x9	61 1/2	23	53	21 1/2	31 1/2	26 1/2	19	12 1/2	13	26	9 1/2	18	5 1/2	2 1/2	8 1/2	5	1 1/2	1 1/2

Dimensions of larger pumps on application.

Specification Form.

Make specifications read as follows:  
"Furnish and install at point shown on plan 1.....x.....  
Connersville Valveless Vacuum Pump, having a displacement of  
.....to.....gallons per hour, as made by THE  
CONNERSVILLE BLOWER CO., Connersville, Ind."  
NOTE—For equal displacements our pump is more effective  
than a piston pump.

Representative Installations.

- Montgomery Courthouse, Montgomery, Ala.
- State Capitol Building, Little Rock, Ark.
- Title Guarantee Building, Los Angeles, Cal.
- Standard Oil Building, San Francisco, Cal.
- Bureau of Standards, Washington, D. C.
- Perskey & Starin Building, New Haven, Conn.
- Shubert Theater, Denver, Colo.
- Sunny Brook Gardens Co., Jacksonville, Fla.
- Rhodes Building, Atlanta, Ga.
- Springer Hotel, Columbus, Ga.
- Gaynor Theater, Chicago, Ill.
- Hamilton Club Building, Chicago, Ill.
- Kesner Building, Chicago, Ill.
- Medinah Temple, Chicago, Ill.
- Washington School Building, Peoria, Ill.
- L. S. & M. S. Passenger Station, Gary, Ind.
- Washington Hotel, Indianapolis, Ind.
- Severin Hotel, Indianapolis, Ind.
- St. Mary's-of-the-Woods, Terre Haute, Ind.
- St. John's Church, Des Moines, Iowa
- Iowa City Bank, Iowa City, Iowa
- State Soldiers' Home, Leavenworth, Kans.
- Bell Telephone Building, Topeka, Kans.
- F. Walker Co., Florist, Louisville, Ky.
- New Orleans Courthouse, New Orleans, La.
- Hauselman Building, Kalamazoo, Mich.
- Hermitage Hotel, Grand Rapids, Mich.
- Soo High School, Sault Sainte Marie, Mich.
- Blake School, Minneapolis, Minn.
- Commerce Building, St. Paul, Minn.
- Jefferson Monument Building, St. Louis, Mo.
- Municipal Court Building, St. Louis, Mo.
- Rieger Building, Kansas City, Mo.
- Commerce Building, Kansas City, Mo.
- Waldheim Building, Kansas City, Mo.
- Custer County Hospital, Miles City, Mont.
- Courthouse, Lincoln, Nebr.
- First Trust Co., Lincoln, Nebr.
- Flatiron Building, Omaha, Nebr.
- Eastwood Apartments, Paterson, N. J.
- Buffalo Natural Gas Fuel Co. Building, Buffalo, N. Y.

SIZES, CAPACITIES, SPEEDS, ETC.

Code	Size, ins.	Diam. openings, ins.	Pulley, ins.	Speeds, r.p.m.	Horse-power	Gals. per hour	Shipping weight, lbs.	Price
Herd...	3 x 3 1/2	2	10 x 2 1/2	300 to 500	3/4 to 1 1/2	3,000 to 5,000	375	\$165.00
Hose...	4 x 4	2 1/2	12 x 3	250 to 400	1 1/2 to 2 1/2	5,000 to 8,000	600	200.00
Horn...	4 x 6	3	12 x 3	250 to 400	2 1/2 to 4	8,000 to 12,000	625	220.00
Hoop...	5 x 8	3 1/2	14 x 4 1/2	200 to 300	4 to 5 1/2	12,000 to 18,000	875	300.00
Host...	6 x 9	5	18 x 5	200 to 250	5 1/2 to 6 1/2	18,000 to 22,500	1,500	500.00

Larger sizes on application.

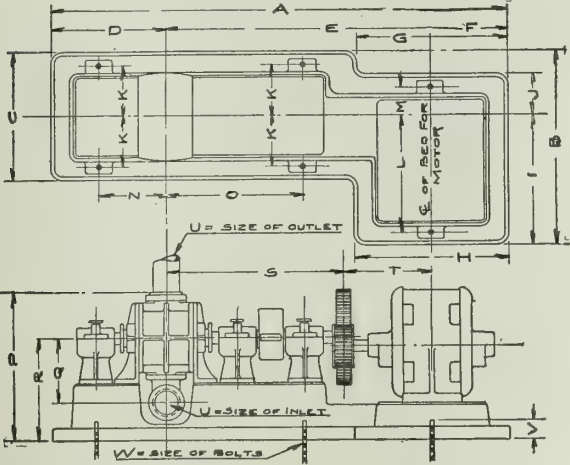


Fig. 6. DIMENSIONS, GEAR DRIVEN VACUUM PUMPS

Size	A	B	C	D	E	F	G	H	I	J	K	N	O	P	Q	R	S	T	U	V	W
3x3 1/2	51 1/2	25 1/2	15	11 1/2	28 1/2	12	12 1/2	18	7 1/2	5 1/2	7	13	15	7 1/2	11	19 1/2	9	12	2 1/2	1 1/2	1 1/2
4x4	60 1/2	27 1/2	16 1/2	14 1/2	34 1/2	13 1/2	12 1/2	19 1/2	16 1/2	9	16 1/2	19 1/2	9 1/2	14 1/2	23	7 1/2	2 1/2	2 1/2	1 1/2	1 1/2	1 1/2
4x6	58 1/2	28 1/2	16 1/2	14 1/2	32 1/2	13 1/2	12 1/2	19 1/2	16 1/2	9	16 1/2	19 1/2	9 1/2	14 1/2	21 1/2	9 1/2	3	2 1/2	1 1/2	1 1/2	1 1/2
5x8	65	28 1/2	19	17	36 1/2	11 1/2	12 1/2	19 1/2	16 1/2	7 1/2	10	20 1/2	22	9 1/2	15 1/2	26 1/2	13 1/2	3 1/2	2 1/2	1 1/2	1 1/2
6x9	80	31 1/2	23	21 1/2	47 1/2	10 1/2	12 1/2	24 1/2	21 1/2	10 1/2	13	26	26 1/2	12 1/2	19	33 1/2	14 1/2	5	2 1/2	1 1/2	1 1/2

For reference only.

# THE DEMING COMPANY

Hand and Power Pumps, Pumping Systems for Public and Private Water Supply

SALEM, OHIO

## GENERAL AGENCIES FOR DEMING POWER PUMPS

CHICAGO, HENION & HUBBELL  
PITTSBURGH, HARRIS PUMP & SUPPLY Co.  
BUFFALO, ROOT, NEAL & Co., 178-180 Main Street  
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BOSTON, CHAS. J. JAGER Co., 13-15 Custom House Street  
DENVER, HENDRIE & BOLTHOFF MFG. & SUPPLY Co.  
CHARLOTTE, THE DEMING Co., Realty Building

CANADA: MONTREAL, TORONTO, WINNIPEG, DARLING BROS., LTD.

PHILADELPHIA, W. P. DALLETT Co.  
BIRMINGHAM, MOORE & HANDLEY HARDWARE Co.  
LOUISVILLE, LAIB COMPANY  
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### Products.

Pumping Machinery, for operation by any power, including SINGLE and DOUBLE ACTING TRIPLEX PUMPS for various services, DEEP WELL POWER WORKING HEADS, ARTESIAN WELL CYLINDERS.

DEMING HYDRO-PNEUMATIC SYSTEMS, operated by Hand or Windmill, Gasoline Engine, or Electric Motor.

Rotary and Centrifugal Pumps, Hand and Windmill Pumps, Hydraulic Rams, Spray Pumps and Accessories.

### Slogan.

"Hand and Power Pumps for All Uses."

### Catalogues.

The products are illustrated and described in the following catalogues:

No. 25, Complete General Catalogue. "J," Power Pump Catalogue. Catalogue of Spray Pumps and Accessories. Hydro-pneumatic Water Supply System Bulletin.

### Agencies for Deming Pumps.

Many agencies, not mentioned above, carry in stock our hand and windmill pumps and cylinders, spray pumps, hydraulic rams, etc. The above agencies, however, specialize on Deming power pumps.

### Co-operative Engineering Service.

Architects and engineers are invited to refer their pumping and water system problems to the Deming engineering department. On receipt of layout of conditions and statement of requirements, an estimate for the pumping equipment will be submitted. Blue prints and photographs showing typical installations will be sent on request.

### Information Required for Estimate Basis.

To determine size and capacity of pump or water system required, the following information should be furnished:

(1) The source of water supply. If a deep drilled well, give diameter and depth; also distance from surface of ground to water level maintained under continuous pumping.

(2) The approximate number of people using the water, or the amount in gallons used per day.

(3) The vertical distance from the pump (or pressure, if hydro-pneumatic system) to the highest point of plumbing fixtures.

(4) The number and kind of water fixtures in the house, and the number of garden and barn fixtures, such as hydrants; and if there is live stock to water, state number of head.

(5) Method of pumping; whether by hand, windmill, electric motor or gasoline engine. If electricity is used, give voltage and state if alternating or direct current. If alternating, give phase and cycles.

### Triples and Other Power Pumps.

Deming power pumps and deep well working heads are made in such a variety of styles and sizes, that their range of application is practically unlimited where belts, water wheels, electric motors, or steam, gas or gasoline engines are available sources of power. Their efficiency is much higher than direct acting steam pumps.

### Deming Hydro-pneumatic Water Supply Systems.

SCOPE OF USE—For furnishing water under pressure to farm, village, suburban and city residences, greenhouses, country clubs, apartment houses, hotels, hospitals, asylums, theaters, office buildings, municipalities, factories, etc.

OPERATION—The systems may be operated by hand, windmill, gasoline engine, or electric motor. Each has its advantages, according to conditions and requirements. It is necessary to re-charge the tank with air to replenish that lost through absorption by the water. This is done by a special air pumping attachment furnished with the pump.

CAPACITIES—These water systems can be furnished to pump from 100 to 130,000 gals. per hour, and all sizes of tanks supplied from 60 to 20,000 gals. capacity.

ADVANTAGES—(1) No elevated tanks to freeze or topple over; no upstairs tanks to leak; no frozen pipes in winter. Ample water supply under pressure and of even temperature.

(2) Less plumbing than with other systems.

(3) System need not be visible from outside.

(4) Sufficient pressure assures positive fire protection, and materially decreases insurance rates.

LIST OF INSTALLATIONS—Upon request, a list of representative installations of Deming pumps and water systems will be furnished.

Write for complete catalogue, "Deming Water Supply Systems."



Deming "Atlas" Double Acting Pump.

The "Atlas" pump, Fig. 691, is especially designed for use with hydro-pneumatic water systems. System No. 2014, illustrated on this page, shows the "Atlas" pump in conjunction with electric motor.

Fig. 691 is also adapted for open tank supply and for any service of 75 lbs. pressure or less.

PUMP ONLY

- CYLINDER—Brass lined. Cast in one piece with base.
- GEARING—Machine cut and fully guarded. Ratio 5 to 1.
- BEARINGS—Babbitt lined and provided with large oil pockets.
- PISTON—Furnished with cup packing.
- PISTON ROD—Drawn brass.
- CROSSHEAD—Guided by 2 rigid steel guide rods.
- VALVES—Easily accessible without disturbing pipe connections.
- AIR CHARGING—Size 2¼ by 5 ins. is furnished regularly with air snifter. See illustration below.
- SPECIAL AIR COMPRESSOR—Supplied (see illustration System No. 2014) when desired, at extra price.

TYPES OF DRIVE

- TYPE "B" DRIVE—Includes cast iron subbase, intermediate gear and rawhide pinion for connecting electric motor.
- TYPE "C" DRIVE—Same as Type "CI" drive with addition of cast iron subbase under pump and motor. Belt is included. Motor furnished at extra price.
- TYPE "CI" DRIVE—Includes tight pulley, 20 ins. diameter or smaller, with belt tightener of gravity type for driving by electric motor or gas engine with short belt pulley centers. Larger diameter pulley supplied at extra price. Belt is not included.
- TYPE "G" DRIVE—Includes a horizontal or vertical water cooled, or a vertical air cooled, gasoline engine mounted on a cast iron subbase with pump, and connected by gearing.
- HAND OPERATION—Size 2¼ by 5 ins. is furnished with lever, link and attachments for operating by hand in emergency at extra price.

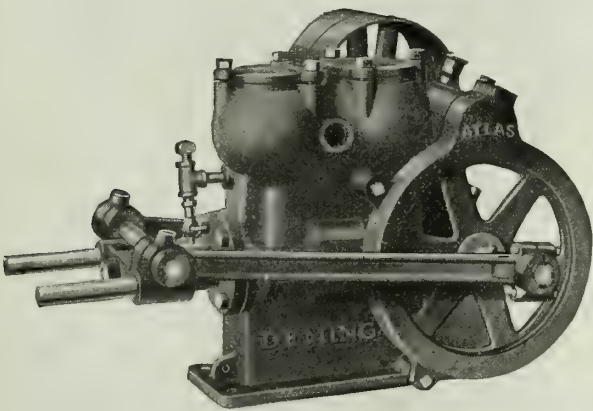


FIG. 691. DEMING "ATLAS" DOUBLE ACTING PUMP  
With tight and loose pulleys and air charging device. For wells and cisterns 25 ft. deep or less

SIZES, CAPACITIES, PRICES, ETC.

Cylinder		Capacity		Max-imum working pressure, lbs.	Diameter of pipes		Price		
Diam. ins.	Stroke, ins.	Revs. per min.	Gals. per min. at max-imum speed		Suc-tion, ins.	Dis-charge, ins.	Tight and loose pulleys	With stand-ard pulleys	Extra for air com-pressor
2¼	5	60	9.6	75	1¼	1	8x2½	*	*
3	6	55	19.2	75	1½	1¼	14x3		
4	8	50	42.5	75	2	1½	16x4		

Cylinder		Motor or engine not included			With "G" Drive—Engine included					
Diam., ins.	Stroke, ins.	With "B" Drive	With "C" Drive	With "CI" Drive	Horizontal engine water cooled		Vertical engine water cooled		Vertical engine air cooled	
					H.	Price	H.	Price	H.	Price
2¼	5	\$75	\$70	\$45	1½		1½		1½	
3	6	120	115	88	2½	*	3	*	2½	*
4	8	160	155	120	4		4		3½	

\*Prices on application

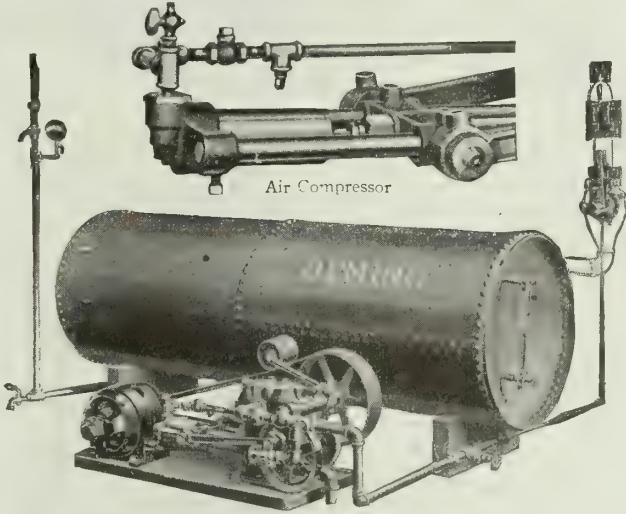
Deming "Atlas" Water System No. 2014.

In System No. 2014, the air supply is provided by a special air compressor, instead of the air charging device. In many cases the air compressor is preferable; especially when the pump is to be placed below the water level, such as pumping from a cistern with the pump located in the cellar. With the independent compressor, the air is pumped into the air chamber and is not taken through the valves of the pump.

The pump and motor are mounted on a cast iron subbase, 3 ft. 3 ins. by 18 ins., with pump belted to motor. This insures permanent alignment of the pump and motor. The pump is automatically controlled. Capacity of pump, 575 gals. per hour at 60 r. p. m. This company should be informed regarding the kind of current available and also the voltage. This outfit is practically noiseless in operation.

- EQUIPMENT SPECIFICATIONS OF SYSTEM No. 2014—One 30-in. x 8-ft. horizontal tank.
- One Fig. 691, 2¼ x 5-in. "Atlas" double acting power pump with brass lined cylinder and special independent air compressor; with Type "C" drive (including cast iron subbase and 20 x 3-in. pulley).
- One ¾ h. p. A. C., single-phase, 60-cycle, 110-220-volt motor. Price varies slightly with motor required. Motor includes canvas belt for connecting to pump.
- One Fig. 1508 automatic pressure regulator for starting and stopping motor. One Fig. 1526 ¾-in. relief valve. One Fig. 688 pressure gage. One Fig. 904 1-in. check valve. One Fig. 900 1-in. globe valve. One Fig. 913 1-in. stop and waste cock. One Fig. 917 ½-in. hose bibb. One glass water gage. One 2-pole switch.
- The system below shows the usual arrangement of the various units which enter into the construction of the many Deming water supply systems.
- In several other Deming systems the "Atlas" power pump operated by electric motor or gasoline engine is used, the pump being in some cases direct connected to the driver, and sometimes belt connected.

Deming hydro-pneumatic water systems are fully described in our catalogue "Deming Water Supply Systems," which gives full particulars concerning Deming hand and power operated systems for shallow and deep wells. A copy of this book will be sent on request.



WATER SYSTEM NO. 2014  
With electric motor and air compressor. For wells or cisterns 25 ft. deep or less

SIZES, CAPACITIES, PRICES, ETC.

Pump					Capacity of 30 ins. by 8 ft. tank, gals.	Weight of complete outfit, lbs.	Price		
Diam. cylinder, ins.	Stroke, ins.	Capacity per min. at 60 strokes, gals.	Weight, lbs.	Good for maximum pressure, lbs.			With ¾ h.p. A. C. motor	For D. C. motor deduct from list	For A. C. 2- or 3-phase motor deduct from list
2¼	5	9.6	140	75	295	1100	*	*	*

\*Prices on application

**Deming "Marvel" Electric House Pump, Fig. 1685.**

Used with electric motor and automatic control for wells 22 ft. deep or less.

The "Marvel" is especially designed to meet the water supply requirements of small and medium sized suburban or country homes, summer cottages, etc. It is a noiseless, reliable, moderate priced pump for open or hydro-pneumatic service wherever electric current is available.

The "Marvel" is recommended for use with hydro-pneumatic tanks of not less than 50 nor more than 315 gals. capacity; also, for any medium sized open tanks. For open tank service, a float switch for automatic control is provided at the same price.

**The "Marvel" Water System No. 2085.**

The system comprises Fig. 1685 as above, with vertical galvanized tank (18x48 ins.), subbase, piping, etc.

**"Straight Line" Working Head, Fig. 1717.**

This working head is for the operation of cylinders in wells up to 300 ft. deep.

It may be operated by hand, windmill, gasoline engine or electric motor. Fig. 1717 is often used in connection with hydro-pneumatic water systems. See System No. 2020 shown in adjoining column.

**ADAPTABILITY**—Fig. 1717 may be arranged to discharge into underground pipe by using a tee in drop pipe the required distance below ground. A shut-off should be placed in the underground pipe to check flow, when desired.

Fig. 1717 may also be equipped with air compressor (shown in No. 2020) at extra price, and with water system No. 2020, thus adapting it for use with pneumatic water supply systems. The discharge from

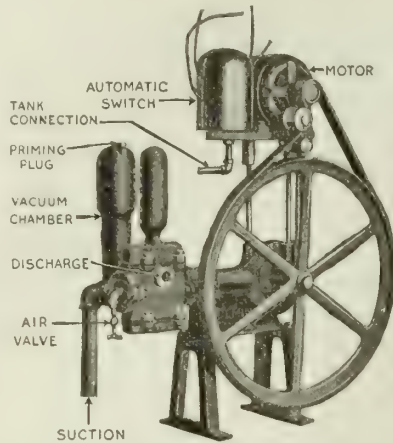


FIG. 1685. DEMING "MARVEL" ELECTRIC HOUSE PUMP COMPLETE, WITH MOTOR, ETC., AS SHOWN

**CAPACITIES, DIMENSIONS, ETC.**

Capacity per hour, gals.	Diameter of pipes, ins.		Maximum working pressure, lbs.	Dimensions, ins.	Shipping weight, lbs.
	Suction	Discharge			
180	1	1/2	50	32 high 28 long 12 wide	145

MOTORS—With A. C. 60-cycle single phase 110-volt motor.  
Can furnish also with A. C. two- or three-phase, or with D. C. motor.

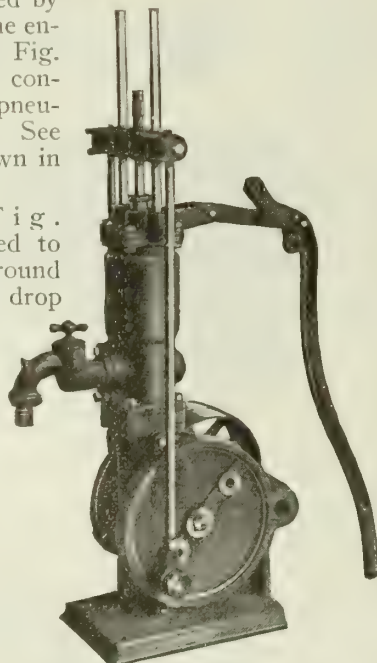


FIG. 1717. WORKING HEAD

compressor is preferably piped direct into pneumatic tank. It may, however, be connected to discharge pipe from pump where tank is a distance away. Write for special "Straight Line" bulletin.

**SIZES AND PRICES, FIG. 1717**

Largest drop pipe, ins.	Back outlet, ins.	Stroke, ins.	Gear ratio	Tight and loose pulleys	Dimens. of base, ins.	Approx. weight, lbs.	Price
3	2	6, 8 and 10	6-1	14x3	10x16	235	*

\*Price on application.

**CAPACITIES, FIG. 1717, WITH DIFFERENT SIZE CYLINDERS**

Diam. and stroke of cylinder, ins.	Gals. per revolution of crank shaft	Maximum revolutions per min.	Gals. per min.	Maximum lift in ft., surface of water to point of discharge
2 1/4 x 10	.172	40	7	300
2 3/4 x 10	.257	40	10	190
3 1/4 x 10	.359	40	14	140
4 x 10	.544	40	21.7	90

**"Straight Line" Deep Well Water System, No. 2020; With Gasoline Engine and Fig. 1717 Head.**

For supplying pure water from deep wells for suburban and country homes, district schools, greenhouses, etc. Electric motor may be supplied instead of gasoline engine where current is available.

System No. 2020 will operate a 2 1/4 by 10-in. deep well cylinder in a 100-ft. well against 50 lbs. pressure in the tank, and will supply about 420 gals. per hour.

**SPECIFICATIONS OF SYSTEM, No. 2020—**

Vertical tank, 36 ins. by 6 ft.

Fig. 1717, deep well working head, with tight and loose pulleys, 14 by 3 ins., and special air compressor.

Fig. 311, 2 1/4 by 10 ins. special brass cylinder.

1 1/2-h.-p. water-cooled, vertical engine with friction clutch.

12 ft. of leather belting.

Automatic engine stop or circuit breaker.

Fig. 1526, 3/4-in. relief valve.

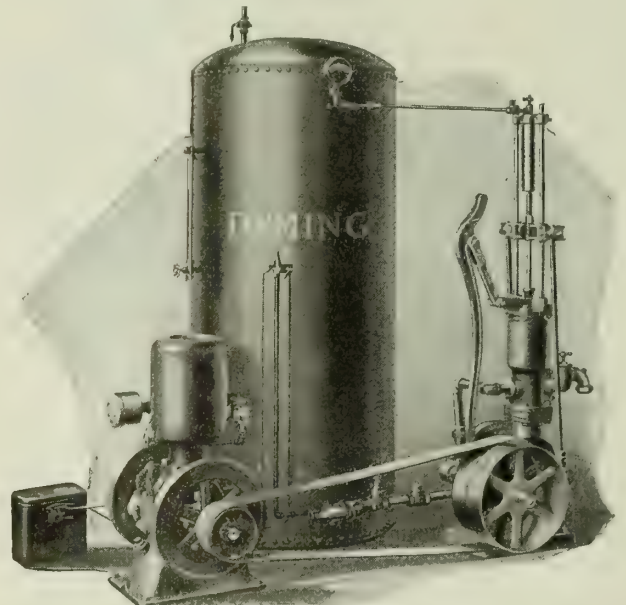
Fig. 688, pressure gage.

Fig. 900, 1-in. globe valve.

Fig. 913, 1-in. stop and waste cock.

Fig. 917, 1/2-in. hose bibb.

Glass water gage.



"STRAIGHT LINE" DEEP WELL WATER SYSTEM NO. 2020  
Using Fig. 1717 working head, with air compressor

**SIZES, CAPACITIES, PRICES, ETC.**

Tight and loose pulleys, ins.	Back outlet, ins.	Working head stroke, ins.	Cylinder		Total capacity of tank, gals.	Weight, complete outfit, lbs.	Price
			Diam. and length, ins.	Capacity per min. at 40 revs., gals.			
14x3	2	6, 8, 10	2 1/4 x 10	7	315	1425	*

\*Prices on application.



Deming Triplex Plunger Pump, Fig. 50.

STANDARD DESIGN, SINGLE ACTING—Fig. 50 is designed for water works, hydraulic elevator service, boiler feeding, mine pumping and for general water supply where the suction lift is 25 ft. or less.

SPECIFICATIONS—*Frame*—Of large sizes, made in one casting, with guides and crankshaft bearings lined with antifriction metal. In sizes 4 by 4 and smaller, frame and cylinder cast in one piece. *Gearing*—Machine cut, double in sizes 9 by 10 and larger. *Pinion Shaft*—Of steel, running in antifriction metal, bolted to main housing. *Connecting Rods*—In sizes 4 by 6 and larger, have bronze boxes with wedge and screw adjustment at crosshead end and marine type babbitted boxes at crank end. Smaller sizes have bronze bushings at crosshead ends. *Crossheads*—Run in bored guides. Sizes 4 by 6 and larger have bronze adjustable shoes. *Plungers*—Of best cast iron, finished true and smooth; packing of ample depth. *Cylinders and Base*—In one casting in sizes 10 by 10 and smaller. In larger sizes, cylinders are separate castings. *Valve Chambers*—In sizes 3½ by 4 and larger, separate castings bolted to cylinders. *Valves*—Of large area and readily accessible; for cold water, are rubber disks, protected on top from cylindrically wound springs by brass plates; for hot water, either special hard composition or bronze valves. *Valve Seats*—Bronze, of grid type, screwed into decks. Iron seats and valves furnished, if required. *Grease Cups*—With all pumps. Gear ratios 5 to 1.

Pumps furnished with bronze plungers, and varying otherwise from standard construction, at extra price.

Types of drive are shown in 192-page Deming Power Pump Catalogue.

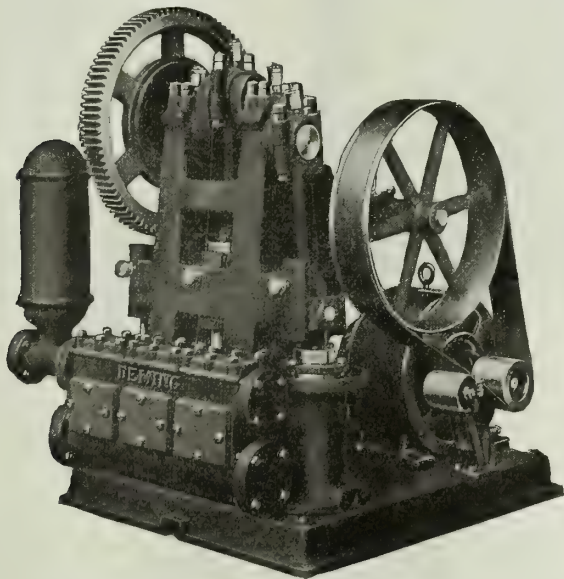


FIG. 50. DEMING TRIPLEX PLUNGER PUMP  
Size 5½ by 8 ins. with Type "C" drive

SIZES, CAPACITIES, PRICES, ETC.

Plungers		Capacity		Maximum workin pressure, lbs.	Diam. of pipes		*Tight and loose pulleys	List price, with pulleys
Diam., ins.	Stroke, ins.	Usual revs. per min.	Gals. per min.		Suction, ins.	Dis-charge, ins.		
2	2	70	5.67	150	1½	1	8x 2	Prices on application
2½	2	70	8.89	150	1½	1	10x 2	
2½	3	60	11.4	150	2	1½	12x 3	
3	3	60	16.2	150	2	1½	14x 3	
3½	3	60	22.	150	2	1½	16x 3	
3½	4	60	30.	150	2½	2	16x 4	
4	4	60	39.	150	2½	2	18x 4	
4½	4	60	59.	160	2½	2	20x 5	
4½	6	60	74.	150	3	2½	20x 5	
5	6	60	91.	150	3	2½	24x 5	
5½	8	60	147.	150	4	3	28x 6	
6	8	55	161.	140	4	3	30x 6	
7	8	55	220.	150	5	4	30x 8	
8	8	55	287.	150	5	4	36x 8	
8½	8	55	324.	140	6	5	36x 8	
9	10	50	413.	160	8	6	42x10	
10	10	45	459.	150	8	6	42x12	
11	12	42	622.	160	10	8	48x14	
12	12	42	740.	150	10	8	48x16	
12	14	40	820.	150	12	10	48x18	
13	14	40	964.	140	12	10	48x20	

\*Note—Sizes 9 by 10 and larger regularly furnished with tight pulley only.

Deming Deep Well Working Head.

Fig. 62 is adapted especially for supplying water from deep wells for private estates, manufacturing plants, farms, etc. It is very substantially built, and the "low-down" design, as well as other features, make it the most accessible deep well pump on the market. By disconnecting the differential plunger from the crosshead, and the walking beam from the connecting rod, and removing the stuffing box cap, the plunger can be readily withdrawn without disturbing the pipe connections.

SPECIFICATIONS—*Main Base*—Of cast iron, carries crank and pinion shaft bearings, which are lined with best babbitt metal. *Gearing*—Machine cut, main gear bolted to a flange integral with crank shaft. *Crosshead*—Babbitt lined, guide rods of polished steel.

Each pump has a differential plunger which discharges part of the water on the down stroke, equalizing load and giving a more uniform flow of water. *Stuffing Box*—Easy of access for repacking, gland being of the bolted type. *Air Chamber*—Furnished at extra price.

Types of drive showing Fig. 62 direct connected to electric motor, gas engine, etc., may be seen in complete 192-page Deming Power Pump Catalogue. Booklet "Deming Water Supply Systems" illustrates Fig. 62 in connection with hydro-pneumatic steel tanks. Write for them.

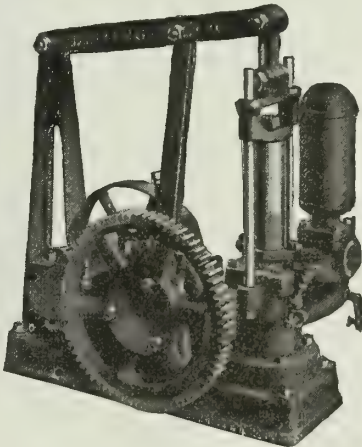


FIG. 62. WORKING HEAD  
With Fig. 63 air pump attachment and tight and loose pulleys for belt drive



FIG. 324  
BRASS ARTESIAN WELL CYLINDER

FIG. 62, CAPACITIES OPERATING CYLINDER, FIG. 324

Sizes, Prices, Etc.					
Stroke, ins.	Maximum diameter of pipes		Gear ratio	Tight and loose pulleys	Maximum height, ins.
	Suction, ins.	Dis-charge, ins.			
8, 9 and 10	4½	2½	6 to 1	16x3	40½
12, 14 and 16	6	3	7 to 1	20x5	51
20, 22 and 24	8	4	6½ to 1	28x6	73

\*Prices on application

Diam. and stroke of cylinder, ins.	Capacity			†Maximum depth of well, ft.
	Gals. per rev. of crank shaft	Maximum revs. per min.	Gals. per min.	
2¾x10	.257	40	10.2	300
2¾x16	.41	35	14.3	300
2¾x24	.617	28	17.2	350
3¾x10	.478	40	19.1	175
3¾x16	.765	35	26.7	175
3¾x24	1.147	28	32.1	190
4¾x10	.614	40	24.5	130
4¾x16	1.227	35	42.9	100
4¾x24	1.841	28	51.5	120
5¾x16	1.798	35	62.9	70
5¾x24	2.696	28	75.4	80
6¾x24	3.716	28	104.0	60
7¾x24	4.900	28	137.2	45

†Refers to vertical distance from lowest surface of water in well to highest point of delivery.

# THE GOULDS MANUFACTURING COMPANY

## Pumps and Hydraulic Machinery

SENECA FALLS, N. Y.

### BRANCHES

NEW YORK, N. Y., 16 Murray Street  
BOSTON, MASS., 58 Pearl Street  
PITTSBURGH, PA., 636 Oliver Building

HOUSTON, TEX., 1001 Carter Building

CHICAGO, ILL., 12-14 South Clinton Street  
PHILADELPHIA, PA., 111 North 3rd Street  
ATLANTA, GA., 3rd National Bank Building

### Products.

HAND and POWER PUMPS for every service: Cistern and Well, Lift and Force Pumps; House Force Pumps; Single Stage and Multi-stage Centrifugal Pumps; Deep Well Power Working Heads and Cylinders; Vacuum Pumps; Air Compressors; Sump Pumps; Single and Double Acting Triplex Power Pumps.

Hydraulic Rams; Pump Jacks; Double Acting Piston Pumps, hand and power; Rotary Pumps; Deep Well Triplex Pumps; Diaphragm Pumps; Hydraulic Pressure Pumps.

### Specification Goulds Standard Triplex Power Pump.

The following is specification for Goulds standard triplex power pump, small and moderate capacity type, Fig. 1009, 1¼ by 2 ins. to 8 by 10 ins., capacity 2 to 350 gals. per minute:

**FRAME**—Close grained iron, cast in one piece with cross-head guides and cylinders, forming exceptionally rigid construction and accurate alignment of all working parts.

**CRANK SHAFT**—High carbon open hearth steel, accurately machined to gage.

**BEARINGS**—Crank shaft and pinion shaft bearings are of babbit metal.

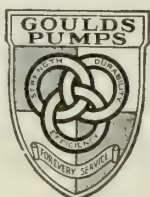
**GEARING**—Gear and pinion charcoal iron, machine cut from the solid. A gear guard covers the pinion and adjacent teeth of the gear. Gear ratio 5 to 1.

**CROSSHEADS**—Sizes 4 by 6 ins. and larger, fitted with adjustable bronze shoes, which run in bored guides. Sizes 3½ by 4 ins. and smaller, the crossheads are cylindrical in form, made of bronze and run in bored guides.

**CONNECTING RODS**—Sizes 4 by 6 ins. and larger, strap head and wedge adjustment with bronze boxes at crank end and adjustable bronze boxes, marine type, at crosshead end. Sizes 3½ by 4 ins. and smaller have adjustable boxes babbitted at crank end, and bronze bushings at crosshead end.

**CYLINDERS**—Close grained iron cast in one piece with standards.

**PLUNGERS**—Sizes 2½ by 4 ins. and larger are fitted with hard cast iron plungers. Sizes 2 by 3 ins. and smaller have bronze plungers accurately machined and ground true and smooth.



TRADE-MARK

**GLANDS**—Sizes 2½ by 4 ins. and larger have iron glands. Sizes 2 by 3 ins. and smaller have bronze glands.

**BASE AND VALVE BOXES**—Charcoal iron in one casting, of liberal proportions, affording large valve area.

**VALVES**—3 by 4 ins. and smaller bronze valves. 3½ by 4 ins. and larger—for cold water—rubber disks on bronze grid seats, cylindrically wound springs. For hot water the grid seat valve with special disks is recommended.

**AIR CHAMBER**—Supplied with pump. Vacuum chamber to order.

**SPECIAL CONSTRUCTION**—Phosphor bronze plungers, lined cylinders and glands, rawhide pinions, etc., to order.

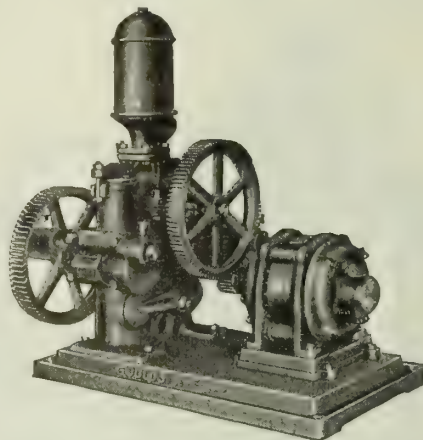


FIG. 1531. "PYRAMID" PUMP, WITH GEAR CONNECTED MOTOR  
For heads up to 175 ft. and capacities up to 114 gals. per m.n.

### Catalogues, Dimension Sheets and Prices.

Complete specifications on all types and capacities of Goulds power pumps are given in a set of bulletins. A bound set of these bulletins, including a special bulletin containing all the handy data and tables needed in making pump calculations, will be furnished to architects on request. A set of dimension sheets on all standard sizes will also be provided if desired. Blue prints and data on special types and sizes will be furnished by the engineering department on request.

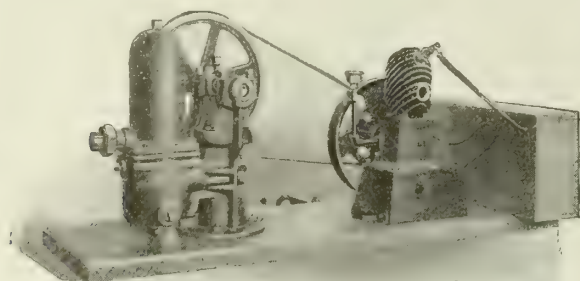


FIG. 1695. OUTFIT "N" "HIGH-SPEED" ENGINE DRIVEN PUMPING OUTFIT

Capacity, 3 gals. per min. For homes, apartment houses, small factories, etc. Furnished to pump both air and water when wanted for service on pneumatic systems. Same outfit furnished with ¼ h.p. electric motor for operation on any commercial electric circuits or on farm lighting plants

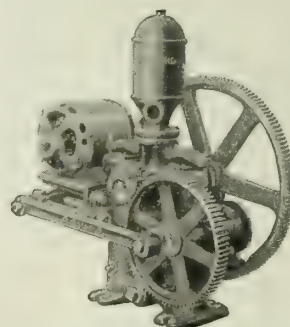


FIG. 1531. PYRAMID PUMP, FORM "Q" DRIVE  
6 gals. per minute size as supplied complete with motor mounted on brackets. Good for total heads up to 100 ft. For house and small factory service



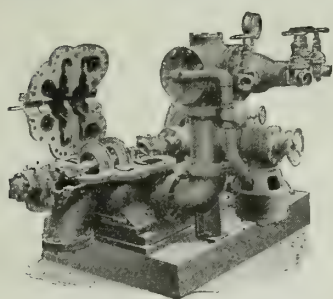


FIG. 3014. GOULDS TWO-STAGE  
AND THREE-STAGE CENTRIFUGAL  
FIRE PUMP  
Open view

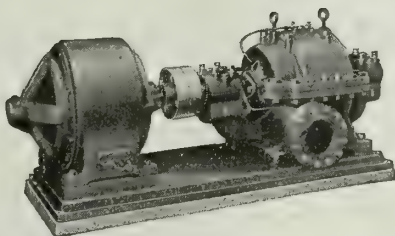


FIG. 3300. GOULDS MULTISTAGE  
CENTRIFUGAL PUMP  
For heads up to 580 ft., and capacities up  
to 1500 gals. per minute

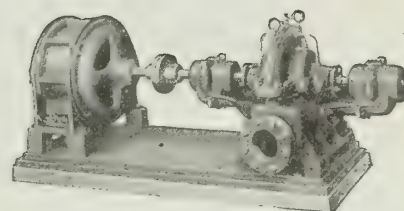


FIG. 3030. GOULDS SINGLE-STAGE  
DOUBLE SUCTION CENTRIFUGAL  
PUMP  
Direct connected to electric motor. For  
heads up to 150 ft., and capacities  
up to 8,000 gals. per min.

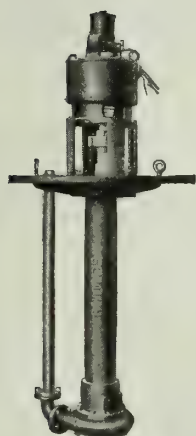


FIG. 3013. GOULDS  
DIRECT CON-  
NECTED CENTRIFUGAL  
SUMP  
PUMP



FIG. 1030. GOULDS POWER WORKING HEAD  
For operating cylinders in deep wells



FIG. 1604. GOULDS AIR  
AND WATER  
FORCE PUMP  
For use with pneumatic  
pressure water supply sys-  
tems

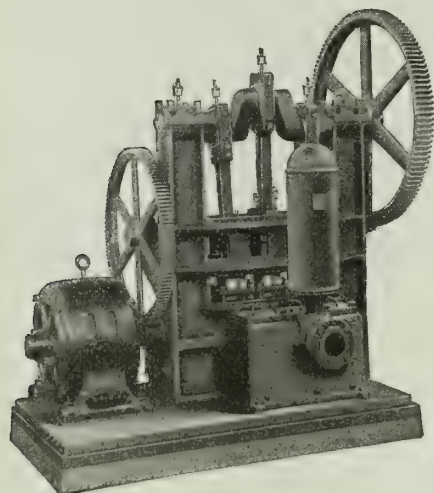


FIG. 1009. GOULDS ACTING TRIPLEX  
PUMP  
With gear connected motor. For heads up to  
350 ft., and capacities up to 350  
gals. per min.

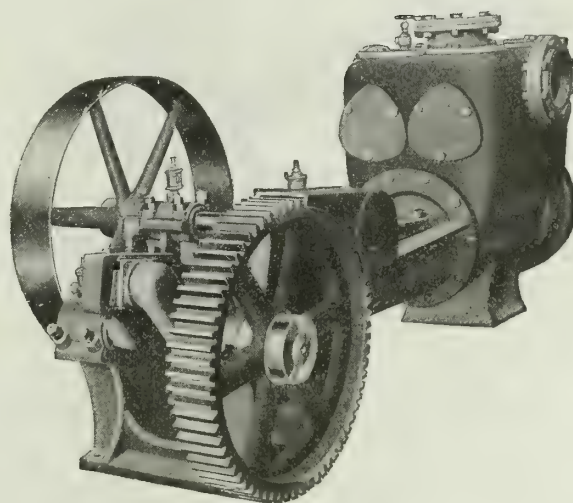


FIG. 1049. GOULDS DOUBLE ACTING VACUUM PUMP  
For vacuum heating systems. Displacement 10,200 to  
81,000 gals. per hour

# KERR MACHINERY & SUPPLY CO.

Manufacturers of Electric Driven Pumps and Water Systems

GENERAL OFFICES AND FACTORY

Kerr Machinery Building, Fort and Beaubien Streets  
DETROIT, MICH.

## Products,

KERR VORTEX PUMPS, including HIGH SPEED CENTRIFUGAL, TURBINE, and VACUUM PUMPS; SEWAGE EJECTORS; AIR COMPRESSORS, etc.

## Kerr Vortex Pumps.

These pumps have been developed and perfected during the past 10 years, so that they are now recognized by hydraulic engineers as superior pumps, of simple, reliable mechanism, applicable to a wide range of use.

Special attention has been given to the design and development of a turbine pump of high efficiency, high heads and small capacities for direct connection to standard motors.

This type of pump is especially adapted for use as a booster pump in cities where the water pressure is low. It is used in connection with the Kerr hydro-pneumatic and open tank water systems, to supply sufficient water pressure on the upper floors in hotels, apartment houses, office buildings, factories, etc.

They are also used as filler pumps for automatic sprinkler systems and are adapted for the circulation of brine, cutting fluids, oils and water in heating systems. Also built as sewage ejectors, bilge pumps on vessels, and used for any purpose for which a centrifugal pump of this type is suitable.



TRADE-MARK

## Special Information.

It is desirable that our Engineering Department have the following information when advising as to size and type of pump suitable for individual requirements:

(1) Capacity desired in gallons per minute. (2) Total head in feet or pounds to be pumped against, including friction and suction. (3) Length and size of discharge pipe. (4) Length and size of suction pipe. (5) Number of elbows in suction and discharge pipe. (6) Source from which supply will be taken. (7) If city water is used for supply, minimum and maximum pressures. (8) Supply clean, muddy or gritty. (9) Liquid to be pumped. (10) Hot or cold.

## Model Specifications, Horizontal Type Booster Pump Outfits.

There shall be furnished and installed, in location indicated in building plans, a Kerr Machinery & Supply Co.'s, Detroit, Mich., or equal, Compression Tank [or Open to Atmosphere Tank] System to force water to upper floors of building.

PUMP—Pump to be single [multi-] stage, centrifugal type, having a capacity of ..... gals. per minute against a total head of ..... ft., or ..... lbs. per sq. in. Water will flow to pump suction under city pressure of ..... lbs. per sq. in.

Each stage to have hydraulically balanced impeller of bronze.

Bearings to be of bronze of sufficient size and to be removable and interchangeable. Pump case to be of cast iron heavily ribbed to withstand pressure required. Pump shaft to be of high carbon steel and to be bronze covered in interior of pump.

Bearings to be supplied with proper means of lubrication and pump to have all necessary pet cocks for freeing case from air. A suitable ball bearing to be provided to take care of any unbalanced thrust.

Pump to be direct connected to motor by means of flexible coupling of improved type. Pump and motor to be mounted on heavy cast iron bed plate.

MOTOR—Motor to be ..... volt, direct current [..... phase, ..... cycle, ..... volt alternating current], of standard manufacture adapted for direct connection and shall be of ample horsepower to operate pump continuously without undue heating or overload.

AUTOMATIC STARTER—Automatic starter to be furnished by this contractor, to be complete with Pressure Regulator for Compression Type Tank [Float Switch Control if Open to Atmosphere Type Tank is used].

NOTE—If Compression System instead of Open to Atmosphere Tank is desired, add the following specifications:

TANK—One Hydro-pneumatic Tank, having a capacity of ..... gals.

Vertical [Horizontal] ..... diam. .... length.

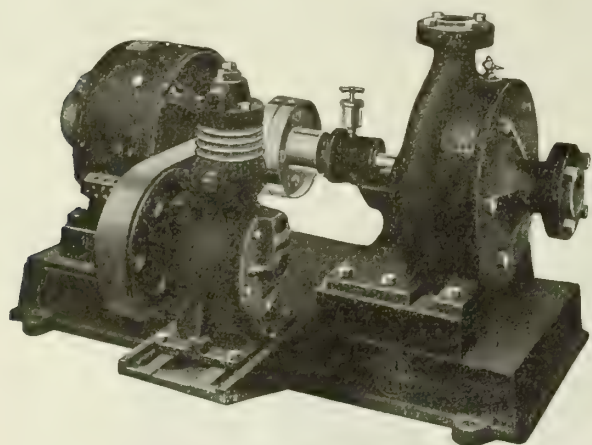


FIG. 1. KERR VORTEX TURBINE PUMP AND AIR COMPRESSOR FOR HYDRO-PNEUMATIC BOOSTER SYSTEMS

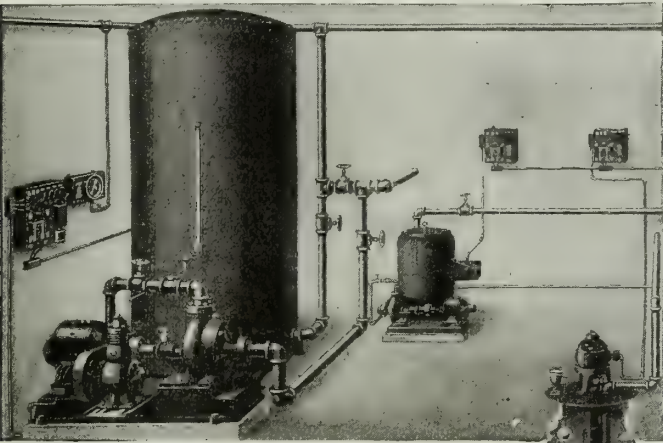
SIZES AND CAPACITIES BOOSTER PUMP OUTFITS

Series	10 and 20						30					40 and 50								
Pump No.	11	12	13	21	22	23	31	32	33	34	35	41	42	43	44	45	51	52	53	54
Number stages.	1	2	3	1	2	3	1	2	3	4	5	1	2	3	4	5	1	2	3	4
Suction, ins.	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3	3
Discharge, ins.	1	1	1	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2	2	2	3	3	3	3
Conservative motor, h.p.	1 1/2	1	1 1/2	1	2	3	2	3	5	7 1/2	10	3	7 1/2	10	15	20	5	10	15	20
Height, ins.	16 1/2	16 1/2	16 1/2	15 1/2	15 1/2	17	22	22	23	24	26	28	28	28	30	32	28	28	30	32
Floor space with motor, ins.	15x30	15x33	17x38	15x32	17x39	17x43	18x40	18x46	20x52	22x57	22x60	20x47	22x55	22x60	26x66	26x72	22x50	26x60	26x68	26x72
Approx. weight with motor, lbs.	170	230	320	190	350	400	360	500	700	950	1225	670	750	1500	1800	2000	740	800	1700	2100
Capacity, gals. per min.	10	10	10	25	25	25	40	40	40	40	40	80	80	80	80	80	120	120	120	120
	25	25	25	35	35	35	60	60	60	60	60	100	100	100	100	100	150	150	150	150
	25	50	75	35	70	105	60	120	180	240	300	65	130	195	260	325	90	180	270	360
Total head in ft.	15	30	45	30	60	90	50	100	150	200	250	60	120	180	240	300	80	160	240	320



This tank to be of black steel, guaranteed for 125 lbs. working pressure and shall be complete with gage glass, fittings and openings suitable for above pump.

AIR COMPRESSOR—There shall be furnished with the above outfit, direct belted to same, one Kerr Air Compressor of suitable capacity to furnish air for Hydro-pneumatic Tank above specified.



Automatic Electric Driven Booster Pump with Air Compressor and Hydro-pneumatic Tank      Automatic Electric Driven Condensation Return and Boiler Feed Pump      Automatic Electric Driven Ejector or Sump Pump

FIG. 2. INSTALLATION OF KERR BOOSTER OUTFIT

Kerr Automatic Ejector Pumps.

These pumps are built of the same high grade materials that make the Kerr vortex turbine pump so

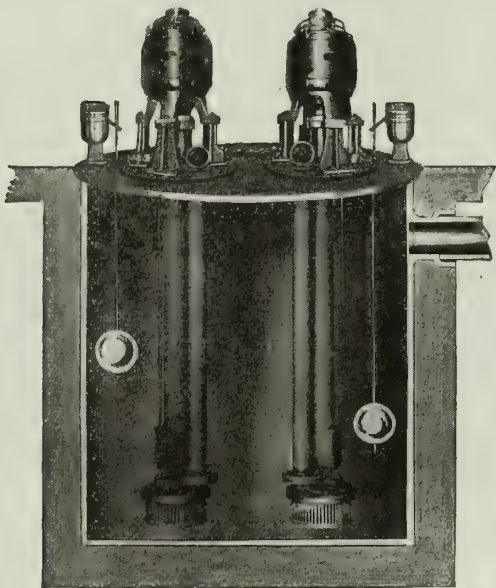


FIG. 3. KERR EJECTOR PUMP ARRANGED AS DUPLEX UNIT WITH 2 PUMPS IN 1 COVER PLATE

SIZES AND CAPACITIES, EJECTOR PUMPS

Pump No.	KO	KI	KII	KIII	KIV
Capacity, gals. per min. . . . .	10	50	100	200	400
Head in ft. . . . .	10	15	20	20	20
Suction . . . . .	Full opening suction strainer				
Discharge, ins. . . . .	1	1½	2	3	4
Conservative motor, h.p. . . . .	¼	1	1½	3	5
*Diam. cover plate, ins. . . . .	22	25	42	42	42
Motor floor plate, ins. . . . .	..	..	22	22	22
†Depth of pit required, ins. . . . .	48	60	72	72	72
Approx. weight with motor, lbs. . . . .	250	450	1000	1200	1600

\* 42 in. diam. cover plate is fitted with manhole. Larger diam. cover plates will be furnished when required.

† Dimensions given are standard. All pumps can be built for pits from 3 to 12 ft. deep.

All the above listed ejector pumps may be arranged as duplex units with 2 pumps in 1 cover plate. See Fig. 3.

efficient and durable. They are a single stage, vertical type fitted with Kerr semienclosed bronze impeller, bronze covered shaft, with flexible coupling between pump shaft and motor. All pumps are fitted with full area strainer on intake.

Kerr automatic ejector pumps are furnished to operate singly or in duplex, as may be necessary.

Model Specifications, Vertical Type Ejector Pump Outfits.

Furnish and install, in room where shown, one Kerr Machinery & Supply Co.'s, Detroit, Mich., single [duplex], or equal, Electric Ejector Pump as follows:

PUMP—Pump to be of submerged centrifugal type with vertical shaft direct connected to motor. The shell to be of heavy, close grained iron, impeller to be of bronze and shaft to be of high carbon steel.

The pump is to have a total capacity of.....gals. per minute against a total head of.....ft.

MOTOR AND FLOOR PLATE—Motor to be of vertical type, of ample capacity to perform above duty without sparking or overloading, and to be furnished complete with thrust and ball bearings.

The motor is to operate on .....volt direct current, [.....phase, .....cycle, .....volt alternating current].

Coupling between motor and shaft to be of an improved flexible type.

Motor to be supported with vertical tripod legs on cast iron motor floor plate. In floor plate there is to be furnished a radial and thrust bearing, this bearing to support the entire weight of shaft and impeller. From floor plate, pump is to be suspended and supported by a cast iron column, for a pit ..... ft. deep.

Lower bearing in pump to be oiled from a force feed grease cup located on top of floor plate. Floor plate to be proper diameter for a cast iron sump, [cement basin], measuring ..... ins. inside diameter and provided with manhole and vent pipe opening.

CONTROLLER—With this outfit is to be furnished one automatic controller with knife switch and fuses, actuated by copper float and connected with proper guide pipes.

Note: In case of 3-phase current, the use of a circuit breaker or protective relay is recommended.

The wiring between motor and automatic starter to be installed by this contractor.

NOTE—The following specification should be added to the above if cast iron basin is desired.

BASIN—Above described cover plate to be fitted for ..... diameter by ..... ins. deep cast iron catchbasin. Catchbasin is to be provided with ..... in. standard screwed or soil pipe connections in side for inlet. Location of openings to be given later by architect or engineer. Complete drawings and specifications to be submitted for approval after contract is awarded.

A Standard of Service.

In the manufacture of Kerr vortex pumps, unusual care is taken to produce a pump that will be the leader in its class.

The use of highest quality materials and modern equipment by skilled employees in a daylight factory enable delivery of a superior pump.

But responsibility does not end there. We are interested in seeing that each purchaser gets the greatest possible service from the pump purchased. Kerr pumps are sold under a very liberal guarantee.

Our Engineering Department is always at the command of those who are interested in Kerr products.

Bulletins descriptive of Kerr products will be mailed on request.

# KEWANEE PRIVATE UTILITIES COMPANY

(FORMERLY KEWANEE WATER SUPPLY CO.)

Manufacturers of Water Supply, Sewage Disposal and Electric Lighting Systems

MAIN OFFICE AND FACTORY

KEWANEE, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street

CHICAGO, ILL., 1212 Marquette Building

## Products and Services.

KEWANEE SYSTEMS FOR ISOLATED AND PRIVATE SERVICE, which include:

WATER SUPPLY SYSTEMS, COMPLETE PUMPING UNITS, and PNEUMATIC TANKS.

SEWAGE DISPOSAL SYSTEMS.

ELECTRIC LIGHTING SYSTEMS, with or without STORAGE BATTERY, for Light, Heat and Power.

A competent Engineering Department will co-operate with architects in planning and selecting apparatus for each particular requirement, and layouts will be made and submitted free of charge.

## In General.

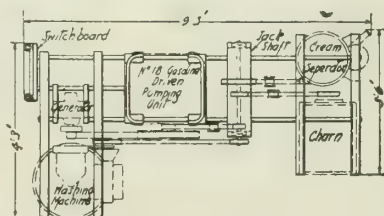
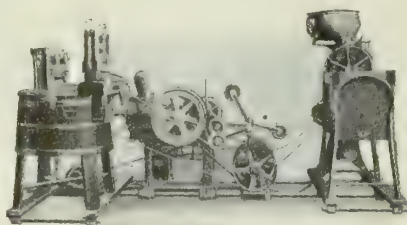
The KEWANEE PRIVATE UTILITIES COMPANY provides high grade equipment and dependable service for the average man in the out of the way place. They go together without mistake, start without coaxing, run without skilled attention, wear the longest time possible, and can be repaired by the unskilled man without shop tools or conveniences.

## The Kewanee Plan.

Country homes should have a plan for complete equipment covering water supply, sewage disposal, electric lighting, heating, and the use of power for all work around the buildings that can be done by machinery; and every machine bought, every addition to buildings or equipment made, should be in accordance with this plan. Anyone who will write for and fill out our information blank will be supplied with such a plan free of charge.

## "Elastic" Sub-base.

A Kewanee gasoline engine is a power plant that is of the greatest possible service; and owing to the method of mounting on the "elastic" subbase, it not only drives the pumping unit, but other machinery, such as electric lighting plants, vacuum cleaning



PLAN SHOWING SYSTEM OF KEWANEE MOUNTING



TRADE-MARK

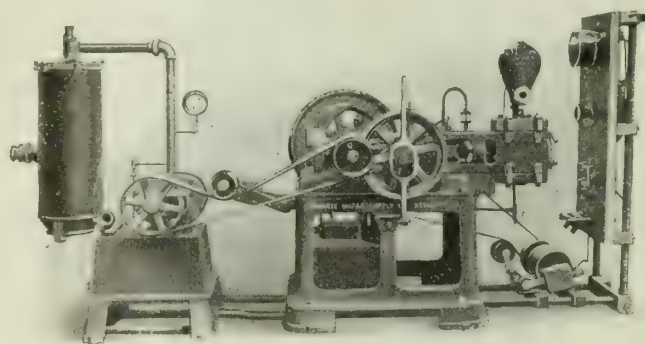
machines, cream separators, churns, washing machines, feed grinders, bone cutters, emery wheels, grindstones, etc.

The "elastic" features of the subbase and jack shaft allow for provision of special needs in each case, as is well shown in illustrations. Machines may be run separately or all together up to the capacity of the engine.

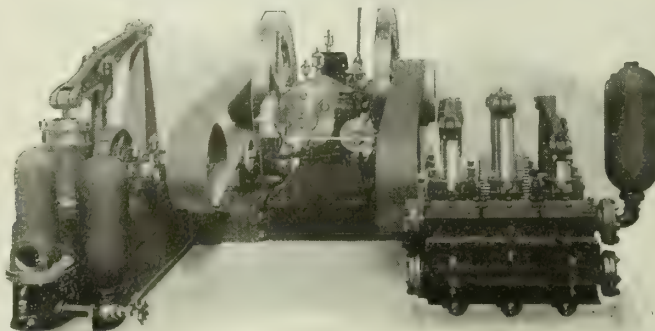
It can be bought all at once, or a piece at a time; no foundations are required, or "lining up" or fastening down. All expert work is done at the factory.

All machines are held off the floor, which can be flushed with water and kept clean and sanitary. No line shafts or countershafts attached to walls or ceilings to carry noise and vibration through the house.

Where electric power is available and a gasoline engine is not required, the same system of mounting can be used for driving all the machines from one motor.



NO. 25 KEWANEE PUMPING UNIT, SUCTION TYPE, VACUUM CLEANING MACHINE, ELECTRIC LIGHTING PLANT



KEWANEE LONG STROKE TRIPLEX SUCTION PUMP, AND DIFFERENTIAL PLUNGER DEEP WELL WORKING HEAD, DRIVEN BY KEWANEE GASOLINE ENGINE

Each machine mounted on a rigid cast iron subbase, all bolted together. No lining up, no special foundations or fastening down

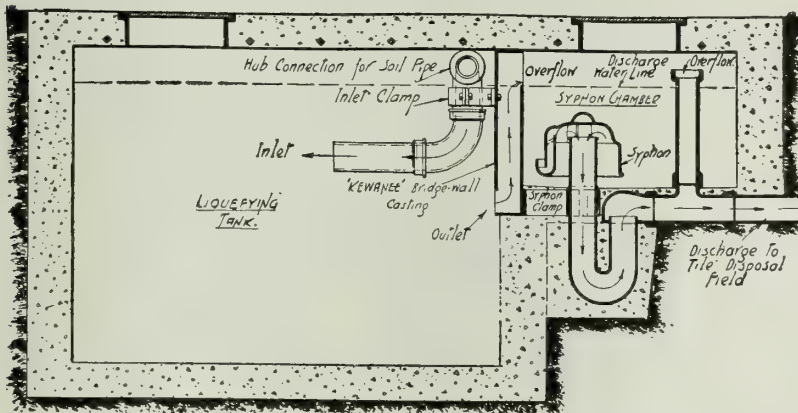


### Kewanee Bacterial System of Sewage Disposal.

The Kewanee bacterial system of sewage disposal represents a scientific and highly approved simplification of the sewage problem for residences and other buildings not served by public sewers. It accomplishes its results bacteriologically, and without the use of any chemicals. It converts the sewage into liquid, and distributes it, over a disposal field, as pure, clean, inorganic matter, harmless to life or vegetation.

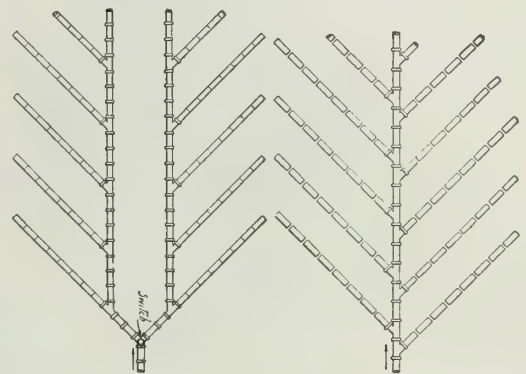
This system is recommended for installations having capacity requirements of not over 100 persons.

(2) Number of people using fixtures. Fixtures in basement. (3) Depth of basement floor below ground level. (4) Fall of ground in yard. (5) Is brook, ditch, or drain tile available for purified water? (6) City or private water supply. If private, give description of plant and well. (7) Kind and depth of surface soil; of subsoil. (8) Make rough sketch of buildings and grounds, giving distances. (9) Show direction and amount of fall of ground from buildings. Show location of well. (10) Show preferred location of liquefying tank and tile disposal field.



VERTICAL SECTION SHOWING CONSTRUCTION OF SEWAGE TANK

Tank of concrete and carefully proportioned according to capacity requirements. A simple casting carries inlet, outlet and vent openings, bridge wall and baffle plate between the two chambers, and fixes position of siphon. Entrance to outlet is vertical, and does not collect solid matter. Automatic siphon discharges periodically into the disposal field.



Double Tile for large systems or heavy soil

Single Tile for small systems and light soil

#### DISPOSAL FIELDS

Distributing lines of 4-in. land tile laid in long or short runs, straight or curved, with  $\frac{1}{4}$ -in. spaces between the 1-ft. lengths of tile

For these capacities, the system is entirely automatic in operation, and requires no attention whatsoever. It is unaffected by changes in temperature, and is vented through the soil pipe, all odors and gases being discharged through the soil pipe stack above the roof.

A few Kewanee operating specialties and installation instructions, together with necessary construction materials purchasable locally, make it possible for any mechanic to properly install this system.

**BACTERIAL PRINCIPLE INVOLVED**—The principle involved in a bacterial sewage disposal plant is very simple. Certain bacteria, called anaerobes because they thrive only when kept in the dark and out of contact with air, have the power to reduce vegetable and animal solids to liquids and gases. Certain other bacteria, called aerobes because they thrive only when kept in contact with air, have the power to purify this liquid product produced by the anaerobes, by oxydizing it and reducing it to pure water and harmless gases.

The bacteria necessary for this work exist everywhere, and all that is necessary to do in the development of a sewage system is to provide the best conditions for them to live and multiply in, subjecting the sewage, in turn, to each of the two kinds of bacteria.

**BRIEF DESCRIPTION**—The Kewanee system consists, primarily, of a septic tank, or anaerobian breeding plant, into which the sewage is first passed and in which it is liquefied, and of a subsurface disposal field through which the liquefied sewage is passed for exposure to air and aerobes, and consequent conversion into clean inorganic gases and pure water.

**FITTINGS SUPPLIED**—Kewanee bridge wall casting, inlet clamps, siphon and all necessary bolts; also two manhole rings and covers, when specified.

**INFORMATION REQUIRED WHEN ORDERING**—(1) Number and kind of buildings; of plumbing fixtures.

### Bulletins on Private Utilities.

A Complete Handbook of Information on Private Utilities for Country Homes is contained in our set of bulletins which total almost 200 pages with only the necessary information and details. The complete set of bulletins, in neatly bound form, or any separate bulletins, will be sent to any architect on request.

The complete list of bulletins, with the subjects covered, follows:

**BULLETIN "A"**—Private Utilities and details of combination plants.

**BULLETIN "B"**—Complete Kewanee System of Water Supply, giving method of operation and ranges in size.

**BULLETIN "C"**—Kewanee "Indian Brand" Pneumatic Tanks from 140- to 20,000-gal. capacity.

**BULLETIN "D"**—Kewanee Light Service Pumping Machinery with capacities up to 300 gals. per hour.

**BULLETIN "E"**—Kewanee Standard Service Pumping Machinery with capacities from 100 to 1000 gals. per hour.

**BULLETIN "F"**—Kewanee Long Stroke Triplex Pumps with capacities from 1500 to 10,000 gals. per hour, and working pressures from 75 lbs. to 200 lbs.

**BULLETIN "G"**—Kewanee Deep Well Working Heads. Capacity from 600 to 9300 gals. per hour. Maximum depth to water 300 ft.

**BULLETIN "H"**—Kewanee Sewage Disposal System, explaining septic tank action and showing method of construction.

**BULLETIN "I"**—Kewanee Gasoline Storage Tanks and Pumps for public and private garages.

**BULLETIN "J"**—Kewanee Gasoline Engines, 1 to 4 h. p.

**BULLETIN "K"**—Kewanee Gasoline Engines, 4 to 50 h. p.

**BULLETIN "L"**—Kewanee Isolated Service Storage Battery Electric Plants.

**BULLETIN "M"**—Kewanee Isolated Service Large Electric Plants with or without storage batteries.

**BULLETIN "N"**—Kewanee Windmill Pumps.

**BULLETIN "O"**—Kewanee Centrifugal Pumping Machinery.

**BULLETIN "P"**—Kewanee Stationary Vacuum Cleaning Machinery.

# MILWAUKEE AIR POWER PUMP CO.

## Private Water Supply System

886 Third Street  
MILWAUKEE, WIS.

### Product.

MILWAUKEE AIR POWER WATER SYSTEM for country homes, schools, clubs, institutions, farms and other places where city water systems do not reach; also for private wells and cisterns in the city.

### Milwaukee Air Power Water System.

The two types of water supply systems most generally used are: The non-storage system that brings water through pipes from well or spring direct to the faucet; and the storage system, which pumps water into a tank where it is stored.

The Milwaukee air power water system is a "direct from the well," non-storage system, and supplies water that is absolutely fresh.

The system consists of five principal parts as follows: engine or motor, pump, air storage tank, air pressure valve, air compressor. The pump is placed in the water in well, rain water or fresh water cistern, spring, or intake well which draws its water from a lake or running stream.

**POWER EQUIPMENT**—Consists of engine or motor, air compressor and air tank, and may be located in any existing building or in small shed erected especially for it. The average power equipment occupies space of about 4 by 14 ft. on the floor, and 5 ft. high.

**FLEXIBILITY OF SYSTEM**—The power equipment does not have to be at the well, but may be located anywhere, thus utilizing the engine to operate other machinery such as electric generators, feed grinders, washing machines and cream separators, charging storage batteries, inflating tires. A dozen or more pumps may be operated by one power equipment of size giving sufficient air capacity.

**HOT AND COLD, HARD AND SOFT WATER**—One power equipment and two pumps with necessary piping will give hard and soft, hot and cold water, any place desired.

### Advantages of Non-storage System.

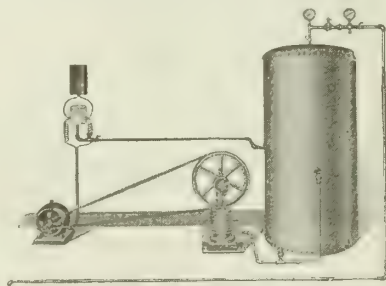
Water always fresh, right from well or spring. In summer water is cool. In winter water is same temperature as that in well or spring.

For a given quantity of water, a much smaller tank is required. With tanks of equal size, the Milwaukee system delivers about 5 times as much water as a storage system.

Air tank may be placed anywhere; air does not freeze. Power equipment may be placed where engine or motor may be used for other work. One or a dozen springs, wells or cisterns may be pumped with one tank and one power equipment. There is always plenty of air to operate the pump. Water for fire protection is at high pressure.

### Motor Installation.

Where current is available, a motor installation is always recommended, as it can be made automatic in its operation.



MOTOR INSTALLATION

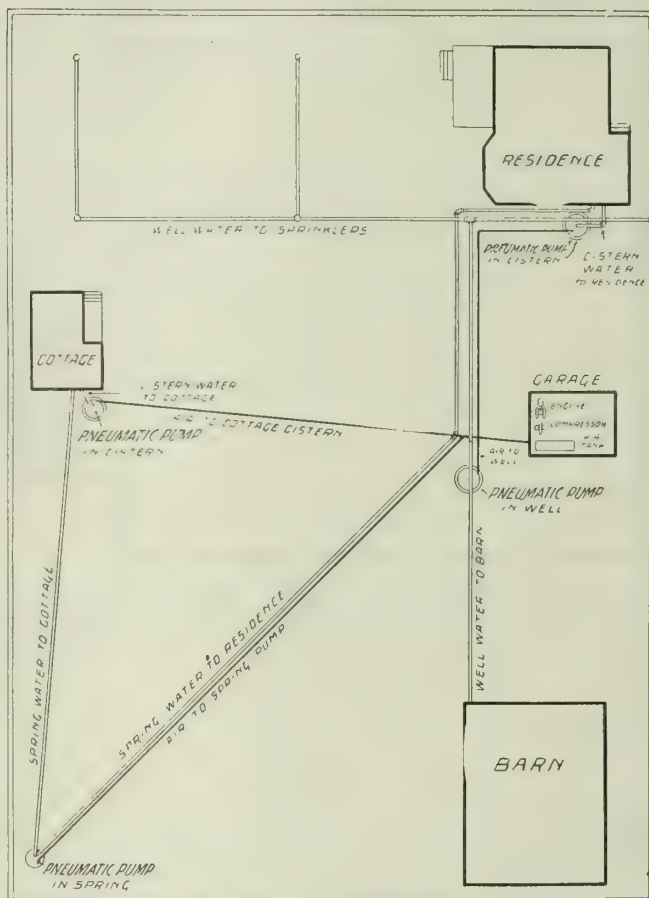
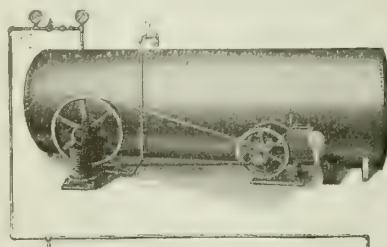


DIAGRAM SHOWING INSTALLATION OF MILWAUKEE AIR POWER WATER SYSTEM

Pumping equipment installed in existing buildings at any convenient point. In this case it is a garage. Pump is placed in well or cistern. 4 pumps used in this installation, 1 each for 2 cisterns, 1 in spring and 1 in well. The air lines are carried underground to each of 4 pumps. Thus there are 2 systems of pipes, 1 for air and 1 for water.

Spring, well or cistern water can be supplied to any building or point by merely adding necessary piping



ENGINE INSTALLATION

### Engine Installation.

Small oil or gasoline engines operate most of the Milwaukee installations. A 2½ h. p. engine supplies ample air for two No. 5 pumps. This is the outfit generally installed.

By using air tank of sufficient capacity to pump one day's supply of water, the engine need be run only a short time each day. A larger air tank makes pumping necessary only two or three times a week.

Air may be taken from tank to soft water cistern, spring, lake or river, where one or more pumps may be installed. Other pumps may be added any time after original installation has been made.



### Important Feature.

A storage water system generally can be changed into a Milwaukee air power "direct from the well" water system at comparatively small cost, as the water storage tank may be used for an air reservoir.

### Milwaukee Single and Double Cylinder Pumps.

FOR OPEN WELLS, CISTERNS, SPRINGS, LAKES, ETC.—Type "R" shallow water pump is used in shallow wells, cisterns, lakes, springs and rivers. Delivers 15 gals. per minute or 800 gals. per hour; is 12 ins. outside diameter, and will work in 8 ins. of water. For simplicity and durability these pumps have no equal.

They require no shifting mechanism. An expansion tank on the water line equalizes the flow while the water chamber is filling.

For the reason that the air exhaust valve seats independently of air inlet valve, no fine adjustments are necessary. The action of these pumps is governed by two floats, so that no motive power, spring action, pistons or latches are required.

Type "K" shallow water pump is especially designed for heavy duty and where large volume of water is used. This pump is 16 ins. in diameter; requires a well 18 ins. or larger; and when submerged in 3½ ft. of water, delivers 2,000 gals. or 60 barrels of water per hour, and 10 gals. per minute in 1 ft. of water. Especially adapted to shallow water work, such as springs, cisterns, intake wells near rivers or lakes, where it is very difficult to get a good head of water.

No. 4 is for use in 4-in. wells and has delivering capacity of 400 gals. per hour. No. 5 is for 5 ins. inside diameter or larger wells and delivers 800 gals. per hour.

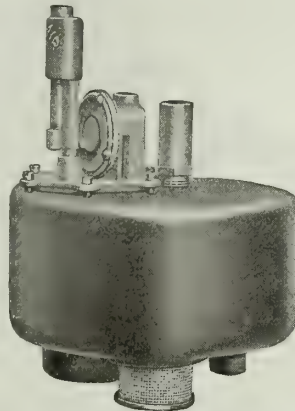
Nos. 4, 5 and 6, both single and double cylinder pumps, are made of brass and bronze, and all working parts of "K" pump are brass and bronze.

FOR TUBULAR WELLS—For use where a large quantity of water is required. No. 5 double cylinder is designed for 5 ins. or larger inside diameter wells; will work in 5 ft. of water and has maximum delivering capacity of 1,000 gals. per hour. No. 6 double cylinder built on same lines as No. 5; requires 6 ins. or larger inside diameter well and delivers 1,500 gals. per hour.

### Fire Protection.

A Milwaukee air power system is specially adapted for fire use, and supplies an unbroken stream of water of steady volume and even pressure. Normal pressure of

5 to 10 lbs. can be increased almost instantly by simply turning a valve to give a pressure of from 50 to 100 lbs., sufficient to throw a stream to any point on the gables or roof of the ordinary house or barn. This is accomplished by use of our pressure regulator, an exclusive feature and one which may be worth in five minutes five times the cost of the entire plant.



SHALLOW WATER SINGLE CYLINDER "R" PUMP  
Also made double cylinder "K"



AIR PRESSURE REGULATOR

### Cost of Milwaukee Water System.

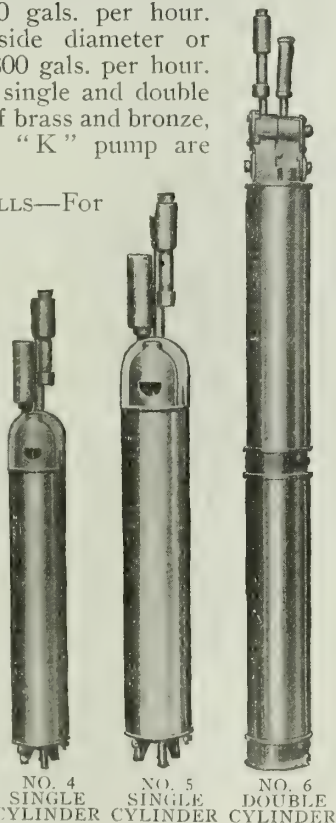
Cost of any individual installation and full particulars will be given upon receipt of necessary data as indicated on information blank, copy of which follows: Estimate will be furnished either directly by the company or by dealer. Dealers who install this system are widely distributed over the United States; and where no such dealer is located, a competent plumber or steamfitter does the work.

### Information Required to Make Specifications.

- (1) Give depth of well.
- (2) Give depth to the water from top of well.
- (3) Give diameter of well at smallest place in inches.
- (4) Give amount of water required each 24 hours.
- (5) How many, and what, plumbing fixtures in house, barn and on lawn to be provided with water?
- (6) What power do you have?
- (7) If electric motor or gasoline engine, give horsepower.
- (8) Do you want to draw or raise water from both rain-water cistern and well?
- (9) How high do you want to deliver water from mouth of well?
- (10) Make rough diagram showing points to which you wish to deliver water from well, giving distance in feet.
- (11) Will you want pressure enough for sprinkling purposes?
- (12) If you have no power at present, or are in need of a new power, what do you prefer—electric motor or gasoline engine?
- (13) If electric motor, state voltage and whether direct or alternating current; and if alternating current, whether 1-, 2- or 3-phase. Also give number of cycles.
- (14) State whether or not current is continuous. If interrupted any time during 24 hours, give hours when there is no current.
- (15) Do you need power for any purpose other than supplying water?
- (16) Do you separate cream every day?
- (17) Give distance of well to location of motive power.

### References.

Up to date, 7,500 installations have been made in all parts of the country. List will be furnished on application.



NO. 4 SINGLE CYLINDER  
NO. 5 SINGLE CYLINDER  
NO. 6 DOUBLE CYLINDER

# UNITED PUMP & POWER CO.

Manufacturers of Fresh Water Systems

MILWAUKEE, WIS.

REPRESENTATIVES IN ALL PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

## Products.

NATIONAL FRESH WATER SYSTEMS, operated by Engine or Motor, Belt or Gear Driven.

## Distinguishing Features.

Fresh water is delivered direct from the source of supply to the faucets, making it entirely unnecessary to store the water in a tank to get it under pressure. This non-storage feature eliminates any possibility of contamination or deterioration of the water, and insures a supply of fresh drinking water at all fixtures. The natural palatableness of the water is unimpaired in any manner and is as safe as the source of supply itself, having an even temperature the year round, cool in summer and temperate in winter.

## General Description.

The National Fresh Water System consists of the following:

National fresh water pump (with air trap).

Air compressor.

Pressure maintaining valve.

Special angle check valve.

Special air strainer.

Pop safety valve.

2 Special air cut-off valves.

Special air cut-off valve.

Special air trap valve.

3 Special air release valves.

Shut off valve.

Pressure gauge.

Altitude gauge.

Air tank.

Belt.

Engine or motor.

Automatic electric controller or automatic cut-out switch.

Special for hot water pipe: special hot water safety valve; swing check valve.

## Explanation.

An engine or motor of proper size and power must be furnished to operate the system.

Where electric current is available the system may be made entirely automatic by means of our automatic electric controller.

Where an engine is used, the system may be made semiautomatic by means of our automatic engine cut-out switch.

The size of the air tank to be supplied will be determined by the amount of water required, and the height to which it must be delivered.



FIG. 1. ILLUSTRATION SHOWS NATIONAL FRESH WATER SYSTEM INSTALLED IN THE BASEMENT OF A RESIDENCE

## Operation.

Refer to Fig. 4. The motor or engine operates the air compressor, which in turn fills the air reservoir with compressed air. The compressed air furnishes the power to operate the pump. The pressure is continuously on the pump, but is only used when the pump is actually delivering water; that is, when a faucet is opened.

The principle of operation may be aptly compared to winding up a watch. A certain amount of energy is stored in the main spring, and the use of this energy or stored-up power is spread out over a long period of time.

The pump, being of the single cylinder type, has an interval when it is refilling, when it delivers no water, and to maintain a constant and equal

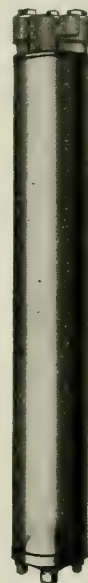


FIG. 2.  
TYPE "A"  
PUMP  
For drilled  
wells



FIG. 3.  
TYPE "A"  
PUMP,  
CASING  
REMOVED



flow at the faucets at all times, an air trap or equalizer is introduced into the water line, at any convenient place. This maintains the flow at the faucets, when the pump is refilling.

The air pressure from the air reservoir to the pump is controlled and regulated by means of the pressure maintaining valve on the air line. This is set to give the pressure desired at the faucets and automatically regulates the amount of air passing to the pump in direct proportion to the amount of water being delivered, an extremely economical feature, and only to be had on this system.

### Sanitary and Mechanical Advantages.

The National fresh water systems offer many points of superiority, both sanitary and mechanical:

(1) Store no water, but deliver it in its natural purity direct from the source of supply. There is absolutely no possibility of contamination or foulness due to storage tanks.

(2) No tanks to clean periodically or freeze up in winter.

(3) No attic tank to sag the building or overflow and ruin ceilings and floors.

(4) Two or more pumps, one for hard and one for soft water may be operated from one air compressing equipment.

This is a most important advantage where space is limited, or where only hard water is installed and soft water contemplated later.

(5) No working head is required for deep wells. The National fresh water pump does not depend on suction or plungers for delivering water—hence the one type is suitable for either deep or shallow wells.

(6) The power unit may be located at any convenient place, without regard to the source of water supply.

This makes an extremely flexible system and this feature is very often of the greatest convenience when planning the location.

(7) Because only air is stored, with the same size tank approximately three times more water can be delivered than by any hydro-pneumatic system.

### Type "A" National Fresh Water Pump.

The pump is the "heart of the system" and is shown in the accompanying illustrations (Fig. 2) ready to be placed in service and in (Fig. 3) with the outside cylinder removed, exposing the working parts. Its construction is clean cut throughout, simple and reliable.

The workmanship is of the most skilled and highest order.

The materials used are gun bronze, copper and phosphor bronze.

The design has been carefully and consistently developed through a long period of years, and it embodies the very best and

most correct principles of hydraulic engineering. Internal friction, so common to most pumps, has been practically eliminated.

The type "A" National fresh water pumps will operate in any water which is suitable for domestic use, and may be operated in drilled or open wells, cisterns and lakes. Can be installed in cased well 3 ins. in diameter or larger, and where the total lift from the bottom of the pump to the highest fixture does not exceed 125 ft.

Because the type "A" National fresh water pump fills by gravity, provision should always be made to have at least 6 ft. of water over the top of the pump to insure rapid refilling and best results. This is readily accomplished in a well by submerging the pump so that its top is 6 ft. under the working level, and in a cistern a sump pit is used (Fig. 4).

### Size and Capacity.

National fresh water systems range in capacity from 300 to 1200 gals. per hour.

All equipments include the Type "A" National fresh water pump together with air compressor and controlling valves.

Detailed list furnished on application. Size will vary, depending upon the capacity of the system.

### Selection of Proper Equipment.

This company manufactures about 30 different size equipments to meet all general or special conditions. An engineering department is maintained, whose services are at the free disposal of clients, and full particulars and advice will be gladly furnished in drawing up plans and specifying.



FIG. 4. INSTALLATION FOR SUPPLYING WATER FROM A LAKE

The one air compressing equipment at the left in the above illustration will supply both lake and well water. May be placed in any convenient location, as air in tank will not freeze (as will water in tanks of water storage system). If electricity is available, air compressor may be operated by electric motor and automatically started and stopped by automatic electric controller, thus requiring no attention other than an occasional oiling.

See Figs. 4 and 5, and following pages.

DATA, NATIONAL FRESH WATER PUMPS

Number of pump	Inside diameter of well	Diameter of pump	Length of pump	Number of faucets in use	Capacity per hour (approx.)
A-305	3 ins.	2½ ins.	42 ins.	1	300 gals.
A-410	4 ins.	3⅝ ins.	42 ins.	2	600 gals.
A-515	5 ins.	4⅝ ins.	42 ins.	3	900 gals.
A-620	6 ins.	5⅝ ins.	42 ins.	4	1200 gals.

In order that the proper equipment may be specified, the following information should be supplied to the company:

- (1) Source of water supply.
  - (2) Inside diameter of well; total depth of well.
  - (3) Total depth of water in well.
  - (4) How much does water level in well lower when delivering — gallons per minute?
  - (5) How high (in feet) is water to be delivered, measuring from the ground to the highest fixture?
  - (6) Water used daily (in gallons).
- How many persons to be supplied? How many

head of stock—horses, cattle, sheep and dogs?

How many bathtubs.....? shower baths.....? lavatories.....? sinks.....? closets.....? laundry tubs.....? lawn faucets.....? faucets in barn.....? stock tanks.....? drinking fountains.....? other connections.....?

(7) Is gasoline engine or electric motor to be used?

(8) If electric motor, state voltage..... Is current direct or alternating? If alternating, state whether 1-, 2- or 3-phase, number of cycles.....? Is electric service continuous?

(9) Is water wanted from both rain water cistern and well?

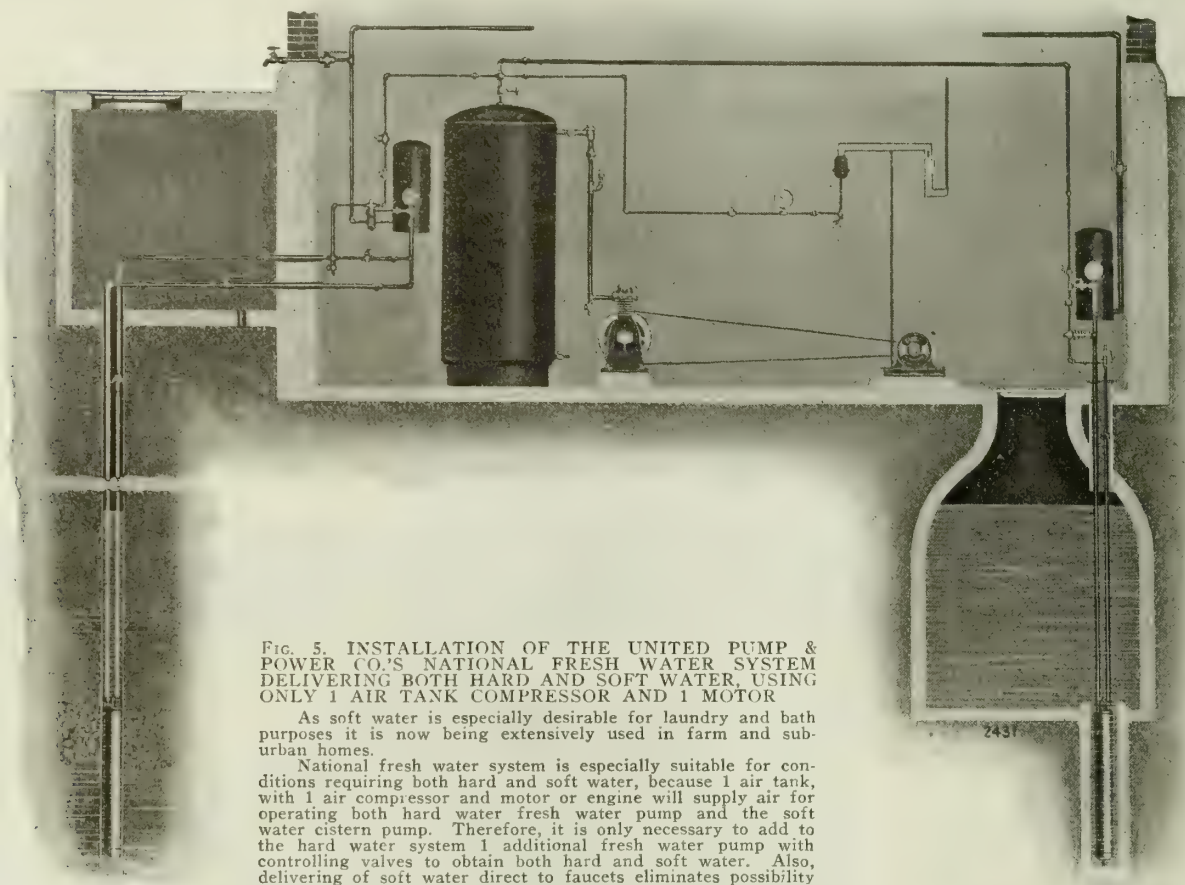


FIG. 5. INSTALLATION OF THE UNITED PUMP & POWER CO.'S NATIONAL FRESH WATER SYSTEM DELIVERING BOTH HARD AND SOFT WATER, USING ONLY 1 AIR TANK COMPRESSOR AND 1 MOTOR

As soft water is especially desirable for laundry and bath purposes it is now being extensively used in farm and suburban homes.

National fresh water system is especially suitable for conditions requiring both hard and soft water, because 1 air tank, with 1 air compressor and motor or engine will supply air for operating both hard water fresh water pump and the soft water cistern pump. Therefore, it is only necessary to add to the hard water system 1 additional fresh water pump with controlling valves to obtain both hard and soft water. Also, delivering of soft water direct to faucets eliminates possibility of ever getting rusty water, as is often the case when soft water is stored in a steel tank.

January 2, 1918.

GENTLEMEN:

"Under separate cover I am sending you some photos of the residence at Cherrycroft, my home near Omaha.

"I am using your National Fresh Water System there and find it economical and very satisfactory.

"I am able with it to have the rain water from my cistern both hot and cold in laundry, kitchen and bathrooms and well water in those rooms also, and have the latter at barn, poultry house, gardens and lawns.

"I cannot see how it could be improved upon for homes without city water supply.

"We would give up almost any other modern convenience rather than your water works system."

Yours very truly,

JOHN W. WELCH.

Welch's Restaurant, Omaha, Nebr.



CHERRYCROFT, SUBURBAN RESIDENCE OF J. W. WELCH, OMAHA, NEBR.

V. R. SHELLEY, Contractor, Omaha, Nebr.





RESIDENCE OF M. L. BENEDUM, PITTSBURGH, PA.  
W. H. VANTINE, Architect, Detroit, Mich.

The above illustration shows a front view of the residence of M. L. Benedum, Pittsburgh, Pa., in which a Fresh Water System has been in operation for a number of years, both spring and cistern water being used; also the air compressing equipment and tanks located in the garage, consisting of two 5 h.p. gear driven compressing units and two 4 by 20-ft. air tanks.

The water is carried to a large spring reservoir on the side of a hill and a capacity of 80 gals. per minute provided for the spring water. In the cistern near the house 80 gals. pumping capacity is also provided for cistern water.

In the basement are 2 pressure filters for mechanically cleaning the water, and are so piped that the direction of the flow through the filters may be reversed which thoroughly washes the filters.

This installation was made by the Pittsburgh branch in 1911.

In addition to the water supply equipment, we installed a 25 kw. direct connected natural gas engine and generator for electric lights, and a large storage battery

April 27, 1917.

DEAR SIRs:

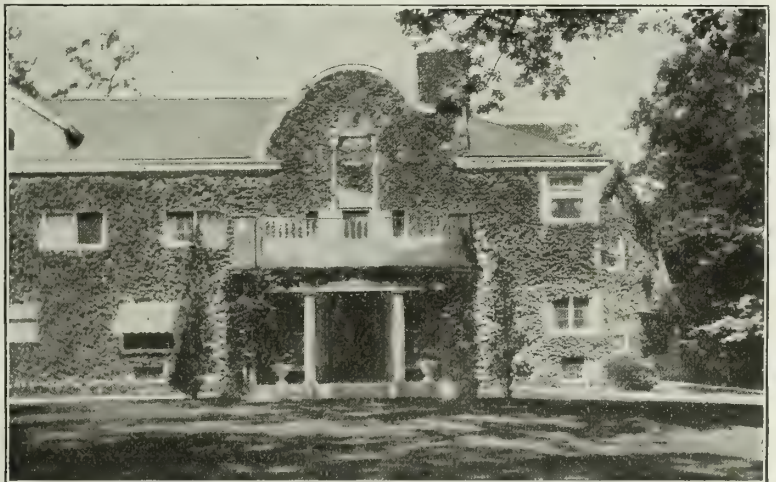
"I have your letter of the 24th instant in which you ask permission to use my name as a user of your Fresh Water System which I gladly consent to, having had the system in my home at Lake Forest for about ten years. It has given great satisfaction and has been a source of great pleasure to always have fresh, clear water and the fact has often been commented upon by our guests.

"We have, of course, had no trouble whatsoever with frozen tank, as there is none, and the temperature is, during the winter and summer, practically the same, inasmuch as it comes direct from the earth to the consumer.

"I am enclosing two postal card photos of the house, but cannot say that the Boston Ivy which completely covers the front is due to your Fresh Water System. These you may use as your judgment dictates."

Yours very truly,

E. A. RUSSELL,  
Otis Elevator Co., Chicago.



RESIDENCE OF E. A. RUSSELL, LAKE FOREST, ILL.  
J. T. HETHERINGTON, Architect, Chicago, Ill.



# THE VAILE-KIMES CO.

## Manufacturers of House Pumps

### DAYTON, OHIO

#### Products.

"V&K" WATER SUPPLY SYSTEMS for every domestic requirement.

"V&K" SHALLOW and DEEP WELL PUMPS for operation by electric motor, gasoline engine or belt drive.

"V&K" Water Motor Pumps; "V&K" Rain Water Pumps.



TRADE-MARK

#### Experience.

Many years of experience as specialists in the manufacture of house pumps has enabled this company to include in its designs many improvements of special value, and on which numerous patents have been allowed.

#### Simplicity of "V&K" Pumping Apparatus.

The design of "V&K" apparatus is made as simple as possible, consistent with effective work. No expert knowledge is required to install or operate.

#### Construction.

The material used in "V&K" apparatus is the best that can be bought for the purpose, and all parts are machined and finished to an accurate degree, and finally subjected to rigid tests.

#### Silent Operation.

The "V&K" method of driving pump from motor, as well as every other point in the construction and arrangement of parts, make "V&K" pumps practically noiseless in operation.

#### Electric Motors.

The electric motors used with "V&K" pumps were developed especially to meet the exacting requirements of automatic pump drive. Experience has proved that the ordinary stock motor is not suitable, nor will it prove reliable in pump service.

#### Lubricating System.

"V&K" pumps are equipped with a special lubricating system, which automatically distributes oil to all working parts.

#### "V&K" Automatic Electric Pressure Switch.

This mechanism is actuated by change of pressure in the tank, starting and stopping the electric motor automatically. A valuable feature in the design of the "V&K" switch permits of a certain drop in the tank pressure before starting the pump, thus greatly reducing the number of starts each day.

#### Air Attachment.

All "V&K" electric pumps are fitted with a special air attachment for supplying air to the tank.

#### Fresh Water Service.

By use of the "V&K" fresh water attachment "Koltap," water may be had direct from the well independent of the storage tank, giving a supply of cool fresh water at one or more of the fixtures for drinking or cooking purposes. May be used with both shallow and deep well systems.

#### Guarantee.

All "V&K" pumps are guaranteed to be made of

first class material, free from flaws and imperfect workmanship, and any part proving defective will be replaced without charge.

#### Co-operative Service.

This company maintains a fully equipped service department, which is at the service of those requiring assistance in connection with pump problems, whether it be for correcting trouble, working out new systems, or general information.

#### "V&K" Shallow Well Systems.

COMPLETE WATER SUPPLY SYSTEM FIG. 267—Designed especially to fill the demand for a complete and absolutely reliable outfit, which may be used for supplying the house fixtures with soft water, or for general water service from a well or other source of supply where the vertical depth to water does not exceed 22 ft.

Especially adapted for use with private lighting plants.

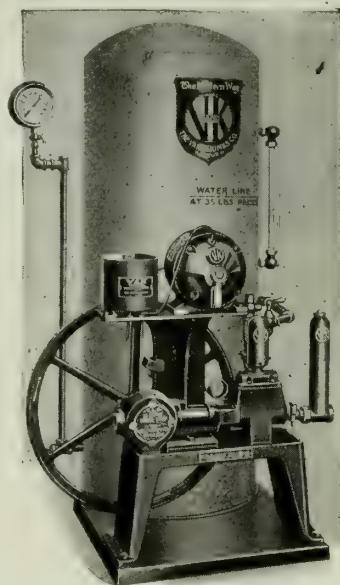


FIG. 267. COMPLETE SHALLOW WELL SYSTEM  
Pressure, 35 to 50 lbs.  
Suction lift, 22 ft.

DATA, FIG. 267 SHALLOW WELL SYSTEMS

Size No.	Pump capacity, gals. per hour	Tank capacity, gals.	Dimensions, ins.			Suction, ins.	Discharge, ins.	Horse-power motor	Shipping weight, lbs.
			Height	Width	Depth				
267 E-2	120	42	48	23	28	3/4	1/2	1/6	240
267 E-3	180	53	50	23	30	3/4	1/2	1/4	300
267 E-4	120	80	63	23	32	3/4	1/2	1/6	300
267 F-4	210	80	63	32	32	3/4	1/2	1/4	370
267 F-6	210	120	63	32	36	3/4	1/2	1/4	430
267 F-8	210	220	75	32	40	3/4	1/2	1/4	480
267 G-8	360	220	75	36	44	1	3/4	1/2	520
267 G-10	360	315	75	36	48	1	3/4	1/2	700

Furnished with "V&K" electric automatic pressure switch. Above outfits furnished with motor for 32, 110 and 220 volts, D. C., also for 110 and 220 volts, A. C., any cycle.

The medium and larger outfits are adapted for well water service, especially if lawn sprinkling will be included in the requirement.

For pumping rain water to the fixtures in bathroom, laundry, etc., the small outfits should be used.

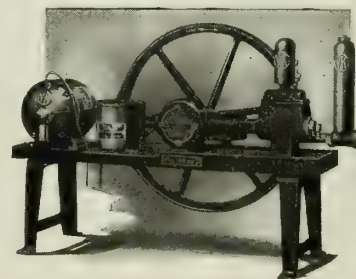
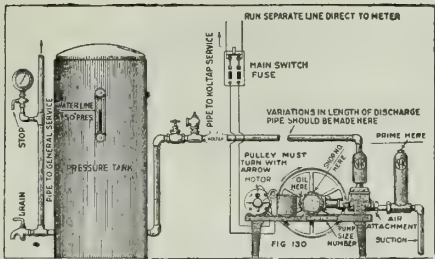


FIG. 130. ELECTRIC DIRECT PRESSURE SHALLOW WELL PUMP





ELECTRIC DIRECT PRESSURE SHALLOW WELL PUMP SYSTEM Showing Fig. 130 pump and "V&K" automatic electric pressure switch installed in complete system

DATA, "V&K" SHALLOW WELL PUMPS  
Maximum pressure, 50 lbs. Suction lift, 22 ft.

Fig. Nos.	Capacity, gals. per hour	Suction pipe, ins.	Discharge pipe, ins.	Dimensions, ins.			Shipping weight, lbs.	
				Length	Width	Height		
130	150						130	150
Size Nos.								
3	503	210	3/4	33	10	24	150	145
5	505	360	1	41	13	27	225	220
7	507	720	1 1/4	52	13	31	300	290

Fig. 145 pumps are of the same construction as Fig. 130, except that they are arranged for belt drive from gasoline engine or other moderate speed power. Fig. 153 pumps are the same construction as Fig. 130, except that they are arranged for belt drive and provided with reduction gears for driving direct from a high speed motor. Above outfits furnished with motor for 110 or 220 volts D. C. or A. C., any cycle.

"V&K" Deep Well Systems.

"SET - LENGTH" PUMPS FOR MODERATE SERVICE—Designed to meet the requirements of small or medium size residences, etc., where depth to water is from 22 to 50 ft. These pumps have ample capacity for all household demands, including lawn sprinkling.

They may be used in open or driven wells. Pump cylinder will go in a 2-in. well pipe.

Electric or power driven.

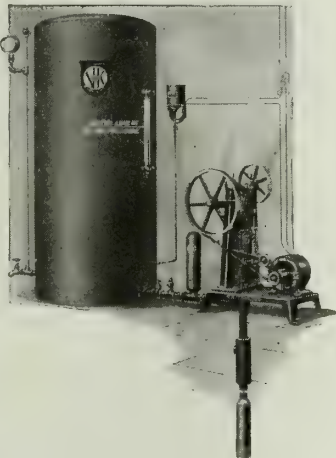
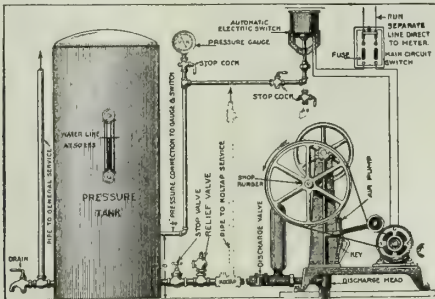


FIG. 269. "SET-LENGTH" PUMP DEEP WELL OUTFIT

DATA, OUTFIT 269  
Maximum pressure, 50 lbs. Capacity, 150 gals. per hour

Size No.	Pump	BLACK TANK	
		Dimensions, ins.	Capacity, gals.
269-A	Fig. 173—No. 203	24 x 60	120
269-B	Fig. 173—No. 203	30 x 72	220
269-C	Fig. 173—No. 203	36 x 72	315

Above outfits furnished with motor for 110 or 220 volts, A. C., any cycle; or 32, 110 or 220 volts, D. C.



"SET-LENGTH" ELECTRIC DEEP WELL PUMP

Showing Fig. 173 pump installed in complete direct pressure system, using a "V&K" automatic electric pressure switch. Can be used for discharge into open elevated tank, operating same by hand switch, or "V&K" automatic float switch.

Fig. 175 is similar in construction to Fig. 173, except that it is arranged for belt drive from gasoline or other belt power and may be used with pneumatic water supply systems in place of electric drive, or may be used for discharging into open elevated tanks

DATA, "SET-LENGTH" DEEP WELL PUMPS  
Pressure, 50 lbs. Capacity, 150 gals. per hour  
For wells where depth to water does not exceed 50 ft.

Stroke, ins.	Pump cylinder, ins.	Discharge pipe, ins.	Drop pipe, ins.	Dimensions, ins.			Shipping weight, lbs.
				Length	Width	Height	
6	1 3/4	3/4	1	35	14	32	200

Air pump required only when pumping into pneumatic tank. Pump cylinder will go in well pipe having 2-in. clear opening. Set-length drop, 5 ft. Specify voltage. If alternating current, give number of cycles.

"OPEN CYLINDER" PUMPS FOR HEAVY SERVICE—Designed for a heavier class of work than the "set-length" pump. They are adapted for wells where depth to water is 22 to 250 ft.

Fitted with pump cylinder of the open type, which permits pulling sucker rod and removing pump plunger and valves without disturbing pump cylinder and pipe connections. Electric or power driven.

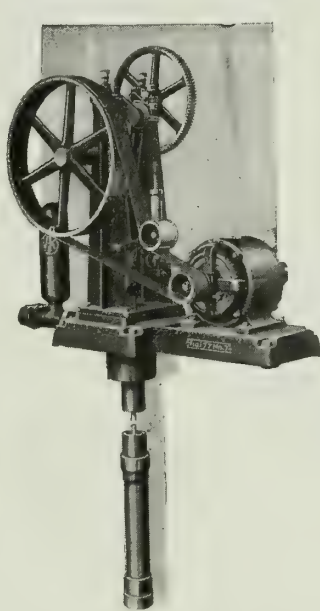


FIG. 177. Electric Drive "OPEN CYLINDER" DEEP WELL PUMP

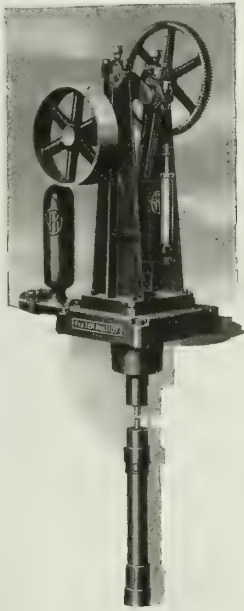
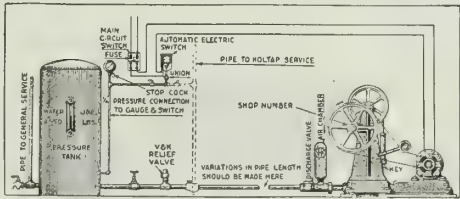


FIG. 181. Belt Drive "OPEN CYLINDER" DEEP WELL PUMP



"OPEN CYLINDER" ELECTRIC DIRECT PRESSURE DEEP WELL SYSTEM

Showing Fig. 177 pump and automatic electric pressure switch installed in complete system. Length, 46 ins.; width, 21 ins.; height, 40 ins.; shipping weight, 540 lbs.

Fig. 178 similar, except fitted with frostproof drop. Fig. 181: Length, 30 ins.; width, 18 ins.; height, 40 ins.; shipping weight, 360 lbs.

DATA, "OPEN CYLINDER" DEEP WELL PUMPS  
Pressure, 50 lbs. Capacity, 215 to 740 gals. per hour  
For wells 22 to 250 ft. to water

Size Nos.		Diam. cylinder, ins.		Vertical distance from tank to pump cylinder, ft.	Motor required, h.p.	Stroke, ins.	Crank turns per min.
		Inside	Extreme outside				
177-A1	181-A1	1 3/4	27 1/2	50	1 1/2	8	43
177-A2	181-A2	1 3/4	27 1/2	100	1 1/2	8	43
177-A3	181-A3	1 3/4	27 1/2	175	3/4	8	43
177-A4	181-A4	1 3/4	27 1/2	250	1	8	43
177-B1	181-B1	2 1/4	3 3/8	50	3/4	8	43
177-B2	181-B2	2 1/4	3 3/8	100	1	8	43
177-B3	181-B3	2 1/4	3 3/8	175	1 1/2	8	43
177-C1	181-C1	2 3/4	4	50	1	8	43
177-C2	181-C2	2 3/4	4	100	1 1/2	8	43
177-D1	181-D1	3 1/4	4 1/2	50	1 1/2	8	43

Specify voltage. If alternating current, give number of cycles.

# YEOMANS BROTHERS COMPANY

Manufacturers of Electric Pumping Machinery  
Engineers and Contractors

GENERAL SALES AGENTS for SHONE COMPANY. (See page 884)

221 Institute Place  
CHICAGO, ILL.

## REPRESENTATIVES

NEW ENGLAND: BOSTON, POWER EQUIPMENT Co., 131 State Street  
NEW YORK and VICINITY, E. A. JULIE, 307 Vanderbilt Avenue Building, 51 East 42nd Street  
PHILADELPHIA, BALTIMORE and WASHINGTON, DeWitt W. SMITH, 1001 Commercial Trust Building, Philadelphia, Pa.  
PITTSBURGH, N. C. DAVISON GAS BURNER & WELDING Co., 3145 Penn Avenue  
CLEVELAND, CLEVELAND PUMP & SUPPLY Co., 427 Guardian Building  
DAYTON, CHAS. M. KELSO Co., Reibold Building  
TOLEDO, W. HAWLEY & Co., Nicholas Building  
DETROIT, POWER PLANT SUPPLY Co., Chamber of Commerce Building  
MINNEAPOLIS and ST. PAUL, HEALY-RUFF Co., Plymouth Building  
OMAHA, McCULLEY-WIDENER Co., W. O. W. Building

KANSAS CITY, MO., H. H. WRIGHT, 208 Reliance Building  
PORTLAND, ORE., GORDON & FINKBEINER, 224 Pine Street  
SEATTLE and TACOMA, L. A. MARSH, 222 Marion Street, Seattle  
SAN FRANCISCO, CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY Co., 70 Fremont Street  
LOS ANGELES, F. C. MILLARD Co., Marsh-Strong Building  
DENVER, HENDRIE & BOLTHOFF MFG. & SUPPLY Co., 1621 17th Street  
SALT LAKE CITY, THOS. A. WILLIAMS, Scott Building  
BIRMINGHAM, GENERAL MACHINERY Co., American Trust Building  
CHARLOTTE, N. C., J. R. PURSER, Commercial Bank Building  
MONTREAL, WINNIPEG, TORONTO, CALGARY, CAN., DARLING BROTHERS, LTD., Montreal  
VANCOUVER, B. C., FRANK DARLING & Co., 1142 Homer St.  
HONOLULU, HONOLULU IRON WORKS  
BUENOS AIRES, BUXTON, OLDITCH & Co.

## Products.

YEOMANS FORM "A" DUPLEX CENTRIFUGAL ELECTRIC SEWAGE EJECTORS; YEOMANS SINGLE and DUPLEX ELECTRIC BILGE or SUMP PUMPS; YEOMANS HOUSE PUMPS; CONDENSATION RETURN PUMPS and PUMPING MACHINERY for all purposes.

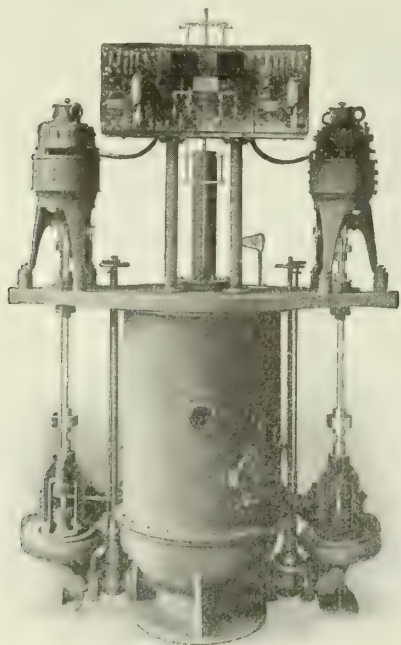
### Yeomans Form "A" Ejector.

A duplex equipment consisting of two special vertical centrifugal pumps operating in dry pit, connected to cast iron sewage receiver and driven by direct con-

nected vertical motors mounted on receiver cover, equipped with automatic controllers, high water alarm, pit drainage connections, cast iron bar screen of large area, gate and flush back check valves. Pumps arranged so that top plate can be raised without disturbing shafting, bearings or impellers. No accumulation of solids in receiver; minimum space requirements; high efficiency; noiseless; sanitary and reliable.

CAPACITY IN GALLONS PER MINUTE EACH UNIT, AND SIZE OF PIT REQUIRED

No. 3	100-125 g. p. m.	8 ft. diameter pit
No. 4	150-200 g. p. m.	8 ft. diameter pit
No. 5	250-350 g. p. m.	8 ft. diameter pit
No. 6	400-500 g. p. m.	10 ft. diameter pit



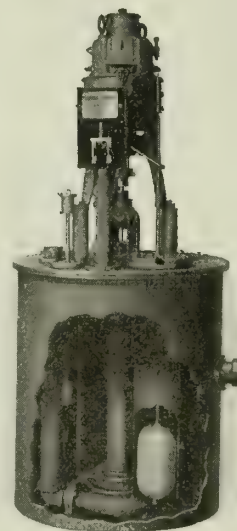
FORM "A" EJECTOR

### Yeomans Single Electric Bilge Pumps.

Automatic, self-contained, heavily constructed, slow speed machines, with submerged centrifugal pumps, vertical direct connected motors and automatic controllers for handling waste water and sewage. Built in two grades: Grade 1 pumps operating at slow speeds and equipped with high water alarm, pipe casing for float, force feed lubricated bearings, etc. Grade 2, moderate speed.

CAPACITY IN GALLONS PER MINUTE AND BASIN DIAMETER

No. 1/2	15-25 g.p.m.	24-in. diameter basin
No. 1	35-50 g.p.m.	36-in. diameter basin
No. 2	50-75 g.p.m.	36-in. diameter basin
No. 3	100-125 g.p.m.	36-in. diameter basin
No. 4	150-200 g.p.m.	36-in. diameter basin
No. 5	250-350 g.p.m.	48-in. diameter basin
No. 6	400-500 g.p.m.	48-in. diameter basin



GRADE 1 BILGE PUMP





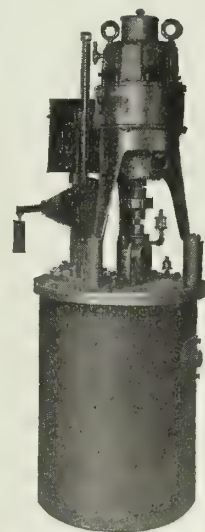
## YEOMANS DUPLEX ELECTRIC BILGE PUMP

STANDARD DRILLING



### TYPE "H" CONDENSATION RETURN PUMP

Pump No.	HORSE POWER OF MOTOR	
	Boiler pressure 10 lbs.	Boiler pressure 20 lbs.
1	1 $\frac{1}{2}$	1
2	1 $\frac{1}{2}$	1
3	3 $\frac{1}{4}$	11 $\frac{1}{2}$
4	3 $\frac{1}{4}$	11 $\frac{1}{2}$
5	1	2
6	2	3



TYPE "V" CONDENSATION RETURN PUMP

---

SWEET'S CATALOGUE

# INTERNATIONAL FILTER CO.

## Water Softening and Filtration Plants

NEW YORK OFFICE:  
233 Broadway

42 South Dearborn Street  
CHICAGO, ILL.

### Products.

WATER SOFTENING, PURIFYING, STERILIZING and FILTRATION PLANTS for Municipal, Industrial and Domestic Supplies.

Swimming Pool Filters, De-oiling Filters and Filtering Sand.

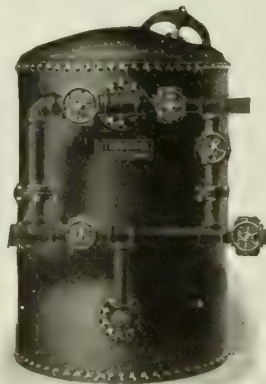
### International Sand Filters.

Filtration is downward through a bed of specially washed and graded filter sand, superimposed upon layers of graded gravel. The filter bed is enclosed in a cast iron or steel tank in the pressure type of filter, or in an open wood, concrete or steel tank in the gravity type. Automatic coagulant feed. Filter bed is washed by a reverse flow of water. The muddiest water filtered bright and clear. Filters connected in battery for any capacity.

VERTICAL PRESSURE FILTERS (BULLETIN PF)—See table for range of sizes regularly furnished.

SIZES AND CAPACITIES

Style	Diameter, ins.	Hgt., ins.	Pipe connections, ins.	Capacity, gals. per hour
CG	12	50	1	140
	16	51	1½	250
	20	52	1½	400
	24	53	1½	565
C	15	51	1½	220
	18	52	1½	320
	24	53	1½	565
I	30	61	2	880
	36	62	2	1270
	42	63	2½	1730
	48	64	2½	2260
L	50	64	3	2450
	54	65	3	2860
	60	66	3	3530
	66	72	3½	4270
	72	74	3½	5110
	78	76	3½	5980
	84	78	4	6930
	90	79	4	7950
	96	81	5	9050

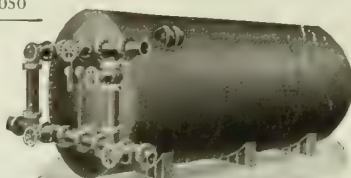


VERTICAL PRESSURE FILTER

Intermediate or larger sizes can be furnished.

Capacities figured at 3 gals. per minute per sq. ft. of filtered area.

HORIZONTAL PRESSURE FILTERS (BULLETIN PF)—See above general description. Complete data on application.

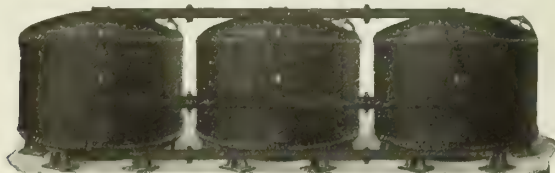


HORIZONTAL PRESSURE FILTER

SIZES AND CAPACITIES

Size, ft.	Pipe connections, ins.	Capacity, gals. per hour	Size, ft.	Pipe connections, ins.	Capacity, gals. per hour
7 x 8	6	9360	8 x 10	6	13860
7 x 10	6	11700	8 x 12	6	16200
7 x 12	6	14040	8 x 14	6	18900
7 x 14	6	16380	8 x 16	6	21600
7 x 16	6	18720	8 x 18	6	24300
7 x 18	6	21060	8 x 20	8	27000
7 x 20	6	23400	8 x 22	8	29700
7 x 22	8	25740	8 x 24	8	32400
7 x 24	8	28080	8 x 25	8	33840
7 x 25	8	29160			

Capacities figured at 3 gals. per minute per sq. ft. of filter area.



BATTERY, STYLE L FILTERS

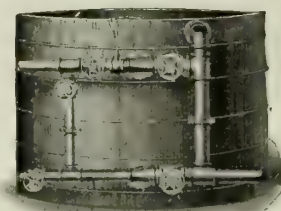
GRAVITY FILTERS (BULLETIN G)—Wood, steel or concrete tank.

Full specifications supplied upon application. Intermediate and larger sizes can be furnished.

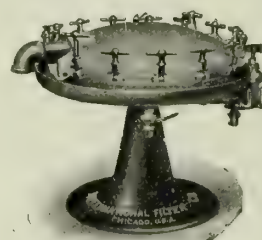
SIZES AND CAPACITIES

Size, ft., diameter, by height	Pipes		Capacity, gals. per hour
	Inlet and outlet, ins.	Waste, ins.	
6 x 8	3	4	3456
8 x 8	4	6	6036
10 x 8	4	6	9420
12 x 8	5	8	14172
14 x 8	5	8	18480
15 x 8	6	8	21204
16 x 8	6	8	24120
17 x 8	8	10	27240
18 x 8	8	10	30540

Capacities figured at 2 gals. per minute per sq. ft. of filter area.



GRAVITY FILTER



DISK FILTER

### International Disk Filters (Bulletin 11).

For putting the "finishing touch" on water already comparatively clean. Upward filtration through compressed cotton fiber disks, which are replaced with fresh ones when clogged. Specially adapted for drinking water supplies, ice plants in hotels and institutions, and for refiltering water coming from sand, quartz and charcoal filters. Operated under any pressure from 1 to 50 lbs. Also used for other liquids.

SIZES AND CAPACITIES

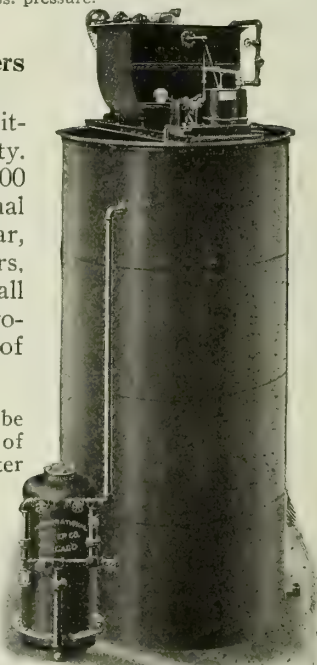
Size	Diameter, ins.	Hgt., ins.	Ship. wgt., lbs.	Connections, inlet and outlet, ins.	Capacity, gals. per hour
0	15	23	90	¾	75
1	18	31	180	1	150
3	24	36	325	1½	300
5	33	28	650	2	600

Capacities figured with comparatively clear water under 15 lbs. pressure.

### International Water Softeners (Bulletin 63).

Continuous and intermittent types for any capacity. Junior sizes for 125 to 3500 gals. per hour. International softeners deliver clean, clear, soft water suitable for boilers, ice plants, laundries and all industrial uses. Complete proposal furnished on receipt of the following information:

- (1) Quantity of water to be handled per hour.
- (2) Source of water supply.
- (3) How will water be delivered to apparatus and under what pressure?
- (4) Where is water from apparatus to be delivered and at what elevation?
- (5) What trouble is experienced in using the water?
- (6) Copy of analysis of water, or send 1 gal. sample in glass bottle.
- (7) Headroom and floor space available.



WATER SOFTENER  
Junior sizes



ESTABLISHED 1880

38TH ANNIVERSARY

# LOOMIS-MANNING FILTER DISTRIBUTING CO.

## Filters for Cleansing and Purification of Water

CABLE ADDRESS, "LOOMISMAN,"  
W. U. T. Code1431 South 37th Street  
PHILADELPHIA, PA.

BRANCH OFFICES

NEW YORK, 10 East 43d Street

BOSTON, 53 State Street

BALTIMORE, 820 Law Building

CHICAGO, ANSON-BYRNE Co., 10 South La Salle Street

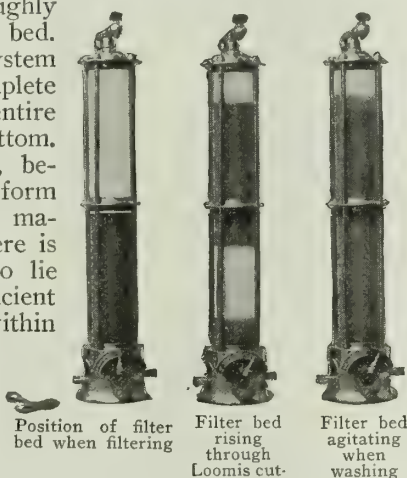
### Products.

WATER FILTERS and WATER FILTRATION SYSTEMS for the cleansing and purification of water supplies for all purposes. Water made bright, clean, free from all matters in suspension; free from odor, taste or iron stain, and safe for all purposes.

Filter Parts, Quartz, Sand, Bonechar and Alum.

### Loomis-Manning Filters.

**DESIGN**—The effectiveness of a filter depends on its ability to thoroughly cleanse the filter bed. Loomis-Manning system provides for a complete agitation of the entire bed from top to bottom. This can be done, because only a uniform grade of filtering material is used. There is no heavy gravel to lie stagnant. Sufficient space is provided within the filter chamber to allow the bed to rise through the Loomis cutting plate, break up and vigorously agitate. The illustrations, showing a glass model in operation, demonstrate the washing process.



Position of filter bed when filtering

Filter bed rising through Loomis cutting plate

Filter bed agitating when washing

ILLUSTRATING OPERATION DURING WASHING PROCESS

Construction makes filtration and washing uniform over and throughout the entire bed. Bed can not escape when washing

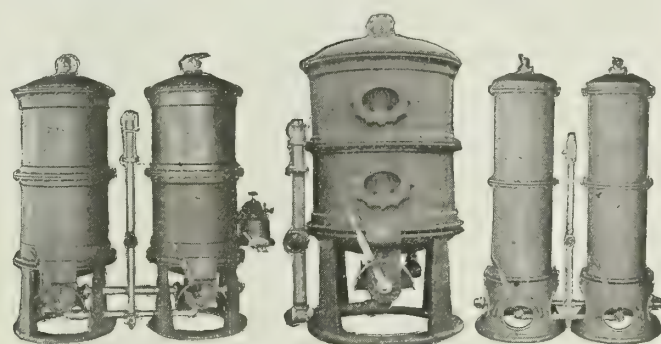
**OPERATION**—The cleansing of the filter is controlled by the Manning single controlling valve, which reduces the operation to the movement of one lever. All mistakes are avoided. The control is accurate and sure. Amount of water used in washing is economized.

**DURABILITY**—The substantial construction is indicated by the following specifications. The use of such high grade materials and careful workmanship means long life and freedom from frequent repairs.

**SPECIFICATIONS**—Outside shell, cast iron, made in parts to facilitate delivery and erection. Manning single controlling valve, solid bronze throughout. Fitted with Loomis confining plate to prevent entrance of large particles and loss of filter bed when washing; Loomis cutting plate; sandtight screens to support filter bed. All plates and screens, perforated copper strongly supported. Galvanized iron pipe and fittings. Filtering materials, the finest selected grades. Workmanship, expert and accurate. All filters tested under 100 lbs. pressure. Special construction for higher pressures if required. Also cylinders can be porcelain lined and filters fitted with brass pipe if desired.

**CAPACITIES**—The capacities as indicated below depend on condition of unfiltered water and requirements

of service. Loomis-Manning filters are made in single or double styles to meet any water condition. The double cylinder filter does not give a greater capacity than a single cylinder filter of the same size, but it does effect the removal of certain objectionable properties from water which can not be removed by ordinary filtration through sand only. Filters are installed in pairs where conditions of service require duplication.



TYPES OF LOOMIS-MANNING FILTERS, SINGLE AND DOUBLE STYLES

SIZES AND CAPACITIES COVERING BOTH SINGLE FILTERS (STYLE L) AND DOUBLE FILTERS (STYLE M)

Filter No. Style L or M	Inlet and outlet, ins.	Waste, ins.	Capacity, gals. per minute	Shipping Weights, in lbs.	
				Style L	Style M
17	3/8	3/8	1 1/2 - 3	275	475
27	3/4	1/2	2 - 4	500	980
37	1	3/4	4 - 8	750	1400
47	1 1/4	3/4	6 - 12	1000	1900
57	1 1/2	1	8 - 16	1150	2150
67	1 1/2	1 1/2	11 - 22	1450	2700
77	2	1 1/2	15 - 30	1700	3425
87	2 1/2	2	25 - 50	3500	6600
97	3	3	50 - 100	5700	10000
107	4	3	75 - 150	8200	13500
112	4	3	100 - 175	10500	19000
117	5	4	125 - 200	13800	25700

### Baltimore Filters.

Cast iron shell made in sections. Operated by a brass single controlling valve. Equipped with heavy brass sandtight sand valves screwed into a cast iron diaphragm. Retaining screen over the inlet. Chain breaker to assist in the washing process. Good grades of filtering material. Galvanized iron pipe. All carefully put together and tested to stand 100 lbs. pressure. Higher pressure if desired.

The use of a single controlling valve makes this filter free from complications and easy to care for, requiring no expert attention.

The washing process is thorough, since the chain breaker prevents the formation of lumps in the bed and brings about thorough agitation. The filter bed is practically uniform, and agitates thoroughly when washing.

SIZES—1/2 gal. to 150 gals. per minute for one unit.

# THE NEW YORK CONTINENTAL JEWELL FILTRATION COMPANY

East Centre Street  
NUTLEY, N. J.

## BRANCH OFFICES

NEW YORK, N. Y., LOUIS WHEELWRIGHT, Flatiron Building CHICAGO, ILL., 111 West Monroe Street  
SAN FRANCISCO, CAL., THE CALIFORNIA JEWELL FILTER Co., The Merchant's Exchange  
MONTREAL, CAN., New Birks Building

## Products.

WATER FILTERS, both pressure and gravity types; for all purposes for which pure water is desired.

## Principles of Filtration and Their Application.

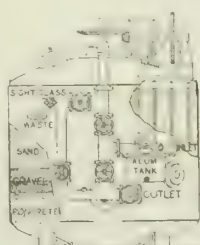
Pressure filters can be connected into any pressure line without double pumping equipment.

Unless there is a storage tank to contain filtered water and take care of peak loads, filter should be large enough to take care of the maximum consumption figured on a per minute basis, irrespective of the average or total use for any longer period. There is an additional advantage in a storage tank, in that filter may then be washed with filtered water.

If there is no storage tank and conditions are such that filter can not be cut out of service for daily washing periods, filtration plant should consist of more than one unit; so that it may be cleaned without shutting off entire supply of filtered water.

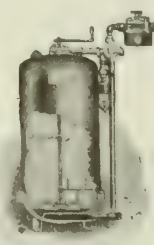
In order to suspend and disintegrate the bed and wash filter quickly and economically, water should be introduced into filter under pressure of about 15 lbs. Volume of water required per square foot of surface area of filter bed per minute varies from 6 to 12 gals. per minute, according to construction of filter.

The chief difference in the several types and makes



"JEWELL" VERTICAL PRESSURE FILTER

All sizes, 30 to 120 ins. Steel tank. Cast iron flanged piping. Alum tank. Sight glass. Revolving rakes for breaking up bed during washing process. For hand operation, motor or belt drive, as specified



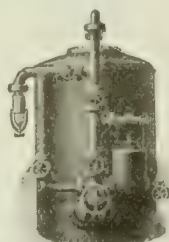
"NEW YORK" HOUSE FILTER

Sizes 12, 16 and 20 ins. Cast iron tank. Brass operating valve. Alum tank. Sight glass. Hand operated rake for breaking up bed during washing process



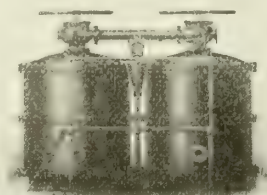
"CONTINENTAL" STEEL FILTER

Sizes, 30, 40, 50, 60, 78 and 96 ins. Steel tank. Five-way operating valve. Alum tank. Sight glass or funnel for waste discharge. Also made double (two tanks, double filtration, via sand and bone char). Can be equipped for "air wash"



IMPROVED "NEW YORK" SECTIONAL WASH VERTICAL PRESSURE FILTER

All sizes, 30 to 120 ins. See schedule. Steel tank. Cast iron flanged piping. Alum tank. Sight glass. Washed in sections. No rakes or air required



CAST IRON "CONTINENTAL" FILTER

Sizes, 14, 20, 24, 30, 40, 48 and 60 ins. Cast iron tank. Five-way operating valve. With or without alum tank. Sight glass or funnel for waste discharge. "Single" filters for "single filtration." "Double" filters for "double filtration," via sand and bone char. Can be equipped for "air wash"

of pressure filters, aside from quality of materials and minor points of construction, is in the adjuncts to reversed flow of water for "washing" or cleaning filter.

EXAMPLES—A 48-in. filter, having an area of 12½ sq. ft., without sectional wash, air wash, revolving rakes, or other means of breaking up the bed of filtering material, would require 12 gals. per sq. ft. or 150 gals. per minute; same size filter, with a proper air wash or rakes, would require only 8 gals. per sq. ft. or 100 gals.; and with Hyatt sectional wash, same size filter could be washed with only 6 gals. per sq. ft. or 75 gals. per minute.

The capacity of a filter depends upon area of top surface of filter bed. All filters of the same area are of the same capacity. Capacity, as applied to a filter, means the rate at which filter will pass water of a certain character with a specified result.

## CAPACITIES OF FILTERS AT VARIOUS RATES

Size of filter, inside diameter	Capacity U. S. gals. per minute				Approximate floor space required	Approximate weight in operation, lbs.
	At 2 gals. per sq. ft. per minute. For 97% Bacterial efficiency	At 3 gals. per sq. ft. per minute. For re-filtration, swimming pools, etc.	At 4 gals. per sq. ft. per minute. For clarification, 95% iron removal (See note below)	At 5 gals. per sq. ft. per minute. For removing sus- pended matter		
12"	1½	2½	3	4	1' 7" x 2' 8½"	800
14"	2	3	4	5	1' 10" x 2' 10½"	1,020
16"	2½	4½	5½	7	1' 10" x 2' 11"	1,250
20"	5	7	10	12	2' 0" x 3' 3"	1,725
24"	7	10	14	17	2' 5" x 3' 8"	2,480
30"	10	15	20	25	3' 7" x 3' 8"	3,700
36"	15	21	30	36	3' 10" x 4' 3"	5,200
40"	18	26	36	44	4' 3" x 4' 9"	6,300
42"	20	29	40	49	4' 4" x 4' 11"	6,800
48"	25	38	50	63	4' 9" x 5' 8"	8,950
50"	28	41	56	69	4' 10" x 5' 10"	9,700
54"	32	48	64	80	5' 1" x 6' 2"	11,000
60"	40	59	80	99	5' 8" x 6' 8"	13,700
66"	48	72	96	120	6' 2" x 7' 4"	19,600
72"	57	85	114	142	6' 8" x 8' 0"	24,000
78"	67	100	134	167	6' 9" x 8' 6"	28,400
84"	77	115	154	192	7' 3" x 9' 3"	34,300
96"	100	150	200	250	8' 3" x 10' 2"	45,200
120"	157	235	314	392	10' 4" x 12' 6"	69,400

NOTE—For iron removal, if iron is in solution, provide preliminary aeration or specify "lime feeding device" or "Continental Double Cylinder Sand and Charcoal Filter." Note that a "double" filter consists of two tanks operated in tandem. Do not specify a "double" filter if two separate filters operated in parallel are desired. In specifying, always state maximum working pressure to which filter will be subjected. All standard filters up to and including 60-in. size carried in stock good for 100 lbs. w.p.; larger sizes also for 60 lbs. w.p. Specify which is desired. Steel filters for higher pressures made to order. Specify filters by diameter, and not by capacity only

Referring to the above table of capacities, it should be borne in mind that the more slowly water passes through a filter, the more thorough the filtration. Increasing the rate decreases the efficiency. When the raw water is not contaminated the minimum rate above stated may be exceeded with safety.

These statements as to capacity and rate of filtration are in accordance with the report of the Filter Standardization Committee of the American Society of Mechanical Engineers, December, 1916:

"The permissible rate of filtration in any instance depends upon the character of the water to be filtered and the purpose for which the water is used. \* \* \*

"Whenever the water is to be used for domestic purposes or to secure full bacterial purification, the capacity shall be based upon a rate of filtration not to exceed 2 gal. per min. per sq. ft. of filtering area and a coagulant must be used."



NORWOOD ENGINEERING COMPANY

Water Filters and Water Purification Plants

FLORENCE, MASS.

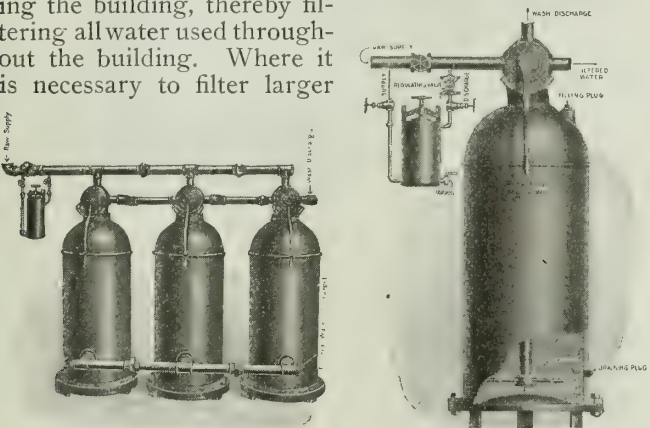
Products.

- GRAVITY and PRESSURE FILTERS for domestic water supply.
- SWIMMING POOL FILTERS for purifying and maintaining pure water in swimming pools.
- MUNICIPAL WATER PURIFICATION PLANTS.

Wilson Pressure Filters for Domestic Water Supply.

These filters are built of cast iron in 5 sizes. They are operated by means of one lever operating a 3- or 5-way brass plug valve.

Filters are connected direct to supply pipe entering the building, thereby filtering all water used throughout the building. Where it is necessary to filter larger



Battery of 3 Filters with Coagulant Feeder

Single Unit Wilson Filter with Coagulant Feeder

Combination Sand and Charcoal Filter PRESSURE FILTERS FOR DOMESTIC WATER SUPPLY

Diameter	Height	Filtering area, sq. ft.	Capacity, gals. per min.	Size of connections	Shipping weight, lbs.
12"	44"	.7854	2 to 4	3/4"	500
15"	48"	1.22	3 to 6	1"	700
18"	56"	1.76	4 to 8	1 1/2"	1500
21"	62"	2.18	5 to 10	2"	2200
24"	57"	3.14	6 to 15	2 1/2"	3700

quantities of water than given in the accompanying table, filters are connected in a battery of 2 or more units—preferably 3 units, as shown in illustration above.

Where the water supply contains a large amount of color in solution, as well as objectionable odors, it is desirable to use a charcoal filter in connection with the sand filters, the water first passing through the sand filters and then through the charcoal filter—the latter filter having a chemical action on the water, thereby removing all color, as well as odor.

When desired, filters are equipped with pressure gages connected to the raw supply line and filtered

water discharge line, which show the friction loss taking place in the filters; also with a coagulant feeding arrangement for feeding a small amount of sulphate of alumina into the raw water for removing bacteria.

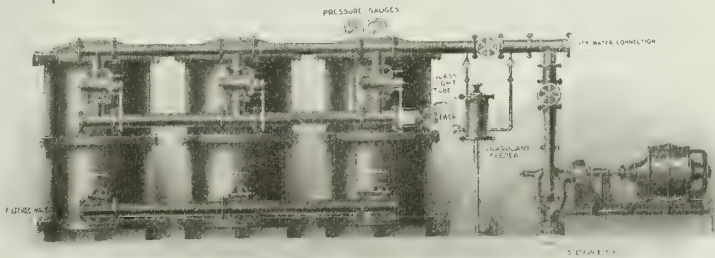
Norwood Swimming Pool Filters.

Swimming pool filters are generally of the pressure type and are installed for the purpose of keeping the pool in a clean and sanitary condition at all times. This is obtained by means of a circulating pump having connection to the outlet of the pool, which pumps the water from the pool through the filters back to the pool again. The size of the filters is governed by the size of the pool. Best results are obtained when filters are installed of sufficient size to recirculate and refilter the pool in a period of 10 hours or less. These filters are built of cast iron up to 30 ins. in diameter, and of heavy steel plate construction in all sizes above 30 ins.

The Norwood 3-unit filter system is conceded by architects and engineers to be the most effective system known. Each filter is washed with filtered pool water by means of the circulating pump, thereby insuring the correct amount of wash water to thoroughly disintegrate the sand bed and clean it of all impurities.

The rate of filtration for swimming pool filters should not exceed 4 gals. for each square foot of filtering area per minute.

Each filtering outfit includes coagulant feeders, loss of head gages, sight glass tubes, and all accessories necessary to make the plant complete.



TYPICAL BATTERY OF THREE SWIMMING POOL FILTERS  
With pump and motor for refiltration of swimming pools

Diameter of filters	Capacity in gals. per min. for 3 filters (4 gals. per min. per sq. ft.)	Floor space	Weight of 3 units complete, lbs.
15"	15	5' 0" x 2' 0"	2,000
18"	20	5' 9" x 2' 0"	4,600
21"	30	6' 6" x 2' 6"	6,720
24"	38	8' 0" x 3' 0"	11,250
30"	60	9' 0" x 3' 6"	14,800
36"	85	11' 0" x 4' 6"	11,700
42"	115	12' 6" x 4' 9"	14,800
48"	150	14' 0" x 5' 6"	18,700

Municipal Water Purification Plants.

This company manufactures and installs filtration plants of both pressure and gravity types for municipal water purification systems. As each is an engineering problem in itself, estimates and other information will be furnished on request.

Co-operative Service.

The NORWOOD ENGINEERING COMPANY is prepared to make an investigation and study of any water problem in filtration work, and make such recommendations as will insure a satisfactory installation.

# ROBERTS FILTER MANUFACTURING CO.

MAIN OFFICE

DARBY (Suburb of Philadelphia), PA.

FACTORIES: DARBY, PA., AND FRANKFORD, PA.

NEW YORK OFFICE, 1707 Flatiron Building

## Products.

ROBERTS' PRESSURE AND GRAVITY WATER FILTERS.

## Scope of Use.

Roberts' filters are made in a variety of sizes and types, and may be used singly or in groups and combinations for use in households, apartment houses, swimming pools, hotels, hospitals, sanitariums, dye houses, laundries, bleacheries, mills, factories, industrial plants, water works and municipalities.

## Operation of Filters.

Raw water, admitted to the filter through the inlet pipe, passes through the filtering medium composed of pure silicate sand, quartz or marble (in some cases, refined charcoal) upon a gravel foundation, the filtering material being carefully screened, graded, washed and sterilized. The filtered water collects in the strainer system, and discharges through the outlet pipe, pure, clean, and sparkling.

The entire operation is governed by the Roberts' single control valve. The filtered water is collected by Roberts' bronze strainers, or sand valves, which compose the strainer system, and are guaranteed not to clog nor corrode. No wire gauze or perforated metal is used.

Coagulant is applied by means of a Roberts' coagulant tank, which operates automatically and accurately.

The filter is cleaned by simply moving the lever on the controlling valve, and the water is automatically reversed upward through the filter and to the drain, passing through the sight glass on drain, indicating when the filter is sufficiently washed. The lever is then moved to the position of filtering to waste for settling filter bed, and then filtered water is turned to house.

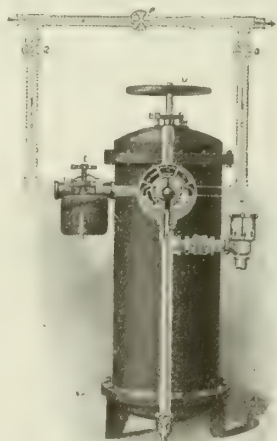
## Guarantee.

The Roberts' filters are guaranteed to render any water, regardless of its turbidity, bright, clear, and sparkling, and are guaranteed against defects for one year.

## Roberts' Style "D" Filters.

The Roberts' Style "D" filter is the model household filter. The construction is of cast iron, and is equipped with the Roberts' coagulant tank, Roberts' single control valve, sight glass, and the Roberts' agitator, which is used when cleaning to assist the wash water in breaking up the filtering material, effectively cleansing the filter from all accumulated impurities.

The filter is simple of construction and operation, and an essential and dependable addition to the home, being easily operated by children or servants.

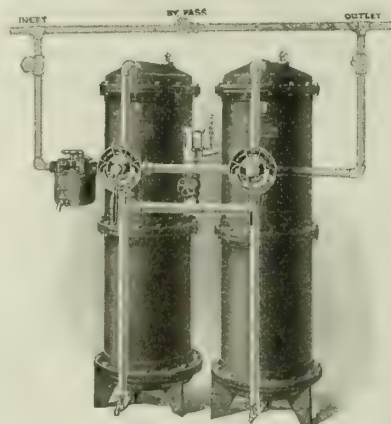


STYLE "D" FILTER

## Roberts' Style "M" Filters.

The Roberts' Style "M" filter consists of two cast iron filters, each equipped with a Roberts' single control valve, only one coagulant tank and sight glass being necessary. Filter is constructed for double filtration: the first filter containing a filtering medium of silicate sand, and ground marble; and second cylinder containing refined charcoal.

The water under treatment passes through first cylinder, which removes the suspended matter; and then through second cylinder, removing all odor, taste, and color.



STYLE "M" FILTER

## Roberts' Style "E" Filter.

The Roberts' Style "E" filter is of cast iron construction, and is equipped with the Roberts' single control valve, the Roberts' coagulant tank, sight glass, and a Roberts' baffle plate under the inlet opening to prevent the inflowing water from disturbing the filtering medium.

These filters have a 4-in. filling hole in the top head, and the larger sizes are provided with a manhole for convenient access to the interior of the filter.

These cast iron filters are neat and pleasing in appearance, being built in sections and bolted together and can be taken through small doorways, etc.

## Roberts' Style "O" Filter.

The Roberts' Style "O" filter is of cast iron construction and consists of two Style "E" filters connected together for double filtration. Each filter is equipped with a Roberts' single control valve, but only one Roberts' alum tank and one sight glass are used. The first filter contains a filtering medium of silicate sand and ground marble, and the second, refined charcoal.

The water under treatment passes through the first cylinder, which removes the suspended matter; and then through the second cylinder, which removes all odor, taste, and color.

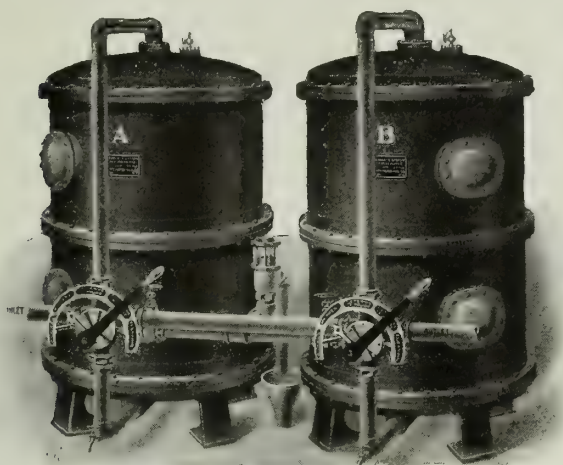
Made in 6 sizes as shown in table, and consists of



STYLE "E" FILTER



two standard style "E" filters connected together as double filters. Styles "G" and "H" may also be connected together as double filters.



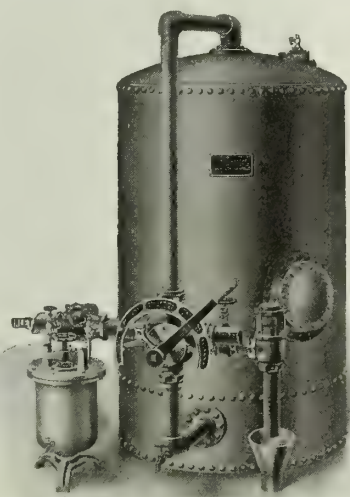
STYLE "O" FILTER

Roberts' Style "G" Filter.

The Roberts Style "G" filter is of steel construction, and is equipped with the Roberts' single control valve, Roberts' coagulant tank, sight glass, and a Roberts' baffle plate under the inlet opening to prevent the inflowing water from disturbing the filtering material.

These filters have a 4-in. filling hole in the top head and man-hole in shell for convenient access to the interior of the filter.

Style "H" is similar to the above, except that the Roberts' single control valve is omitted, and five valves are substituted in place thereof.



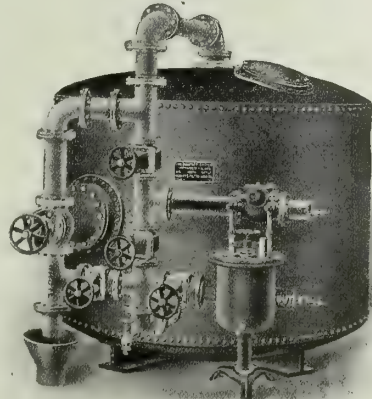
STYLE "G" FILTER

Roberts' Style "L" Filter.

The Roberts' Style "L" filter is of steel construction, and is equipped with the Roberts' coagulant tank and Roberts' baffle plate, but without the Roberts' single control valve.

The strainer system consists of the Roberts' strainers screwed into a manifold, and laterals which are to be embedded in concrete after strainers or sand valves are placed.

The piping is black iron, either with screw or flange fittings. Valves are of the double wedge gate type with iron bodies and brass trimmings.



STYLE "L" FILTER

General.

All filters are given a heavy coat both interior and exterior with a specially prepared antirust paint.

Cast iron filters are built to withstand a working pressure of 65 lbs.

Steel filters are built to withstand a working pressure of 100 lbs.

Filters for heavier pressures are carried in stock, and are supplied at an additional cost.

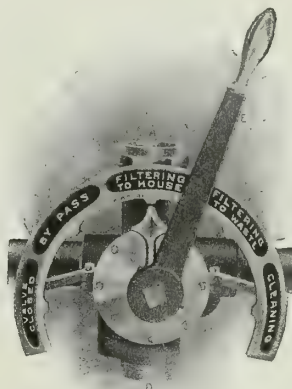
Galvanized piping is used on all filters, with the exception of Style "L."

Filters can be porcelain lined and equipped with plain or nickelplated brass outside piping, or plain or nickelplated brass tin lined piping at an additional cost.

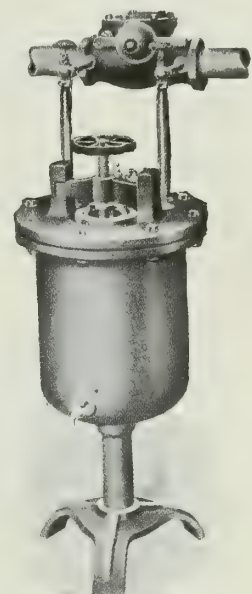
Iron castings are of the best grade gray iron, all flanges being faced and peripheries turned true.

Styles "D," "E," "G" and "H" filters can be piped for operation as single or double filters at will of operator.

Full descriptive catalogue and prices on request.



ROBERTS' SINGLE CONTROL VALVE



ROBERTS' AUTOMATIC COAGULANT TANK

DATA, ROBERTS' FILTERS

Style	Inside diameter, ins.	Capacity, gals. per minute		Height over all, ins.	Weight, filter and parts, lbs.	Weight, filter material, lbs.	Floor space, ft.
		*Minimum	§Maximum				
D	12	2	6	50	470	200	3 x 2 1/2
	16	4	10	55	655	400	3 x 3
	18	6	16	58	800	700	3 x 3
	20	6	16	64	1805	1920	5 1/2 x 3
M	12	2	6	58	950	540	4 x 2 1/2
	16	4	10	63	1300	1040	4 1/2 x 3
	18	6	16	64	1805	1920	5 1/2 x 3
	20	6	16	64	1805	1920	5 1/2 x 3
E	12	2	6	58	530	270	3 x 2 1/2
	16	4	10	63	680	520	3 x 3
	20	6	16	64	950	960	3 x 3
	24	9	24	64	1575	1175	3 1/4 x 3
	30	14	38	70	1865	1800	4 1/2 x 3
	36	21	56	73	2620	2625	5 x 3 1/2
	42	29	76	75	4510	3525	6 x 4
	50	41	110	78	6090	5025	6 1/2 x 5
O	60	59	158	82	8365	7225	7 x 5 1/2
	24	9	24	64	2300	2350	6 x 4
	30	14	38	70	3700	3600	6 1/2 x 4 1/2
	36	21	56	73	5205	5250	7 1/2 x 5
	42	29	76	75	8995	7050	8 x 6
	50	41	110	78	12080	10050	10 x 6 1/2
G	60	59	158	82	16640	14450	11 x 7
	30	14	38	74	1375	1800	4 1/2 x 4
	36	21	56	76	1835	2625	5 x 4
	42	29	76	78	2190	3525	5 1/2 x 4
	50	41	110	79	3120	5025	6 1/2 x 4 1/2
L	60	59	158	81	3900	7225	7 x 5 1/2
	72	84	220	94	4902	10350	8 1/2 x 6 1/2
	78	100	260	96	5425	11625	9 x 7
	84	115	300	98	6476	14125	10 x 7 1/2
	96	150	400	100	7865	18425	10 1/2 x 8 1/2

\*Minimum capacities for turbid water and highest bacterial reduction.  
§Maximum capacities for Croton and Great Lakes waters.

# THE PERMUTIT COMPANY

## Water Softening Apparatus

TELEPHONE:  
MADISON SQUARE 965

440 Fourth Avenue  
NEW YORK, N. Y.

BRANCH OFFICES  
CHICAGO, ILL. CLEVELAND, OHIO DETROIT, MICH. LOS ANGELES, CAL. ST. LOUIS, MO.  
BUFFALO, N. Y. MINNEAPOLIS, MINN. JACKSONVILLE, FLA. PITTSBURGH, PA. KANSAS CITY, MO.  
PHILADELPHIA, PA. BOSTON, MASS. BIRMINGHAM, ALA. HAMILTON, ONT.

### Products.

"PERMUTIT" WATER SOFTENING FILTERS.

Apparatus for the General Rectification of Water, including Clarifying Filters, Iron Removal Apparatus, etc.

### Patents.

"Permutit" filters are patented in the United States, Canada and all other countries. Gold Medal, International Exposition, Ghent, 1913; San Francisco, 1915.

### Description.

The mechanical part of the "Permutit" system is similar in almost every respect to a pressure sand filter. The filtering medium, however, instead of being natural sand, is an exchange silicate under the registered trade-mark name of "Permutit." This "Permutit" has the remarkable property of absorbing all the calcium and magnesium (hardening elements) from the water as it passes through the filter. The effluent of a "Permutit" filter, besides being entirely soft, is absolutely non-caustic.

"Permutit" is manufactured in the United States. It is obtained by fusing feldspar, kaolin, soda-ash and pearlash together in the proper proportion.

### Installation.

"Permutit" filters are easily installed by the local plumber. A complete set of concise directions is sent with each outfit.

The filter is usually placed in the basement on a by-pass of the main supply line; and if its per minute capacity is sufficiently large, softens water as it is being used in the house; or, if not, softens water which flows at a uniform rate into either a gravity or a pneumatic storage tank. The pressure drop through the filter averages about 5 lbs. per sq. in. The maximum drop is 10 lbs.

### Operation.

When the filter has delivered its guaranteed quantity of perfectly softened water, it is not necessary to replace the filtering material, as it is easily and cheaply regenerated and restored to its original efficiency by introducing a 10% solution of sodium chloride (common salt). This salt solution remains in contact with the "Permutit" over night. In the morning it is run directly into the sewer, as it is a perfectly clear liquid. Even if the filter be neglected, no danger to health can result.

### Advantages.

"Permutit" filters furnish a continuous supply of water as soft as rain water, but just as sparkling and live as the original supply, for every department of the home. No chemicals are added to the water.

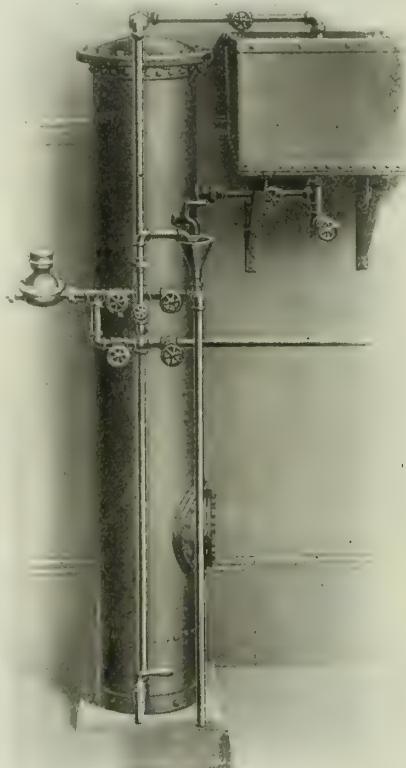
**Permutit**

"Permutit" removes the minerals which injure the skin. It makes the bath more healthful and luxurious. It improves the complexion and brings out the maximum natural luster of the hair.

"Permutit" reduces the amount of soap and labor required in the laundry and makes the linens cleaner, softer and whiter. Its use greatly prolongs the life of linens.

"Permutit" absolutely eliminates boiler scale and the clogging up of the hot water pipes and heating coils. The only cost of operation and upkeep is the cost of the common salt.

"Permutit" filters are made in all sizes—from the smallest home size to the largest club or hotel size. Also for industrial purposes, boiler feed, etc.



"PERMUTIT" SOFTENING FILTER  
For domestic use

#### SPECIFICATIONS FOR DOMESTIC FILTERS

Serial number.....	A3	A4	A5	A6	A7
Diameter.....	9"	12"	18"	21"	24"
Over all height.....	5'0"	5'9"	7'0"	8'0"	8'0"
Minimum installation height.....	6'0"	6'9"	8'0"	9'0"	9'0"
Piping.....	1 1/2"	3/4"	1"	1 1/4"	1 1/2"
Pounds of salt.....	5 1/2	12 1/2	28	38	50

#### SHIPPING WEIGHTS, LBS.

Shell, crated.....	250	486	1340	1210	2100
Salt tank, crated.....	69	140	303	418	543
"Permutit," barrel.....	42	84	240	401	530
Gravel and marble, bags.....	361	710	1883	2244	3173
Total weight in operation.....	500	1000	2000	2800	4300

#### MINIMUM FLOOR SPACE, INCLUDING SALT TANK

Width.....	2'6"	3'2"	4'7"	5'0"	5'5"
Depth.....	2'2"	2'1"	4'6"	4'3"	4'8"

NOTE—Size of filter required depends upon hardness of water and quantity of water to be softened between regenerations.

Specifications are for standard filters carried in stock and designed for a working pressure of 100 lbs. per sq. in.; constructed on order for any pressure up to 200 lbs.

### A Few Representative Users.

M. E. Alexander, Piedmont, Cal.; W. P. Barba, Germantown, Philadelphia, Pa.; James Deering, Miami, Fla.; Julius Fleischman, Cincinnati, Ohio; B. F. Jones, Jr., Sewickley, Pa.; Otto H. Kahn, Morristown, N. J.; W. C. Leland, Pontiac, Mich.; Edgar Palmer, Rye, N. Y.



# W. D. ALLEN MANUFACTURING CO.

## Fire Protection Equipment

566-570 West Lake Street  
CHICAGO, ILL.

69 Warren Street  
NEW YORK, N. Y.

### BRANCH OFFICES

SALT LAKE CITY, UTAH, Scott Building

DENVER, COLO., Colorado National Bank Building

NEW ORLEANS, LA., 410 Camp Street

### Products.

Manufacturers of FIRE FIGHTING APPLIANCES: HOSE RACKS, HOSE CABINETS, NOZZLES, COUPLINGS, VALVES, SIAMESE CONNECTIONS, and complete FIRE PROTECTION EQUIPMENTS; UNLINED LINEN FIRE HOSE and CHEMICAL FIRE EXTINGUISHERS.

Hose Reels.

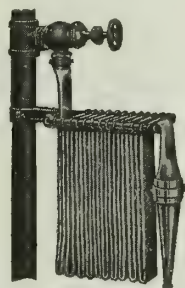
### "Bowes" Hose Rack.

It will be noted by the illustrations that the supports remain on the rack and are a part of it. As the hose is drawn off, the supports are retained by the extension arm. There is no possibility of supports binding or entangling the hose.



STYLE L "BOWES" HOSE RACK

Supported on nipple attached to valve



STYLE K "BOWES" HOSE RACK

Supported on standpipe. Also made for attaching to wall

Can be specified when insurance companies or fire departments do not insist on a labeled rack

### "Bowes" Semiautomatic Underwriters' Labeled Rack.

The "Bowes" idea of the positive supports and extension arm has been incorporated into our semiautomatic underwriters' labeled rack. In case of fire the valve is opened, a simple arrangement automatically holds the water at the first fold of hose, as shown, until a slight tug at the nozzle end releases it. This rack is labeled and approved.

"Bowes" labeled semiautomatic racks secure the lowest possible insurance rate and are intended for first aid streams to be used by occupants of the building, and therefore are made in 1¼-in. and 1½-in. sizes only.

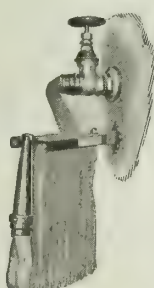
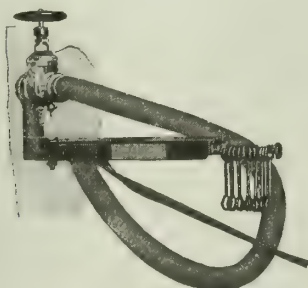


FIG. 2115. Labeled Semiautomatic "BOWES" LABELED UNDERWRITERS' HOSE RACKS

Fig. 2115 shows semiautomatic rack supported by a combination escutcheon and wall bracket, but both racks can be suspended from valve or attached to wall or standpipe. The illustration shows valve open, hose withdrawn and the water held at first fold

### "Bowes" Underwriter's Labeled Storage Rack.

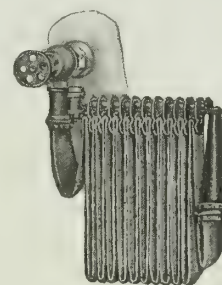
"Bowes" storage rack for 2½-in. underwriters' unlined linen hose is labeled to underwriters' specifications, but is without the semiautomatic feature, and is intended for fire department use only.

Finished in red enamel, aluminum bronze, nickel-plated on iron, polished brass and nickelplated on brass.

### "Yale" Hose Rack.

Note that the hose is supported by a series of brass clips, slideably and permanently mounted on an extension arm. The pressure of the clips is sufficient to support the weight of the hose, but is not great enough to interfere with its easy withdrawal in case of emergency.

It will be seen from the enlarged drawing of the clip that the pressure is applied at the center of the hose only and not on the edge or fold. Pressure so applied can not possibly injure linen hose.

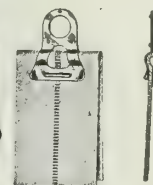


STYLE P "YALE" HOSE RACK

No pressure on folds or edges of hose

Made for any size hose

Can be specified when insurance companies or fire department do not insist on a labeled rack



HOSE CLIPS

The "Yale" rack is made either in iron or brass. The normal finish of the iron rack is architectural bronze plate, with brass clips dipped and lacquered. The brass rack is highly polished and lacquered throughout.

### Siamese Connections.

A Siamese connection can be made an ornament to a building by specifying the Fig. 232 or Fig. 231.

Figure 232 combination Siamese and sill cock as shown is made of bronze, well designed and finished.



Fig. 232

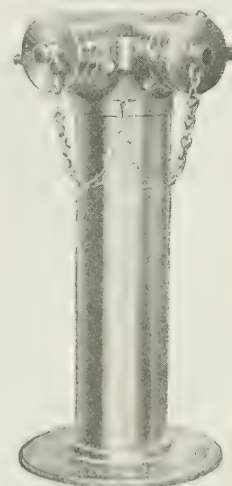


Fig. 231

SIAMESE CONNECTIONS

Figure 222 (not illustrated) is the same as figure 232, but without the sill cock and wall plate.

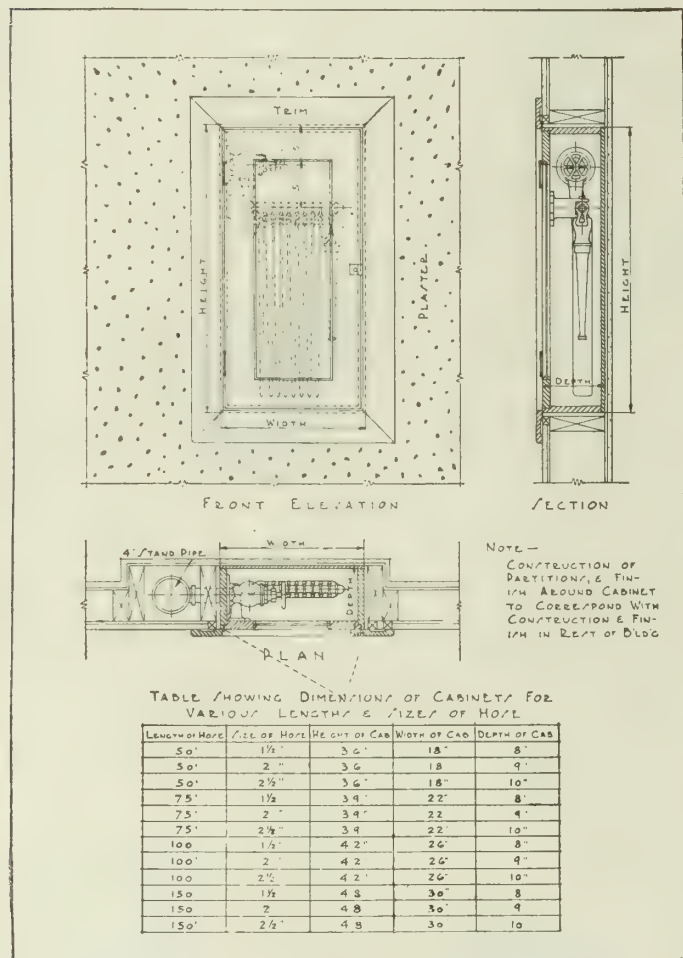
Figure 231 is made as illustrated, with a brass sleeve to cover pipe, sidewalk escutcheon, and is used when the supply comes through the sidewalk.

### Hose.

The practice of specifying 2½-in. hose for use of the occupants of the building is happily passing away, as hose of that size is too large to be used by persons other than trained firemen.

For a first aid stream 1½-in. hose is usually required and is shown in the detail below.

Fire protection engineers usually limit the maximum length of hose served by one standpipe to 100 ft. If longer lengths of hose are required, additional standpipes should be provided or municipal or insurance authorities having jurisdiction should be consulted.



TYPICAL DETAIL OF FIRE HOSE CABINET, SHOWING ANGLE VALVE AND "YALE" OR "BOWES" FIRE HOSE RACK HUNG ON DOOR

Scale, ½-in. to a ft.

Full scale detail and complete specifications furnished on request.

### Specifications for Interior Standpipe.

Furnish, set up and run from sidewalk to roof, riser pipe not less than 4-in. diameter, complete with valves as specified hereinafter; all to be securely fastened to beams and walls; standpipe to be carried up as shown in diagram. Run main 4-in. pipe line from standpipe to street at front wall as directed, attach a Fig. .... W. D. ALLEN MANUFACTURING CO.'s double clapper Siamese with sensible caps. On inside of main wall,

located where frost can not affect it, not less than 10 ft. from wall, place 4-in. check valve, to check against hose tank or pump pressure, with ½-in. automatic ball drip valve, placed at lowest point between check valve and Siamese connection. All fittings to be of long sweep pattern.

PIPE LINE TO HOUSE TANK—Connect 4-in. pipe line from standpipe to house tank at roof with 4-in. underwriters' pattern indicator gate valve and 4-in. underwriters' pattern check valve placed in a horizontal position to check against steamer pressure.

PIPE LINE TO FIRE PUMP—(If a fire pump is specified.) Connect standpipe to fire pump in basement, properly valved and checked against steamer pressure.

DIRECT CONNECTIONS TO CITY MAINS—(When interior standpipes are connected directly to city water pressure, and such pressure is increased in case of fire.) Make necessary connections for interior standpipe. Provide a strainer and pressure regulating valve for house supply, in order to keep house supply at constant pressure.

HOSE EQUIPMENT—On each connection, as shown, provide a .....-in. New York angle hose valve with a ["Yale"], ["Bowes"], ["Bowes" Labeled] hose rack and sufficient 1½-in. Nella brand labeled and approved underwriters' linen hose to reach any portion of the floor served by this standpipe, hose to be coupled in lengths not longer than 50 ft. and equipped with one 1½-in. by 12-in. long, ½-in. discharge, plain hose nozzle with lugs.

Note—Unless the insurance board or fire department having jurisdiction insist on labeled hose racks, our regular "Bowes" or "Yale" racks can be specified. The added security of the labeled rack, however, is well worth the slight additional cost.

SPECIFICATION REMINDER—The size of the valves and hose depends largely on local conditions. Insurance and municipal authorities having jurisdiction should be consulted.

In the absence of specific requirements, it is recommended that on all buildings, 1½-in. valves and hose be installed. On buildings over 5 stories in height, an additional 2½-in. valve should be provided for the use of the fire department.

Install a 2½-in. valve and cap with a 1½-in. valve for the hose line, or a 2½-in. valve with an auxiliary reducer for the 1½-in. hose.

Material can be supplied with any finish, but the following is standard:

VALVES—Rough body, finished trimmings; rough body, nickelplated; polished brass; polished brass, nickelplated; with nozzles and couplings to match valves.

"YALE," "BOWES" OR "BOWES" LABELED RACKS—Polished brass; nickelplated brass; nickelplated on iron; oxidized bronze on iron.

### Hose Equipment.

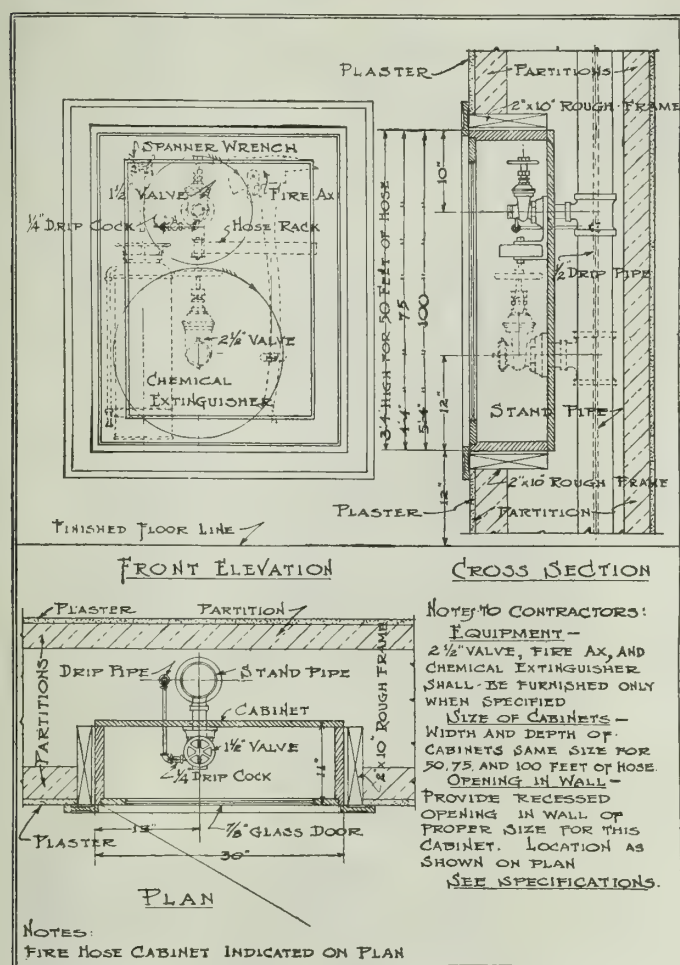
Many cities are requiring the installation of labeled hose racks and approved gate valves.

The above layout includes approved equipment, a chemical extinguisher and fire axe, all contained in a cabinet as indicated. This cabinet, of wood or steel, preferably the latter, and finished to match the trim,



FIG. 184. WOOD OR STEEL CABINET





TYPICAL DETAIL OF FIRE HOSE CABINET

Scale, 1/2-in. to a ft.

Full scale detail and complete specifications furnished on request

costs less than the ordinary closet, is more ornamental, the equipment is prominently displayed, and is instantly available.

On all buildings 5 stories or more in height, even if not required by City or State ordinance, the 2 1/2-in. valve should be installed for use by the fire department.

When this equipment is to be installed in the cabinet detailed above, it is necessary to insert in the specifications the following paragraph in lieu of the "Hose Equipment" listed on the preceding page:

**SPECIFICATIONS—**As indicated in the detail, install one 1 1/2-in. (and one 2 1/2-in.) Alenco underwriters' pattern hose gate valve, with polished brass combination escutcheon and wall brackets to support the hose rack.

The 1 1/2-in. valve to be provided with 1/4-in. drain in barrel of valve.

Furnish and install, in each fire hose cabinet, as shown, one "Bowes" underwriters' labeled hose rack with sufficient 1 1/2-in. Nella brand labeled underwriters' unlined linen hose to reach any portion of the floor served by this standpipe (but not longer than 100 ft. in each cabinet).

The hose to be coupled in lengths not longer than 50 ft., equipped with one 1 1/2-in. by 12-in. long 1/2-in. discharge, nozzle with lugs.

**Note—**Unless the insurance board or fire department having jurisdiction insist on labeled hose racks, our regular

"Bowes" or "Yale" racks can be specified. The added security of the labeled rack, however, is well worth the slight additional cost.

**SPECIFICATION REMINDER—**Material can be supplied with any finish, but the following is standard:

**VALVES—**Rough body, finished trimmings; rough body, nickelplated; polished brass; polished brass, nickelplated; with nozzles and couplings to match finish on valves.

**LABELED RACKS—**Polished brass; nickelplated brass; nickelplated iron; red enamel iron.

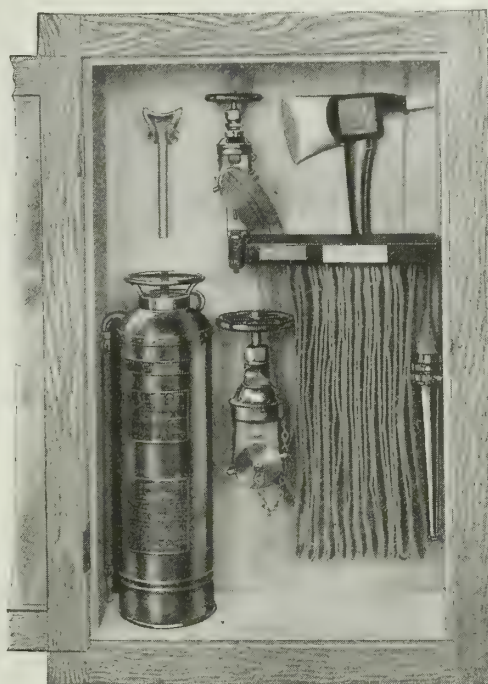


FIG. 190. WOOD OR STEEL CABINET

### Chemical Extinguisher and Fire Axe.

The installation of an axe and a chemical extinguisher is required in many cities and it should be a part of every standpipe equipment. Its timely use can many times save the water damage incident to the use of the fire hose. The following is recommended as part of an architect's specifications:

"Provide an 'ALENCO' 2 1/2-gal. approved extinguisher and 1 approved fire axe, with necessary brackets, as shown on detail."

### Steel Cabinets.

Steel cabinets can be furnished instead of wood cabinets, as shown on detail, and should be included in the plumbing specifications.

**SPECIFICATION—**Furnish and install "Alenco" steel fire hose cabinet where shown on plans. Body of cabinets to be made of No. 18-gage steel. The hollow steel frame forming the door to be made of No. 14-gage steel and to have a plate glass panel in door with bullet catch and pull handle. Finish to be 4 coats of hard baked filler enamel and varnish.

**FINISHES—**White enamel; grained to match trim.

# NEW YORK BRASS FOUNDRY CO.

## Fire Equipment Specialties and Supplies

102-104 Centre Street

NEW YORK, N. Y.

### Products.

Underwriters' approved FIRE EXTINGUISHING APPARATUS for Buildings, including Linen Fire Hose, Cotton Rubber Lined Fire Hose, Hose Valves, Fire Extinguishers, Standard Siamese Connections, Hose Cabinets.

BRASS FITTINGS for Steam, Water, Oil and Gas.

GAS SERVICE SHUT-OFF VALVE, Manual and Automatic Types.

MONITOR DETECTOR SYSTEM for the Annunciation of Rising and Falling Temperatures.

### Trade-mark.

The trade-mark is a guarantee of quality of material and perfection of workmanship. These products have established standards for the purposes for which they are intended, and should not be classed with other products the specifications of which are not definitely fixed.



### Facilities.

The plant consists of fully equipped foundry and up-to-date brass finishing shops. Electric operation assures prompt deliveries at all times.

### Castings.

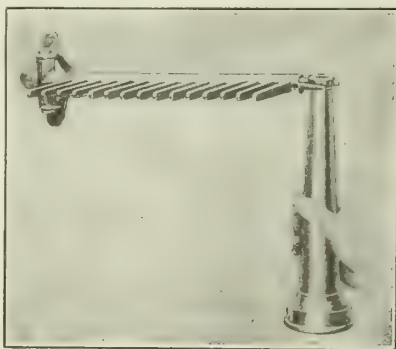
All NEW YORK BRASS FOUNDRY CO.'s brass, bronze and machinery castings are guaranteed to be perfect in workmanship, and to be suitable and efficient in the service for which designed.

### Siamese Connections.

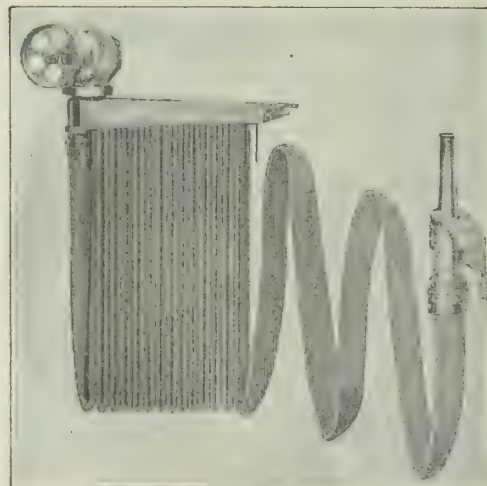
Made 45° and 90° "Y" patterns of cast iron and brass and are furnished complete with plates, escutcheons and brass tubing to fit over wrought iron pipe, also "auto spkr" siamese connections.

### Gas Service Shut-off Valve.

For use in time of fire to shut off gas manually from outside of building, or automatically by use of a fusible link on inside of building. This valve is set up to service supply pipe inside of building on inlet of gas meter. Made in all sizes.



DUPLEX SINGLE ARM HOSE RACK



ACME DOUBLE ARM HOSE RACK

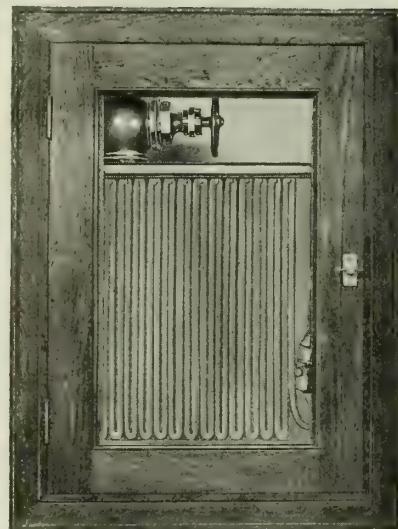
### Hose Racks.

Duplex single arm and Acme double arm.

These hose racks are automatic in action. They are equipped with a yoke nozzle holder which automatically releases the hose when the nozzle is removed.

### Hose Cabinets.

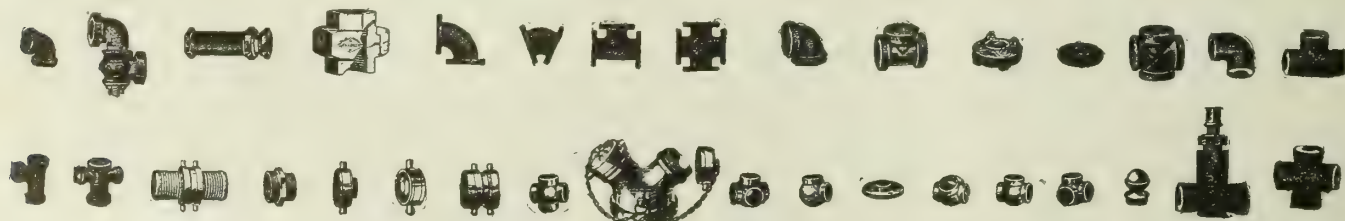
These cabinets are made up to architects' specifications and are equipped with either the Acme or the Duplex hose rack.



HOSE CABINET

SIZES AND CAPACITIES OF HOSE CABINETS

Length of hose, ft.	Size of hose, ins.	Height, ins.	Width, ins.	Depth, ins.
50	1 1/2 2 1/2	28	16	6
75	1 1/2 2 1/2	30	21	6
100	1 1/2 2 1/2	36	21	6



FITTINGS AND CASTINGS FOR STEAM, WATER, OIL AND GAS

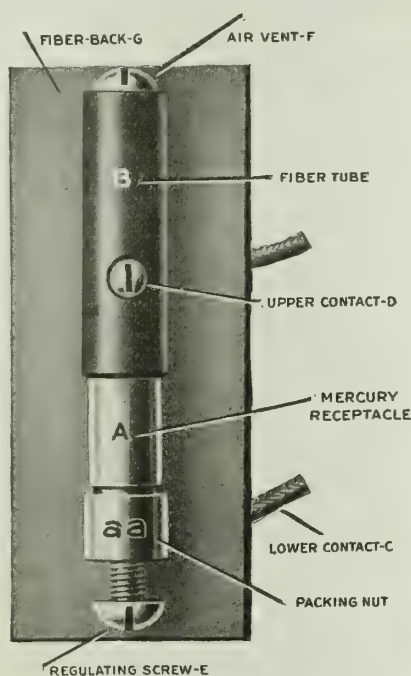


**Monitor Detector System.**

A thermostatic device for the announcement of fire; automatic control and closing of factory fire doors; automatic control and dropping of asbestos fire curtains; automatic control and opening of all exit doors; control of automatic sprinklers; annunciation of rising temperature in refrigeration plants, etc.

It consists of a steel tube "A" as a mercury receptacle, to which is attached the lower contact screw "C," also a regulating screw "E" by which the detector is set to any given degree from the freezing point of mercury to as high a temperature as conditions require, and a fiber tube with upper contact screw "D."

**OPERATION —**  
The Monitor Detector is electrically operated, therefore instantaneous; no waiting for a fusible link to melt. When installed with fire doors it is placed convenient to the door or doors and connected through wiring to an electric door opener on each door. When the temperature rises above the point of safety any detector in the vicinity of the fire will automatically close all fire doors and shutters throughout the plant irrespective of the section in which the fire occurs. It will at the same time give an alarm on the annunciator in the central or other official watch office of the plant.



MONITOR DETECTOR  
Patented February 23, 1909. Other patents pending

**PROTECTION—**Under ordinary conditions the Monitor Detector will protect 200 to 700 sq. ft. of floor area. It is either suspended from the ceiling, centrally located, or attached to the side wall as near to the ceiling as possible, preferably under the picture moulding, if not too low down. For example, in a room 12 by 15 ft. one detector suspended from the ceiling at center would be sufficient, but placed on side wall, two would be required. This, however, should be governed by conditions.

**FINISH—**For factories, loft buildings and plants of like character, the detectors are furnished plain.

For hotels, apartment houses and similar buildings, the detectors are furnished with a guard, made of non-corrosive, nickelplated metal. When it is necessary to make the guards more ornamental than regularly furnished they are subject to additional charges.

The detectors for the above conditions are set to operate at a temperature of 110° Fahr.

**ADAPTABILITY—**The Monitor Detector is adaptable for installation in the following manner:

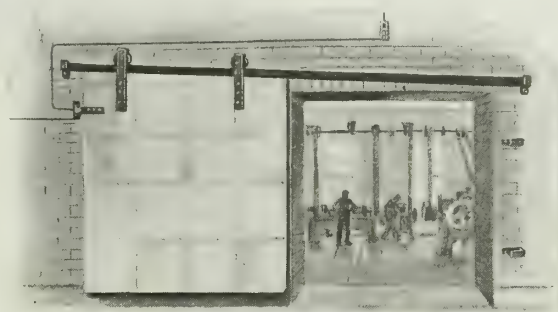
To close factory or other fire doors singly or in battery—Where more than one door is in a system, all doors close at once.

In conjunction with automatic sprinkler systems—They tell where the blaze is.

For residences, apartments, hotels, etc.—It gives a feeling of security.

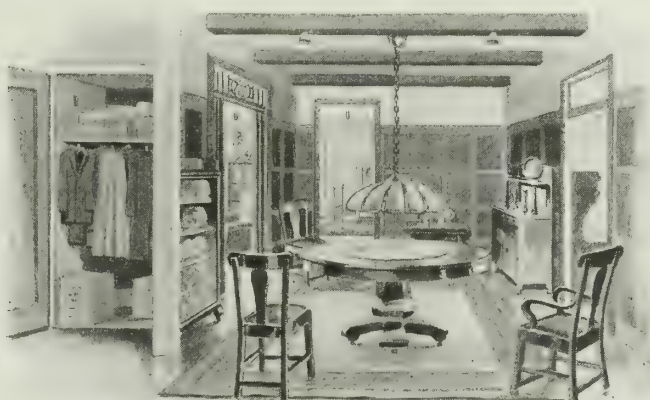
In refrigeration plants—An alarm is registered when temperature rises above the set degree.

**WIRING—**The Monitor Detector is wired to dry or storage batteries, or a 6-volt transformer on an alternating current will work to perfection. They have also been installed on 110-volt direct current circuits with success.



FIRE DOOR EQUIPMENT FOR FACTORIES, WAREHOUSES AND SIMILAR PLANTS

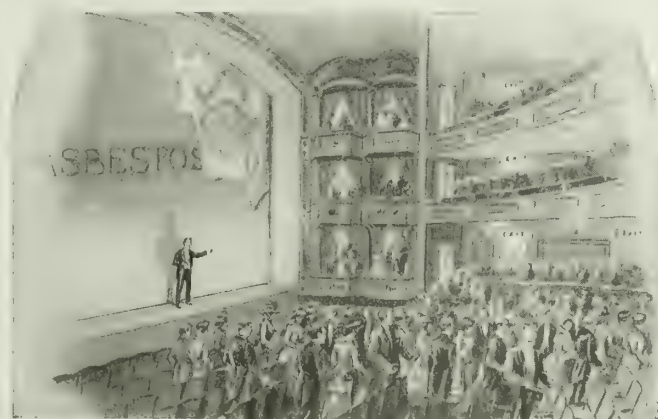
Outfit consists of Monitor Detector without guard, electric door opener, flat steel spring and push button, for each station



EQUIPMENT FOR SUITES IN APARTMENTS, ETC.

Outfit consists of Monitor Detector with or without guard, or more elaborately decorated in accordance with the architect's specifications to conform with surroundings.

In this illustration the detectors are placed in the form of bells suspended from the beam, the detector suspended in a manner similar to that of the bell clapper



EQUIPMENT FOR THEATERS AND OTHER PLACES OF PUBLIC GATHERING

Outfit consists of Monitor Detector without guard, electric door opener, flat steel spring and push button, for each station

# GENERAL FIRE EXTINGUISHER COMPANY

EXECUTIVE OFFICES  
PROVIDENCE, R. I.

NEW YORK, N. Y.  
PROVIDENCE, R. I. (Plant)  
BUFFALO, N. Y.  
MINNEAPOLIS, MINN.  
COLUMBUS, OHIO  
BOSTON, MASS.  
HARTFORD, CONN.  
ALBANY, N. Y.

ST. PAUL, MINN.  
ATLANTA, GA. (Plant)  
PHILADELPHIA, PA.  
CINCINNATI, OHIO  
CLEVELAND, OHIO  
NORTH CHARLOTTE, N. C. (Plant)  
AUBURN, R. I. (Plant)  
BALTIMORE, MD.

CHICAGO, ILL. (Plant)  
ST. LOUIS, MO.  
DETROIT, MICH.  
NEW ORLEANS, LA.  
ROCHESTER, N. Y.  
MILWAUKEE, WIS.  
KANSAS CITY, MO.  
WARREN, OHIO (Plant)

## CANADA

CANADIAN GENERAL FIRE EXTINGUISHER COMPANY, LTD.

MONTREAL, P. Q. (Plant)

TORONTO, ONT. (Plant)

VANCOUVER, B. C. (Plant)

HALIFAX, N. S.

### Products.

The GRINNELL SYSTEMS OF AUTOMATIC FIRE PREVENTION AND AUTOMATIC FIRE ALARM.

For Grinnell System of Ready Heating, see page 1028.

### The Principle.

The basic principle of a sprinkler system is that fire generates heat and that heat rises. In practice, as proved by abundant experience, a temperature (usually 155° Fahr.) is reached at the sprinkler head nearest to the fire while the fire is still in its incipency. This predetermined temperature opens the head, spraying the fire with a drenching spray instead of a stream of water. In 47% of the fires but two or less heads are opened, showing that the fire is put out before a high temperature is reached a few yards away. These facts are amply proved by the record of thirty years. The average fire loss in buildings protected by Grinnell sprinklers is only \$276.00 and this small average loss would be still smaller if it were possible to take into account the many fires so small that they are not reported.

### Planning and Designing Sprinkler Systems.

While it is true that the general requirements of the underwriters and the special rules of the local insurance boards must be complied with in the layout of sprinkler systems, it must be borne in mind that these requirements do not of themselves constitute a complete guide for the preparation of detailed plans and working drawings, nor provide anything in the line of complete specifications.

Every architect and engineer knows from experience that constant supervision and inspection of the work of incompetent or irresponsible subcontractors is at best a very expensive and only partial safeguard against defects and errors. Most of these defects and errors result not only from incompetence, but from a desire to cut the cost of erection. The GENERAL FIRE EXTINGUISHER COMPANY does not attempt to bid so low that a legitimate profit can not be obtained out of the installation of the highest quality work. For this reason the supervision and inspection of architects on Grinnell systems is reduced to a minimum, and the expense so saved often amounts to more than the money they would save by accepting some lower bid.

### Engineering Precautions for Designers.

The methods of meeting the requirements of the underwriters for sprinkler installations are so varied that it is not practicable to reduce them to a code that will be general in application. Practically each individual building is a special engineering proposition as far as the sprinkler system is concerned. Therefore, no reliable guide can be given for laying out systems, but it is possible to indicate points where errors are frequently made.

For instance, in determining what temperature heads should be installed, maximum temperatures should be considered. Higher temperatures should be selected for boiler rooms, engine rooms, etc., than would be selected for storerooms.

Again, the effect of sunlight when heads are exposed to direct rays must be noted, as oftentimes the inexperienced engineer will overlook this feature and install low test heads in a location where unnecessary opening of heads is bound to result.

When gravity or pressure tanks are needed, great care must be used in properly locating them with reference to the most economic method of heating them, but at the same time they must be placed outside any dangerous fire zone. Architects must especially consider this form of supply with reference to the load factor. The main water supply valve should be so located that it will be easily accessible in case of fire, yet as safe as possible from meddling on the part of the ignorant, careless or vicious.

Further than this, the whole system, especially as regards supplies, must be considered from the standpoint of possible additions or alterations being made in the building, especially those which would affect the area controlled by any particular unit of the system.

Owing to the foregoing and many other individual considerations peculiar to sprinkler engineering work, this company has adopted the policy in all of its many branch offices of furnishing architects with working drawings without cost or obligation. We have an expert engineering corps, in each of these offices, who can save architects a great deal of time and trouble by furnishing them with the most economic and efficient layouts.





On duty with many others, waiting for a fire—waiting perhaps for thirty years, up in the dust and cobwebs near the ceiling



Fire at midnight! The column of heat rises and at 155° the fusible strut in the nearest Grinnell softens and melts



A drenching downpour right on the heart of the fire and there only. Alarm bell clanging in the distance



Fire out before watchman arrives. Water turned off. No damage worth reporting. Next morning—business going on as usual

FIG. 1. METHOD OF OPERATION OF GRINNELL AUTOMATIC SPRINKLER SYSTEM

### The Sprinkler-heads.

The Grinnell-head is the result of thirty-three years' development and study of fire protection requirements by the inventor of sensitive sprinkler-heads, Frederick Grinnell.

It has passed from the early stages of experiment through the practical tests of responsibility and action to its present status of dependability and per-

fection. Money and effort have been freely expended for experiment, investigation and improvement in the materials, the parts, manufacture, assembling and installation of this most important device.

Each sprinkler-head, before it leaves the factory, is tested hydraulically to 300 lbs. per sq. in. pressure, and also to 100 lbs. air pressure while immersed in soapy water.

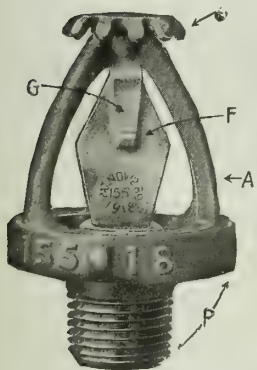


FIG. 2

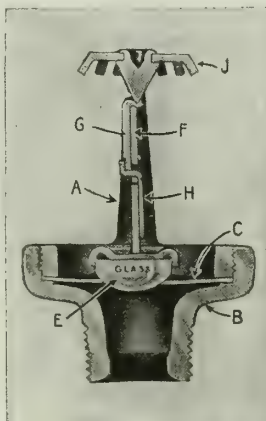


FIG. 3

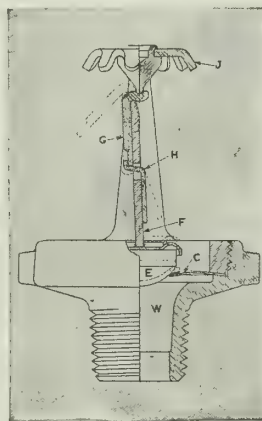


FIG. 4

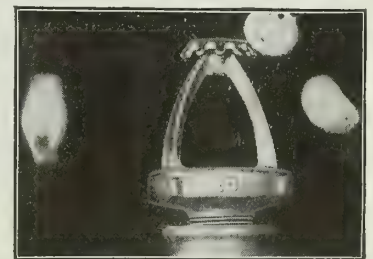


FIG. 5

This illustration of the Grinnell-head operating is enlarged from a moving picture negative. It shows how positive is the action of the strut and flexible diaphragm. The white spots are pieces of the strut flying apart.

### TECHNICAL DESCRIPTION OF GRINNELL AUTOMATIC SPRINKLER-HEAD AND ITS OPERATION

These heads are constructed as follows:

Yoke A and body B of cast bronze are screwed together with a flexible metal diaphragm C clamped between them. A glass valve marked E rests on diaphragm C. Above and resting on glass valve is a strut of 3 pieces, main strut piece F, hook G and key H. These pieces are made from a special non-corrosive nickel alloy and are held tightly together by a special fusible solder which melts at a low temperature, usually 155° Fahr., although other temperature solders may be used when necessary.

Diaphragm C is a most important part and nothing has been spared to insure its perfection. It is of a special alloy expressly produced for this purpose, tested and subjected to microscopic examination for crystalline structure in our own laboratories before incorporation in the sprinkler-head.

Valve E is made of glass especially annealed and accurately formed and rests on a 1/2-in. diameter seat in center of the diaphragm. There is no contact of metal to metal in the valve and therefore no corrosive effect to interfere with its proper functioning, regardless of the length of time of its inaction.

Hook G and key H act as levers, and their arrangement is such that only a very moderate stress is set up in the solder, thus insuring tightness of the sprinkler under heavy water pressure.

Diaphragm C also materially assists in preventing leakage past E, thus making the sprinkler especially well able to resist water hammer, which it does to an extent far in excess of the requirements of the Underwriters' Laboratories, Inc.

When heat from a fire has melted the solder, hook G and key H rock about their respective fulcrums, as in Fig. 4, allowing the water to force glass valve E from its seat and throw the parts of strut from its path. A solid 1/2-in. stream then impinges upon deflector J and the water is thus scattered in every direction, producing a heavy, drenching spray. While the parts of strut are separating, diaphragm C forcibly follows valve E in its upward movement for a sufficient distance to insure complete separation of soldered parts (see Fig. 5 from motion picture film). Operating parts of strut do not slide, one upon the other, but merely rock about fulcrums. The rocking is materially aided by the presence of melted solder which acts as a lubricant.

### Connections and Piping.

The connections and piping of the Grinnell Automatic Sprinkler System may briefly be described as follows:

An ample supply of water is furnished, either from two tanks or one tank, a fire pump and a connection with city water. Often the latter alone is sufficient.

From this abundant source of water a large riser or supply pipe extends from the top to the bottom of the building to be protected (Fig. 6). Connected with this large pipe are lines of smaller pipe. These run near the ceiling in all parts of the building. These pipes are carefully graded in size in order that the water everywhere throughout the building may be under good pressure. At stated intervals along these smaller lines of pipe (usually 8 to 10 ft.) are placed Grinnell automatic sprinkler-heads, illustrated by Figs. 2, 3 and 4.

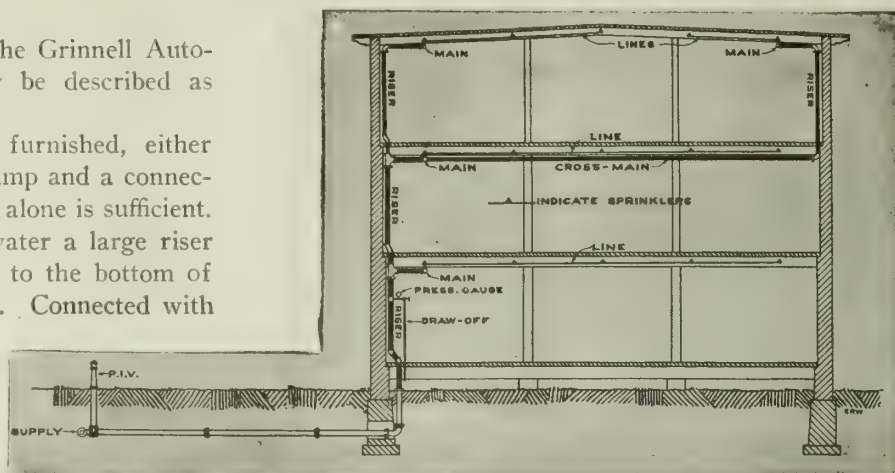


FIG. 6. SECTION OF BUILDING EQUIPPED WITH GRINNELL AUTOMATIC SPRINKLER SYSTEM SHOWING CONNECTIONS AND PIPING

### Automatic Alarm.

In addition to attacking incipient fires automatically, the Grinnell system also gives an automatic alarm of fire whenever a sprinkler-head opens, a water motor alarm being usually installed on the outside of the building.

### The Grinnell Dry Pipe System.

To obviate freezing in the sprinkler piping in buildings which are unheated, the GENERAL FIRE EXTINGUISHER COMPANY installs a dry pipe system. In this system the water is held back of any point where it might freeze by the Grinnell dry pipe valve. The pipes in this system are filled with air under moderate pressure; but when a sprinkler-head opens, the air escapes, and the dry valve operates, admitting water to the system. The New Model "C," Grinnell dry pipe valve, which particularly excels in the important features of compactness, simplicity and dependability has just been placed on the market and a technical description will be sent on request to interested architects.

### Points of Value in Discussing Sprinklers with Clients.

Grinnell automatic sprinklers reduce fire losses an average of 96 2/5%. As a result of this reduction of average loss by fire, underwriters quote insurance rates on sprinklered property running from 40% to 90% lower than rates on the same property unprotected by sprinklers.

This insurance rate reduction is obtainable even in the case of fireproof buildings, for of course underwriters as well as architects realize that fireproof construction does not protect the contents of a fireproof building from burning up just as coal burns in a stove. The City of Chicago investigated the matter of fire losses in fireproof buildings and sprinklered buildings and found that the average loss per fire in the unsprin-

klered fireproof buildings was more than twice as great as the average loss in sprinklered buildings of ordinary construction.

### Tests.

A sprinkler system is installed for all time. It can not economically be installed on trial. It may be 10 or 15 years before it operates. But when it is needed, it is sorely needed. In 20,000 fires Grinnell systems have responded as they were designed to respond. That was engineering proving up and manufacturing proving up.

The GENERAL FIRE EXTINGUISHER COMPANY is the only firm engaged in this work who manufactures in its own plants all of the special parts of a sprinkler system. It feels that this control of manufacture guarantees to the company not only high quality material, but also efficient manufacturing processes and highly skilled workmanship. Furthermore, it allows us to maintain rigid tests and constant inspections of all apparatus going into Grinnell systems, so that Grinnell quality applies, not to a part of the system, but to the whole.

### Fireproof Construction.

Mr. J. K. Freitag, in his book, "Fire Prevention and Fire Protection," has the following to say of fireproof construction:

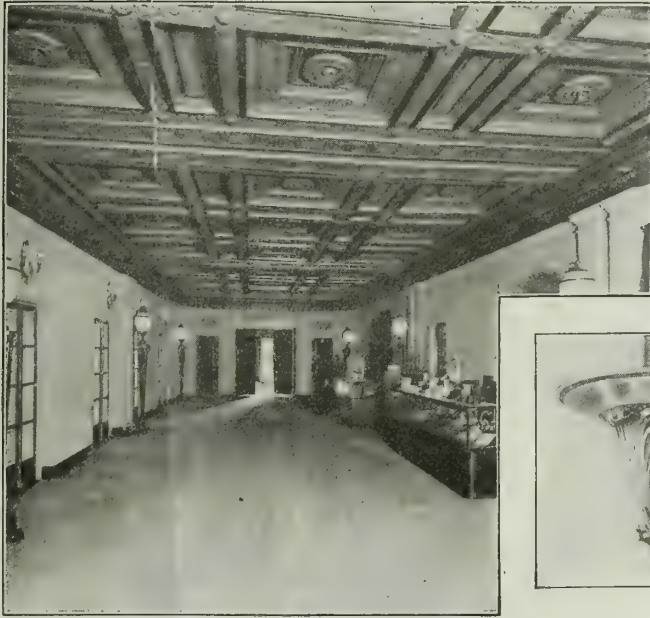
"As a matter of fact, it will be found that the type of construction will make little difference in insurance costs, for the following reasons:

"1. The value of contents is usually far greater than the value of building.

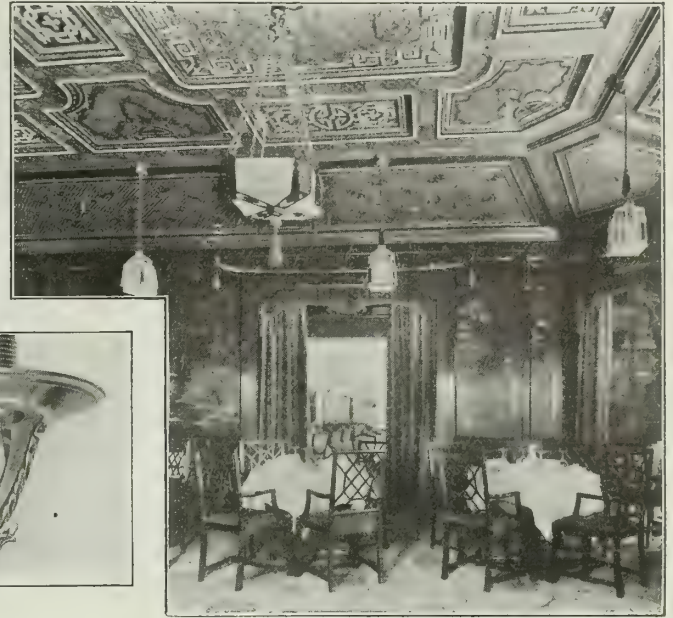
"2. The value and character of contents, rather than the type of construction, will usually determine the amount of fire protection necessary.

"3. Any possible saving in insurance rates which might be effected by the use of concrete construction would be very small as compared with the total, for the reason that practically all fire losses today in mills or factories of standard construction are confined to contents, and insurance rates are made accordingly.

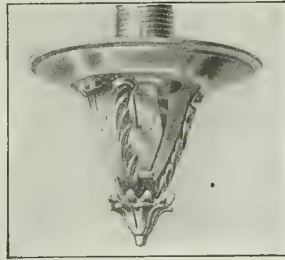




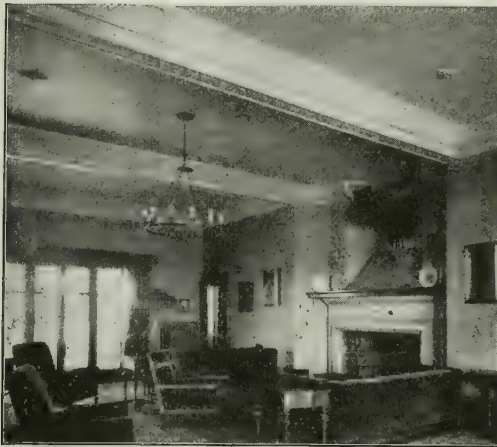
MAIN CORRIDOR RESTAURANT FLOOR,  
LORD & TAYLOR STORE, NEW YORK



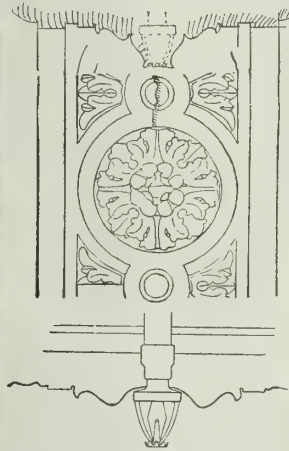
MANDARIN RESTAURANT,  
LORD & TAYLOR STORE, NEW YORK



WESTOVER TYPE HEAD  
STARRETT & VAN VLECK, Architects



SPRINKLER-HEADS ARE HERE SCARCELY  
NOTICEABLE



DETAILS OF ORNAMENTAL  
CEILING INSTALLATION



SHAKER HEIGHTS COUNTRY CLUB

"Hence the decision as to whether standard slow burning construction or reinforced concrete is preferable for use in any particular case is dependent upon considerations other than the cost of insurance."

The foregoing shows clearly why Underwriters quote lowest insurance rates only when a building is equipped with sprinklers. The difference between the sprinklered and unsprinklered premiums on any sizable business building is usually sufficient to wipe out the cost of the equipment in a few years.

Further than this, automatic sprinkler protection is the only real safeguard against having a "going" business interrupted and disrupted by fire, with consequent losses equal to the actual physical property losses.

Of recent years fire protection experts have come to regard the automatic sprinkler system as the best protection against loss of life in case of fire, and today hundreds of schools, hospitals, asylums, hotels, etc., are equipped with Grinnell sprinklers largely because of its life saving value.

### Concealed Pipe Systems.

The increasing use of concealed pipe sprinkler systems, which are installed where the appearance of the piping would detract from the general artistic effect, has brought many new engineering problems which our engineers have successfully solved, especially in such buildings as Lord & Taylor's store in New York, R. H. Stearns Co. in Boston, the Shaker Heights Country Club in Cleveland, and many others. This concealed pipe work makes sprinklers adaptable to the finest type of building.

We are at all times anxious to furnish all possible information to assist architects in preparing plans that will be efficient, economical and will secure the promptest approval of the Underwriters without the necessity for alterations and costly changes.

Literature and special statistical data on any particular class of risk may be obtained by addressing GENERAL FIRE EXTINGUISHER COMPANY, 277 West Exchange Street, Providence, R. I.



# ERWIN MANUFACTURING COMPANY

Fire Protection Engines  
MILWAUKEE, WIS.

## Products.

FIREFOAM PORTABLE EXTINGUISHERS and ENGINES.

## Approval.

Erwin Firefoam fire extinguishing equipment has been granted the Underwriters' label.

## Firefoam.

Erwin Firefoam is vastly superior to the ordinary chemicals used in old style chemical extinguishers. This has been found true, because the hottest fires of wood, excelsior, cotton waste, gasoline, inflammable liquids or chemicals can be smothered almost instantly. Firefoam is a pure white carbon dioxide foam, which is discharged under considerable pressure.

## Advantages of Firefoam.

It is adhesive, and sticks to any surface. Being light, it will float on the most volatile oils, shutting off the air supply and smothering the fire. Firefoam holds the extinguishing gases in permanent form in the millions of bubbles of which it consists. These gases can not, therefore, be blown away by the wind.

Erwin Firefoam will not injure persons, fabrics, varnished woods, etc., as there are no sulphuric or other strong acids used. The chemical charge consists of two harmless dry powders easily soluble in water.

Erwin Firefoam is especially adapted for extinguishing fires in buildings. The consistency of the foam prevents injury to ceilings below as is the case with water or ordinary chemicals.

Each gallon of solution generates 10 gals. of foam.

## Sizes.

EXTINGUISHERS—1½-, 3- and 5-gal. capacities.

ENGINES—25- and 40-gal. capacities mounted on 2-wheel carts. Special 80-, 250-, 500-, 800-gal. and larger mounted on 4-wheel trucks.

Prices on request.

## Installations.

Many of the largest plants in the country are now being protected with Firefoam. A list will be sent on request.



3-GALLON EXTINGUISHER UNASSEMBLED  
Note, charge tubes



BLAZING GASOLINE SOAKED KINDLING PILE



40-GALLON ENGINE IN ACTION



FIRE IN UPPER ILLUSTRATION COMPLETELY SMOTHERED  
BY ONE 5-GALLON ERWIN FIREFOAM EXTINGUISHER



# THE SAFETY FIRE EXTINGUISHER CO.

Manufacturers of Approved Fire Extinguishing Appliances

291-293 Seventh Avenue  
NEW YORK, N. Y.

## Products.

APPROVED FIRE EXTINGUISHING APPARATUS, including the SAFETY FIRE BUCKET TANK, SAFETY FIRE EXTINGUISHER, CHEMICAL ENGINES, UNDERWRITERS' FIRE HOSE, RACKS and REELS, HOSE CARTS.

Axes, Hooks, Watchman's Clocks and Waste Cans.

## Safety Fire Bucket Tank.

Always ready for immediate use and requires no attention. Solution does not evaporate, foul or freeze in any temperature.

Body of heavy steel, top and bottom reinforced with wrought iron rim. Cover and bottom stamped out of one piece, hinges and hasps malleable iron, and entire tank and buckets galvanized after being made. Cover closes on rubber packing, making tank practically airtight and preventing evaporation.

So simple to operate a tank that a child can use it effectively. Open cover, and top bucket is full with handle up, contents of which should be thrown at the base of fire. As fast as one bucket is removed the next fills and handle rises automatically. Six men can each remove a bucket and use its contents on a fire and 4 of the buckets can be refilled with solution remaining in tank.

Endorsed and listed by the Underwriters' Laboratories, Inc., No. 249, and approved by National Board of Fire Underwriters and Board of Supervising Inspectors of Steamboat Inspection Bureau.

## Safety Fire Extinguisher.

Tank is made of extra heavy Lake Superior cold rolled copper; body No. 18-gage; head and bottom No. 17-gage. Outside is highly polished, attractive in appearance, and inside is thoroughly coated with a special preparation of lead to prevent corrosion of copper. Every machine is subjected to a hydrostatic pressure of 400 lbs. to the sq. in. before leaving the factory, and so guaranteed.

Regularly labeled and tested under supervision of the Underwriters' Laboratories, Inc., and approved by the National Board of Fire Underwriters and Board of Supervising Inspectors of Steamboat Inspection Bureau.



SAFETY FIRE EXTINGUISHER



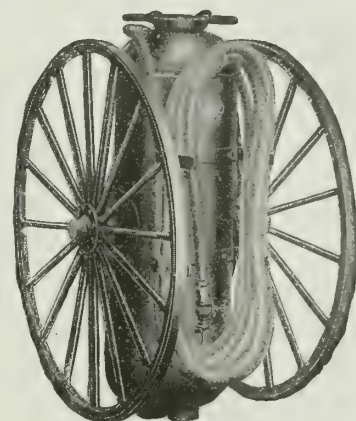
Exterior View Sectional View  
SAFETY FIRE BUCKET TANK

### SIZES AND PRICES

No. 1, Height, 31 ins.; diameter, 15½ ins. Contains 25 gals. chemical solution and six 10-qt. buckets. List price, \$16.00 each.  
No. 2, Height, 34 ins.; diameter, 18½ ins. Contains 40 gals. chemical solution and six 14-qt. buckets. List price, \$18.00 each.

## Chemical Engines.

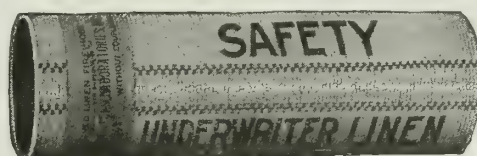
For factory, mercantile and suburban use. Horizontal and perpendicular types. Capacities, 20, 40, 45 and 60 gals. Catalogue gives full description, sizes and use.



TYPES A AND B SAFETY CHEMICAL ENGINE

## Fire Hose.

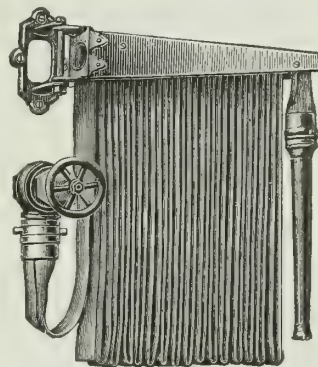
Unlined linen or cotton rubber lined, with Underwriters' label. Sizes, 1, 1½, 2 and 2½ ins., with couplings, nozzles, racks, reels and vales.



UNLINED LINEN, OR COTTON RUBBER LINED FIRE HOSE

## Hose Racks and Reels.

Racks and reels furnished with aluminum bronze finish on iron, solid brass, brass plated, bronze plated, nickelplated. All styles of hose reels and racks and hose cabinets. Send for catalogue.



SAFETY APPROVED HOSE RACK

## Hose Carts.

For factories, warehouses, railroads, and country residences. Catalogue shows various styles.

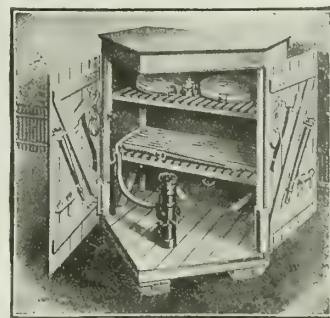
## Safety Fire Hose and Hydrant House.

Approved by Underwriters' Laboratories, Inc., at Chicago, of the National Board of Fire Underwriters and associated factory mutual insurance companies.

SPECIFICATIONS—Length over all, 6 ft. 4 ins.; width over all, 6 ft.; height over all, 7 ft. 3 ins.

Equipment consists of:

- Two fire department axes;
- Two underwriters' play pipes;
- Two ladder straps;
- One heavy mill lantern;
- Two sets brackets for fire axes;
- Four sets brackets for spanners;
- Two crowbars;
- Four Tabor spanners;
- One nozzle holder;
- Two sets brackets for play pipes;
- Two sets brackets for crowbars.



HOSE AND HYDRANT HOUSE



## JOHN SIMMONS CO.

Fire Equipment, Flagpoles

TELEPHONE:  
FRANKLIN 5000110 Centre Street  
NEW YORK, N. Y.

## Products.

APPROVED FIRE EXTINGUISHING APPARATUS, including LINEN FIRE HOSE, HOSE RACKS, HOSE REELS, HOSE VALVES, HOSE CABINETS, METAL FLAGPOLES.

Fire Extinguishers, Standard Siamese Connections, Fire Axes, Crowbars, Hooks and Poles, Malleable Fire Line Fittings, Hydrants, Chemical Engines, Iron Pipe, Fittings and Valves; Steam, Hot Water and Plumbing Supplies.

**"Lightning" Pin Hose Rack, with Hose, Angle or Gate Valve.**

Fig. 1 shows the "Lightning" hose rack. The rack is quickly and easily operated; the mere act of pulling the nozzle releases the hose from the pins. Two sizes; with wall brackets or pipe clamps; finished in bronze, electroplated or japanned; also in solid brass or iron.

## DATA, "LIGHTNING" PIN HOSE RACK

DIMENSIONS	CAPACITY
Length from end of bracket or pipe clamp to end of rack	
No. 1, 20 x 7 ins. wide	No. 1, 75 ft. or less of 2½, 2, 1½, 1¼, or 1 in. hose
No. 2, 24 x 7 ins. wide	No. 2, 100 ft. of 2½, 2, 1½, 1¼, or 1 in. hose

**"Star" Swinging Hose Reel.**

Fig. 2 shows improved design of Simmons well-known "Star" swinging hose reel. Furnished also with pipe clamps; in iron, bronze, japanned or electroplated; also in brass.

## DATA, "STAR" SWINGING HOSE REEL

DIMENSIONS	DIAMETER OF WHEEL	CAPACITY
Length from end of bracket or pipe clamp to end of reel		
Nos. 1-2-3, 18 ¼ ins.	12 ins.	50 ft. hose
Nos. 4-5-6, 23 ins.	16 ins.	75 ft. hose
Nos. 7-8-9, 24 ins.	18 ins.	80 ft. hose
Nos. 10-11-12, 26 ins.	20 ins.	100 ft. hose
Nos. 13-14-15, 35 ins.	26 ins.	(150 or 200 ft.)
Extreme width, 7½ ins.		

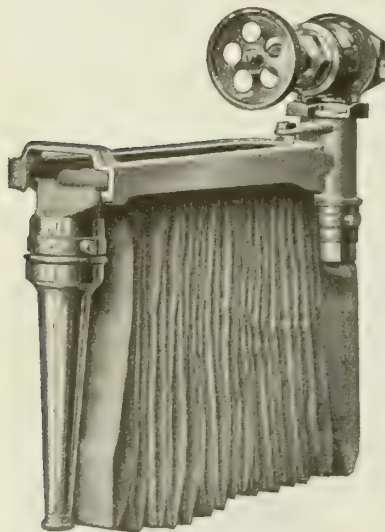


FIG. 1. "LIGHTNING" PIN HOSE RACK

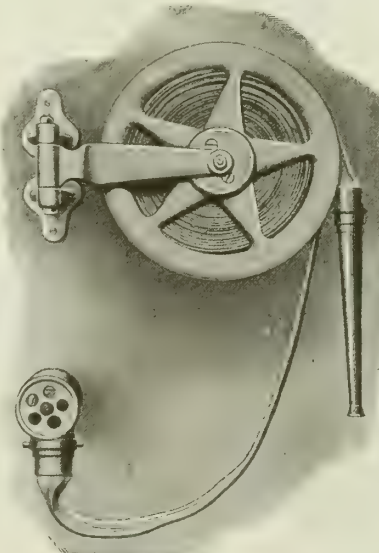


FIG. 2. "STAR" SWINGING HOSE REEL

**"20th Century" Cabinet Fire Hose Equipment.**

This is the latest approved style of fire hose equipment, peculiarly adapted for protection in hotels, theaters, apartments, private residences, etc.

The cabinets are made in all wood, iron, or bronze, according to the requirements, and when made of hardwood throughout adds but a trifle to the cost of the ordinary commercial type of rack or reel.

Cabinets of this type are handsome in appearance and add greatly to the appointments; are practically dustproof and prevent to a large degree pilfering of the brass equipment.

These cabinets are made of a size suitable to contain the required amount of hose and set in flush with the finished plaster, with the ornamental sash set up flat against the plaster and made up permanently on the face of the cabinet. Doors are set with plain or beveled plate glass or tapestry.

Estimates on application. Send for price lists and discounts.

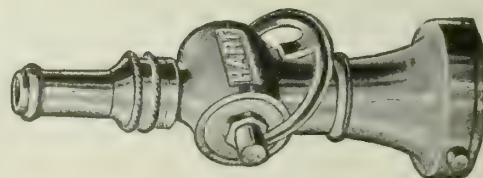
**"TWENTIETH CENTURY" CABINET FIRE HOSE EQUIPMENT**

## DATA, "20TH CENTURY" CABINET FIRE HOSE EQUIPMENT

Cabinet 40 x 10 x 16 ins., holds 100 ft. of 2½-in. hose.
Cabinet 36 x 8 x 10 ins., holds 75 ft. of 2½-in. hose.
Cabinet 30 x 8 x 10 ins., holds 50 ft. of 2½-in. hose.
Cabinets for 1¼-, 1½- and 2-in. hose are the same size, except in that they are made 7 ins. instead of 8 ins. in depth.

**Linen Fire Hose.**

"SS" Approved Underwriter Brand Hose, tested to 400 lbs. pressure to the sq. in.; and "SSS" Commercial Grade Hose, tested to 300 lbs. pressure to the sq. in.



SHUT-OFF NOZZLE





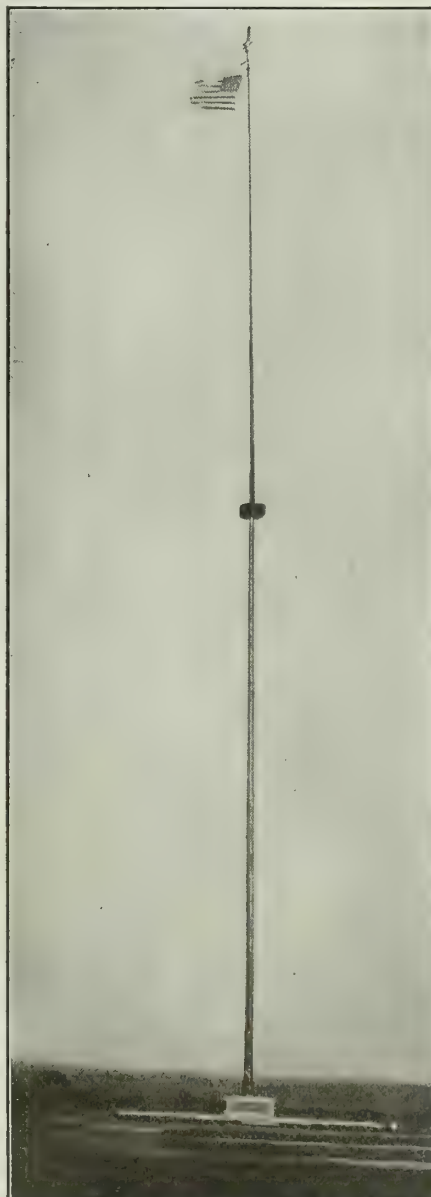
COUNTY COURT HOUSE, HACKEN-  
SACK, N. J.  
Mast 125 ft. above ground



HOTCHKISS SCHOOL, LAKEVILLE,  
CONN.  
Signal mast, 100 ft. above ground



HIGH SCHOOL, JERSEY  
CITY, N. J.  
Pole 90 ft. above ground



SWOPE PARK, KANSAS CITY, MO.  
"Simmons" mast, 200 ft. above ground, designed,  
fabricated and erected by us for Jacob L. Loose, Esq.,  
in June, 1915. Total height, 218 ft.; weight, 19,000 lbs.



GUARANTEE TRUST  
COMPANY, NEW  
YORK, N. Y.  
60 ft. pole, taper welded



PRODUCE EXCHANGE,  
NEW YORK, N. Y.  
90-ft. pole, 60 ft. exposed

# WALWORTH MFG. CO.

## Steel Flagpoles

800 First Street  
BOSTON, MASS.

WORKS:  
BOSTON, MASS.  
KEWANEE, ILL.

NEW YORK, N. Y., 19-21 Cliff Street    SEATTLE, WASH., 414 First Avenue    CHICAGO, ILL., 218 North Desplaines Street

### Products.

WALWORTH STEEL FLAGPOLES, with revolving top.  
WALWORTH PATENT HALYARD TOP for steel or wood poles.

Weather Vanes for steel or wood poles.

### Walworth Steel Flagpoles.

Furnished complete in any height from 20 ft. upwards, and in continuous construction. No topmast required.

Poles are symmetrical; are proof against wind, weather and lightning. They will not chip, crack, warp or twist, and will retain shape and last indefinitely.

Also furnished for residential use in 20 to 25 ft. lengths for setting on piazza ends or on roofs, by means of strong braces.

The Walworth patent ball bearing revolving halyard top, regularly furnished unless otherwise specified, prevents fouling of flag in even a strong gale. The sleeve of this top is securely wedged to steel pole. The shaft carrying ball and bonnet runs on ball bearings and can not get out of order or become affected by dampness.

Erection is simple and quickly accomplished.

Poles furnished to specification as well as from stock.

DATA, WALWORTH STEEL FLAGPOLES, STOCK SIZES

No.	Depth in ground, ft.	Height above ground, ft.	Diam. gilded copper ball, ins.	Number of sections	Diam. of sections, ins.	Prices
00	Roof	20	6	2	3 2 1/2	On application
0	Roof	25	6	2	3 2 1/2	
1	5	25	8	2	5-4	
3	5	35	8	3	6-5-4	
6	8	50	8	4	7-6-5-4	
8	8	60	8	4	7-6-5-4	
11	10	75	8	5	8-7-6-5-4	
16	13	100	8	7	10-9-8-7-6-5-4	

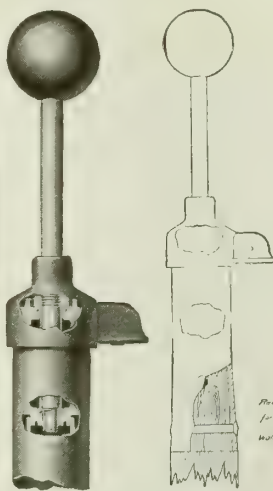
Poles shipped knocked down. Directions for erection given.

### Walworth Patent Halyard Top for Wooden Flagpole.

Walworth patented revolving halyard top for wood flagpoles is the same top which we furnish on steel poles, and is fastened to the wood pole by slipping the top into a short piece of steel pipe, which in turn is slipped over



WALWORTH STEEL FLAGPOLE, MANSFIELD, MASS., COMMON



WALWORTH PATENT BALL BEARING REVOLVING HALYARD TOP

For wood and steel flagpoles.  
Note simple method of attaching the top to a wood pole

the top of the pole and held fast by means of wood screws. This arrangement is furnished complete by us, and makes a very neat finish when erected.

DATA, WALWORTH HALYARD TOP  
For Steel or Wood Poles

I. D. sleeve	Length pipe	Without ball	Gilded copper ball	Diam. ball
2 1/2 ins.	18 ins.	\$10	\$17	6 ins.
4 ins.	18 ins.	11	19	8 ins.

Screws for attaching to pole furnished.



TWO WALWORTH 50-FT. STEEL FLAGPOLES ON BARTON BUILDING AND AMOSKEAG NATIONAL BANK BUILDING, MANCHESTER, N. H.



RAISING THE FLAG ON WALWORTH STEEL FLAG POLE 135 FT. HIGH, TOWN HALL, STOUGHTON, MASS.



# ELECTRICAL INFORMATION AND DATA

FURNISHED BY

The Society for Electrical Development, Inc.

29 West 39th Street

NEW YORK, N. Y.

## Purpose of the Following Pages.

It is believed the following pages will emphasize, to both architects and owners, the advisability of planning better and more complete electrical equipment for proposed buildings than has heretofore been the general custom.

Such improvements, when included in the original plan, do not add materially to the expense, while the alterations necessary to secure such results later may be very costly and sometimes prohibitive.

## Electricity in Modern Building.

Electricity has become so necessary a factor in modern life that no building can be considered modern unless adequately wired for its varied applications.

Not only should provision be made for apparatus already on the market, but so planned as to be able to readily utilize the improvements of the future.

## Estimating Cost of Electrical Installations.

It has been common practice in building estimates to allow a bare  $1\frac{1}{2}\%$  of the cost of the completed structure to cover the electrical installation. Is this important part of the equipment not entitled to more liberal consideration? Even 3% or 4% would be a low rate to charge up to greater safety, comfort and efficiency.

## National Electrical Code.

The National Electrical Code is issued biennially by the National Board of Fire Underwriters. The rules embodied therein are the result of many years' experience and study, drawn up by a committee of the National Fire Protection Association, an organization which has the active co-operation in matters pertaining to fire prevention and protection of a large number of interested organizations. Those co-operating in matters electrical and represented by members on the committee are:

American Electric Railway Association  
American Institute of Electrical Engineers  
Associated Factory Mutual Fire Insurance Companies  
National Association of Electrical Inspectors  
National Board of Fire Underwriters  
National Electric Light Association  
National Electrical Contractors Association

The provisions of this code are enforced by practically all municipal and insurance electrical inspectors.

Do not lose sight of the fact in consulting the code that it merely prescribes the minimum requirements allowable, and that it is wise to provide a wider margin.

The code rules permit only the use of approved fittings and material.

## The Underwriters' Laboratories.

The Underwriters' Laboratories is an organization whose object is to bring to the user the best obtainable opinion on the merits of appliances, devices, machines and materials in respect to the life and fire hazards and accident prevention.

## List of Approved Electrical Fittings.

The Underwriters' Laboratories have prepared complete standards for electrical fittings, and all fittings which have been examined and found to comply with these standards are published by this organization in a book, called "List of Approved Electrical Fittings."

## Standardization of Electrical Construction.

The work of developing the proposed national electrical safety code, which has been undertaken by the United States Bureau of Standards, has attracted much attention among electrical companies, State commissions, city officials, and many others interested in electrical construction and operation throughout the United States. Practically all these interests have given their cordial co-operation in the project, which aims at a standardization of these branches of electrical work.

## Form of Current to Be Used.

In designing an electrical installation it is essential to determine in advance whether central station current will be used or a complete power plant is to be installed. When central station current is available, it is generally conceded to be more economical, except in special cases, to use such power than to install a generating plant. In the latter case it is recommended that the current generated shall correspond to the class of current obtainable from the public service company, for in case of a breakdown of generating plant, central station power will be suitable, and there will be no occasion for interruption of service.

In any case, it is wise to consult with the central station management, as they are always familiar with the latest regulations affecting the industry—both those of the local city administration and of the insurance interests.

As a rule, alternating current is used when transmission is over one-quarter mile, and where constant speed and quite constant service, without frequent stopping and starting, are required, and whenever lighting systems are the principal load. In buildings where stopping and starting of various machines will be frequent, and where adjustable speed motors are desired, or battery charging or electroplating is required, direct current is best adapted.

If the available current is alternating, and direct current desired, the alternating can be converted into direct by employing a rectifier or motor-generator set.

## Electrical Units.

**VOLT**—Unit of Electro-motive Force: The force required to send one ampere of current through one ohm of resistance.

**OHM**—Unit of Resistance: The resistance offered to the passage of one ampere when impelled by one volt.

**AMPERE**—Unit of Current: The current which one volt can send through a resistance of one ohm.

**WATT**—Unit of Power: The power to do work when one ampere passes through one ohm under pressure of one volt (746 watts equal 1 h.p.).

**MIL**—Unit of Measure for Expressing Size of Wire. Mil is equal to 1/1000 in.

**Electrical Formulæ (Direct Current).**

Ohm's law is a method of expressing the relation-ship existing between the electro-motive force, current and resistance, and is practically the basis of most electrical computations.

$$\begin{array}{lll} I = \text{Current (Amperes)} & E = \text{Electro-motive force (Volts)} \\ R = \text{Resistance (Ohms)} & W = \text{Electric power (Watts)} \\ H.P. = \text{Horsepower} & K = \text{Efficiency of machine} \end{array}$$

$$I = \frac{E}{R} \quad R = \frac{E}{I} \quad E = RI \quad W = IE$$

CARRYING CAPACITY, SIZE AND WEIGHT OF INSULATED COPPER WIRES AND CABLES FOR INTERIOR CONDUCTORS, ALL VOLTAGES

Size B & S	Circular mils	NATIONAL ELECTRICAL CODE					
		Single conductor Rubber insulated for 600 volts				Triple braid weatherproof	
		Allow- able current carry- ing capac- ities	Braided		Leaded		Allow- able current carry- ing capac- ities
			Weight per 1000 ft.	Over all diam- eter	Weight per 1000 ft.	Over all diam- eter	
18	1,624	3	17	.19			
16	2,583	6	20	.20	210	.29	19
14	4,107	15	35	.21	228	.31	25
12	6,530	20	46	.23	253	.33	35
10	10,380	25	63	.26	288	.35	53
8	16,510	35	86	.29	335	.38	75
6	26,250	50	139	.37	512	.47	110
5	33,100	55	165	.40	565	.49	137
4	41,700	70	197	.42	618	.51	164
3	52,630	80	240	.45	694	.54	209
2	66,370	90	289	.51	770	.57	255
1	83,690	100	381	.59	935	.65	310
0	105,500	125	464	.63	1055	.69	400
00	133,100	150	563	.67	1202	.73	490
000	167,800	175	683	.72	1372	.78	625
0000	211,600	225	835	.78	1583	.84	765
Cables	250,000	238	1032	.87	2100	.98	937
"	300,000	275	1218	.93	2303	1.00	1120
"	400,000	325	1548	1.03	2753	1.10	1445
"	500,000	400	1888	1.12	3487	1.22	1781
"	600,000	450	2275	1.22	4021	1.38	2113
"	700,000	500	2619	1.30	4474	1.41	2445
"	800,000	550	2959	1.36	4912	1.44	2778
"	900,000	600	3400	1.43	5340	1.53	3128
"	1,000,000	650	3624	1.48	5752	1.59	3478
"	1,250,000	750	4496	1.65	7300	1.79	
"	1,500,000	850	5319	1.77	8343	1.91	
"	1,750,000	950	6394	1.90	9355	2.02	
"	2,000,000	1050	6958	1.99	10367	2.13	

**Conversion Factors.**

1 Horsepower	746 watts
	33,000 ft. lbs. per minute
1 Watt	.001 kilowatt
	.00134 horsepower
1 Kilowatt	1000 watts
	1.34 horsepower
1 Kilowatt hour	1000 watt hours
	1.34 horsepower hours

**WIRING TABLE FOR LIGHT AND POWER**

2-WIRE D. C. AND SINGLE-PHASE A. C., AND 4-WIRE TWO-PHASE A. C.

Multiply current in amperes for D. C. and single-phase, or amperes per phase (when two-phase four-wire) by single distance in feet and refer to the nearest corresponding number under column of actual volts lost, to find wire size.

Volts	PERCENTAGE OF LOSS														
2000	1.2	1.1	1.0	0.75	0.5	0.45	0.4	0.35	0.3	0.25	0.2	0.15	0.1	0.05	
1000	2.4	2.2	2.0	1.5	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	
500	4.8	4.3	3.9	2.9	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2	
220	10.3	9.3	8.3	6.5	4.4	3.9	3.5	3.1	2.7	2.2	1.8	1.4	0.9	0.45	
110	18.5	17.0	15.4	12.0	8.4	7.6	6.8	6.0	5.2	4.4	3.5	2.7	1.8	0.9	
52								11.8	10.3	8.8	7.1	5.5	3.7	1.9	

**ACTUAL VOLTS LOST**

Carrying capacity *amperes	Size B. & S.	25	22.5	20	15	10	9	8	7	6	5	4	3	2	1
225	0000	247000	222300	197600	148200	98800	88920	79040	69160	59280	49400	39520	29640	19760	9880
175	000	196000	176400	156800	117600	78400	70560	62720	54880	47040	39200	31360	23520	15680	7840
150	00	155375	139837	124300	93225	62150	55935	49720	43505	37290	31075	24860	18645	12430	6215
125	0	123250	110925	98600	73950	49300	44370	39440	34510	29580	24650	19720	14790	9860	4930
100	1	97750	87975	78200	58650	39100	35190	31280	27370	23460	19550	15640	11730	7820	3910
90	2	77500	69750	62000	46500	31000	27900	24800	21700	18600	15500	12400	9300	6200	3100
80	3	61500	55350	49200	36900	24600	22140	19680	17220	14760	12300	9840	7380	4920	2460
70	4	48750	43875	39000	29250	19500	17550	15600	13650	11700	9750	7800	5850	3900	1950
55	5	38750	34875	31000	23250	15500	13950	12400	10850	9300	7750	6200	4650	3100	1550
50	6	30750	27675	24600	18450	12300	11070	9840	8610	7380	6150	4920	3690	2460	1230
35	8	19275	17347	15420	11565	7710	6939	6168	5397	4626	3855	3084	2313	1542	771
25	10	12125	10912	9700	7275	4850	4365	3880	3395	2910	2425	1940	1455	970	485
20	12	7625	6862	6100	4575	3050	2745	2440	2135	1830	1525	1220	915	610	305
15	14	4800	4320	3840	2880	1920	1728	1536	1344	1152	960	768	576	384	192

NOTE—In case a larger loss than any given in the table is required, proceed as follows: Divide the ampere feet by 10 and then refer to column of "actual volts lost" divided by 10, from which we find the size wire as before.

\* Rubber insulation. For carrying capacity of weatherproof insulated wires.

**Wire Terminology.**

**WIRE**—A slender rod or filament of drawn metal; while primarily the term "wire" refers to the metal, nevertheless when the contents show that the wire is insulated the term "wire" will be understood to include the insulation.

**CONDUCTOR**—A wire, or combination of wires, not insulated from one another, suitable for carrying a single electric current.

**CABLE**—A stranded conductor, or a combination of conductors insulated from one another. The term "cable" is applied by some manufacturers to a solid wire heavily insulated and lead covered. The usage arises from the manner of the insulation, but such a conductor is not included under the definition of "cable." The term "cable" is a general one, and, in practice, it is usually applied to the larger sizes. A small cable is called a "stranded wire," or a "cord." Cables may be bare or insulated, and the latter may be armored with lead or steel wires or bands.

**STRAND**—One of the wires or groups of wires of any stranded conductor.

**STRANDED WIRE**—A group of small wires, used as a single wire.

**CORD**—A small cable, very flexible, and substantially insulated to withstand wear.

**DUPLEX CABLE**—Two insulated single conductor cables, twisted together. They may or may not have a common insulating covering.

**TWIN CABLE**—Two insulated single conductor cables, laid parallel, having a common covering.

**Wiring Notes.**

In the wiring of new buildings it is advisable, when a considerable consumption of electric energy is anticipated for appliances, small motors, or heating and cooking purposes, to install a separate system of wiring for these devices.

This will permit these devices being connected to a separate meter; and many central stations make a lower rate for current consumed by heating and power apparatus than for lighting current, since these devices are used at the off peak period of the central station load.



The following are important factors in planning the wiring of any building:

- FIRST—Liberal size of wires.
- SECOND—Ample number of lighting outlets.
- THIRD—Good switch control.
- FOURTH—Sufficient appliance outlets (for heating, cooking, power).

In planning various circuits, one should endeavor to locate distribution centers in easily accessible places, so that cut-outs and switches controlling circuits can be grouped for convenience and safety of operation. The load should be divided as evenly as possible among the different circuits, and all complicated and unnecessary wiring should be avoided.

When installing wires, ample outlets should be provided in all rooms for future use, to take care of the rapidly increasing use of electric devices of various sorts.

No one lighting circuit of 300 volts or less shall be used to carry more than 600 watts. Wire for inside work must not be of smaller size than No. 14 B & S gauge, except as allowed for fixture work and pendent cord, and this is not desirable.

By special permission, 32 sockets or receptacles, or 1320 watts may be placed on one circuit of No. 14 wire, when the wire is connected directly to keyless sockets or receptacles, and the outlets are so located that it is unlikely that the lamp cord will ever be connected to them.

All power receptacles should be designed to take the same plug, and these should be made to fit only the power outlets, so as to prevent their attachment to the lighting circuits, which are not designed to carry the relatively heavy currents required by the power consuming devices.

Before laying out wiring plans for any building, the rules of National Electrical Code should be carefully noted, as well as State laws and City ordinances.

Wires for conduit must be rubber covered and have a double braid over the rubber.

Insulation of Wires.

Various grades of rubber covered wire are manufactured. The principal differences lie in the quantity of pure rubber and gum used in the insulating compound. The wire must, in all ways, meet the requirements of the National Electrical Code Standard, that is, have the approval of the Underwriters' Laboratories.

Conduits.

The same conduit must not contain more than four 2-wire or three 3-wire circuits of the same system, except by special permission of the inspection department, and must never contain circuits of different systems.

No conduit tube having an internal diameter of less than 5/8 in. shall be used. All elbows or bends must be so made that the conduit, or lining of same, will not be injured. The radius of curve of the inner edge of any elbow not to be less than 3 1/2 ins. Must have not more than the equivalent of four quarter bends from outlet to outlet, the bends of the outlet not being counted.

In tall buildings special provision must be made to support the conductors in the vertical conduits, to remove their weight from their connections, and the

spacing of supports in such cases is prescribed as follows:

SIZE OF WIRE	DISTANCE OF SUPPORT
14 to 0.....	100 ft.
0 to 0000.....	80 "
0000 to 35000 cm.....	60 "
35000 to 500000 cm.....	50 "
500000 to 750000 cm.....	40 "
750000 cm.....	35 "

In laying out a conduit job, first ascertain the size and number of wires required, then take the size of conduit from the following table:

SIZE OF CONDUITS FOR THE INSTALLATION OF WIRES AND CABLES

NUMBER OF CONDUCTORS IN SYSTEM				
	One conductor in a conduit, size conduit, ins.	Two conductors in a conduit, size conduit, ins.	Three conductors in a conduit, size conduit, ins.	Four conductors in a conduit, size conduit, ins.
Size B & S	Electrical trade size	Electrical trade size	Electrical trade size	Electrical trade size
14	1 1/2	3/4	1/2	3/4
12	1 1/2	3/4	3/4	3/4
10	1 1/2	3/4	3/4	1
8	1 1/2	1	1	1
6	1 1/2	1	1 1/4	1 1/4
5	3/4	1 1/4	1 1/4	1 1/4
4	3/4	1 1/4	1 1/4	1 1/2
3	3/4	1 1/4	1 1/4	1 1/2
2	3/4	1 1/4	1 1/2	1 1/2
1	3/4	1 1/2	1 1/2	2
0	1	1 1/2	2	2
00	1	2	2	2 1/2
000	1	2	2	2 1/2
0000	1 1/4	2	2 1/2	2 1/2
CM				
200000	1 1/4	2	2 1/2	2 1/2
250000	1 1/4	2 1/2	2 1/2	3
300000	1 1/4	2 1/2	2 1/2	3
400000	1 1/4	3	3	3 1/2
500000	1 1/2	3	3	3 1/2
600000	1 1/2	3	3 1/2	
700000	2	3 1/2	3 1/2	
800000	2	3 1/2	4	
900000	2	3 1/2	4	
1000000	2	4	4	
1250000	2 1/2	4 1/2	4 1/2	
1500000	2 1/2	4 1/2	5	
1750000	3	5	5	
2000000	3	5	6	

Test of Completed Installation.

The wiring in any building must comply with the following requirements:

The complete installation must have a resistance between conductors, and between all conductors and the ground (not including attachments, sockets, receptacles, etc.), not less than that given in this table: .

Up to 5 amperes.....	4,000,000 ohms.
Up to 10 ".....	2,000,000 ohms.
Up to 25 ".....	800,000 ohms.
Up to 50 ".....	400,000 ohms.
Up to 100 ".....	200,000 ohms.
Up to 200 ".....	100,000 ohms.
Up to 400 ".....	50,000 ohms.
Up to 800 ".....	25,000 ohms.
Up to 1,600 ".....	12,500 ohms.

The test must be made with all cut-outs and safety devices in place. If the lamp sockets, receptacles, electroliers, etc., are also connected, only one-half of the resistances specified in the table will be required.

Comparative Costs of Wiring.

Owing to varied costs of material and labor, as well as different restrictions placed by state and city ordinances, the following table gives only approximate figures for comparing the various systems of wiring per outlet.

Knob and tube.....	\$1.50 to \$2.50
Flexible steel and armored conductors.....	2.00 to 5.00
Flexible steel conduit.....	3.50 to 5.50
Rigid metallic conduit.....	4.00 to 7.00

## Switchboards.

Before designing a switchboard, it is advisable to get in touch with switchboard manufacturers, as they usually have a line of standard panels, to which the various circuits might be adapted. Standard panels are less expensive than special boards. In locating switchboard, the following requirements of the National Board of Fire Underwriters should be borne in mind:

(a) Must be so placed as to reduce to a minimum the danger of communicating fire to adjacent combustible material. Switchboards must not be built up to the ceiling, a space of 3 ft. being left, if possible, between the ceiling and the board. The space back of the board must be kept clear of rubbish and not used for storage purposes.

(b) Must be made of non-combustible material.

(c) Must be accessible from all sides when the connections are on the back, but may be placed against a brick or stone wall when the wiring is entirely on the face. If the wiring is on the back, there must be a clear space of at least 18 ins. between the wall and the apparatus on the board, and even if the wiring is entirely on the face, it is much better to have the board set out from the wall.

(d) Must be kept free from moisture.

(e) Wires with inflammable outer braiding, when brought close together, as in the rear of switchboards, must, when required, be each surrounded with a tight, non-combustible outer cover. Flameproofing must be stripped back on all cables a sufficient amount to give the necessary insulation distances for the voltage of the circuit on which the cable is used.

## Illumination.

This is a subject which is often neglected. The introduction of many types of diffusing and directing media has drawn the attention of the architect to the great possibilities for effects which may be secured with the aid of artificial lighting. Direction and amount of light plays an important part in the design of an interior.

Below are given a few hints on modern lighting practice. The calculations involved in the design of a lighting installation are comparatively simple, yet space is not available in such a publication as this to enter into detail of design. The reader is referred to one of the numerous handbooks for this material. The reputable manufacturers of lamps and lighting appliances issue such data in convenient and reliable form.

## Arrangements of Lighting Systems.

**LOCAL LIGHTING**—The method of lighting where attention is paid only to illumination over small spaces without reference to any intermediate points, as for example, where a small lamp is used over a lathe. Local lighting is sometimes used to supplement the general illumination where a high illumination is required at particular points or times.

**GENERAL ILLUMINATION**—The method of lighting, an interior in which an attempt is made to give an equal intensity of light throughout the entire room. It is usually applied to lighting with large units, and represents the extreme of practice opposed to local lighting.

**LOCALIZED GENERAL ILLUMINATION OR GROUP LIGHTING**—This is applied to the practice intermediate between general illumination and local lighting, lamps being spaced with reference to machinery or processes, so as to give proper direction of light and maximum intensity at important points.

## Flood Lighting.

A concentrated light source, arc or incandescent, at the focus of a parabolic reflector, emits a very narrow beam of light. When such units are hidden from view and the light trained on the surface to be illuminated, it is known as flood lighting. The splendid

examples of flood lighting at the Panama-Pacific Exposition have given it wide publicity and awakened interest. Developments in incandescent lamps have been such that there are now available a number of types of units which give desirable distributions of light for the various conditions met in practice. The effects produced by properly applied flood lighting to public buildings, monuments and commercial structures are very dignified and striking. Illuminated buildings of this character contribute materially to the appearance of a city. Flood lighting has also been of considerable use to illuminate large outdoor areas where it is not feasible to place overhead lamps or where the objects to be lighted are a considerable distance from a convenient source of power.

## Types of Lighting Units.

**DIRECT LIGHTING**—Commonly applied to a type of lighting unit in which it is apparent that a majority of the light received in useful directions comes directly from the light source without being first reflected by the ceiling or other large surface. For example, clear or frosted incandescent lamp; lamp enclosed in diffusing globe; lamp equipped with ordinary glass or metal reflector.

**INDIRECT LIGHTING**—Applied to a lighting unit in which all the light is reflected to the ceiling or other large surface by an opaque reflector, for redistribution in useful directions. For example, cove lighting or lamps concealed by inverted, opaque reflectors.

**SEMI-INDIRECT**—Applied to lighting units in which the majority of the light is reflected by means of translucent reflectors on to large surfaces, for distribution throughout the room, some light however being transmitted through the reflector.

## Choice of a Semi-indirect Unit.

While it is not in our province to venture an opinion as to which type of lighting unit is best, present practice is tending quite strongly to semi-indirect methods of lighting; and on account of the large number of these units being installed, it is well to briefly summarize some of the features which should be observed if the best effects are to be secured. If the unit is to be used where close application to work is necessary, as, for example, office or schoolroom, it should be of quite dense glass; in other words, transmit but a small proportion of the light. If light density glass is used, the bowl becomes very bright and the system loses many of its advantages.

The fixture or hanger used should be of such a length and the socket in the proper relative position to the bowl that the light is thrown to the ceiling in such a manner as to evenly illuminate this. If the lamp is too low in the dish, the emitted light is concentrated in a fairly narrow angle, resulting in a ring or circle of very bright illumination on the ceiling directly above the unit, with the spaces between units comparatively dark. Of course, the lamp should not be raised so high that the filament becomes visible.

In most localities the glass used should be smooth inside always, and preferably on the outside, as rough glass collects dirt readily and is difficult to clean.

The means of suspension should be such that there is absolutely no danger of the glassware falling, and it is desirable to have some convenient means of cleaning. Semi-indirect units for the commercial installation should have very simple decorations on the glassware, for deep crevices, although they may be decorative, are objectionable from the standpoint of dust accumulation.



### Common Terms Used in Illumination.

**DIFFUSION**—That quality of light produced by the presence of irregular cross rays, as distinguished from parallel rays, or those radiating from a point. It is usually secured by interposition of opal or frosted globes, or by the use of dull surfaced reflectors so as to increase the apparent dimensions of the light source. While diffusion is usually accomplished by some sacrifice in light intensity, it is also accompanied by reduced brilliancy and glare, so that reasonable diffusion improves the seeing value of light.

**GLARE**—A condition of lighting which, on account of an excessive contrast or high brilliancy, produces ocular discomfort or interferes with vision. The most common example is where a brilliant source is seen against a dark background.

**EFFICIENCY**—The efficiency of an electric lamp is usually expressed by the ratio between the light output and watts input. For example, lumens per watt, mean spherical candlepower per watt, watts per mean horizontal candlepower. Watts per candlepower (mean horizontal) has been used extensively in connection with the incandescent lamp, but since it does not properly represent efficiencies of different types of lamps, and also gives a lower value for lamps of higher efficiency, there is now a tendency to abandon the expression in favor of lumens per watt or mean spherical candlepower per watt. The efficiency of a lighting system is expressed by the ratio of effective lumens (foot candles times square feet) to generated lumens (lumens per lamp times number of lamps).

**LUMEN**—The unit of light flux either (a) emitted by a source or (b) falling on a surface. It is equal to intensity times area. For example:

(a) Lumens equal mean spherical candlepower times area in square feet of an imaginary sphere of 1-ft. radius concentric with the source. Total lumens from a lamp equal mean spherical candlepower times 12.57 (total area of such sphere).

(b) The lumens falling on a surface equal average foot candles times area of surface in square feet.

**FOOT CANDLE**—The unit of intensity of illumination received on a surface. If light from a point source of known candlepower falls perpendicularly on a surface, the foot candles can be determined by dividing the candlepower by the square of the distance in feet.

**WATTS PER SQUARE FOOT**—(Of floor area). Has often been used to indicate the relative power consumption of lighting installations. Where similar equipments of equal efficiency are used the watts per square foot is the measure of the relative lighting value. Owing to its simplicity this has often been used.

**MAZDA**—A trade-mark name used by certain American manufacturers of incandescent lamps to designate the quality of lamps established by the leading research laboratory. Mazda B has been used to designate tungsten filament, vacuum types of lamps. Mazda C has been used to designate tungsten filament gas-filled lamps.

### Hints on Lighting Installations.

**LOCATION OF OUTLETS**—For uniform general illumination, the area to be lighted should be divided as nearly as possible into equal squares, and the light unit placed at the center of each square. The size of the square depends upon the use to which the room will be put, and in some cases upon the extent to which shadows will be objectionable; for, in general, the smaller the size of the square, the less intense will be the shadows. For instance, in lighting large offices

where individual desk lamps are not employed, the square should be comparatively small, in order to have the light on any one desk coming from many units.

The ceiling height will, of course, determine the hanging height of the lamp; and, in general, the higher the ceiling, the greater the allowable spacing. As a rough rule for ordinary conditions met in commercial lighting, as stores, public halls, hotels, etc., the distance apart of units should approximate the ceiling height. Of course, local conditions, such as obstructions, piping, etc., will affect this; and special requirements, such as in a factory, mill and the like, can not be thus generally treated.

### Raising the Standard of Lighting Intensities.

Owing to the increased appreciation of artificial light and its reduced cost, the intensities demanded at the present time are in most classes of lighting, considerably higher than, say, five years ago. The indications are that the corresponding requirements five years hence will show even a greater increase. It is therefore desirable to so design the lighting that such demands can be met without excessive demands or difficulty.

Many lighting equipments are now inartistic and ineffective because the fixtures and shades used a few years ago are not suited to the larger, modern lamps now employed. Due consideration should, therefore, be given to the choice of fixture, choosing one with sufficient clearance between the lamp and reflector to permit, if necessary, installing a larger bulb. Fixtures which conceal the lamps from view are advantageous, in that a change in the shape or size of the lamp does not distort the appearance of the equipment.

It is desirable to make lighting equipments as far as possible foolproof. Lack of this precaution has in some instances caused a ruin of artistic lighting effects by thoughtlessness or ignorance on the part of caretakers. Where fixtures are equipped to take lamps of a particular bulb form, as, for example, round bulb, all frosted, it not infrequently happens that those responsible for the maintenance replace the lamps, on burn-out, with other forms, such as ordinary clear lamps. Such changes, of course, spoil the appearance of a fixture and may mar the lighting effect.

As a general proposition it is better to have the diffusion of the light introduced by means of shades or reflectors, external to the lamp bulb; and such equipment should be used where permitted by the artistic requirements.

### Color of Ceilings and Walls.

In the commercial interior such as the office or shop, the best lighting conditions are obtained when the ceiling is a pure white. If it is necessary to tint at all it should be tending toward the cream rather than toward grey or any other dark color. The upper part of the side walls should also be very light in color, to reflect the light which strikes there. It is often good practice to provide a rather dark dado about the lower part of the walls to furnish a space on which the eye can rest momentarily after reading or writing. This also has the advantage that finger marks and other blemishes do not show, and as comparatively little of the light hits the lower part of the walls, a dark finish here does not seriously affect the illumination.

### Colored Lighting.

One phase of the art of illumination, which has never received proper attention, is the application of colored light. Many wonderfully artistic effects can be



produced by the use of tinted lamps. A little experimentation will often reveal the possibilities of decoration for special occasions, and a little touch of color will bring out some feature in the furnishings of a room most attractively. Artificial daylight can be had through the use of correct color filters. This is of service in the store and like interiors. Installations of this character are rapidly increasing in number.

In the home the unmodified light is often thought of as "too cold or hard." Through associations many persons have grown to prefer a light somewhat warm in hue; here amber colored lamps meet the demands.

### Motors.

The selection of a motor best adapted to perform a certain specific duty is a very important matter, and should be determined by an electrical engineer or by a responsible manufacturer. Conditions of current, load on motor, class of service and starting conditions must all be taken into consideration. The following points will prove of some assistance in the determining of type of motor.

- (1) Direct or alternating current.
- (2) Voltage (frequency and phase, if alternating).
- (3) Power consumed in machine or machines motor is to drive.
- (4) Belted, geared, chain or direct connected.
- (5) Service to be continuous or intermittent.
- (6) Frequent starting and torque conditions at starting.
- (7) Speed required, constant, variable or adjustable.
- (8) Location of motor, dust, acid, fumes, dampness, high temperature, etc.

### Elevators.

As over 85% of all elevators which are being installed in New York are electric, the architect or builder should consult the manufacturer of electric elevators before deciding on elevator installation. The importance of having a phase or reverse energy relay device attached to the elevator equipment when alternating current is used is urged. This may prevent serious accident and possible loss of life.

### Ventilation.

Electric blowers, fans and exhaust fans play a very important part in building ventilation. They are not only used to supply fresh air to rooms, but are used to extract foul air, dampness, odors, steam, fumes, etc., from the same.

**DESIGNING INFORMATION**—Cubic feet of air per person delivered per minute by electric fan and blowers:

General hospitals.....	35-40	Kitchens.....	60
Contagious hospitals..	80	Theaters.....	20-30
Workshops.....	25	Assembly halls..	20
Living rooms.....	50	Schools.....	30-40
Prisons.....	30	Offices.....	40

**EXAMPLE**—An office having 30 occupants requires approximately 30 x 40=1200 cu. ft. of air per minute. Select a fan giving approximately this air delivery, and suited for the customer's circuit.

**NOTE**—If air in room is completely changed in 5 minutes or less, a draught is liable to be created, depending upon the location of exhaust fan and occupation of persons in the room.

Air replacing the exhausted air should be pure—from a pure source—or little is gained.

Fans should blow outward instead of inward, as the latter produces draughts.

### Vacuum Cleaners, Stationary.

Machines are usually rated according to the number of outlets that can be operated at one time. However, this does not adequately represent their efficiency, which should be determined by the vacuum maintained at the working end of the hose with the full number of outlets in use.

**HEAVY DUTY**—Where sweeping is mostly done by men, and time is an important factor, in banks, churches, clubs, factories, post offices, hospitals, hotels, stores, theaters, etc.

**MEDIUM DUTY**—Where sweeping is mostly done by women and time is less important, in apartment houses, residences, small banks, club houses, small hotels, etc.

**LIGHT DUTY**—Where time is practically of no importance, in small residences, etc.

**SWEEPER CAPACITY TO INSTALL; ALSO CORRECT ORIFICE AND VACUUM FOR TEST**

Tool	Class of duty	Heavy		Medium		Light	
		Bare	Carpet	Bare	Carpet	Bare	Carpet
	Kind of floor surface						
	Number of formula to use...	1	1	2	2	3	3
15"	Size of round, sharp edged orifice.....	7⁄8"	5⁄8"	7⁄8"	5⁄8"	7⁄8"	5⁄8"
	Minimum vacuum Hg. in. with open orifice at end of hose.	2"	3"	1½"	2¼"	1"	1½"
	Number of formula to use...	2,	2	3	3	4	4
10"	Size of round, sharp edged orifice.....	¾"	11⁄16"	¾"	11⁄16"	¾"	11⁄16"
	Minimum vacuum Hg. in. with open orifice at end of hose.	2"	3"	1½"	2¼"	1"	1½"
Formula No. 1		Formula No. 2		Formula No. 3		Formula No. 4	
A		A		A		A	
N = 7500XT		N = 5000XT		N = 3300XT		N = 2300XT	
A = Sq. ft. of floor. T = hours allowed for each cleaning. N = number of sweepers.							

### Heating Equipment.

Portable and permanent electric heaters of various sizes and designs are now available. There are a number of ways of utilizing electricity for this purpose, the hot air system, hot water or steam circulation. An individual heater or radiator may be installed in each room.

An electric water heater can be obtained which is adaptable for any hot water tank, or receptacle. It is easily installed and quickly heats all necessary water.

### Wiring Diagrams.

In designing the electric wiring of any structure it is always wise to consider future requirements and to anticipate as far as possible the steady development of electrical conveniences. The most economical and by far the least troublesome time to install wiring in a house or public building is when the structure is in progress of construction. Therefore, be liberal in the use of switches, outlets for portable lamps, fans, cooking appliances and the many other devices; provide adequate outlets in the various living rooms for electric vacuum cleaners and floor polishers; also in bedrooms and bathrooms for electric heaters, vibrators, curling irons and electric sewing machines; and in the service rooms for electric ranges, dishwashers, knife sharpeners, buffing and polishing devices, electric ice cream freezers, clothes dryers, refrigerators, washing machinery, irons, etc.

On the second page following are given various wiring suggestions and on pages 1198-1201 are shown floor plans of an electrically equipped home on which are suggested equipment and location of outlets, wattage and other data of designing value.

### Standard Wiring Symbols.

The standard wiring symbols, as adopted by the American Institute of Architects and The National Electrical Contractors Association, and additional symbols to take care of new conditions are also given on the pages referred to (1198-1201), as well as being used on the drawings. Architects are urged to make use of these symbols in designating the various outlets in office and public buildings, apartment houses, and in fact on all working drawings where electric wiring is part of the design.



**Electrical Appliances.**

The domestic servant problem is forcing every householder to seek labor saving devices to help out a situation that is fast growing serious.

The electric range, clothes washer, iron, vacuum cleaner, dishwasher, fan, radiator, sewing machine motor, coffee and food grinder, toaster, percolator and many other electrically operated devices each help to lighten the labor of the home.

The obvious duty of the architect and the landlord is to see that wiring outlets are available for their convenient use.

Houses well lighted by electricity have long been the best renters and sellers. In the same way, to the modern home seeker either renting or buying a house or apartment, those properly wired to conveniently use labor saving devices will be chosen.

For the smaller devices, in fact for all but the range, baseboard outlets with standard interchangeable dimensions at convenient points in the various rooms will suffice.

**Electric Ranges.**

The electric range requires special wiring by reason of its heavier consumption of current and the fact that the electric companies make a lower rate for the current and use a separate meter.

Before attempting to install a range the local central station should be consulted and a capable electrical contractor employed. There are now 5,000 communities in this country with low electric cooking rates—100 companies alone having installed over 25,000 ranges.

Electric ranges are now made in many types and sizes—from the small kitchenette range which fits into a recess in the wall or is fastened to the back of a closet door, to the big hotel type range of large capacity.

Range manufacturers have adopted 110 volts as their standard and unless otherwise specified units will be furnished to operate at this voltage. If the service available on the customer's line varies more than 2 or 3 volts from this figure it should be noted on the range order.

The following extract from specifications of the Range Committee of the National Electrical Lighting Association will furnish information to the architect.

**Specifications for Wiring of Electric Cooking and Heating Devices.**

**GENERAL**—These specifications are not intended to give detailed instructions covering methods to be used in wiring for electric heating devices and ranges but to furnish an outline of certain general arrangements and requirements which should be followed for every installation. Each job presents a different problem to the wiremen, the details of which must be solved by the man on the ground, and the completed job made to conform with the general requirements given herewith and the Regulations of the National Board of Fire Underwriters.

**SERVICE CONNECTIONS—Pole to House**—Service connections will be made 3-wire 110-220 volts from pole line to house outlet for all installations of 1,000 watts or over connected load. No. 6 copper wire will be minimum size used for this class of service.

**Materials, Sizes, etc.**—All range circuits shall be 3-wire rubber covered stranded No. 8, or larger conductor, depending upon size of installation and distance from meter to load. The table given below shall be used to determine the size of conductor which shall be used in these circuits. Where conduit is used, range circuit shall be carried in approved metal conduit of not less than 1-in. inside diameter, which shall be installed in accordance with the Underwriters' regulations.

WIRING TABLE  
Allowable distance in feet for 110-220 volt, 3-wire circuits

Load watts	No. 8 35 amp.	No. 6 50 amp.	No. 4 70 amp.	No. 2 90 amp.	No. 1 107 amp.
1,000	375				
1,500	250				
2,000	185	295			
2,500	145	235			
3,000	125	198	316		
3,500	105	170	270		
4,000	93	148	236		
4,500	83	132	213		
5,000	76	118	188	300	
5,500	68	108	172	273	
6,000	62	99	158	250	312
6,500	58	92	145	231	289
7,000	54	85	135	215	268
7,500	50	79	126	200	250
8,000		74	118	187	234
9,000		66	105	166	208
10,000		59	95	150	187
12,000			79	125	156
15,000				100	125
20,000					94

NOTE—Not more than a 2% drop is advisable.

Three No. 8 conductors shall be used in all new houses where size of range to be installed is unknown, unless it is considered probable that the capacity will be more than 7,000 watts, or 3,500 watts on each side of the 3-wire service. Three No. 8 wires should also be used in old houses, even though they may be larger than at first required, as it will permit installing a larger range without changing the wiring. However, wires only large enough to supply the first range may be used if the small saving in the cost of wiring is considered of great importance. This saving would amount to approximately 5% of the combined cost of the ranges and wiring in most cases.

**Master Switches**—A master switch which clearly indicates whether it is open or closed, and a pilot light where local requirements demand it should be installed at a point within easy access of the range. This switch should be of the 3-pole fused type.

\* \* \* \*

We recommend a safety type enclosed lever switch so constructed that there is no possibility of coming in contact with live parts in opening and closing or re-fusing the switch. Such a switch will cost approximately \$10.

\* \* \* \*

**Domestic Cookery.**

Real estate operators in many cities have erected in the last year or two, large apartment buildings equipped entirely with electric ranges. A contract is made with the central station to purchase all the current for cooking, lighting, elevators, pumps, laundry equipment, vacuum cleaners and other electrically operated devices through one master meter. This brings the monthly consumption into thousands of kilowatt hours and secures from the central station a very low rate. The owner in turn either includes the cost of current used by the tenant in the rent or sells it at cost or at a slight profit. It has been found that the larger rents for the apartments far exceeded the cost of current.

**Commercial Cookery.**

Many hotels, restaurants, bakeries and institutions in the United States have adopted electricity for cooking and baking.

Restaurant equipment in the market to-day includes electric ranges, bake ovens, toasters, broilers, plate and food warmers, frying griddles, pie ovens, steam tables and coffee urn heaters. All these appliances are made in different types and sizes.

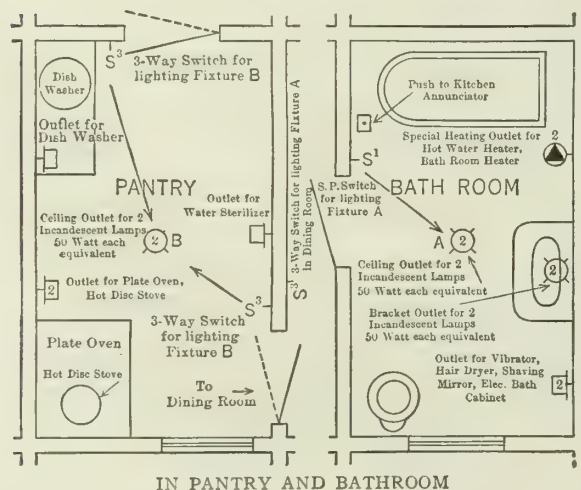
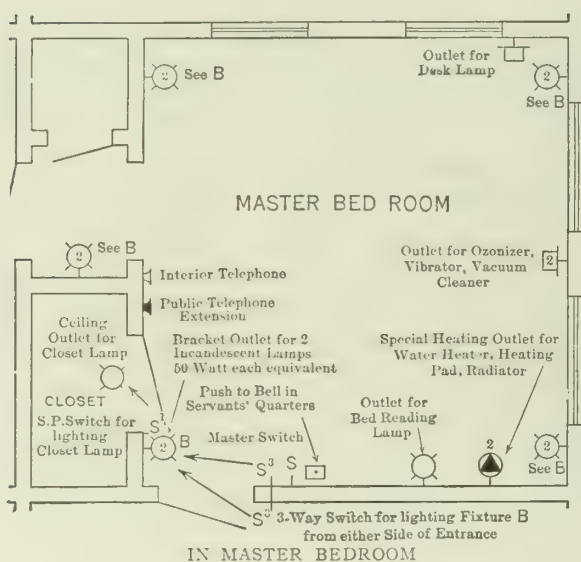
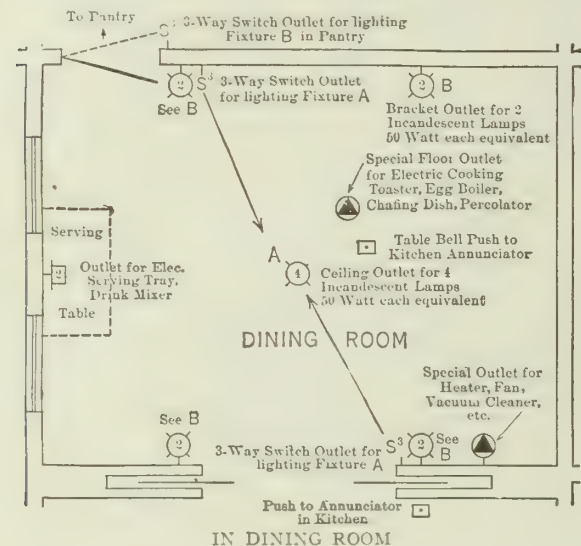
**Advantages of Electric Ranges.**

Simplicity of operation, absolute heat control, saving of labor and time, uniform heat distribution, better cooked food, elimination of matches and flame, of hot vitiated air, of sooty utensils, dirt and ashes, the necessity for maintaining a continuous fire for cooking an occasional order, the utilization of all heat generated, cleanliness and saving in floor and fuel storage space.

### Suggestions in Connection with Standard Symbols.

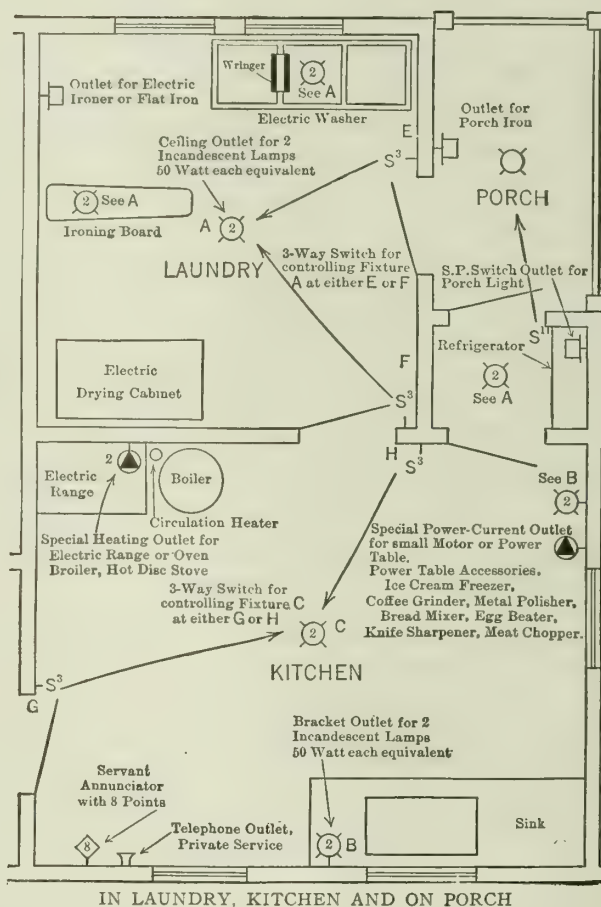
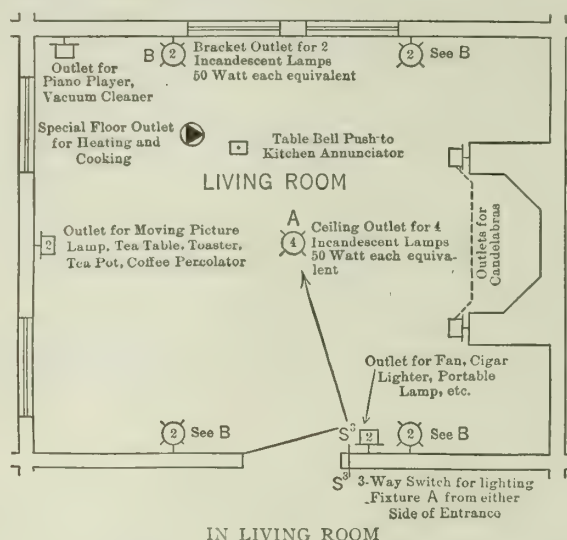
It is important that ample space be allowed for the installation of mains, feeders, branches and distribution panels. It is desirable that a key to the symbols used accompany all plans. If mains, feeders, branches and distribution panels are shown on the plans, it is desirable that they be designated by letters or numbers.

The following plans show the use of standard symbols on plans, with their necessary explanatory matter.



Heights of center of wall outlets (unless otherwise specified) :

Living rooms.....	5 ft. 6 ins.
Chambers.....	5 ft.
Offices.....	6 ft.
Corridors.....	6 ft. 3 ins.
Height of switches (unless otherwise specified).....	4 ft.



### Electrical Handbooks.

The foregoing tables and formulae may be of service, but the following handbooks containing complete data are recommended:

Cushing's Standard Wiring, 1917 (based on the latest 1915 National Electrical Code Rules), which has special section devoted to house wiring.

American Electrician's Handbook, by Terrell Croft.  
American Handbook for Electrical Engineers, by Harold Pender.

Standard Handbook for Electrical Engineers.



# GENERAL ELECTRIC COMPANY

SCHENECTADY, N. Y.

## DISTRICT OFFICES

ATLANTA, GA.  
BOSTON, MASS.

CHICAGO, ILL.  
CINCINNATI, OHIO

DENVER, COLO.  
NEW YORK, N. Y.

PHILADELPHIA, PA.  
SAN FRANCISCO, CAL.

Complete List of Offices on Page 1167

## Products.

The products of the GENERAL ELECTRIC COMPANY comprise practically every kind of APPARATUS and MACHINERY used in the GENERATION, TRANSMISSION, DISTRIBUTION and USE of ELECTRICAL ENERGY. Its thousands of products, in use in all parts of the world, have established the G-E Trade-mark as the Guarantee of Excellence on Goods Electrical.



TRADE-MARK  
Guarantee of Excellence on  
Goods Electrical

## Purpose of These Pages.

It is a well recognized fact that a knowledge of the many functions which electricity performs in modern building practice is necessary to every architect. In these pages, the methods of obtaining electric power, controlling it, and applying it to various uses are illustrated with concrete suggestions which will aid in preparation of electrical specifications for building construction.

## Unified Responsibility.

It is entirely practical, therefore, for the architect to standardize with G-E equipment throughout. By this procedure all parts inter-relate and much time can be saved. The added advantage of having all electrical equipment built by one company, ready for immediate installation and operation is obvious.

## Co-operative Service.

The factory, engineering and laboratory equipment at the command of the GENERAL ELECTRIC COMPANY is ample for all requirements of its business.

The engineering and sales departments are prepared to co-operate with architects, contractors and engineers in the planning and selection of the apparatus and material best suited for electrical requirements.

As a further assistance, catalogues, special bulletins and prices are readily obtained from the nearest offices, listed on page 1167. In requesting bulletins, a prompt reply will be facilitated by referring to bulletin numbers given in description of apparatus on the following pages. A complete index to these bulletins will be found on page 1166.

## Source of Electric Power.

WHERE CENTRAL STATION POWER IS AVAILABLE—When power is purchased from a lighting or power company, it is possible to connect incoming wires direct to switchboard. Suitable switchboard panels with main switch and meters for measuring current should be specified when ordering switchboard. When incoming current is not suitable for requirements, it will be necessary to change the form of the current to meet these conditions by using motor generator sets, rotary converters, transformers or mercury arc rectifiers. When

ever such conditions are encountered, it is advisable to get in touch with the company's nearest office, which will gladly give detailed information.

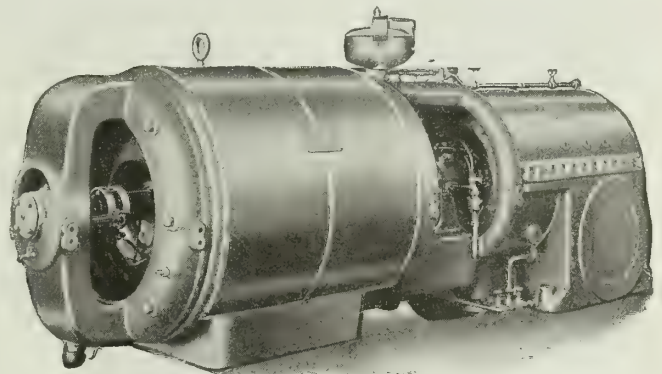
### *Curtis Steam Turbine Generators*

—For power stations supplying electric light and power to office buildings, machineshops, mills, etc., the Curtis steam turbines are admirably adapted for this class of work. Their operation is characterized by a minimum of vibration and noise. They are very compact, requiring

minimum floor space, headroom and attendance. The exhaust steam is free from oil and may be used for heating.

Turbine sets are available in sizes ranging from 100 kw. to 50,000 kw. for alternating current and from 15 kw. to any larger for direct current.

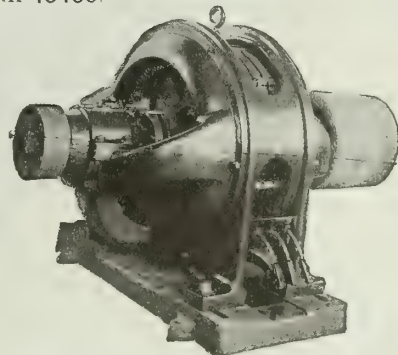
Full details and particulars contained in Bulletins 42201, 42206 and 42010.



300 KW. 60-CYCLE CONDENSING CURTIS STEAM TURBINE

WHERE MECHANICAL POWER IS AVAILABLE—For the production of electrical energy from mechanical sources of power, belt driven generators are used. Such units are available in sizes up to 300 kw. for direct current and up to 550 kw. for alternating current.

Bulletin 40400.



ATB 150 KW., 900 R.P.M., 2300-VOLT, FORM PB, 60-CYCLE, BELT DRIVEN ALTERNATING CURRENT GENERATOR

### Control of Electric Power.

For the control and distribution of current, the GENERAL ELECTRIC COMPANY offers a complete line of switchboards for all systems of electric distribution. These boards are equipped with latest improved instruments and controlling devices. Expert engineering ability and modern manufacturing facilities are at the customers' service.

All devices mounted on these boards are made by a single company, thus centralizing responsibility for the behavior of the entire switchboard.

For the convenience or assistance of architects and consulting engineers, switchboard specialists are stationed in the principal branch offices of the company. Architects and consulting engineers are invited to confer with these engineers in planning a switchboard to meet any unusual requirement or space condition.

Sketches, detailed drawings, and specifications of any such special boards, or the adaptation of standard panels, will be furnished promptly on request.

**"STANDARD UNIT" SWITCHBOARDS**—The GENERAL ELECTRIC COMPANY has developed very complete lines of standard panels, for both direct and alternating current, complete with all switches, instruments and other equipment necessary.

Each panel is listed as a separate unit, and has its own catalogue number. There are thousands of these "standard units," and they are listed in 22 separate lines for different classes of service.

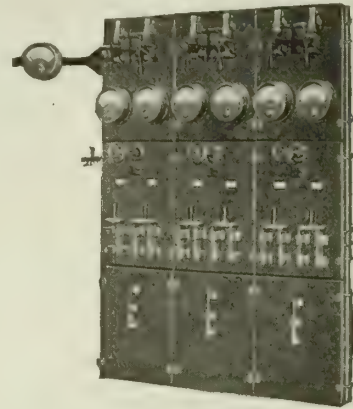
These panels are so designed that they can be assembled in different combinations, to form a complete switchboard having a neat, uniform appearance, both front and back, all parts on the back being easily accessible. Such switchboards can be constructed to fit any usual condition. They are less expensive than special boards, and quick deliveries can be made of these standard panels complete ready for erection.

This is the most advanced system of switchboard manufacture, and obviates the time and expense necessary when original detail specifications are drawn up for each individual job by the architect, contractor or consulting engineer.

Bulletin 47001 gives a short description of each class of panels. This booklet will be found of interest to any one contemplating the use of switchboard panels developed with particular reference to utility and simplicity. It will be furnished on request.

**Material of Standard Panels**—All panels are of slate; the isolated or small plant panels of dull black marine finished slate, and the central station boards of natural black slate, 1½ ins. thick with ⅜-in. bevel, and vary in width from 12 to 32 ins. Height of panel varies from 20 to 90 ins. Size of instruments and controlling devices determine size of

panels. Panels of marble, or different dimensions, can be substituted at prices which may be obtained from any office of the GENERAL ELECTRIC COMPANY.



Front View

"STANDARD UNIT" SWITCHBOARD FOR 125-250 VOLT THREE-WIRE CIRCUIT

**Framework**—A complete supporting framework of 1¼-in. pipe, with necessary fittings, is included for each panel. Total height of switchboard above floor never exceeds 90 ins.

Bulletin 47750 covers details of framework.

**Switches**—For controlling various circuits, switches are employed, and are furnished with each panel. Their size and type are determined by amount of current carried. Their number depends upon number of circuits controlled.

**Fuses**—These are a protective device, used in connection with switching apparatus. When overloads occur, the fuse opens the circuit, thus protecting the electrical apparatus.

**Connections**—Each panel is furnished complete, unless otherwise specified, with small wiring on back of panel and with copper connections between the appliances which comprise the equipment of the panel.

The connections from generator to panel and from panel to all distribution points are invariably made by the electrical contractor and are not furnished by the manufacturers.

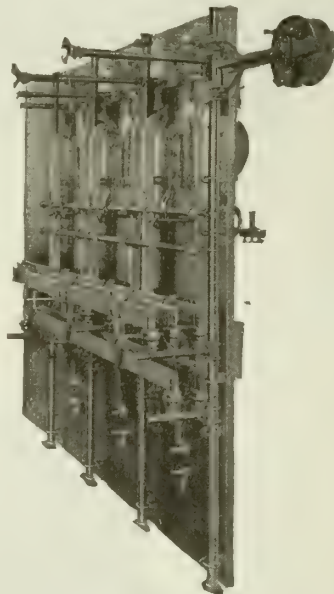
**Card Holder**—For designating different circuits, card holders are used and must be specified. Use one for each switch.

### Air Circuit Breakers.

The air circuit breaker affords the best insurance against costly interruption of service. The operation of the breaker is positive and invariable, and it can be adjusted to trip between wide limits of calibration.

Circuit breakers may be motor, float, solenoid or hand operated; only the type last mentioned is listed, because of its relatively great popularity. When used in conjunction with suitable auxiliary devices, additional protection is afforded in the event of low voltage, high voltage, excessive speed, reversal of current or phase, etc.

By the use of the low voltage release attachment, air circuit breakers may be arranged to operate on a drop in or cessation of voltage; two or more circuit breakers may be electrically interlocked, and by the use of a switch to short circuit the low voltage release, circuit breakers may be tripped from one or more remote

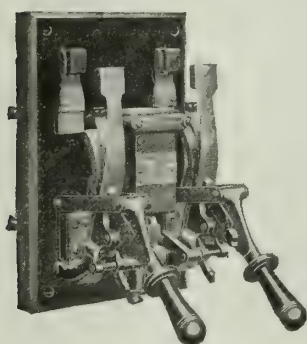


Rear View

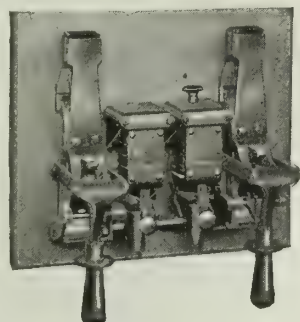
"STANDARD UNIT" SWITCHBOARD FOR 125-250 VOLT, THREE-WIRE CIRCUIT



points. This device is also made use of when it is desired to open the breaker, by the operation of a speed limiting device or reverse current relay.



DOUBLE POLE CIRCUIT BREAKER, WITH SINGLE TRIP COIL TO TRIP OUT BOTH POLES



DOUBLE POLE CIRCUIT BREAKER, WITH SEPARATE COILS FOR TRIPPING OUT THE TWO POLES

The GENERAL ELECTRIC COMPANY has been manufacturing many types of circuit breakers for over twenty years. The satisfactory operation given in all kinds of railway, industrial and building service is an indication of the quality and excellent design of the G-E circuit breaker.

The advantage of purchasing G-E circuit breakers, which will come to customers mounted on switchboard ready for immediate operation, is obvious.

All GENERAL ELECTRIC COMPANY circuit breakers are approved and listed by the Underwriters' Laboratories, Inc., and will carry rated loads continuously at 30° C. temperature rise.

G-E circuit breakers are made in all types for both alternating and direct current.

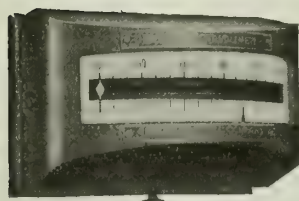
Complete information can be obtained by requesting Bulletins 4837 to 4841.

### Measuring Electric Power.

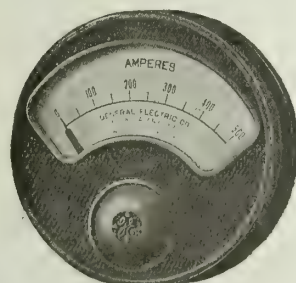
In addition to controlling devices, the switchboard includes an equipment of electrical measuring instruments. These are necessary in order to give the operator of the plant an exact knowledge of the electrical conditions at all times.

The choice of electrical measuring instruments depends upon the class of service as well as the character of the equipment; that is, with direct current equipments, ammeters and voltmeters with watt-hour meters are sufficient; with alternating current equipment, in addition to ammeters, voltmeters and watt-hour meters, there should be included indicating wattmeters, power factor and frequency meters.

In some cases a record of the operation of different circuits is often necessary, and curve drawing ammeters, voltmeters, wattmeters, power factor and frequency indicators should then be furnished.



Type H Instrument



Type D Instrument

MEASURING INSTRUMENTS

Voltmeters, ammeters and wattmeters are made in several forms. Two types are illustrated, and can be furnished for either alternating current or direct current circuits. The type H form is preferable from the standpoint of highest accuracy, and also where space economy is an important factor.

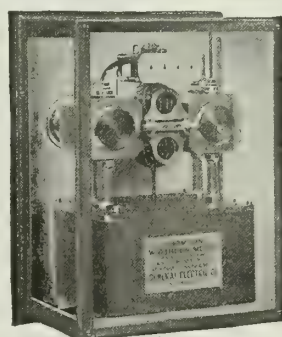
The watt-hour meter is a desirable adjunct to a switchboard for the purpose of measuring the output of the generating apparatus, or for determining the amount of energy delivered to the various circuits in the building, or to any or all current consuming devices. By the use of watt-hour meters the proper charge to various tenants for electric power, light or heat may be determined.

It is often desirable, in addition to the above, to use a ground detector, which will indicate line troubles.

For further information see Bulletin 46013, covering all types of instruments.



TYPE CR SWITCHBOARD VOLTMETER



TYPE G3 DIRECT CURRENT WATTHOUR METER



TYPE CS DIRECT CURRENT WATTHOUR METER

### Transmitting Power.

It is a well-known fact that electricity is the simplest and easiest form of power to transmit. An old building is readily provided with a system of concealed wiring. A new building should be designed to accommodate the future as well as the present uses of electricity. One of the most important movements in this regard is the increasing use of electrical devices, which consume more power than allowed on lighting circuits and, therefore, require heavier wiring. In any event, these devices can usually be operated at a lower cost if a separate wiring system on a power circuit meter is installed.

Most electric companies give a lower rate when current is consumed on a special circuit in this manner, because such use represents a service furnished during the day when their equipment is not required to furnish current for the lighting service.

### Wires and Cables.

Wires and cables are manufactured by the GENERAL ELECTRIC COMPANY in varieties suitable for all uses of the architect. These products include cables with weatherproof, flameproof, rubber (National Electric Code and better grades to meet severer requirements), paper, varnished cambric, or asbestos insulation, and with all special finishes.

**RUBBER INSULATION**—Three types of rubber insulation have been standardized: Red Core, Tricoat and



30% Para (Black or White Core). In addition the company is prepared to manufacture special types and grades of rubber insulated conductors to meet unusual conditions.

Red Core is a high class insulation used primarily on wires for house wiring, and is superior to the requirements of the National Board of Fire Underwriters.

Tricoat insulation was designed for those desiring a very high grade wire, somewhat better than Red Core, but less expensive than the 30% grade.

30% Para insulation meets the Specifications of the Rubber Covered Wire Engineers' Association, and is the best rubber compound for absolutely high grade work. The core may be white or black, as desired.

**BRAIDED WIRE**—All wires and cables No. 8 B. & S. and smaller carry a single braid, while No. 6 B. & S. and larger are regularly made with either 2 braids or a tape and 1 braid; which in accordance with Underwriters' requirements is equal to double braid and suitable for conduit work.

If tape and 2 braids are required, orders must so specify, and extra charge for extra braid will be made.

N. E. Code, Red Core, braided, twin wire is finished with talc, which assures ease in pulling wire into conduits; no extra charge made for this feature. All braided, rubber covered wires may be finished in this way, if desired, without additional cost.

The GENERAL ELECTRIC COMPANY rubber covered braided wires and cables are distinguished by 1 red and 1 black thread woven parallel in braid.

**WEATHERPROOF AND UNDERWRITERS' CABLE**—Standard weatherproof wires and cables are manufactured strictly in accordance with the requirements of the National Board of Fire Underwriters, with 3 braids placed directly over the copper core thoroughly impregnated with a black, weatherproofing compound, and then polished to remove all superfluous compound and give a smooth exterior finish. Double braid weatherproof wire furnished on order.

When the number of braids is not specified, wire with 3 braids, commonly called triple braid, is always furnished; if double braid is required, requisitions or requests for quotations should so state. A stock of triple braid wire is carried.

**ORDERING**—In ordering or making inquiries regarding wires or cables, the following information should be given:

- (1) Size and number of conductors, or current to be carried.
- (2) Working voltage.
- (3) Test voltage.
- (4) Type of insulation (varnished cambric, rubber, paper, etc.).
- (5) Insulation resistance per mile required.
- (6) Finish (braid, lead, armored, etc.).
- (7) Class of service and type of generating apparatus.
- (8) Exact length and shipping lengths of each item.

If there are formal specifications covering the proposition, they should always be forwarded with the inquiry.

Information as to local conditions is always of value in making recommendations.

## Cable Connecting Devices.

A standard line of cable connecting devices of great reliability and convenience is also manufactured. It includes copper cable connectors, end bells, cast iron coupling boxes, junction boxes and fuse boxes.

## Panelboards.

General Electric panelboards are compact and well finished; possess high grade features throughout, and represent the latest and most satisfactory devices on the market.

A complete line of standard panels can be furnished, and the company is prepared to promptly furnish panels to meet the most exacting specifications.

**SWITCHES**—Individual circuits with the following arrangements can be supplied:

Fused terminals. Knife switches, punched clip or sweated and pinned. Rotary snap switches, moulded covers. Push button switches, moulded covers. Safety type rotary snap switches. Safety type push button switches.

Any of the above types may be fused between buses and switches, or outside of switches, with N. E. C. enclosed, Edison plug or open link fuses.

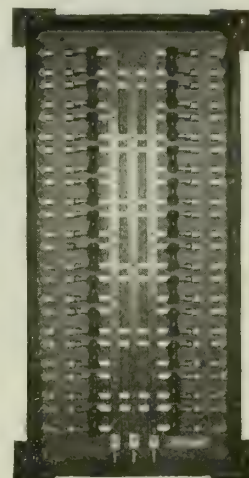
**MAINS AND BRANCHES**—Highest grade copper, having 98% conductivity, is used for the mains and branches. The main terminals, busbars, switches, and fuses are designed for a capacity of 6 amperes per circuit on 2 to 2 wire and 3 to 3 wire 125-volt panels, and 3 amperes per circuit on 3 to 2 wire 125-volt and 2 to 2 wire 250-volt panels. Mains can be arranged for lugs only, N. E. C. enclosed or open link fuses, or with fused or unfused main switch.

**FRAMES**—By the use of a slate frame, or set of barriers around the panel, a more finished appearance is given, as it separates the wiring in the cabinet from the active part of the panel. This frame consists of 4 pieces of slate mounted on the face of the panel and fastened to the back of the cabinet by adjustable corner irons. The slot in the frame opposite each terminal, through which the wire passes, permits the complete wiring of the panel before the slate frame is placed in position, and simplifies the work of connecting the circuit wires.

**FINISHES**—Any finish desired or called for in specifications can be furnished; but the GENERAL ELECTRIC COMPANY strongly recommends its No. 1, or dull black slate, with satin finished busbar, and branch connections. This is a very durable finish and renders the appearance of the panel very attractive.

## Safety Type Panels.

This type of panel has been developed to meet an increasing demand for a strictly high grade safety type panelboard. These panels are furnished with tumbler type switches of 30-ampere capacity in the branch circuits, and are arranged for either N. E. C. enclosed or Edison plug fuses. A distinct feature of this type of panel is the brush contact main switch.



STANDARD CEO  
PANELBOARD  
24-circuit. Lugs in mains

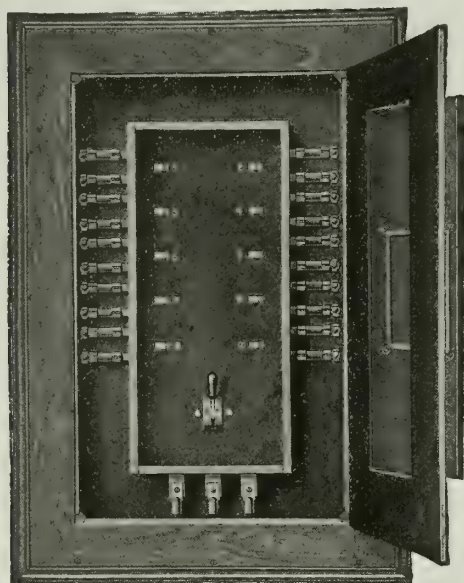


**SALIENT FEATURES**—Switches operated without opening door, exposing current carrying parts.

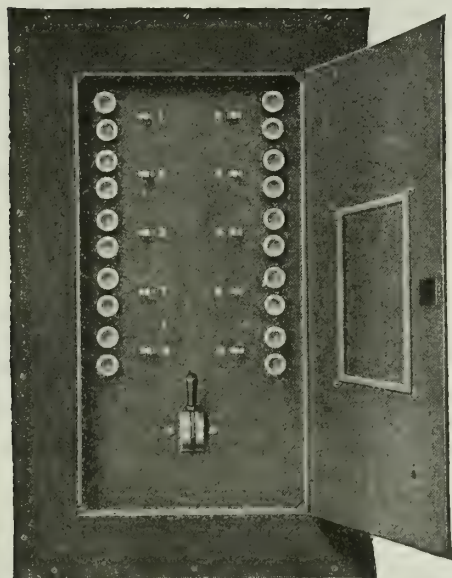
All live metal parts covered by locked door, eliminating possibility of shock to operator.

All parts subject to wear are removable from the front of the board.

Plates are engraved with name or number of circuit controlled.



SAFETY TYPE PANEL FOR N. E. C. FUSES



SAFETY TYPE PANEL FOR EDISON PLUG FUSES

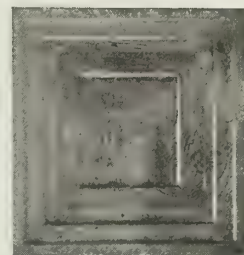
**CABINETS FOR SAFETY TYPE PANELS**—Panelboards arranged for N. E. C. enclosed fuses are furnished with cabinets having double doors.

The main door is equipped with lock, and covers the fuse compartment; a smaller door is furnished over the switch compartment. Cabinets for panels arranged for plug fuses are furnished with single doors over the switch and fuse compartments, as fuses are replaceable in this-panel without danger of contact with live parts.

### Panelboard Cabinets.

These cabinets are made of wood or steel, and can be finished in any color desired.

In addition to standard construction, special cabinets can be supplied to meet any requirement.

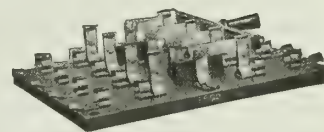
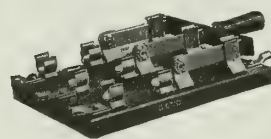


STEEL CABINET

### Lever Switches.

G-E lever switches are constructed to withstand severe and constant usage, and they will carry their rated capacity indefinitely without overheating. Moreover, they embody certain other minor details of construction which, though not essential, add considerably to their efficiency.

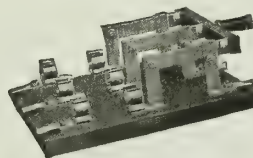
**PUNCHED CLIP TYPE**—These switches will meet every requirement where efficient and low-priced switches are required.



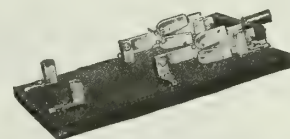
PUNCHED CLIP TYPE LEVER SWITCHES

**TYPE L**—Type L, Form D-12, lever switches were designed to meet the demand for a high grade lever switch of simple but strong construction.

**TYPE Q, FORM C-2**—These are similar to the Type L, Form D-12, with the addition of a quick break feature.



LEVER SWITCH, TYPE L  
FORM D-12



QUICK BREAK LEVER SWITCH,  
TYPE Q, FORM C-2

### Snap Switches.

The GENERAL ELECTRIC COMPANY manufactures a line of mechanically and electrically efficient snap switches in all standard rating. The types and sizes are too numerous to be listed here, but a few representative switches are shown.



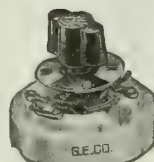
88985  
Porcelain, for Mould-  
ing Work



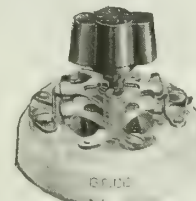
GE248  
Ceiling Type



68141  
Miniature, Full Metal  
Cover



GE241  
"Pony" Type  
Cover Removed

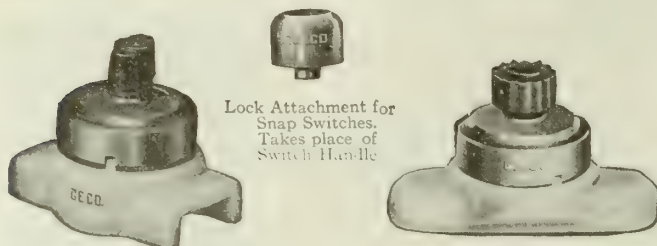


60954  
Three-way Switch  
Cover Removed



GE563  
Pendent Switch

SNAP SWITCHES



GE180  
For National Metal Moulding

GE238  
For Condulets

#### SNAP SWITCHES

### Sockets and Receptacles.

The standard and special lamp sockets made by this company cover all possible requirements in electric installation.

G-E Quick Make and Break socket, 660 watts, 250 volts, fills a long felt need for a key or pull socket which can be used interchangeably with keyless socket and switch control where electric heating devices and other small portables are used on lighting circuits.

G-E locking sockets and receptacles afford a positive protection to lamps and also prevent the theft of current. When the key is removed, the screw shell of the socket swivels freely, preventing injury to either the lamp base or the socket if an attempt is made to remove the lamp without the key.

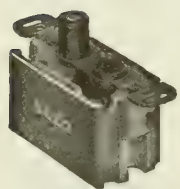


GE459  
G-E LOCKING  
SOCKET

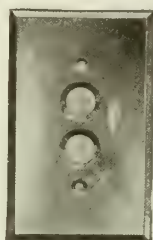
### Flush Switches.

G-E flush switch, both push button and rotary types, are known for their absolute reliability. They are furnished with adjusting nuts, which feature insures accurate alignment.

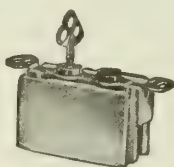
The locking type is recommended for use in public buildings, to prevent the switch from being operated by unauthorized persons. Flush switch plates can be furnished in any finish required. White enameled plates should be used with delicately tinted walls and wood-work.



68247  
FLUSH PUSH  
BUTTON SWITCH



GE232  
PLATE FOR FLUSH  
PUSH BUTTON  
SWITCH



GE688  
FLUSH PUSH  
BUTTON SWITCH,  
LOCKING TYPE



60473  
FLUSH ROTARY  
SWITCH



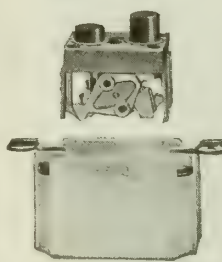
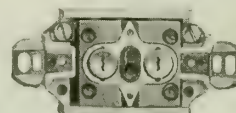
61044  
PLATE FOR INDICATING  
FLUSH ROTARY SWITCH



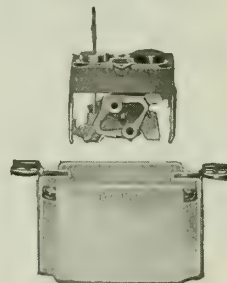
60468  
FLUSH ROTARY  
SWITCH, INDICATING  
TYPE

### Removable Mechanism, Flush Push Button Switch.

Constructed especially to comply with the restriction of the underwriters in regard to having loose wires in buildings during erection. With this type of switch, only the porcelain box, with a temporary fiber cover, is installed with the wiring during plastering and other rough building operations. The removable mechanism, separately packed, is retained, ready for insertion as soon as there is no longer any danger of injury to it.



GE733



GE686

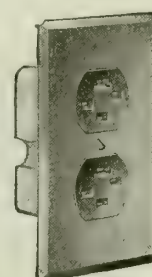
#### REMOVABLE MECHANISM SWITCHES

### Flush Receptacles.

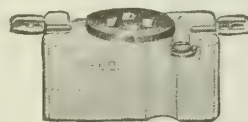
The very complete line of wiring devices manufactured by this company includes a variety of flush receptacles for use as outlets for various electric portables.



CAT. NOS. GE658 and 49491



CAT. NOS. GE694 and 695



CAT. NO. GE658

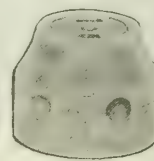


CAT. NO. GE694

#### G-E "STANDARD" FLUSH RECEPTACLES



CAT. NO. GE544



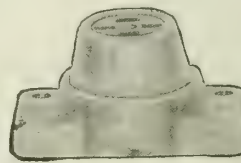
CAT. NO. GE665



CAT. NO. GE546



CAT. NO. GE545



CAT. NO. GE547



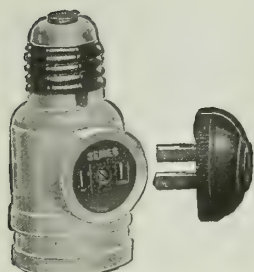
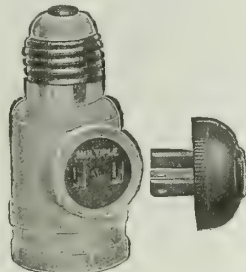
CAT. NO. GE543

#### G-E "STANDARD" SURFACE TYPE RECEPTACLES

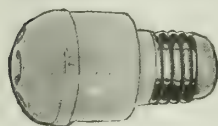


CAT. No. GE625  
Moulded MaterialCAT. No. GE662  
Metal Covered Moulded  
MaterialCAT. No. GE663  
Polarity Moulded  
Material

CAPS FOR DEVICES LISTED ON PRECEDING PAGE

CAT. No. GE696 (Series)  
G-E "STANDARD" COMBINED SOCKETS AND ATTACHING PLUGS

CAT. No. GE697 (Multiple)



CAT. No. GE702



CAT. No. GE682



CAT. No. GE624

G-E "STANDARD" SEPARABLE ATTACHING PLUGS

**Remote Control Switch.**

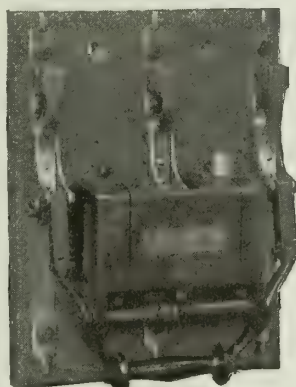
The Type R, Form C-2, electrically operated remote control switch can often be used to advantage to connect and disconnect lighting circuits, motors not subject to heavy overloads, or other electrical devices located at a distance.

It is especially adapted for use in large buildings, libraries, theaters, halls, stores, etc., where control from a central point is desired.

This switch is a self-contained unit, and is operated by a special, single pole, double throw, push button switch, which is normally in the open position and remains closed only when held by the operator.

The standard finish of all live parts is polished copper, and of the mechanism, marine (dead black).

Bulletin A-4070.

TRIPLE POLE, SINGLE  
THROW, REMOTE CON-  
TROL SWITCHSPECIAL PUSH  
BUTTON SWITCH**Power Applications.**

The GENERAL ELECTRIC COMPANY'S motors cover a wide range of applications of electric power to mechanical service. Constant and variable speed motors, for both alternating and direct current service, are built.

Complete lines for alternating and direct current motors are manufactured, varying in size from 1/10 h.p. up to any size desired.

The smaller motors are applicable to sewing machines, buffers, ice cream freezers, washing machines, and similar household devices; and the larger ones to all manufacturing and power service.

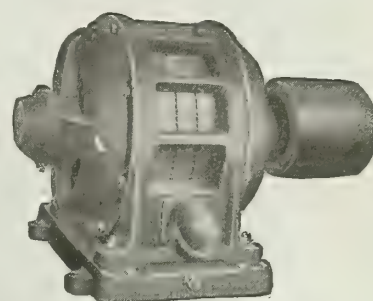
In selecting motors, it should be remembered that for the same horsepower rating the cost will vary inversely as the speed at which the machine is designed to run.

**INDUCTION MOTORS**—Multispeed induction motors, Form B, are standard in small sizes. In general, 4 speeds, 1800, 1200, 900, 600 r.p.m., may be obtained from a 60-cycle motor of this design, the horsepower being the same for all 4 speeds.

Variable speed induction motors can be furnished for any ordinary horsepower rating. The variation in speed is obtained by the use of a controller; but as the speed is reduced, the power of the motor is also reduced proportionally.

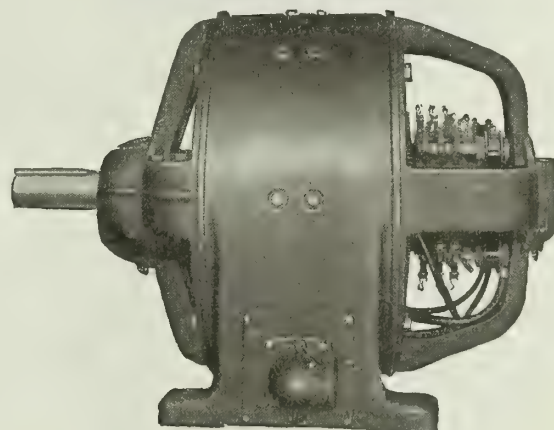
**REVERSIBLE PLANER MOTORS**—Type R.F. adjustable speed, commutating pole motors are standard. They have been designed for machine tool and similar service where widespread variation and adjustment of speed independent of load is required.

Bulletin 41021.

STANDARD, FORM B, INDUCTION  
MOTOR

APPROXIMATE SPACE REQUIRED

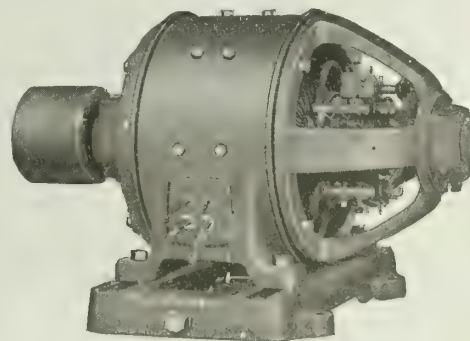
H.p.	Speed, r.p.m.	Length, ins.	Width, ins.	Height ins.
1	1800	14	13	11
10	1200	33	28	23
25	1200	42	32	28
50	900	49	43	35



TYPE R. F. REVERSIBLE PLANER MOTOR

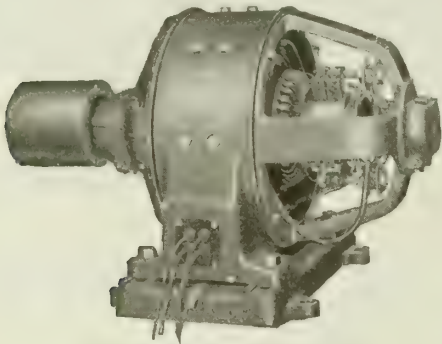
**DIRECT CURRENT MOTORS**—The type RC constant speed motors of moderate speed meet a majority of the ordinary requirements of motor applications. These motors have commutating poles as well as other mechanical and electrical refinement.

Bulletin 41013.

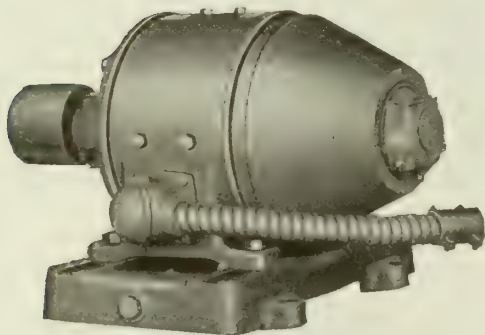
CONSTANT SPEED DIRECT CURRENT  
MOTOR, TYPE RC

## APPROXIMATE SPACE REQUIRED FOR CONSTANT SPEED D. C. MOTOR, TYPE R. C.

H.p.	Speed, r.p.m.	Length, ins.	Width, ins.	Height, ins.
1	1700	18	14	11 $\frac{1}{2}$
10	1150	32	28	22
25	775	51	36	33
50	650	62	46	40



TYPE RC MOTOR, 20 H. P.



ENCLOSED TYPE RC MOTOR, WITH CONDUIT TERMINAL

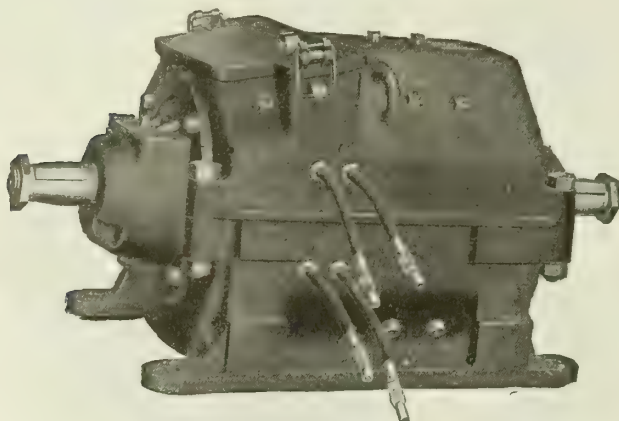
Special fixtures for conduit connections, as illustrated, may be supplied at a slight extra cost

Type CO-1800 variable speed motors are specially adapted for crane and hoist service.

For special conditions where dust, fumes or moisture are present, it is advisable to specify the enclosed type of motor illustrated herewith.

Motors suitable for mounting on the wall or ceiling can be furnished for installations where it is desirable to economize space.

Bulletin 48100.



TYPE CO, D. C. CRANE AND HOIST MOTOR

**Information Required for Power Applications.**

For specific information on motors kindly answer the following questions:

## CONSTANT SPEED SERVICE

- Item 1*—Alternating or direct current available?  
*Item 2*—Voltage and frequency (if alternating current)?  
*Item 3*—What is the motor to drive?  
 (If an individual machine—the manufacture and size.)  
*Item 4*—Belted or direct connected  
 (Pulley dimensions, if not standard.)  
*Item 5*—Gear or chain drive?  
 Outward bearing and shaft extension.  
 Subbase and by whom to be furnished.  
*Item 6*—Load { Continuous  
 Intermittent (details).  
 If the load is intermittent, give cycle of duty, i.e. maximum horsepower; length of time load is on; time off and friction load.  
*Item 7*—Frequent starting } Yes. (Number of times per hour.)  
 and stopping } No.  
*Item 8*—Give details as to starting conditions. Is time of acceleration long? Must motor accelerate long line shafting, flywheels, etc.?  
*Item 9*—Conditions of location—dust, acid fumes, high temperatures, etc.?  
*Item 10*—If special mechanical features are required, send sketch if possible.

## VARYING SPEED SERVICE

In addition to the information specified for constant speed motors, please advise regarding the following:

- Item 11*—Speed range required.  
*Item 12*—At reduced speeds is horsepower output reduced in proportion to speed (i.e., constant torque); if not, state proportion.

NOTE—If more than 50% reduction from normal speed is required, reduced ventilation may require increasing the size frame. Give complete details of service.

**Cooking and Heating.**

A wide range of domestic appliances is now practical for the modern building. These devices are of vital interest to the architect in two ways:

First, because the value of the complete structure as a working unit can be vastly increased by their use; and, secondly, because special wiring is invariably required and should be provided for in the original plans of the building. By installing separate meter, the charges for current consumption will be much lower than for lighting circuits.

Since the limit established by the underwriters is 660 watts from a lighting circuit wire, the architect can readily determine the advisability of a separate circuit by noting the wattage of the various devices which will probably be used. Kitchen ranges, three-unit and four-unit radiators, circulation water heaters and air heaters, for instance, are above the 660-watt limit, and must, therefore, be connected to the special power circuit wire.

The GENERAL ELECTRIC COMPANY offers a complete line of electric heating and cooking appliances for domestic, hotel and restaurant installations and industrial applications.

**ELECTRIC RANGES**—Easy to operate, the heat is quickly available and is readily regulated. They are clean, safe and labor saving, and their use promotes comfort and cleanliness. There is no fire requiring constant attention; no excess heat, smoke or fumes to vitiate the atmosphere. There is no longer need of continued scouring and scrubbing to keep cooking utensils clean and free from soot. Dust and dirt, together with the bother and burden of handling and storing coal and ashes, are entirely eliminated. The superiority of electric cooking devices over gas heated appliances is self-evident. The same current will always produce the same temperature; therefore, other things being equal, uniform results are obtained.

The electric range performs all kinds of cooking and baking. Ordinary cooking utensils are used with them. The broiler is combined with the oven, the meat



being broiled by radiant heat from above. The cooking top is equipped with hot plates for boiling and frying and electric cookers for steaming and slow cooking.

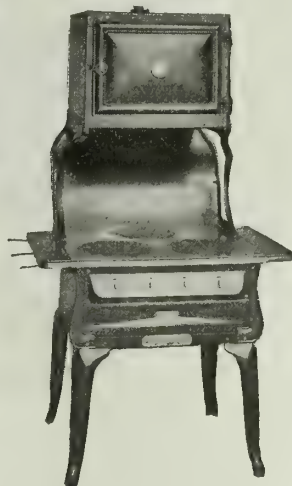


TYPE R-1 ELECTRIC RANGE

3 hot plates 3-heat 250-500-1000 watts each  
1 oven 2-heat 500-1000 watts  
1 broiler 1-heat 1000 watts  
2 cookers 1-heat 200 watts each

The oven door opens downward and has a drop latch with ebonized wooden handle.

Height, 52 ins.; length, 33 ins.; depth, 26 ins. Net weight, 195 lbs.; shipping weight, 335 lbs.



TYPE S-2 ELECTRIC RANGE

The Type S-2 has 3 hot plates in the cooking top. With the elevated oven it is not necessary to stoop or bend over when using same.

Height, 65 ins.; length, 34 ins.; depth, 31 ins.; shipping weight, 250 lbs.



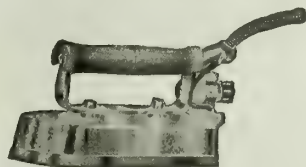
ELECTRIC RANGE

FLATIRONS—3-lb., 6-lb. and 8-lb. sizes. With separate or attached stand. Full nicked or with barffed base.

TAILORS' IRONS—For tailors, clothing houses, etc. Made in 12-lb., 15-lb., 18-lb. and 24-lb. sizes.



6-LB. FLATIRON

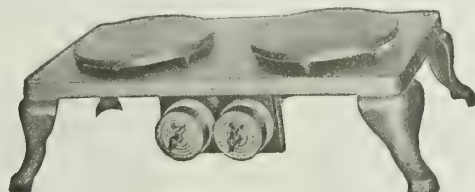
TAILORS' ELECTRIC IRON  
With 2 regulating heats

CAT. No. 153473

DISK STOVES

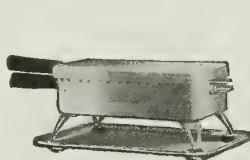
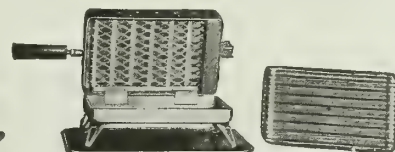
CAT. No. 196715

HOT PLATE—Does the same work as the ordinary gas hot plate.



HOT PLATE

GRILL—A combination device which will grill, fry, toast, boil and bake. Hinged unit frame permits cooking to be done both above and below heating coils.

RADIANT GRILL  
Closed to show top plateCAT. No. 153488  
RADIANT GRILL  
Open to show lower pan

COFFEE POT—Percolates delicious coffee. A graceful design with full nickel finish. 5-cup and 7-cup sizes. Costs 1/6¢ to 1/3¢ per cup.

COFFEE URN—Similar to pot style, but has a faucet and 2 handles with ebony finish. 5-cup size.



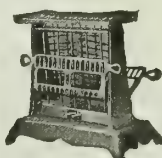
PERCOLATOR URN



PERCOLATOR POT

TOASTER—Convenient and ornamental for use on the dining room table. Makes fresh toast, as needed. 10 slices cost but 1¢

CHAFING DISH—Prepares light menus quickly and conveniently. Polished nickel finish.

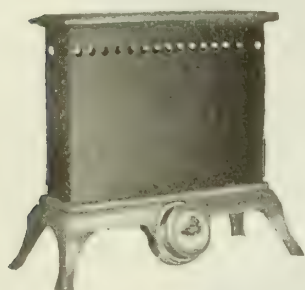
CAT. No. 177397  
TOASTERCAT. No. 195524  
CHAFING DISH

STOVES—Portable disks for many purposes. 4-in., single heat. 6-in. and 8-in., 3 heats each.

AIR HEATERS—Particularly adapted for the heating of rooms in buildings or residences where the heat is

to be used continuously. The heating units are so constructed as to allow a free passage of air over the heating element, the heat being rapidly conducted away to the surrounding air. Heating units easily renewable. Snap switch heat control.

**GLOWER RADIATORS**—Adapted for intermittent service, particularly in removing the chill before or after the heating system is in use. Ideal for nurseries and bathrooms. Consists of a handsomely finished ornamental metal frame, with a highly polished reflector, and 2, 3 or 4 luminous heating units. Safety from danger of fire or fumes.



AIR HEATER  
1200 to 5000 watts

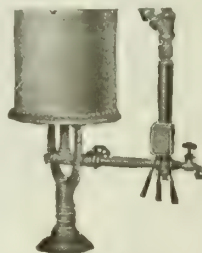


THREE-GLOWER RADIATOR  
50 or 1500 watts

**CIRCULATING WATER HEATER**—This circulating water heater may be readily connected with the ordinary kitchen hot water tank.

It is designed for low wattage continuous heating, but the larger wattages adapt it for intermittent use.

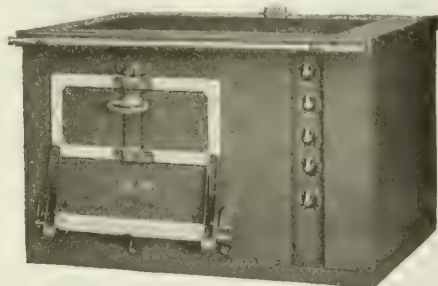
No tank, piping or switches furnished.



CIRCULATING  
WATER HEATER

### Hotel Equipment.

**RANGE**—This electric range meets the requirements of heavy hotel duty where a large amount of baking must be produced continuously. The oven is 21½ ins. wide by 18 ins. high by 26½ ins. deep.



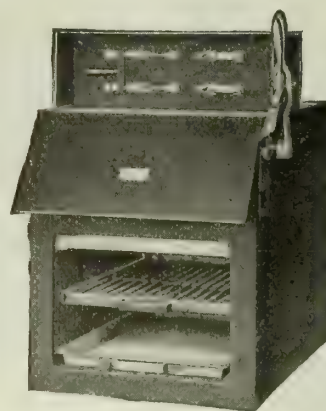
TYPE D-87, ELECTRIC HOTEL RANGE  
22 kw., 220 volts

The cooking top has 4 rectangular hot plates each 9 ins. long by 24 ins. wide.

All heating units are of the self-protecting and self-insulating sheathed wire. They are easily renewable. Each unit has 3 heats controlled by a snap switch, with indicating handle which shows at a glance whether the heat is at *high*, *medium*, *low* or *off*. A guard rail extends along the front of the range below the cooking top.

**BROILERS**—The radiant heating unit quickly sears the surface of the meats and retains all their juicy ten-

derness. The effective broiling area is 16 by 23 ins., which is sufficient for broiling 12 lbs. of steak 1½ ins. thick at one time.



HOTEL ELECTRIC BROILER

The broiler is an open compartment of sheet steel with an angle iron frame. It is furnished complete with substantial drip pan and a gridiron on which the meat is placed. The gridiron is supported below the unit on a movable frame which may be raised or lowered by means of a lever on the side of the broiler, for turning or removing the meats.

The heating unit is operated by a double pole knife switch located on the top of the broiler.

**BAKE OVENS**—The initial cost of a G-E electric oven is far less than that of a brick oven and about the same as that of a gas oven of a similar capacity. The upkeep is a very small item, and so satisfactory is the



TYPE D-85, BAKE OVEN  
10 kw., 110-220 volts, fifty-six 1½-lb. loaves

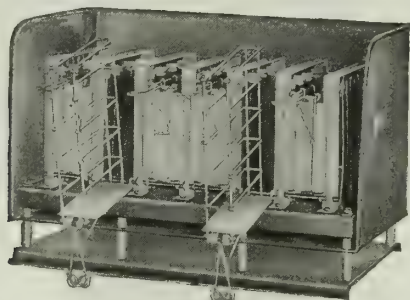
G-E bake oven, mechanically and electrically, that with reasonable care it should last a lifetime. Brick ovens have to be relined frequently—an expensive and time consuming job.

G-E bake ovens of the type shown above are made in 3 sizes, ranging capacity from 50 to 150 loaves an hour.

**HOTEL TOASTERS**—The G-E hotel toaster promptly provides quantities of fresh toast. The slices to be toasted are placed in hinged wire racks, which are tipped into the toasting position between the heating coils. The coils instantly glow red when the current



is turned on. 2, 3 or 6 slices can be toasted simultaneously.



ELECTRIC TOASTER

### Lighting.

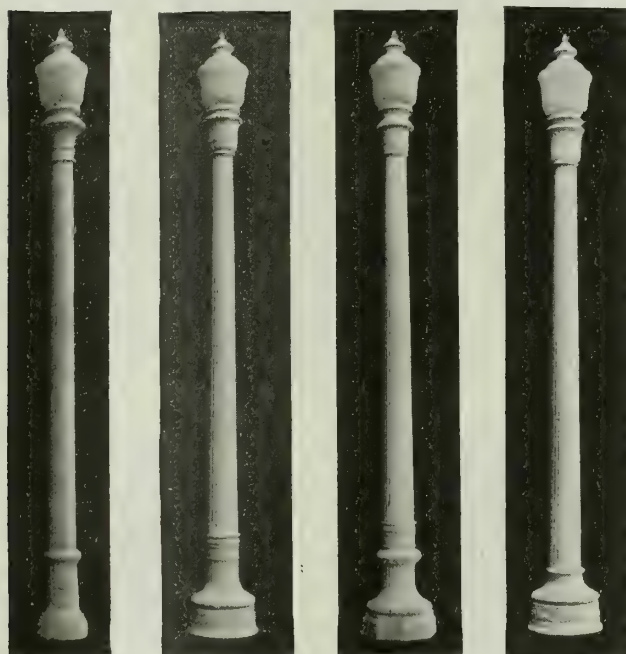
The GENERAL ELECTRIC COMPANY manufactures a complete line of units for both interior and exterior lighting and will gladly co-operate with the architect in making every installation the last word in the art of illumination.

**NOVALUX ORNAMENTAL UNITS**—The Novalux ornamental units manufactured by the GENERAL ELECTRIC COMPANY are highly ornate and are built to accommodate the Mazda C lamp.

In addition to lighting the streets and sidewalks, these units are designed to throw considerable light upward to illuminate the building fronts.

By combining illuminating efficiency with a dignified and distinctive appearance, they beautify their surroundings and are an asset by day as well as by night.

The Novalux ornamental units are made for all standard lighting circuits and for all candlepowers.



NOVALUX ORNAMENTAL UNITS

**FLOOD LIGHTING PROJECTORS**—Flood lighting the exteriors of buildings has achieved considerable prominence because of its extensive use at the Panama Pacific International Exhibition. Its popularity is due to the fact that the building, not the lighting, is presented to the eye; the means of illumination is concealed

and does not distract the attention and the building appears natural and real, exactly the impression the architect wishes to give. The flood lighting projector manufactured by the GENERAL ELECTRIC COMPANY is designed expressly for this class of lighting and by its use, buildings, statues, monuments and other objects of public pride and interest are not lost to view at night-time but are made more conspicuous than in the day-time.

These flood lighting projectors are made to accommodate either the 200-watt or 400-watt Mazda C lamps, which are made expressly for this class of work.

Bulletin 42850.

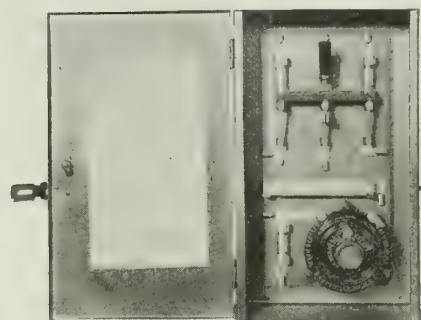
FORM L-1 FLOOD  
LIGHTING PROJECTOR  
Front viewFORM L-1 FLOOD  
LIGHTING PROJECTOR  
Side view

### Battery Charging Outfits.

The rapidly increasing use of electrically propelled vehicles makes thoroughly reliable charging equipment of high commercial efficiency very necessary. The GENERAL ELECTRIC COMPANY is prepared to furnish battery charging equipments for all classes of service.

### Individual Vehicle Charging Sets.

The individual vehicle charging sets, herewith illustrated, can be furnished for the charging of either Lead or Edison vehicle batteries. They can be furnished for service on various frequencies, either single phase or polyphase circuits of the standard voltages, and in suitable capacities for charging Lead batteries of 44 cells and under or Edison batteries of 60 cells and under.

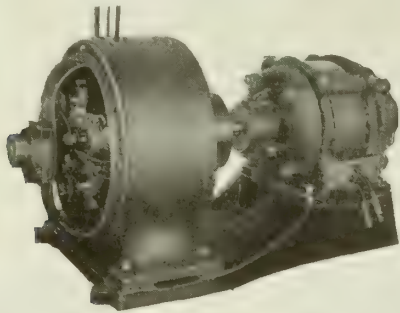
STEEL WALL CABINET CONTROLLING  
VEHICLE CHARGING SET

The selection of the proper set for any particular charging work depends upon the make of battery and type of cell, as well as the frequency, voltage and number of phases of the alternating current supply.

No series resistances are required with these sets. The sets can be mounted on the floor, wall or ceiling.

The wall cabinet illustrated, it will be noted, contains the switch, fuses and generator field rheostat. Di-

rect current ammeter and voltmeter can be furnished as extras, mounted in a box above the door. The individual charging sets are simple to operate.



MOTOR-GENERATOR OF INDIVIDUAL VEHICLE CHARGING OUTFIT

### Ignition and Lighting Battery Charging Outfits.

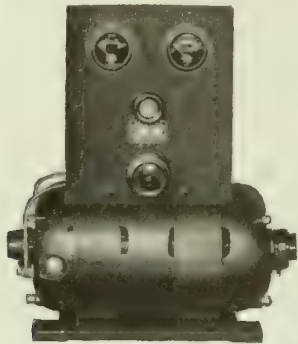
The motor generator charging outfits illustrated herewith are for home or garage use in charging automobile starting and ignition batteries.

They consist of a small, compact, two-bearing motor generator set, on which is mounted a small steel switchboard completely equipped.

These outfits are furnished in capacities of 175, 250, 375, 500 and 750 watts, giving a range of sizes the smallest of which will charge any combination of 1 to 4 six-volt batteries and the largest any combination of 3 to 12 six-volt batteries.

These sets are operated from the ordinary circuit. Operation is very simple and by the use of one of these sets excellent results in battery charging may be secured without the services of an expert.

Larger sets wound for 37½ volts, 20-, 30-, 45- and 60-ampere outfit in three-bearing construction, with common base, are also available.



MOTOR GENERATOR SET FOR BATTERY CHARGING

### Tungar Rectifiers.

Another charging device for private garage or service station use is the new Tungar Rectifier, operating on the principle of the emission of small particles of negative electricity from an incandescent filament in a bulb filled with inert gas.

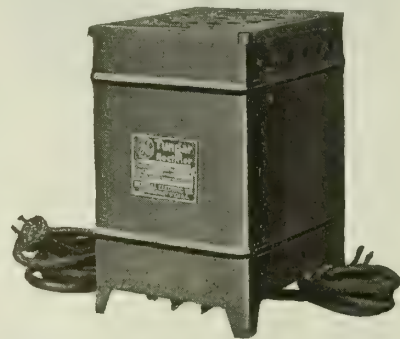
This charger is simple in construction, light in weight and requires no expert attendance. It is self-starting, and reversals and overloads are impossible. Its first cost and operating expense are very low. The smaller sizes connect with any alternating current lamp socket.

There are 3 sizes. The 6-ampere 75-volt size will charge from 3 to 30 cells of lead plate battery in any combination at from 1 to 6 amperes. It is particularly

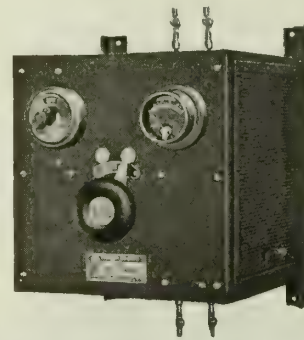
adapted to the needs of public garages and service stations.

The 6-ampere 15-volt Tungar will charge from 3 to 6 cells at 6 amperes. It is designed for charging, starting and lighting batteries in the private garage.

The 2-ampere 7.5-volt outfit will charge 3 cells at 2 amperes, 6 cells at about 1 ampere and 8 cells at about 0.75 ampere. It is suitable for motorcycle and motorboat owners or service stations.



6-AMPERE 15-VOLT TUNGAR RECTIFIER

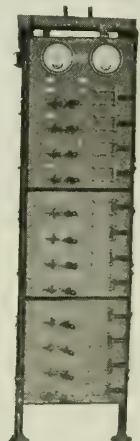


6-AMPERE 75-VOLT TUNGAR RECTIFIER

### Battery Charging Outfits for Large Garages.

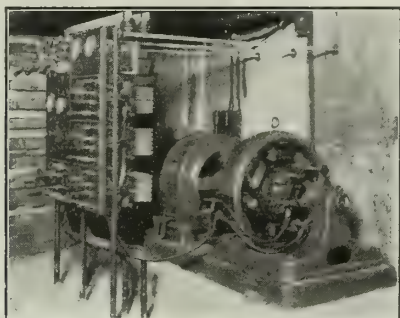
The problems for selecting battery charging outfits for large garages present conditions so diversified in character that it is best to take each case up individually with the engineers of the GENERAL ELECTRIC COMPANY.

The following pictures of equipments for battery charging only serve to illustrate some of the problems that have been successfully solved by this company.



SWITCHBOARD PANELS FOR BATTERY CHARGING





MOTOR GENERATOR SETS FOR BATTERY CHARGING

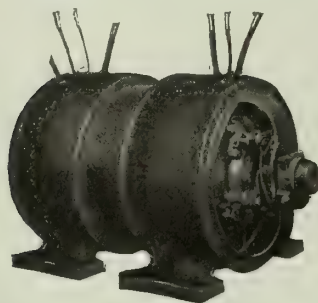
### Fort Wayne Compensarc.

For the reduction of voltage incident to operating moving picture machines, Fort Wayne compensarcs are available for reducing direct or alternating current and transforming alternating to a usable direct current voltage.

For illustration of apparatus, for changing alternating current to direct, see illustration under Individual Vehicle Charging Set.

These machines are built especially for this class of work, and are much more efficient, reliable and satisfactory in operation than the ordinary motor generator sets that have heretofore been offered for this service. The only energy taken from the line being that required by the arc lamp and the small losses incidental to the running of the machine.

It is simple to install, as no sub-base or special foundations are required, and there are absolutely no difficulties to be encountered in connecting it into the circuit.



DIRECT CURRENT COMPENSARC

For projection purposes in small theaters and in the home, the new type compensarc is used in connection with Mazda lamps. This equipment is simple to operate and requires very little attention.



ALTERNATING CURRENT COMPENSARC



NEW TYPE COMPENSARC

**FOR NIGHT LIGHT**—A miniature transformer (the All-nite-lite) is screwed to the lamp socket in place of the ordinary lamp, and transforms the supply voltage to operate a 6-volt 2-c.p. bayonet base Mazda lamp, the same as used for automobile rear and speedometer lighting.

Bulletin B-3341.

**FOR BELL RINGING SYSTEMS**—The Wayne bell ringing transformer serves every ringing requirement. The one illustrated, Catalogue No. 179541, is adapted for operating household type electric bells, annunciators, door openers, thermostats, etc.

It has sufficient capacity to operate three 3-in. bells simultaneously.

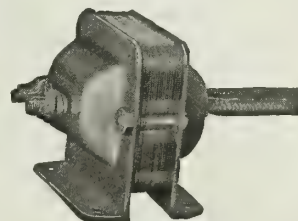
It has been approved by Fire Underwriters.

A bell ringing transformer should be included in all wiring specifications.

Described in Flyer B-3400.



TRANSFORMER FOR NIGHT LAMP



TRANSFORMER FOR BELL RINGING SYSTEMS

### Fans.

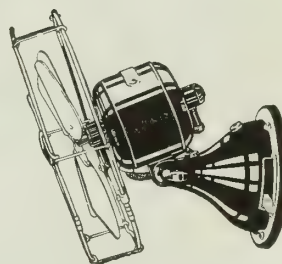
Fans for residences and offices are made in 3 sizes: 9, 12 and 16 ins. in diameter; and with 3-speed control, except the 9-in., which has a 2-speed control. Can be furnished for desk or wall mounting, either oscillating or non-oscillating.

These fans are quiet in running, light in weight, very efficient and durable.

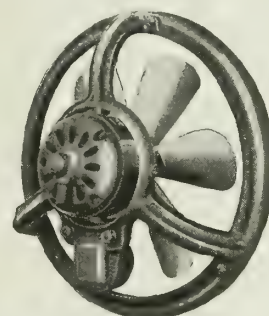
Made for different voltages for both alternating and direct current.

Desk fan Bulletin B-3402.

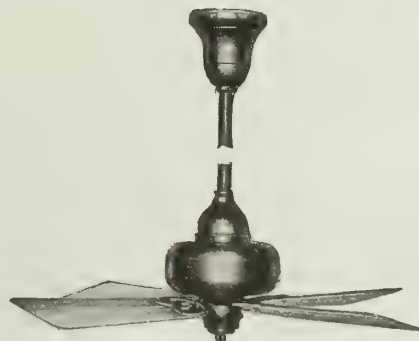
For ventilating outfit, ask for special bulletin.



DESK FAN



G-E VENTILATING OUTFIT



32-INCH ALTERNATING CURRENT CEILING FAN

### Special Transformers.

For small devices, such as bells, toys, small lamps, etc., the use of batteries has been replaced by small transformers, which give the required low voltages at a small cost and without attention.

Transformers can be used only on alternating current systems.

**Suggestions for Electric Specification.**

(Numbers refer to General Electric Catalogue.)

**CONDUIT SYSTEM**—Install a complete system of Genuine Hot Galvanized, Wiped Interior Conduit, for all wires, as shown on plans. All conduit shall be "Greenfield Duct," of sufficient size to take all wires of each circuit.

**OUTLET BOXES**—Install a Galvanized Steel Outlet Box at each electric outlet. Provide all outlets with  $\frac{3}{8}$ -in. fixture stems. All wall and ceiling outlet boxes shall be Sprague No. 6200.

**WIRING**—All wiring shall be done with Tricoat Wire of No. 14 B. & S. gage, or of the size shown on plans.

**PANELBOARDS**—Furnish two G-E Marbleized-slate Panelboards of the 220-110 volt type, with a polished copper knife switch and N. E. C. enclosed fuses for each circuit. Panelboards shall be set in recessed type steel boxes with steel doors and trims, set and connected complete at the points shown.

**SWITCHES**—Install at points indicated a G-E Removable Mechanism Push Switch. They shall be of the single pole (G-E731), double pole (G-E732), 3-way (G-E733) and 4-way (68250) pattern as shown. Each switch shall be fitted with solid brass plate finished to match hardware. Where switches occur in pairs or in threes, gang plates shall be used. A No. 60478 Electrolier Switch with 61044 Plate shall be installed in the dining room for turning on fan or light, singly or together.

**BASE RECEPTACLES**—Install at points shown a Removable Flush Wall Receptacle, consisting of a G-E No. 694 Receptacle and a G-E No. 695 Plate. Receptacles shall be fitted with solid brass plates finished to match hardware.

**BURGLAR LIGHTS**—The lights marked "B" shall be so wired and switched with the G-E 732 and 733 removable 2-pole and 3-way switch mechanisms, specified above, that any light may be turned on by its respective 3-way switch, and so that all lights may be turned on by the 2-pole control switches in bedrooms.

**PULL CHAIN AND DROP CORD RECEPTACLE**—Install at points shown in closets No. 88963 Pull Chain Receptacles. In basement at all outlets marked "D" install Reinforced Drop Cords with G-E No. 099 porcelain Key Sockets. The 1-light receptacles under range hood shall be Keyless Receptacles, G-E No. 411.

**FANS**—Install at points shown in den and reception room No. 60561 16-in. D-C Oscillating Bracket Fans; in dining room a No. 177660 110-volt Ceiling Fan with a 1-light 100-watt fixture; in pantry a No. 34011 16-in. Ventilating Fan with a No. 34036 Speed Controller.

**ELECTRIC HEATING OUTLET HEATING DEVICES, etc.**—For electric ranges, install at points shown Pilot Light Boards G-E No. 947, consisting of a plug, fuse cut-out, double pole snap switch, pilot light and receptacle. Where special heating outlets are shown for large heaters, G-E No. 112 Lamp Board shall be used.

Also install at points shown in kitchen a No. 153464 Water Heater, a Flatiron, and Universal Oscillator; in pantry a No. 153473 Hot Plate; in dining room a No. 153479 Samovar, a No. 153483 Coffee Percolator, a No. 153485 Chafing Dish, a No. 153477 Toaster, and a No. 78871 Luminous Radiator with 250-watt bulbs;

in sitting room a No. 139320 Mantel Type Luminous Radiator with three 250-watt bulbs; in each bathroom a No. 76215 Hot Water Heater and a No. 165825 Air Heater; in shop a No. 153498 Glue Pot and a No. 153509 Soldering Iron Heater.

**MOTOR**—Install a G-E996 Receptacle, with 997 Plate and a 59197 Plug, and connect in the shop a 2-h.p., 230-volt, CVC No. 111 G-E Compound Wound Motor with a CR No. 107 Starting Box.

**SPECIAL TRANSFORMERS**—For ringing all bells, install a No. 179541 Bell Ringing Transformer. For small lights at night for porches, halls, bathrooms, install an All-nite-lite.

**Bulletins.**

The following list and corresponding bulletin numbers are referred to in foregoing pages.

<b>SOURCE OF ELECTRIC POWER—</b>	
Steam turbines.....	42206, 42201
Belt driven generator.....	40400
<b>CONTROL OF ELECTRIC POWER—</b>	
Switchboards.....	"Standard Units," 47001
Circuit breakers.....	47502, 47503, 4840-A
<b>MEASURING ELECTRIC POWER—</b>	
Electrical instruments.....	46013
Electrical meters.....	46201, 46253, 46203
<b>TRANSMITTING ELECTRIC POWER—</b>	
Wires and cables.....	49300 to 49304
<b>DISTRIBUTION—</b>	
Panelboard .....	*
Cabinets .....	*
<b>WIRING DEVICES—</b>	
Switches .....	Supply Catalogue
Wiring devices.....	Supply Catalogue
Remote control switches.....	A-4070
<b>POWER APPLIANCES, MOTORS—</b>	
Induction motors.....	41302
Direct current motors (constant speed).....	41013
Direct current motors (variable speed).....	A-4130
Direct current motors (crane and hoist).....	48108
<b>LIGHTING—</b>	
Novalux ornamental units.....	*
Flood lighting projectors.....	43407
<b>COOKING EQUIPMENT—</b>	
Ranges, domestic.....	B-3353
Broilers, domestic.....	Y-744
Disk stoves, domestic.....	B-3344
Water heaters, domestic table.....	Y-744
Radiant grill, domestic table.....	Y-744
Ranges, hotel.....	Y-744
Broiler, hotel.....	B-3278
Ovens, hotel.....	Y-744
Toaster, hotel.....	Y-744
<b>HEATING EQUIPMENT—</b>	
Air heaters, domestic.....	Y-744
Water heaters, domestic.....	Y-744
Luminous radiator.....	Y-744
Irons, flat, domestic.....	B-3318
Irons, flat, tailors.....	B-3318
<b>MISCELLANEOUS SERVICE—</b>	
Tungars .....	Y-1010
Battery charging outfits.....	B-3374
Motor generator sets.....	42552
Controlling cabinet.....	*
Switchboards .....	*
Compensars .....	*
<b>Transformers—</b>	
Night lamp.....	B-3341
Bell ringing systems.....	B-3400
<b>Fans—</b>	
Desk .....	B-3367
G-E ventilating outfits.....	*

Information regarding those marked with an asterisk (\*) will be furnished on application to the company's nearest office.



## GENERAL ELECTRIC COMPANY

## PRINCIPAL WORKS

Schenectady, N. Y.  
Pittsfield, Mass.

Lynn, Mass.  
Harrison, N. J.

Newark, N. J.  
Cleveland, Ohio

Watsessing, N. J.  
Erie, Pa.

Fort Wayne, Ind.

## SALES OFFICES

ATLANTA, GA. .... Third Nat'l Bank Building  
BALTIMORE, MD. .... Munsey Building  
BIRMINGHAM, ALA. .... Brown-Marx Building  
BOSTON, MASS. .... 84 State Street  
BUFFALO, N. Y. .... Electric Building  
BUTTE, MONT. .... Electric Building  
CHARLESTON, W. VA. .... Charleston Nat'l Bank Building  
CHARLOTTE, N. C. .... Commercial Nat'l Bank Building  
CHATTANOOGA, TENN. .... James Building  
CHICAGO, ILL. .... Monadnock Building  
CINCINNATI, OHIO. .... Provident Bank Building  
CLEVELAND, OHIO. .... Illuminating Building  
COLUMBUS, OHIO. .... Columbus Savings & Trust Building  
DAYTON, OHIO. .... Schwind Building  
DENVER, COLO. .... First Nat'l Bank Building  
DES MOINES, IOWA. .... Hippee Building  
DETROIT, MICH. .... Dime Savings Bank Building  
DULUTH, MINN. .... Fidelity Building  
ELMIRA, N. Y. .... Hulett Building  
ERIE, PA. .... Marine Nat'l Bank Building  
FORT WAYNE, IND. .... 1600 Broadway  
HARTFORD, CONN. .... Hartford Nat'l Bank Building  
INDIANAPOLIS, IND. .... Traction Terminal Building  
JACKSONVILLE, FLA. .... Heard Nat'l Bank Building  
JOPLIN, MO. .... Miners' Bank Building  
KANSAS CITY, MO. .... Dwight Building  
KNOXVILLE, TENN. .... Bank & Trust Building  
LOS ANGELES, CAL. .... 724 South Spring Street

For Texas, Oklahoma and Arizona business—  
SOUTHWEST GENERAL ELECTRIC COMPANY  
(formerly Hobson Electric Co.)

DALLAS, TEX. .... 1701 No. Market Street  
HOUSTON, TEX. .... Third and Washington Streets  
EL PASO, TEX. .... 500 San Francisco Street  
OKLAHOMA CITY, OKLA. .... Insurance Building  
For all Canadian business—

CANADIAN GENERAL ELECTRIC COMPANY, LTD.  
TORONTO, ONT.

LOUISVILLE, KY. .... Starks Building  
MEMPHIS, TENN. .... Randolph Building  
MILWAUKEE, WIS. .... Public Service Building  
MINNEAPOLIS, MINN. .... 410 Third Avenue, North  
NASHVILLE, TENN. .... Stahlman Building  
NEW HAVEN, CONN. .... Second Nat'l Bank Building  
NEW ORLEANS, LA. .... Maison-Blanche Building  
NEW YORK, N. Y. .... Hudson Terminal Building  
NIAGARA FALLS, N. Y. .... Gluck Building  
OMAHA, NEBR. .... Union Pacific Building  
PHILADELPHIA, PA. .... Witherspoon Building  
PITTSBURGH, PA. .... Oliver Building  
PORTLAND, ORE. .... Electric Building  
PROVIDENCE, R. I. .... 1012 Turks Head Building  
RICHMOND, VA. .... Virginia Railway and Power Building  
ROCHESTER, N. Y. .... Granite Building  
SALT LAKE CITY, UTAH. .... Newhouse Building  
SAN FRANCISCO, CAL. .... Rialto Building  
SCHENECTADY, N. Y. .... General Electric Works  
SEATTLE, WASH. .... Colman Building  
SPOKANE, WASH. .... Paulsen Building  
SPRINGFIELD, MASS. .... Massachusetts Mutual Building  
ST. LOUIS, MO. .... Pierce Building  
SYRACUSE, N. Y. .... Onondaga Co. Savings Bank Building  
TOLEDO, OHIO. .... Spitzer Building  
WASHINGTON, D. C. .... Evans Building  
YOUNGSTOWN, OHIO. .... Wick Building

For Great Britain business—  
BRITISH THOMSON-HOUSTON COMPANY, LTD.  
RUGBY, ENG.

GENERAL FOREIGN SALES OFFICES—  
SCHENECTADY, N. Y.

NEW YORK, N. Y. .... 30 Church Street  
LONDON, E. C., ENG. .... 83 Cannon Street

## FOREIGN OFFICES OR REPRESENTATIVES

ARGENTINA: Cia. General Electric Sudamericana, Inc. .... Buenos Aires  
AUSTRALIA: Australian General Electric Co. .... Sydney and Melbourne  
BRAZIL: Companhia General Electric do Brazil. .... Rio de Janeiro  
CENTRAL AMERICA: G. Amsinck & Co. .... New York, U. S. A.  
CHILE: { International Machinery Co. .... Santiago  
          { Nitrate Agencies, Ltd. .... Iquique  
CHINA: Andersen, Meyer & Co. .... Shanghai  
COLOMBIA: Wesselhoeft & Wisner. .... Barranquilla  
CUBA: Zalzo & Martinez. .... Havana  
ENGLAND: General Electric Co. (of New York). .... London  
HAWAIIAN ISLANDS: Catton, Neill & Company, Ltd. .... Honolulu  
INDIA: General Electric Co. (of New York). .... Calcutta  
JAPAN and KOREA: { General Electric Co. and Bagnall & Hilles. .... Yokohama  
                          { Mitsui Bussan Kaisha, Ltd. .... Tokyo and Seoul  
MEXICO: Mexican General Electric Co. .... Mexico City  
NEW ZEALAND: The National Electrical & Engineering Co., Ltd. .... Wellington, Christchurch, Dunedin and Auckland  
PERU: W. R. Grace & Co. .... Lima  
SOUTH AFRICA: South African General Electric Co. .... Johannesburg, Capetown and Durban



SCHENECTADY WORKS AND GENERAL OFFICES

# SPRAGUE ELECTRIC WORKS

OF GENERAL ELECTRIC COMPANY

TELEPHONE:  
GREELEY 2000

527-531 West 34th Street  
NEW YORK, N. Y.

## BRANCH OFFICES

CHICAGO, ILL., Fisher Building  
PHILADELPHIA, PA., Witherspoon Building  
BOSTON, MASS., 201 Devonshire Street  
BALTIMORE, MD., American Building  
PITTSBURGH, PA., Oliver Building  
CLEVELAND, OHIO, Illuminating Building  
CINCINNATI, OHIO, Provident Bank Building

ATLANTA, GA., Third National Bank Building  
ST. LOUIS, MO., Chemical Building  
MILWAUKEE, WIS., Public Service Building  
SAN FRANCISCO, CAL., Rialto Building  
LOS ANGELES, CAL., Corporation Building  
PORTLAND, ORE., Electric Building  
SEATTLE, WASH., Colman Building

## Products.

FLEXIBLE STEEL ARMORED CABLE, FLEXIBLE STEEL CONDUIT, FLEXIBLE ARMORED CORD, GREENFIELDDUCT, SPRAGUEDUCT, OUTLET BOXES, ELECTRIC FANS, EXHAUST FANS and OUTFITS, SWITCHBOARDS, PANELBOARDS, METERING PANELS, GENERATORS, MOTORS, CONTROLLERS, DYNAMOMETERS, HOISTS, MONORAIL CRANES, WINCHES and WINDING DRUMS, ELECTRIC STORAGE BATTERY TRUCKS, OZONATORS, ARMORED HOSE.

### Flexible Steel Armored Cable.

Known to the trade as BX, a name originated and copyrighted by the SPRAGUE ELECTRIC WORKS.

Adapted to new building construction and particularly favorable on account of the ease with which it can be installed in finished buildings without defacing the walls. It is made with single, double and triple conductors.

BXL has a sheathing of lead between the steel armor and the insulation, and is used in damp places, in concrete and in underground construction.

BM is for marine work.

### Flexible Steel Conduit.

Single strip type is designed especially for fire-proof construction, but is equally adaptable to non-fire-proof work, or for the wiring of finished buildings.

Double strip type is strongly recommended for use in existing buildings on account of its extreme flexibility. A gasket is provided between the inner and the outer strip of steel, rendering the conduit moisture-proof.

### Flexible Armored Cord.

Type E, for lamp pendants, show windows, theaters, factories, etc.

Type EM, reinforced, for portables and all current consuming devices.

### Greenfieldduct.

A rigid conduit, hot galvanized on both the exterior and the interior surfaces.

### Spragueduct.

A black enameled rigid conduit.

### Outlet Boxes.

A full line of outlet, junction and switch boxes, together with fittings and tools, is manufactured, to make the wiring systems complete.

### Electric Fans.

A complete line of fans for the desk, wall or ceiling.

The desk and the wall fans may be either oscillating or non-oscillating.

### Exhaust Fans and Outfits.

Motor driven exhaust fans of all sizes, with direct current or alternating current motors attached. Standard equipments carried in stock.

## Switchboards.

Switchboards, panelboards and metering panels of standard or special types built to meet the most exacting specifications.

## Generators.

Direct current generators for isolated plants.  
Built in sizes up to 1000 kw.

## Motors.

Direct current and alternating current, all types. Special attention to applications of motors in printing presses, pumps and ventilating fans of all kinds.

## Controllers.

Printing press and blower motor controllers for all applications, hand operated, semiautomatic and full automatic.

Sizes from  $\frac{1}{4}$  h. p. to 125 h. p.

## Dynamometers.

For testing gasoline engines and the measurement of power, generated or absorbed.

## Hoists.

Electric hoists for general lifting and conveying purposes.

Sizes from  $\frac{1}{4}$  ton to 6 tons.

## Monorail Cranes.

For the economical transportation of heavy material about the plant.

A number of cranes may be used on the same track system, provided the necessary switches and turnouts are supplied.

## Winches and Winding Drums.

For pulling freight cars and heavy trucks into and out of shops, for warping vessels through drawbridges and along docks, for use in lumber yards, shipyards, etc.

## Electric Storage Battery Trucks.

Rapid and economical means of handling miscellaneous loads on docks, piers, railroad terminals, and in industrial plants.

## Ozonators.

A successful device for removing objectionable odors in department stores, restaurants, markets, cold storage warehouses, offices, etc.

The use of ozone as an adjunct to ventilation is rapidly becoming recognized.

## Armored Hose.

Rubber hose incased in a flexible steel armor to protect it from external injury and prolong its service. Made for steam, air and water.

Used in engineering projects, excavating operations, power plants, etc.



# WESTINGHOUSE ELECTRIC & MFG. CO.

Manufacturers of Apparatus for the Generation, Application and Control of  
Electric Power

EAST PITTSBURGH, PA.

FOR DISTRICT SALES OFFICES, SERVICE DEPARTMENT REPAIR SHOPS, AND WESTINGHOUSE AGENT-JOBBER, SEE PAGE 1176

## Products.

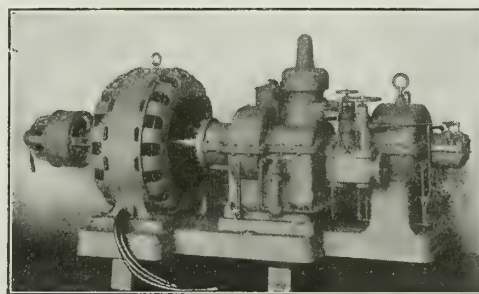
GENERATING EQUIPMENT:	PAGE
STEAM TURBINE GENERATING SETS.....	1169
BELT DRIVEN GENERATORS.....	1170
STEAM OR GAS ENGINE DRIVEN GENERATORS.....	1170
SWITCHBOARDS.....	1170
WATTHOUR METERS.....	1171
SWITCHBOARD INSTRUMENTS.....	1171
MOTORS:	
FOR FANS AND BLOWERS.....	1171
FOR OPERATING ELEVATORS.....	1171
FOR DRIVING PUMPS.....	1172
FOR DRIVING VACUUM CLEANER SYSTEMS.....	1172
FOR DRIVING LAUNDRY EQUIPMENT.....	1172
FOR DRIVING ICE AND REFRIGERATING MACHINES...	1172
LIGHTING FIXTURES:	
FOR MAZDA LAMPS.....	1172
FLAME CARBON LAMPS.....	1172
ORNAMENTAL STREET UNIT.....	1172
BLOWERS:	
WESTINGHOUSE-SIROCCO.....	1172

## Products (Continued.)

FANS:	PAGE
EXHAUST FANS.....	1173
WESTINGHOUSE-VENTURA EXHAUST FANS.....	1173
DESK AND BRACKET FANS.....	1173
CEILING FANS.....	1173
COLUMN FANS.....	1173
HEATING DEVICES:	
LUMINOUS RADIATORS.....	1174
AIR HEATERS.....	1174
WATER HEATERS.....	1174
CURRENT RECTIFYING OUTFITS:	
FOR BATTERY CHARGING.....	1174
BELL RINGERS.....	1175
ELECTRIC RANGES:	
AUTOMATIC AND SEMI-AUTOMATIC.....	1175
Automobile Equipments: Electric Starting, Lighting and Ignition; Insulating Material; Converters; Transformers; Vulcanizers; Welding Outfits, Electric Arc; Water Wheel Generators.	

## Co-operative Service.

Architects and engineers are invited to use the facilities of the Westinghouse Engineering and Sales Departments in the planning and selection of material and electrical equipment to solve special problems.



STEAM TURBINE GENERATOR—ALTERNATING CURRENT

## Steam Turbine Generating Sets.

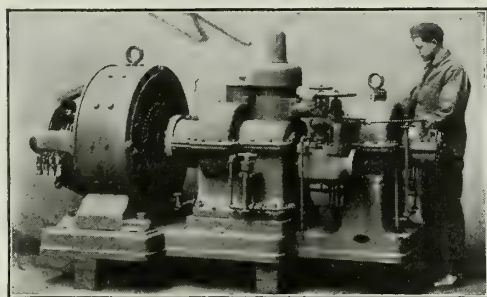
DIRECT CURRENT ENGINE TYPE GENERATORS, TYPE Q—Cool

operation, ability to withstand heavy loads, and sparkless commutation from no load to heavy overloads, with a fixed brush position, are identifying features of Type Q generators.

Each armature is arranged for mounting on a prime mover shaft, which, together with the bearings, is furnished by the builder of the engine. The field structure is designed for mounting on the prime mover bed plate or sole plates set in masonry foundation.

ALTERNATING CURRENT ENGINE TYPE GENERATORS, TYPE E—The many years of practical experience of the Westinghouse Company in the design and construction of various types of alternators of all capacities and speeds have been embodied in Type E generators, which constitute a standard line of 60-cycle alternators.

These generators are applicable to all prime movers, being suitable for direct connection to steam, gas or oil engines, or slow speed horizontal water wheels.



STEAM TURBINE GENERATOR—DIRECT CURRENT

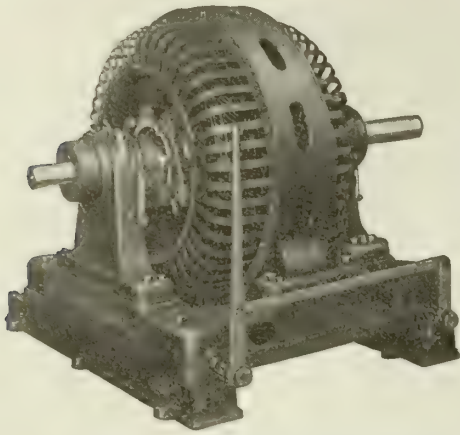
BELT DRIVEN ALTERNATORS, TYPE G—Small central stations and industrial plants requiring belt driven alternators will find the Type G line of 60-cycle generators especially well adapted to this service. More than 1,000 of these machines are in successful operation.

They are highly efficient at all loads, well ventilated, simple in electrical and mechanical construction, made of high grade materials throughout, and very rugged; also economical to operate and maintain.

DATA, STEAM TURBINE GENERATING SETS

Capacity, kw.	Over all dimensions			Size of pipe, ins.		Number 40-watt lamps, 125 volts
	Length, ft. ins.	Width, ft. ins.	Height, ft. ins.	Steam	Exhaust	
DIRECT CURRENT						
1	2 11	1 1	1 6	1 2	1	
15	5 3 5/8	2 10 3/8	2 6 7/8	3 3/8	5	
25	5 4 1/4	3 0	2 8 1/2	3 3/8	5	
50	6 10	3 7 3/8	3 1 1/2	3 3/8	5	
75	9 4 1/4	3 10	4 8	3	8	
100	9 2 1/2	3 10	4 8	3	8	
ALTERNATING CURRENT						
30	7 2 1/2	3 5	2 10 3/8	2	5	
75	10 1	3 11 3/4	4 5	3	8	
100	10 6 5/8	4 2 3/4	4 8	3	8	
150	10 10 7/8	4 8 1/2	4 8	3	8	
200	12 7 1/2	5 6 1/2	5 1 1/2	5	12	

Larger sizes on application.

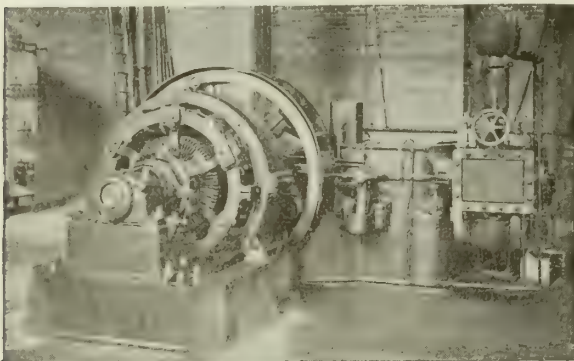


BELT DRIVEN GENERATOR, TYPE G

Capacity, kw.	Over all dimensions			Speed, r.p.m.	No. 40-watt lamps, 125 volts
	Length, ins.	Width, ins.	Height, ins.		
DIRECT CURRENT					
1 <sup>1</sup> / <sub>2</sub>	29 <sup>11</sup> / <sub>16</sub>	15	18 <sup>1</sup> / <sub>2</sub>	1390	38
5	37 <sup>1</sup> / <sub>16</sub>	17 <sup>5</sup> / <sub>8</sub>	22 <sup>3</sup> / <sub>4</sub>	1120	125
9	37 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>8</sub>	1700	225
12 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>4</sub>	22 <sup>5</sup> / <sub>8</sub>	27 <sup>1</sup> / <sub>8</sub>	1350	363
25	50	27 <sup>1</sup> / <sub>8</sub>	34 <sup>1</sup> / <sub>8</sub>	1150	625
30	53 <sup>1</sup> / <sub>16</sub>	29 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>8</sub>	1090	750
50	64 <sup>1</sup> / <sub>2</sub>	36	45 <sup>1</sup> / <sub>2</sub>	835	1250
75	69 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>8</sub>	46 <sup>3</sup> / <sub>8</sub>	900	1875
100	75 <sup>1</sup> / <sub>16</sub>	39 <sup>1</sup> / <sub>8</sub>	49 <sup>1</sup> / <sub>8</sub>	900	2500

ALTERNATING CURRENT

25	39	31	26	1800	625
50	45	39	37	1200	1250
62.5	47	42	39	1200	1563
100	47	42	39	1200	2500
125	55	48	48	900	3125
187	70	57	48	900	4700
250	88	74	67	600	6250



GENERATOR DIRECT CONNECTED TO STEAM ENGINE

Capacity, kw.	Over all dimensions			Speed, r.p.m.	No. 40-watt lamps, 125 volts
	Length, ins.	Width, ins.	Height, ins.		
STEAM ENGINE—DIRECT CURRENT.					
25	38 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>8</sub>	295-325	625
50	43	32	43 <sup>1</sup> / <sub>2</sub>	275-300	1250
100	53	45 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>4</sub>	250-275	2500
STEAM ENGINE—ALTERNATING CURRENT					
62.5	55	53	49	300	1563
75	58	59	56	277	1875
100	58	59	56	300	2500
GAS ENGINE—DIRECT CURRENT					
50	47 <sup>3</sup> / <sub>4</sub>	35 <sup>1</sup> / <sub>2</sub>	48 <sup>1</sup> / <sub>4</sub>	200-220	1200
100	53	45 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>4</sub>	250-275	2500
GAS ENGINE—ALTERNATING CURRENT					
62.5	55	53	49	300	1563
100	82	72	77	140	1500
225	121	83	105	120	5625

## Switchboards.

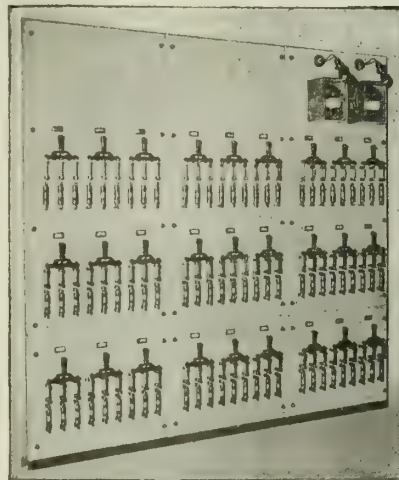
Switchboards are built by the WESTINGHOUSE ELECTRIC & MFG. CO. to cover all requirements from the smallest plant to the largest. They are built to conform to the specifications of the architect or engineer where necessary; but in order to save the time of the designer, a complete assortment of switchboard panels has been standardized.

To make up a switchboard for any desired installation, all that is necessary is to select the panels for the required purposes. All panels bearing the same type designation match up in appearance and in the alignment of apparatus, and can be combined to form a complete switchboard.

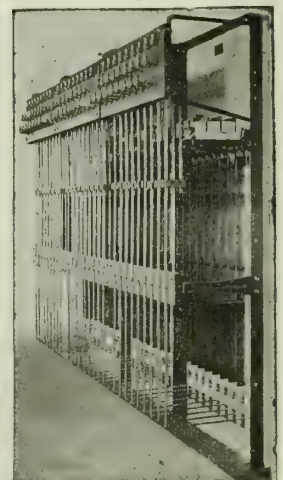
Special care is taken with the arrangement of apparatus on both the front and the rear of panels. Apparatus on the front is arranged with special reference to the convenience of operation, and apparatus on the rear, to provide access to all connections. The rear of a Westinghouse switchboard is arranged as neatly as the front.

FINISH—Standard finish is a dull velvety black. Any special finish can be had on order. Current carrying parts on front of panel are polished copper.

DELIVERY—On standard panels of the smaller capacities listed in the Westinghouse catalogue, delivery can be made within 15 days of receipt of order. The higher capacity panels and panels with special features require longer time for delivery.

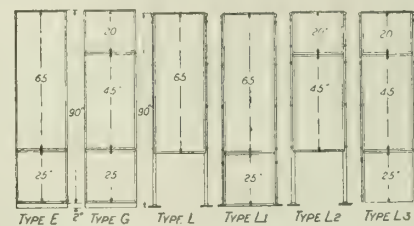


Front View

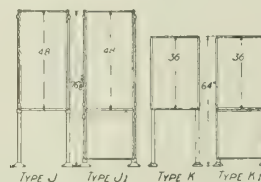


Rear View

SWITCHBOARD OF FIDELITY SAVINGS AND TRUST COMPANY, BALTIMORE, MD.



TYPE E TYPE G TYPE L TYPE LI TYPE LB TYPE LS



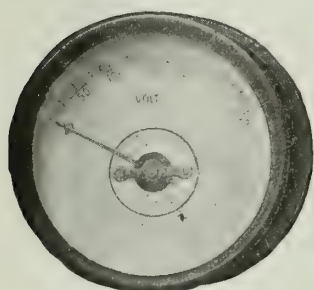
TYPE J TYPE LJ TYPE K TYPE KL

OVER ALL DIMENSIONS OF SWITCHBOARD FRAMES  
NOTE—The type does not cover width, thickness or material of slabs

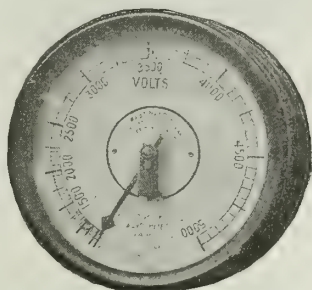


### Instruments.

A distinct advance was made in switchboard instrument practice when the Westinghouse 7-in. round pattern instruments were placed on the market. These instruments can be enclosed in a rectangle of 55 sq. ins., and have scales 7 ins. long in the D. C. meters and 14½ ins. long in the A. C. These scales are as long as the largest types of instruments of other manufac-



TYPE SL 7-INCH DIRECT CURRENT VOLTMETER



TYPE SM 7-INCH ALTERNATING CURRENT VOLTMETER

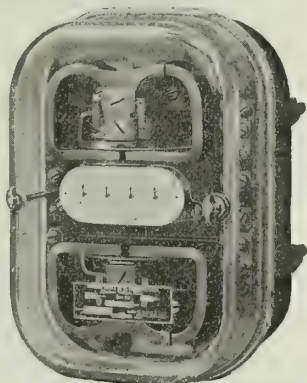
turers and yet occupy no more switchboard space than the smallest types of edgewise instruments, which have scales only 6 ins. long. The scales of these 7-in. instruments are twice as long as the scales of 9½-in. instruments of other makes.

The 7-in. instrument permits of great saving in switchboard area and floor space, as it is possible to mount 2 instruments in a horizontal line, on a 16-in. panel, or 3 on a 24-in. panel. This is impossible with any other practical type of instrument.

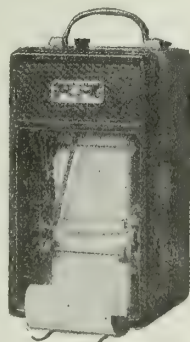
The WESTINGHOUSE ELECTRIC & MFG. Co. is the only manufacturer able to offer a complete line of 7-in. instruments for both alternating and direct current. These instruments are of uniform size and match up in general appearance, thus permitting mounting side by side, which results in a most pleasing design without irregularities and incongruities. They have a high degree of accuracy and permanence of calibration. In addition to the long scales, facility in reading is enhanced by the flat glass front. This makes illumination of the dial possible without the troublesome reflections found in the curved covers of instruments of edgewise types, and makes the whole pointer visible, rendering it possible to take accurate readings from a distance and from any angle.



TYPE CW-6 DIRECT CURRENT WATTHOUR METER



TYPE C, POLYPHASE SWITCHBOARD WATTHOUR METER, GLASS COVER



TYPE U, PORTABLE GRAPHIC METER

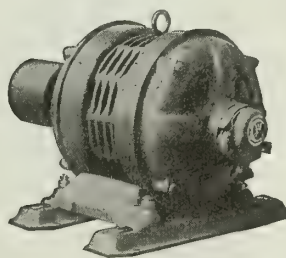
The company also manufactures a complete line of portable instruments, watthour meters and graphic instruments. Full details obtained from the regular catalogues, or on request.

### Westinghouse Motors.

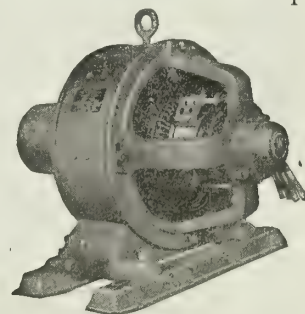
Westinghouse motors and control are supplied for practically all machines within the architect's field of activity. Special motors have been developed for certain specialized service. Others, for more general service where no special characteristics are required, can be applied to a wide variety of machines. They can be mounted directly on the machine or on the floor, wall or ceiling, and may be belted, geared or direct connected to the driven machine. For special cases above 1½ h. p., vertical motors may be supplied.

If the architect states in his specification the exact service under which the motor is to be operated, a Westinghouse motor and controller will be furnished, which perfectly fit the conditions.

ENGINEERING CO-OPERATION AND DATA SHEETS—Assistance will be gladly given in selecting the proper motor and controller for any application. The experience of Westinghouse engineers, gained through designing many different motor applications, is at the architect's disposal. Prices and information will be supplied on request.



Alternating Current



Direct Current

WESTINGHOUSE MOTORS

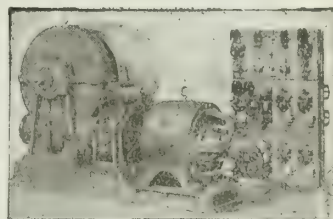
MOTORS FOR DRIVING FANS AND BLOWERS—A line of Westinghouse motors has been specially designed for ventilating fans and blowers of any type and size. Some of their features are quiet operation, cleanliness, economy in the use of current, and reliability. For small ventilating outfits see page 1173.



VENTILATING FAN DRIVEN BY WESTINGHOUSE MOTOR

FOR OPERATING ELEVATORS—Westinghouse elevator motors and controllers have been specially designed and built for elevators of all types, high and moderate speed passenger and low speed freight elevators. They are quiet in operation, start the car quickly but smoothly, and permit exact stops without jolts. They give reliable operation with very little attention, not only when new, but after years of service.

Direct current motors commutate sparklessly. They are furnished in several classes

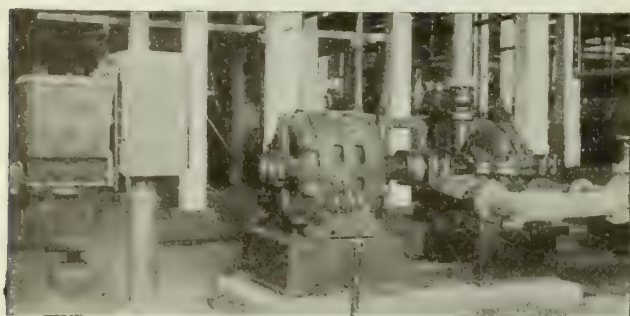


ELEVATOR MACHINE DRIVEN BY WESTINGHOUSE MOTOR



in order to suit the different kinds of service; squirrel cage alternating current motors are supplied in sizes up to 20 h. p. and wound-rotor alternating current motors in all capacities required for the service.

**FOR OPERATING PUMPS**—Westinghouse motors and control are supplied for all types of pumps and all

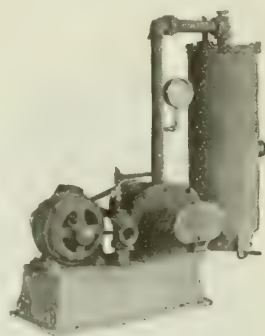


PUMP DRIVEN BY WESTINGHOUSE MOTOR

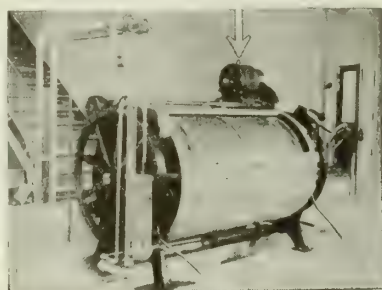
classes of pumping service, including centrifugal, triplex, duplex, single acting, deep well and fire pumps. Special protection from moisture may be given where conditions require it. Automatic control permits operation to be controlled from a distance or, if desired, entirely automatically. A full line of motors is available for small house pumps.

**FOR DRIVING VACUUM CLEANER SYSTEMS**—Westinghouse motors for driving vacuum cleaners can be operated successfully by unskilled operators. This service has been carefully studied by the WESTINGHOUSE ELECTRIC & MFG. Co. Most manufacturers of vacuum cleaners supply their machines complete with motors attached.

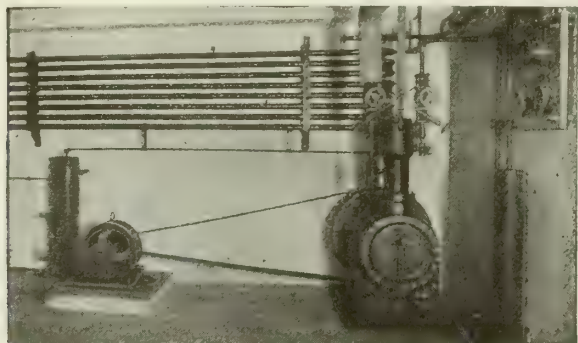
**FOR DRIVING LAUNDRY EQUIPMENTS**—The moist atmosphere of the laundry, the presence of dripping water, and the want of technical knowledge on the part of the operators make laundry service especially severe for electric motors.



VACUUM CLEANER EQUIPMENT DRIVEN BY WESTINGHOUSE MOTOR



LAUNDRY EQUIPMENT DRIVEN BY WESTINGHOUSE MOTOR



7 1/2 H.P. WESTINGHOUSE DIRECT CURRENT MOTOR DRIVING 4-TON REFRIGERATING MACHINE

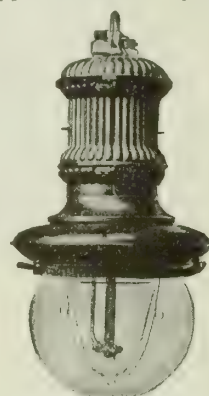
Westinghouse laundry machine motors are adapted in every respect for their purpose, as is proved by the fact that the leading laundry machine manufacturers have standardized on their use.

**FOR DRIVING ICE AND REFRIGERATING MACHINES**—Westinghouse motors can be supplied for driving all types and sizes of ice and refrigerating machines from any power circuit. These motors are characterized by high efficiency and great reliability.

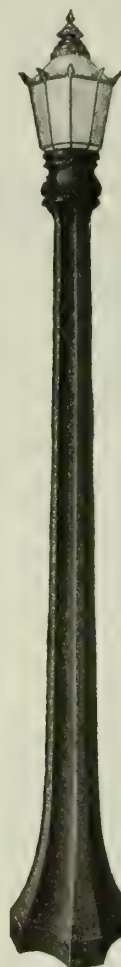
### Lighting Fixtures.

**FLAME CARBON ARC LAMPS**—Flame carbon arc lamps are well known for their intense and efficient illumination. The Westinghouse lamps have these desirable characteristics, and in addition give uniform distribution and burning life of carbons of somewhat over 100 hours, thus securing low maintenance cost.

Either white or yellow light carbons can be used. White light carbons give an intense illumination that closely approximates daylight.



FLAME CARBON ARC LIGHT



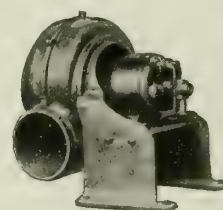
ARCADIAN POST WITH EXTENSION CAPITAL AND OCTAGONAL SENIOR GLOBE

**FIXTURES FOR MAZDA C LAMPS**—The WESTINGHOUSE ELECTRIC & MFG. Co. carries a complete line of ornamental posts, newels, brackets and other fixtures for use with the high-efficiency Mazda C lamps.

Send for Catalogue 7-A.

### Westinghouse-Sirocco Blowers.

Westinghouse-Sirocco blowers are especially adapted for use in connection with a system of piping, or where there is some resistance to the passage of the air. They should be used where the exhausted air contains smoke, fumes, dust, etc., as the air does not pass through the motor windings.



WESTINGHOUSE-SIROCCO BLOWER

DATA. WESTINGHOUSE-SIROCCO BLOWER

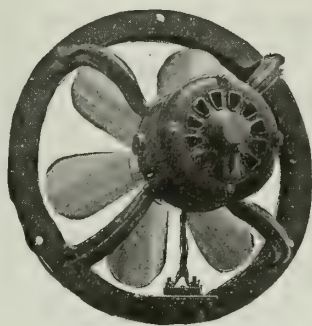
Hp.	Over all dimensions				Cu. ft. air per min.	Size of pipe	
	Length, ins.		Width, ins.	Height, ins.		Intake, ins.	Outlet, ins.
	A.C.	D.C.					
1/20	10 <sup>23</sup> / <sub>32</sub>	11 <sup>35</sup> / <sub>32</sub>	8 <sup>13</sup> / <sub>16</sub>	9 <sup>13</sup> / <sub>16</sub>	175	4 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>
1/16	11 <sup>27</sup> / <sub>32</sub>	12 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	12 <sup>5</sup> / <sub>8</sub>	275	6 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>
1/10	13 <sup>17</sup> / <sub>32</sub>	14 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>32</sub>	15 <sup>3</sup> / <sub>4</sub>	400	7 <sup>7</sup> / <sub>8</sub>	6
1/8	13 <sup>17</sup> / <sub>32</sub>	14 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>32</sub>	15 <sup>3</sup> / <sub>4</sub>	525	7 <sup>7</sup> / <sub>8</sub>	6
1/8	15 <sup>13</sup> / <sub>32</sub>	17 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	18 <sup>13</sup> / <sub>32</sub>	700	9 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>8</sub>

Voltage either 110 or 220.



**Westinghouse 12-inch and 16-inch Exhaust Fans.**

These fans are for ventilation rather than cooling. They should exhaust freely, not into flues or pipes. Where there is back pressure, or where the exhausted air contains smoke, fumes, dust, etc., blowers should be used instead.



12-INCH EXHAUST FAN

DATA, WESTINGHOUSE EXHAUST FANS

Cycles	Blades	Over all dimensions, ins.		Watts	Cu. ft. air per min.	Weight lbs.
		Diam.	Depth			
12-INCH FANS						
60	6	15 $\frac{1}{4}$	9 $\frac{1}{4}$	36	725	25 $\frac{1}{2}$
50	6	15 $\frac{1}{4}$	9 $\frac{1}{4}$	36	625	25 $\frac{1}{2}$
40	6	15 $\frac{1}{4}$	9 $\frac{1}{4}$	31	750	25 $\frac{1}{2}$
25-30	4	15 $\frac{1}{4}$	9 $\frac{1}{4}$	50	580	24 $\frac{1}{2}$
D.C.	6	15 $\frac{1}{4}$	9 $\frac{1}{4}$	24	725	25

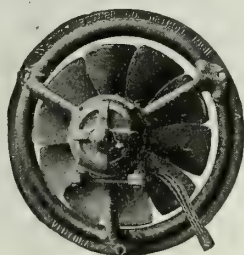
16-INCH FANS

60	6	19 1/4	9 3/4	90	1500	30 1/2
50	6	19 1/4	9 3/4	85	1300	30 1/2
40	6	19 1/4	9 3/4	80	1500	30 1/2
25-30	4	19 1/4	9 3/4	80	1175	29 1/2
D.C.	6	19 1/4	9 3/4	62	1500	30

Diameter for bolt holes—12-in. fan: 13 1/2 ins.; 16-in. fan: 17 1/2 ins.  
Made for 110 and 220 volts.

**Westinghouse-Ventura Exhaust Fans.**

Westinghouse Ventura fans are used for the same purpose as the exhaust fans listed above, but are made in larger sizes. The fan has 10 blades, so designed that it is very quiet and highly efficient, allowing no back-flow through the center of the fan. Totally enclosed motors are used.



WESTINGHOUSE-VENTURA EXHAUST FAN

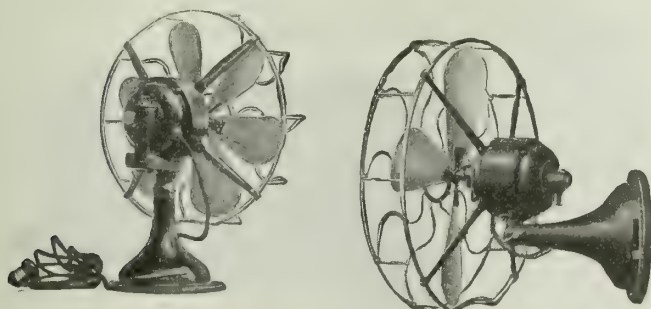
DATA, WESTINGHOUSE-VENTURA EXHAUST FANS

Size	Diam., ins.	Depth, ins.		Diam. for bolts, ins.	Cu. ft. air per min.	Hp.
		A.C.	D.C.			
3 1/2	25 3/8	11 1/8	12 5/8	23 1/2	1860	.085
4	28	12	14 1/8	26 5/8	2770	.11
5	34 1/4	13 1/8	15 1/2	32 7/8	4420	.17
6	40 1/8	15 1/8	17 3/4	38 1/2	6530	.26
7	45 3/8	16 1/8	18 3/4	43 3/4	9830	.42

Voltagcs either 110 or 220.

**Desk, Bracket and Ceiling Fans.**

**STATIONARY FANS**—The stationary fans can be tilted forward 15°, backward 90° (for bracket mounting), and the 12- and 13-in. rotated 340°. A wing nut clamps all adjustments.



DESK AND BRACKET FANS

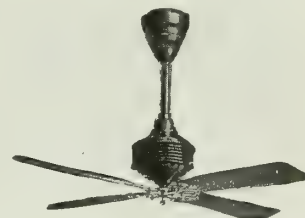
**OSCILLATING FANS**—The oscillating mechanism lets the oscillation stop when the fan strikes an obstruction. Can not drop oil. Oscillates over 45° or 90°, as desired. Fan can be tilted 20° forward when arranged either for upright or for bracket mounting. Oscillation can be stopped or started with the fan running.

DATA, DESK AND BRACKET FANS

Diam., ins.	Blades	Non-oscillating			Oscillating		
		Watts	Weight, lbs.	Approx. - price	Watts	Weight, lbs.	Approx. price
60-CYCLE ALTERNATING CURRENT FANS							
8	4	29	6	\$10.00			
10	4	32	7	17.00	34	9	\$22.00
12	4	42	15	21.00	44	17	27.00
12	..	...	...	...	44	17½	27.75
16	4	83	19	25.00	85	21	30.50
16	..	...	...	...	85	21½	31.50
DIRECT CURRENT FANS							
8	4	24	4½	\$10.00	..	..	..
10	4	22	6	17.00	23	8	\$22.00
12	4	25	13	20.25	27	15	26.25
16	4	63	16	24.25	65	18	28.00

Made also for 50-, 40-, and 25- to 30-cycle alternating current.  
Made for 100 to 120, and for 200 to 230 volts.  
Prices given are for 100 to 120 volts.

**CEILING FANS**—32-in. ceiling fans are for use in hallways, vestibules and small rooms; 56-in. for stores and other large interiors. Where ceiling fans can not be used, 56-in. column fans of similar type are available, for both counter and floor mounting.



CEILING FAN

**GYRATING FANS**—These have been called the "Scientific Breeze Makers." They keep all the air stirring, not just a draft. Moving part rests on a ball bearing, and is revolved by mechanical drive, not by air reaction; can not run too fast. Made in ceiling, counter-column and floor-column types. Special bearing arrangement prevents the escape of oil.



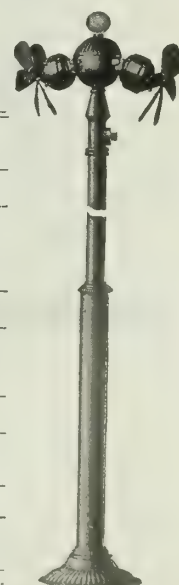
CEILING TYPE GYRATING FAN

DATA, CEILING FANS

Diam., ins.	Finish	Watts	Speeds	Approx. price
60-CYCLE A.C. 4-BLADE TYPE				
32	M	65	2	\$30.00
32	W	65	1	30.00
32	B	65	1	30.00
56	M	150	3	47.00
56	B	150	2	47.00
D.C. 4-BLADE TYPE				
32	W	50	1	\$27.00
32	B	50	1	27.00
56	M	110	3	44.00
56	B	110	3	44.00
60-CYCLE A.C. GYRATING TYPE				
2 x 12	D	88	3	\$55.00
D.C. GYRATING TYPE				
2 x 12	D	64	1	\$53.50

Finishes: M—Mottled copper; W—White enamel; B—Black enamel; D—Dull black.  
Made also for 50-, 40- and 25- to 30-cycle alternating current.

Made for 110 and 220 volts.  
Prices are for 110 volts.



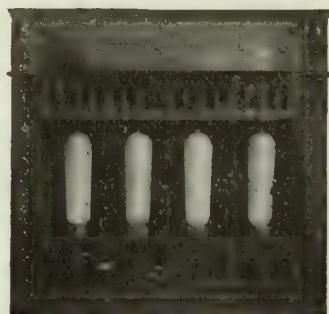
FLOOR-COLUMN TYPE GYRATING FAN WITH TOP LIGHT

## Heating Devices.



SMALL LUMINOUS RADIATOR

For use in fireplaces or mounted flush in walls. Adapted for intermittent or occasional service.



LUMINOUS RADIATOR

## DATA

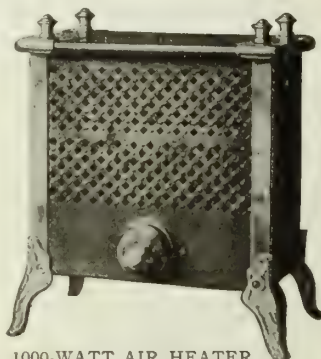
No. of units	Dimensions, ins.	Tiles	Styles available
2	15 1/2 x 18	..	1
3	24 x 26	..	1
3	24 x 30	16	5
4	30 x 30	17	5

Heater units made for 250 or 500 watts each. Voltage 100 to 125 and 200 to 250. Send for catalogue 8-C.

**AIR HEATERS**—Useful for furnishing auxiliary heat for bathrooms and halls.

Also used extensively for garages, barns, scale houses, watchmen's booths, etc.

They are absolutely safe, giving off no fumes and requiring no outlet.



1000-WATT AIR HEATER

## DATA, AIR HEATERS

Size	Length, ins.	Width, ins.	Height, ins.	Watts	Weight, lbs.	Approx. price
1	11 3/4	7 1/4	13 3/4	1000-500-250	7	\$13.50
2	18 3/4	7 1/4	14	2000-1000-500	10 1/2	19.50
3	26 3/4	7 1/4	15	3000-1500-750	14	25.50

Voltages 100 to 125 and 200 to 250.

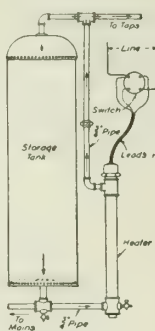
**WATER HEATERS**—The bayonet or circulation heater is adapted for hot water storage systems, various forms of sterilizers, steam generators, and other uses of this nature.

The complete heater is provided with a pipe casing and tees arranged for 3/4-in. connections by means of which it may be attached to a water system. The connections are made in the same manner as those of gas or circulation type of heater.

Supplied with 6-ft. flexible cord and control switch.



IMMERSION WATER HEATER, BAYONET TYPE COMPLETE



APPLICATION OF HEATER

## DATA

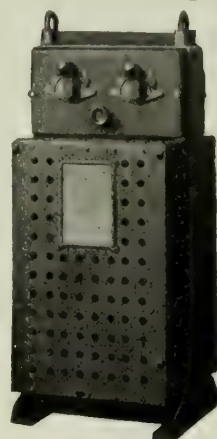
Watts		Boiler capacity, gals.		Length, ins.
Starting	Running	Covered	Not covered	
2800	700	60	15	18 3/8
3600	900	100	20	22 1/8
4800	1200	190	30	26 1/8
6000	1500	...	45	31 1/8
8500	2125	...	85	31 1/8
10500	2625	...	120	36 1/8

Made for 100 to 125 and 200 to 250 volts.

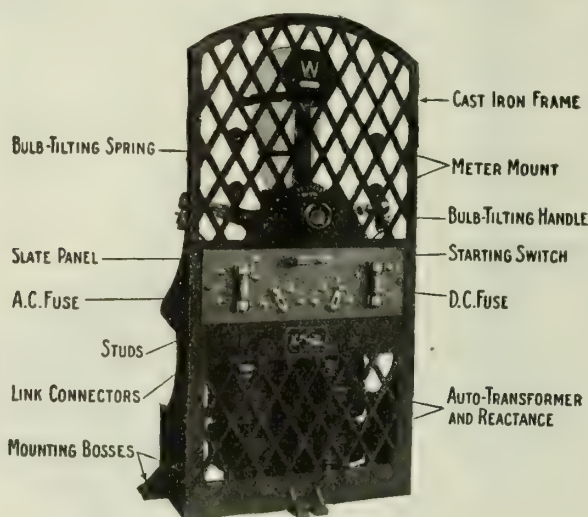
## Battery Charging Outfits (Westinghouse-Cooper-Hewitt Rectifier).

These outfits are used for the purpose of changing alternating current to direct current where only alternating current is available to furnish direct current for charging storage batteries, or for any purpose.

These rectifiers are easy to install and require little space, and their first cost is low compared with that of other devices used for changing alternating current to direct current. They are very simple to operate, and have no moving parts. The regulation of current is effected by means of an auto-transformer, so that power is not wasted; the efficiency of operation is therefore high.



TYPE AA BATTERY CHARGING OUTFIT



TYPE W 30-AMPERE CHARGING OUTFIT

**TYPE AA**—For charging automobile storage batteries, automatic starting.

**TYPE AE**—For charging Edison storage batteries, automatic starting.

**TYPE AN**—For charging automobile storage batteries, non-automatic.

**TYPE W**—For charging battery in a private garage where the same battery will always be charged.

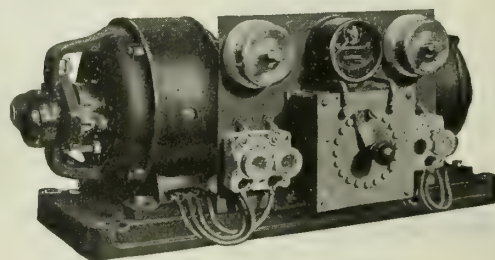
## DATA, BATTERY CHARGING OUTFITS

Type	Height, ins.	Width, ins.	Depth, ins.	Number of cells	D.C. volts	D.C. amperes
AA	44 7/8	18 3/4	18 3/8	{ 14-32 20-44 }	{ 28-85 40-120 }	30
AE	56	21 1/8	21 3/4	20-60	30-120	40
AN	44 7/8	18 3/4	18 3/8	{ 14-32 20-44 }	{ 28-85 40-120 }	30
W	34 1/2	19 3/4	8 3/4	38-46	76-120	{ 15 30 }

A.C. Voltage, 110 or 220.

## Battery Charging Motor Generator Sets.

Small motor generator sets for charging batteries used for starting, lighting and ignition on gasoline cars are



SMALL MOTOR GENERATOR



supplied complete, with control panel mounted directly on the frame where it occupies the minimum of space and provides the most convenient means of controlling the set. Several sizes are furnished.

DATA, BATTERY CHARGING MOTOR GENERATOR SETS

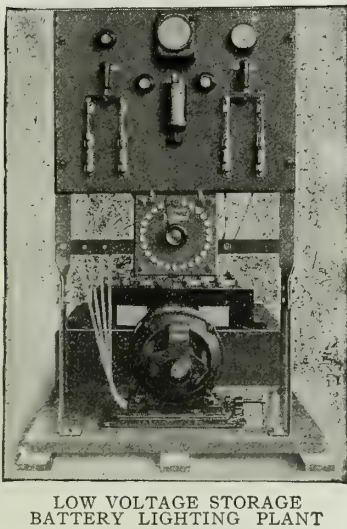
No.	Generator			Batteries charged	Dimensions, ins.		
	Watts	Volts	Amperes		Height	Width	Length
†1	100	12	8	(a)	7 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	15 <sup>3</sup> / <sub>8</sub>
2	170	12	14	(a)	8 <sup>5</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>8</sub>	24 <sup>1</sup> / <sub>2</sub>
3	250	32	8	(b)	10 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	25
4	450	32	14	(b)	10 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	25 <sup>5</sup> / <sub>8</sub>
5	400	50	8	(c)	10 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	25
6	700	50	14	(c)	11 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	30 <sup>1</sup> / <sub>2</sub>

† Self-contained set.  
(a) Will charge 1 to 2, 6-volt batteries or one 12-volt battery.  
(b) Will charge 1 to 5, 6-volt batteries or their equivalent in 12-, 18-, or 24-volt batteries.  
(c) Will charge 1 to 8, 6-volt batteries, or their equivalent in 12-, 18-, or 24-volt batteries.

Westinghouse Low Voltage Storage Battery Lighting Plant.

These low voltage storage battery plants are designed especially for lighting country residences, farms and small manufacturing plants, and may also be used for driving motors up to their capacity. Any available source of power may be used to drive them.

These sets are supplied wired complete, ready for operation when unboxed.

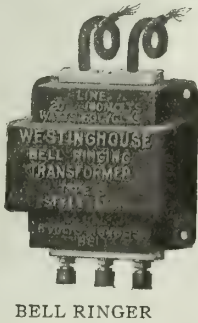


DATA, LOW VOLTAGE STORAGE BATTERY LIGHTING PLANTS

No.	Battery capacity at 8-hour discharge rate, ampere hours	Generator		Full load r.p.m. of generator	H.p. of engine required to operate generator	Number of 15-watt lamps operated		
		Am-peres	Volts			Battery alone hours		Gener-ator alone
1	44	20	32-42	1800	2	18	12	42
2	80	20	32-42	1800	2	30	20	42
3	80	30	32-42	1700	3	30	20	64
4	120	30	32-42	1700	3	45	30	64
5	160	40	32-42	1800	5	63	42	85
6	200	40	32-42	1800	5	80	55	85
7	240	40	32-42	1800	5	100	65	85
8	280	40	32-42	1800	5	110	75	85
9	320	40	32-42	1800	5	125	85	85

Bell Ringer.

The bell ringer connected to a 110-volt, 60-cycle lighting circuit, produces a voltage suitable for operating door bells, buzzers, annunciators, miniature incandescent lamps, or for any similar purpose for which 1 to 15 dry or wet cell batteries are used. The transformer replaces the batteries and precludes the trouble of keeping them in condition, the expense of replacing them when worn out, and, finally, the annoyance of having the bell out of order.



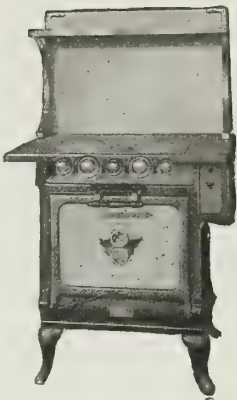
ADAPTABILITY—Adapted for residences, hotels, restaurants, apartment houses, amusement halls and buildings of similar character.

Electric Ranges.

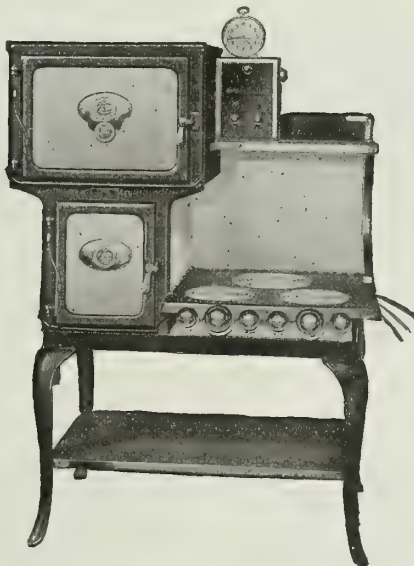
Electric ranges furnish the ideal means for cooking because of their absolute cleanliness and wonderful convenience.

The Westinghouse ranges are furnished with automatic or with semi-automatic features. In the automatic ranges the current can be turned on at a pre-determined time, by proper setting of the clock; and turned off when the proper temperature has been reached, by proper setting of the thermostats on the oven doors. The semi-automatic range rings a bell, when the current must be turned off by hand.

All the ranges operate on the heat storage principle; that is, they require electric current only for raising the temperature to the proper cooking point, after which no further current is required, the heat insulation of the oven retaining and utilizing the stored heat for hours. This feature results in wonderful economy, and makes the electric range really practical. The stove top heaters are conveniently arranged with heat control



TYPE 2-19 AUTOMATIC RANGE



TYPE 3-19 AUTOMATIC RANGE, NICKEL FINISH

switches, which further economize in the use of electricity.

COMBINATION GAS AND ELECTRIC RANGES—Electric ovens with gas stove tops—are also furnished for localities where the cost of electricity is high. For oven cooking, owing to the fireless cooker principle and the automatic features, electricity is as cheap as gas.

DATA, ELECTRIC RANGES

Type	Total watts	Length, ins.	Height, ins.	Depth, ins.
2-19 B. Automatic.....	6000	32	34	24 <sup>1</sup> / <sub>2</sub>
2-19 B. Semi-automatic.....	6000	32	34	24 <sup>1</sup> / <sub>2</sub>
2-19 B. Combination.....	2000	32	34	24 <sup>1</sup> / <sub>2</sub>
3-19 B. Automatic.....	7000	43	59	25
3-19 B. Semi-automatic.....	7000	43	59	25
3-19 B. Combination.....	3000	43	59	25

## WESTINGHOUSE ELECTRIC &amp; MFG. CO.

EAST PITTSBURGH, PA.

## DISTRICT SALES OFFICES

ATLANTA, GA., Candler Bldg., 127 Peachtree St.  
 BALTIMORE, MD., Westinghouse Bldg., 121 E. Baltimore St.  
 BIRMINGHAM, ALA., Brown-Marx Bldg., 1st Ave. and 20th St.  
 BLUEFIELD, W. VA., Law and Commerce Bldg.  
 BOSTON, MASS., Rice Bldg., 10 High St.  
 BUFFALO, N. Y., Ellicott Square Bldg., Ellicott Square  
 BUTTE, MONT., Montana Electric Co., 50-52 East Broadway  
 CHARLESTON, W. VA., Union Trust Bldg.  
 CHARLOTTE, N. C., Commercial Bank Bldg., corner Tryon and Fourth Sts.  
 CHATTANOOGA, TENN., Hamilton National Bank Bldg.  
 CHICAGO, ILL., Conway Bldg., 111 W. Washington St.  
 CINCINNATI, OHIO, Traction Bldg., 5th and Walnut Sts.  
 CLEVELAND, OHIO, Swetland Bldg., 1010 Euclid Ave.  
 COLUMBUS, OHIO, Interurban Terminal Bldg., 3rd and Rich Sts.  
 \*DALLAS, TEX., Cotton Exchange Bldg., Akard and Wood Sts.  
 DAYTON, OHIO, Riebold Bldg., Main St.  
 DENVER, COLO., Gas and Electric Bldg., 910 15th St.  
 DES MOINES, IOWA, 416 Seventh St.  
 DETROIT, MICH., Dime Savings Bank Bldg., Fort and Griswold Sts.  
 DULUTH, MINN., Providence Bldg., 332-334 West Superior St.  
 \*EL PASO, TEX., Mills Bldg., Oregon and Mills Sts.  
 INDIANAPOLIS, IND., Traction Terminal Bldg., Illinois and Market Sts.  
 \*W. E. & M. CO., of Texas

JOPLIN, MO., BaSom Bldg., 418 Joplin St.  
 KANSAS CITY, MO., Orear-Leslie Bldg., 1012 Baltimore Ave.  
 LOUISVILLE, KY., Paul Jones Bldg., 312 4th Ave.  
 LOS ANGELES, CAL., I. N. Van Nuys Bldg., 7th and Spring Sts.  
 MEMPHIS, TENN., Exchange Bldg., 6 N. 2nd St.  
 MILWAUKEE, WIS., First National Bank Bldg., 425 E. Water St.  
 MINNEAPOLIS, MINN., Metropolitan Life Insurance Bldg., 119-131 S. 3rd St.  
 NEW ORLEANS, LA., Maison Blanche Bldg., 921 Canal St.  
 NEW YORK, N. Y., City Investing Bldg., 165 Broadway  
 PHILADELPHIA, PA., Widener Bldg., 1325-1329 Chestnut St.  
 PHOENIX, ARIZ., 16 So. Center St.  
 PITTSBURGH, PA., Union Bank Bldg., 306 Wood St.  
 PORTLAND, ORE., Northwestern Bank Bldg., Broadway and Morrison Sts.  
 ROCHESTER, N. Y., Chamber of Commerce Bldg., 119 E. Main St.  
 ST. LOUIS, MO., 300 N. Broadway  
 SALT LAKE CITY, UTAH, Walker Bank Bldg., 2nd, South and Main Sts.  
 SAN FRANCISCO, CAL., First National Bank Bldg., 1 Montgomery St.  
 SEATTLE, WASH., Alaska Bldg., 2nd and Cherry Sts.  
 SYRACUSE, N. Y., University Bldg., 120 Vanderbilt Square  
 TOLEDO, OHIO, Ohio Bldg., Madison Ave. and Superior St.  
 WASHINGTON, D. C., Hibbs Bldg., 723 15th St., N. W.  
 WILKES-BARRE, PA., Miner's Bank Bldg.

## SERVICE DEPARTMENT REPAIR SHOPS

ATLANTA, GA., Mangum and Markham Sts.  
 BOSTON, MASS., 37 Wormwood St.  
 BUFFALO, N. Y., 6 and 8 Lock St.  
 CHICAGO, ILL., 32 So. Peoria St.  
 LOS ANGELES, CAL., 2026 Bay St.

NEW YORK, N. Y., 467 Tenth Ave.  
 PHILADELPHIA, PA., 214-220 North 22nd St.  
 PITTSBURGH, PA., Amberson Ave. and P. R. R.  
 SAN FRANCISCO, CAL., 1400 Fourth St.  
 SEATTLE, WASH., 560 First Ave. South

## WESTINGHOUSE AGENT JOBBERS

JULIUS ANDRAE & SONS Co., 364 Broadway, Milwaukee, Wis.  
 CARROLL ELECTRIC Co., 714 12th St., N.W., Washington, D. C.  
 COLUMBIAN ELECTRICAL Co., 820 Frederick Ave., St. Joseph, Mo.  
 COMMERCIAL ELECTRIC SUPPLY Co., 42-46 Congress St., E., Detroit, Mich.  
 ELECTRIC RAILWAY & MFRS. SUPPLY Co., 36-40 2nd St., San Francisco, Cal.  
 FOBES SUPPLY Co., 285-287 Couch St., Portland, Ore.  
 FOBES SUPPLY Co., 560 1st Ave., S., Seattle, Wash.  
 ILLINOIS ELECTRIC Co., 308-310 W. Madison St., Chicago, Ill.  
 ILLINOIS ELECTRIC Co., 261 S. Los Angeles St., Los Angeles, Cal.  
 INTER-MOUNTAIN ELECTRIC Co., 43-59 E. 4th South, Salt Lake City, Utah  
 THE JOHNSON ELECTRICAL SUPPLY Co., 232-234 E. 5th St., Cincinnati, Ohio  
 LEE ELECTRIC Co., 217-219 N. Calvert St., Baltimore, Md.  
 THE MCGRAW Co., 1208-1212 Harney St., Omaha, Nebr.  
 THE MCGRAW Co., 517 5th St., Sioux City, Iowa  
 THE MONTANA ELECTRIC Co., 50-52 Broadway, Butte, Mont.  
 MOORE-HANDLEY HARDWARE Co., Birmingham, Ala.

NORTHWESTERN ELEC. EQUIPMENT Co., 35 Vestry St., New York, N. Y.  
 PENN ELECTRICAL ENGINEERING Co., Traders National Bank Bldg., Scranton, Pa.  
 N. M. REAY & Co., 112-114 W. Plume St., Norfolk, Va.  
 H. C. ROBERTS ELECTRIC SUPPLY Co., 905 Arch St., Philadelphia, Pa.  
 H. C. ROBERTS ELECTRIC SUPPLY Co., 215 E. Water St., Syracuse, N. Y.  
 ROCHESTER ELECTRICAL SUPPLY Co., 100 St. Paul St., Rochester, N. Y.  
 SATTERLEE ELECTRIC Co., 22-24 E. 9th St., Kansas City, Mo.  
 STUART-HOWLAND Co., Cor. Congress & Purchase Sts., Boston, Mass.  
 SUPERIOR SUPPLY Co., Bluefield Ave., Bluefield, W. Va.  
 H. C. TAFEL ELEC. Co., Inc., 236 W. Jefferson St., Louisville, Ky.  
 TEL-ELECTRIC Co., 602-604 Preston Ave., Houston, Tex.  
 TOWER-BINFORD ELEC. & MFG. Co., 5 Governor St., Richmond, Va.  
 UNITED ELECTRIC Co., 203-205 N. Water St., Wichita, Kan.  
 THE VARNEY ELECTRICAL SUPPLY Co., 235 S. Meridan St., Indianapolis, Ind.  
 THE VARNEY ELECTRICAL SUPPLY Co., 204 Upper Front St., Evansville, Ind.  
 THE WASHINGTON ELEC. SUPPLY Co., Paulson Bldg., Spokane, Wash.



# BENJAMIN ELECTRIC MFG. CO.

## Panelboards and Cabinets

GENERAL OFFICES AND WORKS  
120-128 S. Sangamon Street  
CHICAGO, ILL.

### BRANCH OFFICES

SAN FRANCISCO, 590 Howard Street  
LONDON, ENGLAND

### DISTRICT OFFICES

BOSTON

PITTSBURGH

CINCINNATI

DETROIT

ST. LOUIS

NEW YORK, 243-47 West 17th Street  
TORONTO, ONT., CANADA

### Products.

#### PANELBOARDS and CABINETS.

For Electric Lighting Specialties, Industrial Lighting Equipment, Wiring Devices and Enameled Steel Reflectors, see page 1206.



TRADE-MARK

#### Benjamin-Starrett Panelboards.

These panelboards are made in standard unit panels of 4, 6, 8 and 10 circuits, each of which has a composition base and enclosed busbars. These 4-panel unit sizes constitute the basis of the Benjamin-Starrett panelboard line, in which the purpose is to standardize panelboard construction. From these lighting circuit panelboards may be built up to any desired capacity.

They are easier to install and safer to operate and maintain than the slate panel with its exposed busbars.

**WEIGHT AND SIZE**—Benjamin-Starrett panelboards weigh less than 50% of any corresponding size and type of slate panelboard. In square inches of space occupied they are; circuit for circuit, the smallest panelboards made.

**BASES**—Moulded of strong fireproof composition of high dielectric strength, unaffected by heat, moisture, oils or acids. Dead black finish.

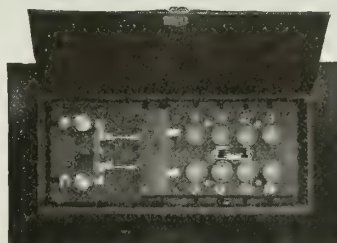
**BUSBARS**—Standard unit panels have the busbars formed from hard drawn copper and concealed in the base. Branch busbars are double riveted to mains.

**CAPACITY**—Based on a maximum current density of 1,000 amperes per sq. in. cross section.

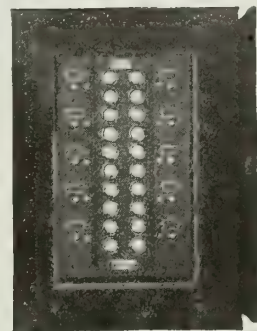
**MAINS**—Mains on 2-2 wire panelboards are figured at 6 amperes per circuit, and on 3-2 wire panelboards at 3 amperes per circuit.

**TYPES**—Panelboards with type symbol beginning with "R" have plug fuse receptacles only in branches. Panelboards which have type symbol beginning with "S" have receptacles as above, and 10 amperes double pole indicating switches in branches as follows: snap

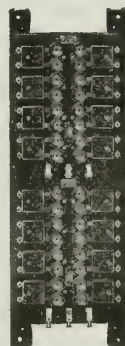
switches with polished copper covers; snap switches with composition covers; push switches with composition covers; or, 30-ampere double pole knife switches.



TYPE "RD" RESIDENCE  
PANEL WITH FLUSH  
CABINET



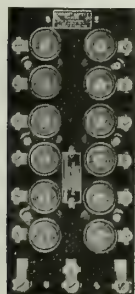
TYPE "SG" DEAD FRONT  
PANEL, FLUSH CAB-  
INET



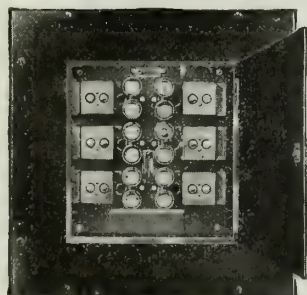
TYPE "S"  
STANDARD  
PANEL-  
BOARD



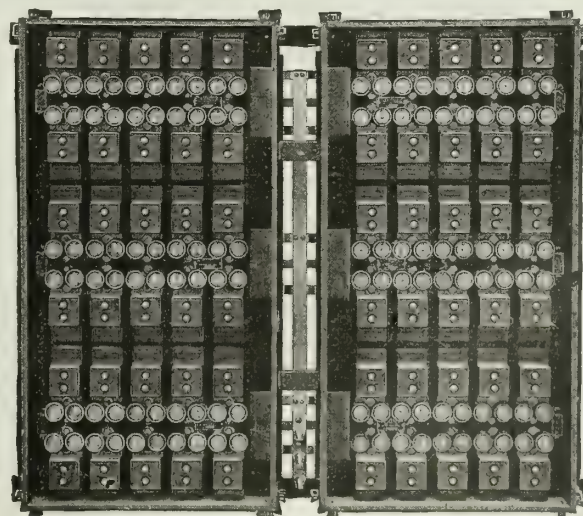
TYPE "SH" STAND-  
ARD DEAD FRONT  
PANELBOARD  
WITH CABINET



TYPE "RA" STAND-  
ARD UNIT STOCK  
PANEL WITHOUT  
CABINET



TYPE "SC" STANDARD UNIT  
PANEL WITH CABINET



TYPE "SJ" 60-CIRCUIT DEAD FRONT PANELBOARD  
Mounted on channel iron frame, with all barriers in place. This shows the method employed in building up a large type panelboard of standard unit stock panels



# CROUSE-HINDS COMPANY

Manufacturers of Electrical Appliances

SYRACUSE, N. Y.

BRANCH OFFICES

NEW YORK, 30 Church Street

BOSTON, 201 Devonshire Street

CHICAGO, 417 South Dearborn Street

## Products.

Manufacturers of PANELBOARDS; DISTRIBUTING BOARDS; PANELBOARD CABINETS, steel and wood; KNIFE SWITCHES, fused and fuseless, front and back connection; CONDUIT OUTLETS (known as "CONDULETS").

Voltmeter, Ammeter and End Cell Battery Switches; Condulet Covers and Fittings, including Receptacles (plug and lamp), Plugs, Rosettes and Fused Switch Cut-outs; Receptacles for conduit box, moulding, cleat and temporary installation.

## Panelboards.

The standard line of panelboards includes both open and dead front (safety) types with cartridge or plug fuses only in branches, and with push button switches; also open front panelboards with either style of fuse in connection with knife or flush rotary switches.

A specialty is made of designing panels to meet uncommon conditions, and this service is offered without extra charge to customers.

Customers' requirements met in both style of panelboard and time of delivery. In regard to quality of material and workmanship, no better panelboards can be made.

## Panelboard Cabinets.

Boxes and trims are equally as high class as the panelboards. Steel boxes are formed from one-piece No. 10-gauge sheet steel, although lighter gauge metal is allowed. The standard line includes cabinets with side gutters, with back gutters and without gutters.

## Switches.

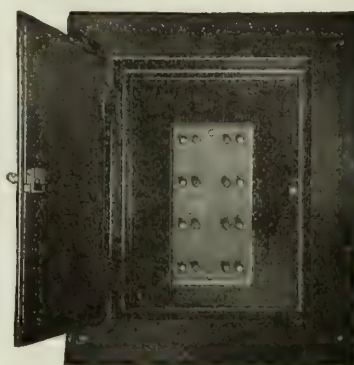
The switches' current-carrying parts are of highest grade hard drawn copper of 98% conductivity, with a current density rating of 1,000 amperes per sq. in. of sectional area. Sliding contacts are rated at 75 amperes per sq. in. Blades are ground in contact, and parts do not work loose under hard treatment.

## Condulets.

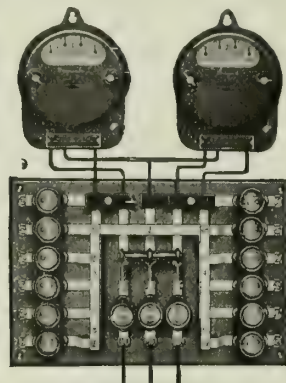
Condulets are made in hundreds of types and sizes, from single branch pull boxes for  $\frac{3}{8}$ -in. conduit to the massive, fused service entrance fitting (type FF) for 4-in. conduit. Between these two extremes are types of condulets that meet every conduit outlet requirement. They are cast iron; therefore, strong as conduit. They have threaded hubs to receive conduit; therefore, are easy to install. They have well drawn lines and are no larger than their purpose demands; therefore, make an attractive installation.

## Catalogues.

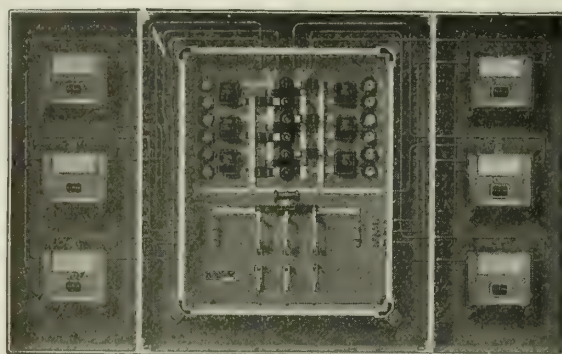
Complete descriptions, illustrations and listings given in catalogues. Copies will be mailed to any address free, on application.



CROUSE-HINDS "SAFETY FIRST" PANEL IN S2 CABINET

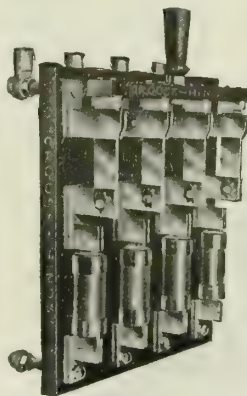


RESIDENCE PANEL  
Arranged for two services. Regular equipment includes steel cabinet

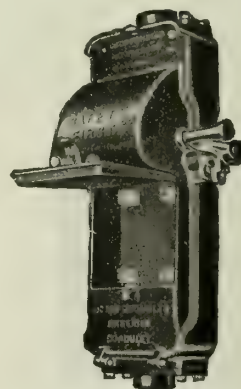


MULTIMETER PANEL (TYPE H CONSTRUCTION)

Permits instant change of circuit from one meter to another without use of tools



TYPE B KNIFE SWITCH



MKC "SAFETY FIRST" IRON CLAD SWITCH CONDULET



# MUTUAL ELECTRIC & MACHINE CO.

Manufacturers of Electrical Controlling Devices  
DETROIT, MICH.

## Products.

"BULL DOG" KNIFE SWITCHES, SWITCHBOARDS, PANELBOARDS and CABINETS.

## Underwriters' Approval.

These switches are all approved and listed by the Underwriters' National Electrical Association, under rules and regulations of the National Board of Fire Underwriters.



TRADE-MARK  
BULL DOG SWITCH WITH POWERFUL JOINTS

## "Bull Dog" Switches.

"Bull Dog" switches are made of pure copper, 98% conductivity, milled and sweated type. "Multiple" (two or more) blades are used with each pole of the switch larger than 200 amperes. Round studs are regularly furnished on all back connected switches, 30 to 2000 amperes, respectively. "Laminated" busbar studs are used on switches of larger capacity.

RANGE OF "BULL DOG" SWITCHES

Capacity, amperes	30, 60, 100, 200, 300, 400, 600, 800, 1,000, 1,200, 1,500, 2,000, 2,500, 3,000, 4,000, 5,000, 6,000, 8,000, 10,000									
Voltage*	A.C.	30, 125, 250, 440, 500, 600								
	D.C.	250, 600								
No. of poles	Single, double, triple, four, five, six									
Throw	Single or double									
Fuse	With or without fuse holders									
Connection	Front or back connected									

\* Switches of higher voltages are designed primarily for that installation.

## "Dead Face" or "Safety First" Switchboards.

"Dead Face" switchboards are furnished for theaters, office buildings and industrial plants. There are no live metal parts on the face of the switchboards.

Switches are interlocking, and may be arranged so that a master shaft lever can operate the switches in groups.

"Dead Face" switches are double break type. Switches and fuses are dead when open.

## "Bull Dog" Panelboards and Cabinets.

"Bull Dog" panelboards and cabinets are manu-

factured in all types to meet all conditions.

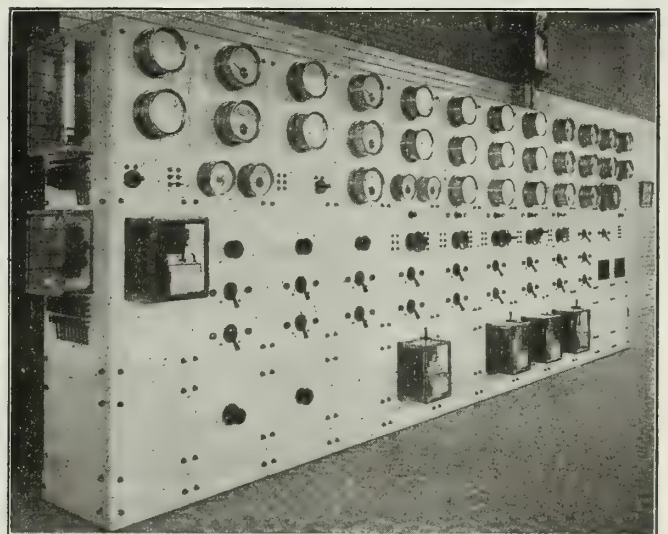
Mains may be 2, 3 or 4 wires, according to the system, with lugs only, fuse holders only, no fuse switch, or switch and fuse holders.

Circuits or branches may be for Edison plug fuses, NEC enclosed cartridge fuses, or open link fuses, with or without knife switch, push switch or snap switch as required. Push switch or snap switch panels may also be furnished in the "dead face" safety type.



MODEL DF-7 "DEAD FACE" THEATER SWITCHBOARD

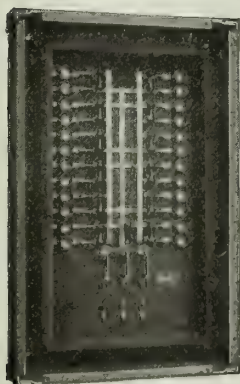
Switches operated in groups by master levers



WHITE CARRARA GLASS SWITCHBOARD

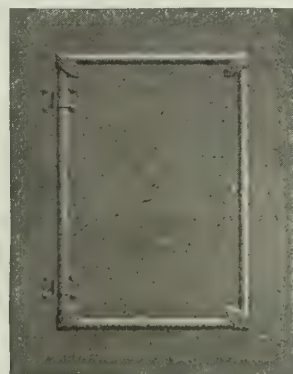
Built of 1½-in. thick glass. Installed in plant of Dodge Bros., Automobile Manufacturers, Detroit, Mich.

Switches are operated by motors and solenoids



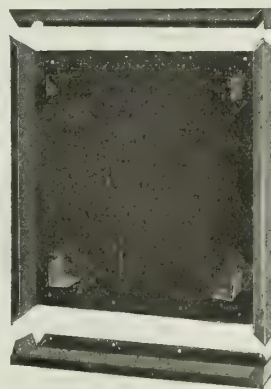
"BULL DOG" PANELBOARD

With main switches and fuse holders, branch switches and Edison plug fuse holders



STANDARD TYPE "TH" STEEL DOOR AND TRIM

Doors and trim of one piece of steel No. 10-gage



CONSTRUCTION OF THREE-PIECE BOX TYPE "AF" OR "AS"

Ends removable to permit conduit drilling or changes, etc.



STANDARD TYPE "AF" OR "AS" STEEL BOX

With corner supports for panels and arranged for wiring gutter

# THE YOUNGSTOWN SHEET & TUBE COMPANY

SUCCESSOR TO THE WESTERN CONDUIT COMPANY

Manufacturers of Rigid Conduits and Flexible Armored Cables

GENERAL OFFICES AND WORKS

YOUNGSTOWN, OHIO

DISTRICT SALES OFFICES

NEW YORK, N. Y., 30 Church Street  
 PHILADELPHIA, PA., 1615-16 Pennsylvania Building  
 BOSTON, MASS., 120 Franklin Street  
 CHICAGO, ILL., 1563 McCormick Building  
 PITTSBURGH, PA., 1625 Oliver Building  
 WASHINGTON, D. C., 718-19 Munsey Building  
 DETROIT, MICH., 1032 Dime Savings Bank Building

DENVER, COLO., 725 First National Bank Building  
 DALLAS, TEX., 915 Busch Building  
 SAN FRANCISCO, CAL., 604 Mission Street  
 ST. LOUIS, MO., 902 Third National Bank Building  
 SEATTLE, WASH., 535 Central Building  
 ATLANTA, GA., 1514 Healey Building  
 CLEVELAND, OHIO, 526 Leader-News Building

REPRESENTED BY

NEW YORK, N. Y., BONNELL ELECTRIC MFG. Co., 132 Church Street  
 SAN FRANCISCO, CAL., THE ELECTRIC AGENCIES Co., 279 and 283 Minna Street  
 LOS ANGELES, CAL., THE ELECTRIC AGENCIES Co., 419-21 East Third Street  
 PHILADELPHIA, PA., WALKER BROS. & HAVILAND, 1352 Sansom Street  
 SEATTLE, WASH., ELECTRIC AGENCIES Co., 1252 First Avenue, South

## Products.

RIGID CONDUITS, black enameled and galvanized.

ARMORED CABLES.

For Steel and Iron Pipe, see pages 1074-75.

## "Buckeye" Conduit.

Furnished regularly in black enamel and electrogalvanized exterior finish. The interior finish is a glass-like enamel of high quality. It is manufactured in all sizes from  $\frac{3}{8}$  in. to 6 ins. nominal inside diameter.



"BUCKEYE" RIGID BLACK ENAMELED CONDUIT

"Buckeye" conduit is made from special mild steel, produced in our own works specifically for this purpose, and peculiarly fitted to supply the qualities necessary in conduit of the highest grade.

"Buckeye" conduit appeals to architects, owners and contractors because of its exceptionally easy working qualities and because of the special attention given



"BUCKEYE" RIGID ELECTROGALVANIZED CONDUIT

to threading it, which assures rapid installation and a first class job at low cost.

"Buckeye" conduit is regularly tested and approved by the Underwriters' Laboratories. It meets the

severest specifications and is largely used on government work. Both galvanizing and enameling are so well done that they will successfully withstand tests borne by few brands of electrical conduits on the market.

**SPECIFICATIONS**—For the use of architects and engineers, specifications for rigid conduit, which are in conformity with the detailed requirements of the National Electric Code, are herewith submitted.

"All wires shall be run in conduits, which shall be of mild steel tube, enameled or galvanized, especially selected with reference to uniformity of thickness and freedom from defects. Conduits shall be delivered at the building in not less than 10-ft. lengths.

"Joints shall be made tight with standard enameled or galvanized couplings and corners turned with elbows or long radius bend in the pipe.

"Ends of all conduits or elbows shall be cut square and reamed. All conduits shall be put up first and made watertight, and wire pulled through after plaster is on.

"All conduits and fittings shall be carefully examined before being installed, and all blistered and defective pieces shall be rejected.

"All conduits shall be concealed unless specified to the contrary, or otherwise shown on drawings.

"All conduits installed underground, or in floors under which there is no excavation, shall be put together with joints made up with white lead and tested as directed by the architects, to show that they are airtight.

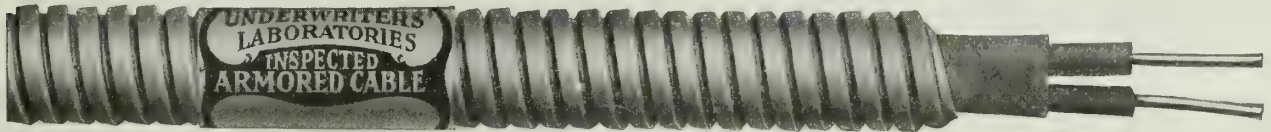
"Special care must be taken to run conduits from switchboard to ceiling along plumb lines.

"Conduit shall be YOUNGSTOWN SHEET & TUBE COMPANY'S 'Buckeye.'"



**"Realflex" Armored Cable.**

This is comparatively a new product, the popularity of which has exceeded all expectations, due to the fact that it combines the protective qualities of rigid conduit with great flexibility and remarkable ease of working, as well as good looks on the job. Unlike most armored conductors, its protecting covering is not made of flat strip steel, but of hot galvanized steel wires, so wound as to give the maximum of protection to the insulated conductors with a minimum of rigidity.



"REALFLEX" ARMORED CABLE

The outside of the wires is flattened, so that the cable is given a very handsome appearance and its easy "fishing" in difficult places is assured.

"Realflex" is as flexible as ordinary garden hose. It is at the same time practically as strong as rigid conduit.

Its armor hugs the rubber covered interior wires, assuring against friction, but without danger of injury to these wires.

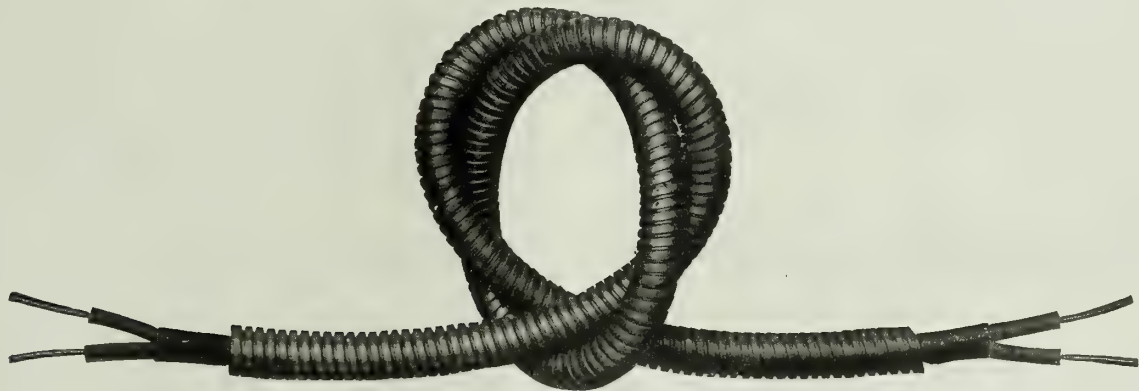
It is ratproof and rustproof.

"Realflex" is peculiarly valuable in remodeling work, or where conductors are to be installed in old structures, whether for power or light. It is also useful at many points in new work where conduit is difficult to install and therefore expensive. Its appearance makes it desirable where conductors are exposed to view, in either new work or old.

"Realflex" is regularly inspected and approved by the Underwriters' Laboratories and successfully undergoes all reasonable tests.

"Realflex" is made regularly with 2 or 4 wires, but any number of wires can be furnished on special orders. For use where excessive dampness or acid fumes are encountered, lead lined "Realflex" is recommended.

Architects desiring to assure the use of a neat and reliable armored conductor may specify "Realflex" with certainty that they will not be disappointed. It can be easily obtained anywhere, being carried in stock by leading jobbers in all large cities.

"REALFLEX" FLEXIBLE ARMORED CABLE  
Double knot

It has clean, even ends when cut in working.

It fits all standard connections, and is easily and quickly attached to them.

Its conductors have different colors, which save time and trouble in testing out during installation.

"Realflex" is unbreakable—that is, it can not be broken with the hands or under strain, as is the case with many other conductors. At the same time, it is easily and quickly cut during installation by the use of an ordinary hack saw.

**Information Furnished.**

THE YOUNGSTOWN SHEET & TUBE COMPANY maintains an efficient corps of metallurgists and engineers in connection with its large operations and these are at the service of any architect who may desire technical information concerning the use of any of its products.

They are always ready to furnish details that will assist the architect in selecting the most available material for his purpose, and thus save the necessity of prolonged research.

# AMERICAN STEEL & WIRE COMPANY

## Manufacturers of Electrical Wires and Cables

### SALES OFFICES

CHICAGO, 208 South La Salle Street

NEW YORK, 30 Church Street  
 WORCESTER, 94 Grove Street  
 BOSTON, 120 Franklin Street  
 PHILADELPHIA, Widener Building  
 PITTSBURGH, Frick Building  
 BUFFALO, 337 Washington Street  
 DETROIT, Foot of First Street  
 CINCINNATI, Union Trust Building  
 CLEVELAND, Western Reserve Building

BALTIMORE, 32 South Charles Street  
 WILKES-BARRE, PA., Miners Bank Building  
 ST. LOUIS, Third National Bank Building  
 MONTREAL, CAN., Bank of Ottawa Building  
 ST. PAUL-MINNEAPOLIS, Pioneer Building, St. Paul  
 OKLAHOMA CITY, State National Bank Building  
 BIRMINGHAM, ALA., Brown-Marx Building  
 DENVER, First National Bank Building  
 SALT LAKE CITY, Walker Bank Building

EXPORT REPRESENTATIVES, UNITED STATES STEEL PRODUCTS Co., 30 Church Street, New York

PACIFIC COAST REPRESENTATIVES, UNITED STATES STEEL PRODUCTS Co., San Francisco, Los Angeles, Portland, Seattle

### Products.

	Page
ELECTRICAL WIRES and CABLES for Telephone, Electric Light and Power Transmission Purposes, Copper, Iron and Steel.....	1182
RESISTANCE WIRE.....	1183
ANNUNCIATOR and OFFICE WIRE.....	1183
WEATHERPROOF WIRES and CABLES.....	1183
SLOW BURNING WIRES and CABLES.....	1184
LAMP CORD.....	1185
REINFORCED PORTABLE CORD.....	1185
BREWERY CORD.....	1186
CANVASITE CORD.....	1186
PACKING HOUSE CORD.....	1186
THEATER OF STAGE CABLES.....	1186
BORDER LIGHT CABLES.....	1186
ELEVATOR LIGHTING and CONTROL CABLES...	1186
RUBBER COVERED WIRES and CABLES.....	1186
For Concrete Reinforcement, see pages 232-33; for Wire Rope, see pages 30-33.	

### Facilities.

Reinforcing the extensive factory equipment, there are well equipped chemical, physical and electrical laboratories, wherein the problems incident to the solution of every difficulty encountered are handled by thoroughly reliable experts and up-to-date methods. All steel and copper used are rolled and drawn in our mills and under our supervision throughout every operation. All raw materials are tested and inspected before being used, the manufacturing processes are constantly checked, and finally the finished material is subjected to an exhaustive series of tests that determine beyond question whether or not it is of proper quality. With such facilities we are enabled to manufacture electrical conductors of all kinds to the severest specifications, and to give to the users of our product a standard of quality that is unexcelled.

### Bare Wires and Cables, Copper, Iron or Steel.

Copper wire for all purposes in any required shape or size; for telephone and telegraph, high voltage long distance transmission, and industrial purposes in general. Copper cables of all capacities and degrees of flexibility, hard drawn or annealed, bare or insulated. Galvanized iron and steel wire is also made in all shapes and sizes, bare or insulated, and for all purposes; telephone and telegraph wires, armor wires, strand and wire rope of all kinds.

### DATA, HARD DRAWN COPPER TELEGRAPH AND TELEPHONE WIRE

Size, B. & S.	Diam., in.	Weight per mile in lbs.	Size, B. & S.	Diam., in.	Weight per mile in lbs.
8	.1285	264	12	.0808	104
9	.1144	209	14	.0641	66
10	.1019	166			

### PROPERTIES OF HARD DRAWN COPPER WIRE (Adopted by the A. S. T. M.)

Size, B. & S.	Diam., in.	Area cir. mils.	Tensile strength, lbs. per sq. in.	Per cent elongation in 10 ins.	Size, B. & S.	Diam., in.	Area circular mils.	Tensile strength, lbs. per sq. in.	Per cent elongation in 10 ins.
0000	0.460	211,600	49,000	3.75	8	0.128	16,380	63,400	1.4
0000	0.410	168,100	51,000	3.20	9	0.114	12,996	64,200	1.3
00	0.365	133,200	52,800	2.70	10	0.102	10,404	64,800	1.2
0	0.325	105,600	54,500	2.4	11	0.091	8,281	65,400	1.1
1	0.289	83,520	56,000	2.1	12	0.081	6,561	65,700	1.0
2	0.258	66,560	57,500	2.0	13	0.072	5,184	66,000	0.9
3	0.229	52,440	58,500	1.9	14	0.064	4,096	66,200	0.9
4	0.204	41,620	59,500	1.8	15	0.057	3,249	66,400	0.8
5	0.182	33,120	60,500	1.7	16	0.051	2,601	66,600	0.8
6	0.162	26,240	61,500	1.6	17	0.045	2,025	66,800	0.7
7	0.144	20,740	62,500	1.5	18	0.040	1,600	67,000	0.7

**EXTRA GALVANIZED W. & M. TELEPHONE and TELEGRAPH WIRE**—There are three standard grades, all made from the very best materials by improved processes: "extra best best" (E. B. B.), "best best" (B. B.), and "steel."

While these grades differ in physical characteristics, there is no difference in the standard as regards galvanizing.

### PROPERTIES OF GALVANIZED TELEPHONE AND TELEGRAPH WIRES Based on Standard Specifications

Size, B. & S.	Diam. in mils. = d	Area in cir. mils = d <sup>2</sup>	Weight, lbs.		Breaking strain, lbs.			Resistance per mile (International Ohms) at 68° F. or 20° C.		
			Per 1000 ft.	Per mile	Ex. B. B.	B. B.	Steel	Ex. B. B.	B. B.	Steel
0	340	115,600	313	1,655	4,138	4,634	4,965	2.84	3.38	3.93
1	300	90,000	244	1,289	3,223	3,609	3,867	3.65	4.34	5.04
2	284	80,656	218	1,155	2,888	3,234	3,465	4.07	4.85	5.63
3	259	67,081	182	960	2,400	2,688	2,880	4.90	5.83	6.77
4	238	56,644	153	811	2,028	2,271	2,433	5.80	6.91	8.01
5	220	48,400	131	693	1,732	1,940	2,079	6.78	8.08	9.38
6	203	41,209	112	590	1,475	1,652	1,770	7.97	9.49	11.02
7	180	32,400	87	463	1,158	1,296	1,389	10.15	12.10	14.04
8	165	27,225	74	390	975	1,092	1,170	12.05	14.36	16.71
9	148	21,904	60	314	785	879	942	14.97	17.84	20.70
10	134	17,956	49	258	645	722	774	18.22	21.71	25.29
11	120	14,400	39	206	515	577	618	22.82	27.19	31.53
12	109	11,881	32	170	425	476	510	27.65	32.94	38.23
13	95	9,025	25	129	310	347	372	37.90	45.16	52.41
14	83	6,889	19	99	247	277	297	47.48	56.56	65.66
15	72	5,184	14	74	185	207	222	63.52	75.68	87.84
16	65	4,225	11	61	152	171	183	77.05	91.80	106.55



DATA, W. &amp; M. TELEPHONE WIRE

Size, B. W. G.	Diam., in.	Bdls. per mile	Weight per 1000 ft., lbs.	Size, B. W. G.	Diam., in.	Bdls. per mile	Weight per 1000 ft., lbs.
4	0.238	4	153	10	0.134	2	49
6	0.203	3	112	11	0.120	2	39
8	0.165	2	74	12	0.109	2	32
9	0.148	2	60	14	0.083	2	19

**TICO RESISTANCE WIRE**—A high grade nickel steel wire for purposes where a high specific and uniform resistance is required.

Used in some constant potential devices, such as electric heaters and rheostats for the purpose of transforming electrical energy into heat.

DATA, TICO RESISTANCE WIRE

Size, B. & S.	Diam. in. mils.	Area cir. mils.	Area, sq. in.	Weight, lbs. per 1000 ft.	Ft. per lb.	Resistance			
						Ohms per ft.	Ohms per lb.	Ft. per ohm	Lbs. per ohm
4	204.31	41743	.032784	110.5	9.05	.0124	.112	80.9	8.94
5	181.94	33102	.025999	87.7	11.40	.0156	.178	64.2	5.63
6	162.02	26250	.020618	69.54	14.4	.0197	.283	50.8	3.53
7	144.29	20820	.016351	55.14	18.1	.0248	.450	40.3	2.22
8	128.49	16510	.012967	43.73	22.9	.0313	.715	32.0	1.40
9	114.42	13092	.010283	34.68	28.8	.0394	1.14	25.4	.879
10	101.90	10884	.008155	27.50	36.4	.0497	1.81	20.1	.553
11	90.74	8284	.006467	21.81	45.8	.0627	2.88	16.0	.348
12	80.81	6530	.005129	17.70	57.8	.0791	4.57	12.6	.219
13	71.96	5179	.004067	13.72	72.9	.0997	7.29	10.0	.137
14	64.08	4107	.003225	10.88	92	.1257	11.6	7.95	.0865
15	57.07	3257	.002558	8.625	116	.1585	18.4	6.31	.0544
16	50.82	2583	.002029	6.842	146	.2000	29.2	5.00	.0342
17	45.26	2048	.001609	5.425	184	.252	46.5	3.97	.0215
18	40.30	1624	.001276	4.302	232	.318	73.9	3.15	.0135
19	35.89	1288	.001012	3.411	293	.401	117	2.49	.00851
20	31.96	1022	.000823	2.707	369	.505	187	1.98	.00535
21	28.46	810.1	.0006363	2.146	466	.638	297	1.57	.00337
22	25.35	642.5	.0005046	1.702	588	.804	473	1.24	.00212
23	22.57	509.5	.0004002	1.350	741	1.014	751	.986	.00133
24	20.10	404.1	.0003173	1.070	934	1.278	1194	.782	.000837

### Annunciator and Office Wire.

**ANNUNCIATOR WIRE**—Commercially pure, soft copper wire from No. 14 to No. 22 B. & S. is used. This is insulated with specially prepared paraffin wax compound.

The outside wrap is made of any color or combination of colors, the most common being bright and fast red or blue with white. Put up in spools weighing about 7 lbs. net.



ANNUNCIATOR WIRE

Size, B. & S.	List number	Length in 1 lb., ft.	Size, B. & S.	List number	Length in 1 lb., ft.
14	3114	67	20	3120	221
16	3116	101	22	3122	311
18	3118	155			

Can also be furnished in "dampproof."

**OFFICE WIRE**—Standard grade consists of copper conductor from No. 14 to No. 20 B. & S., insulated with 1 wind and 1 braid of cotton, both applied tight and even and saturated with special paraffin wax compound. The outer braid is given high polish and is made in any color, or combination of colors, specified. Standard



OFFICE WIRE

Size, B. & S.	List number	Length in 1 lb., ft.	Size, B. & S.	List number	Length in 1 lb., ft.
14	3314	56	18	3318	115
16	3316	80	20	3320	154

Can also be furnished in "dampproof."

colors are red and white or blue and white. The wire is put up in coils of about 20 lbs.

Used largely by telephone and telegraph companies for inside wiring, extending from the instruments to the junction where they connect with outside wires and cables as they enter building.

Also used as high grade bell and annunciator wire.

### Weatherproof and Slow Burning Wires and Cables.

These have moderate degree of insulation and are less expensive than rubber insulated conductors. Double and triple braid. Reliance weatherproof wire meets every requirement for outdoor service, while Reliance slow burning wire is superior for indoor uses.

Wires and cables are made in strict accordance with all requirements of the National Board of Fire Underwriters, sizes varying from No. 20 B. & S. to the largest feeder cables used. Sizes No. 4/0 B. & S. and smaller are usually made of solid wires, while larger sizes have stranded conductors.

Unless hard drawn copper be specified, wires of purest grade of annealed copper, uniform in softness and having minimum conductivity of 98% Matthiessen's standard, will be used.

**RELIANCE WEATHERPROOF INSULATION**—For use outdoors where moisture is certain and where fireproof qualities are not necessary; also where, on account of small separation, bare wires would be liable to swing into contact with each other or with other low tension cables.

The wires are first covered by 2 or 3 closely and evenly woven braids of strong fibrous material, which is then completely saturated with weatherproof insulating compound. After drying thoroughly, the wire receives dressing of mineral wax, when the surface is thoroughly burnished and polished, reducing to a minimum trouble from sleet and ice.

The insulation will withstand all ordinary climatic conditions.



RELIANCE WEATHERPROOF WIRE

Solid copper wire, double braid, black finish

Size B. & S.	Diam., ins., bare wire	Area cir., mils.	List number	Weights		Standard packages, amounts, ft.	Shipped on reel number
				Lbs. per 1000 ft	Lbs. per mile		
0000	460.0	211600	2040	723	3,817	2,400	315
000	409.6	167772	2030	587	3,098	2,500	315
00	364.8	133079	2020	467	2,467	3,200	315
0	325.0	105625	2000	377	1,989	4,300	315
1	289.3	83694	2001	294	1,553	1,000	302
2	257.6	66358	2002	239	1,264	1,300	302
3	229.4	52624	2003	185	977	1,600	302
4	204.3	41738	2004	151	795	2,100	302
5	181.9	33088	2005	122	646	2,500	322
6	162.0	26244	2006	100	529	3,400	322
8	128.5	16512	2008	66	349	5,000	322
9	114.4	13087	2009	54	283	6,000	322
10	101.9	10384	2010	46	241	35 to 50	Coils
12	80.8	6528.6	2012	30	158	25 to 40	Coils
14	64.1	4108.8	2014	20	107	25 to 40	Coils
16	50.8	2580.6	2016	16	83	20 to 30	Coils
18	40.3	1624.1	2018	12	64	20 to 30	Coils



RELIANCE WEATHERPROOF WIRE

Solid copper wire, triple braid, black finish  
National Electrical Code Wire

DATA, RELIANCE WEATHERPROOF WIRE  
Solid Copper Wire, Triple Braid, Black Finish National Electrical Code Wire

Size, B. & S.	Minimum thickness of insulation, in.	List number	Weights		Standard packages, amounts, ft.	Shipped on reel number
			Lbs. per 1000 ft.	Lbs. per mile		
0000	.0781	2140	767	4,050	2,400	315
000	.0781	2130	629	3,320	2,500	315
00	.0781	2120	502	2,650	3,200	315
0	.0781	2100	407	2,150	4,300	315
1	.0781	2101	316	1,670	1,000	302
2	.0625	2102	260	1,370	1,300	302
3	.0625	2103	199	1,050	1,600	302
4	.0625	2104	164	865	2,100	302
5	.0625	2105	135	710	2,500	322
6	.0625	2106	112	590	3,400	322
8	.0469	2108	75	395	5,000	322
9	.0469	2109	62	325	6,000	322
10	.0469	2110	53	280	35 to 50	Coils
12	.0469	2112	35	185	25 to 40	Coils
14	.0469	2114	25	130	25 to 40	Coils
16	.0469	2116	20	105	20 to 30	Coils
18	.0469	2118	16	85	20 to 30	Coils

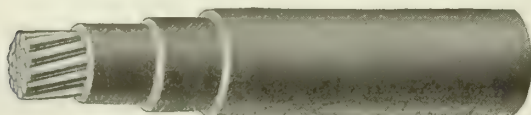
DATA, SOLID COPPER WEATHERPROOF COILS

Size, B. & S.	Weights per coil, lbs.		Outside diam. of coil, ins.	Diam. of eye of coil, ins.	Thickness of coil, ins.	Covering of coil	How shipped
	2 braids	3 braids					
0000	360	383	30 to 34	19	7 1/2	Paper and burlap	Loose coils
000	352	377	30 to 34	19	7 1/2		
00	326	350	30 to 34	19	7 1/2		
0	301	325	30 to 34	19	7 1/2		
1	294	316	30 to 34	19	7 1/2		
2	310	338	30 to 34	19	7 1/2		
3	305	330	30 to 34	19	7 1/2		
4	317	344	30 to 34	19	7 1/2		
5	317	350	30 to 34	19	7 1/2		
6	320	180	30 to 34	19	6		
8	171	195	30 to 34	19	5	Paper	Coils packed in barrels
10	50	50	18 to 20	12	5		
12	40	40	18 to 20	12	5		
14	40	40	18 to 20	12	5		
16	30	30	18 to 20	12	5		
18	30	30	18 to 20	12	5		



RELIANCE WEATHERPROOF CABLE  
Stranded copper conductors, double braid, black finish

Size	No. and diam. of wires in strand, in.	Diam. bare strand, ins.	List number	Weights	
				Lbs. per 1000 ft.	Lbs. per mile
2,000,000	91 x .1482	1.6302	2250	6690	35,323
1,750,000	91 x .1386	1.5246	2251	5894	31,119
1,500,000	91 x .1284	1.4124	2252	5098	26,915
1,250,000	91 x .1172	1.2892	2253	4264	22,516
1,000,000	61 x .1280	1.1520	2254	3456	18,246
900,000	61 x .1215	1.0935	2257	3137	16,513
800,000	61 x .1145	1.0305	2259	2799	14,779
750,000	61 x .1109	.9981	2260	2635	13,913
700,000	61 x .1071	.9639	2261	2471	13,046
600,000	61 x .0992	.8928	2263	2093	11,052
500,000	37 x .1162	.8134	2265	1765	9,318
450,000	37 x .1103	.7721	2267	1601	8,452
400,000	37 x .1040	.7280	2268	1436	7,584
350,000	37 x .0973	.6811	2269	1248	6,589
300,000	19 x .1257	.6285	2270	1083	5,721
250,000	19 x .1147	.5735	2271	907	4,788
0000	19 x .1055	.5275	2240	745	3,935
000	19 x .0940	.4700	2230	604	3,190
00	7 x .1378	.4134	2220	482	2,544
0	7 x .1228	.3684	2200	388	2,051
1	7 x .1093	.3279	2201	303	1,599
2	7 x .0973	.2919	2202	246	1,301
3	7 x .0867	.2601	2203	190	1,004
4	7 x .0772	.2316	2204	155	820
5	7 x .0687	.2061	2205	126	668
6	7 x .0612	.1836	2206	103	544
8	7 x .0485	.1455	2208	68	359



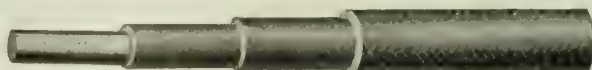
RELIANCE WEATHERPROOF CABLE  
Stranded copper conductors, triple braid, black finish  
National Electrical Code Wire

DATA, RELIANCE WEATHERPROOF CABLE

Size	Minimum thickness of insulation, in.	List number	Weights		Standard packages, amounts, ft.	Shipped on reel number
			Lbs. per 1000 ft.	Lbs. per mile		
2,000,000	.1250	2350	7008	37,000	600	324
1,750,000	.1250	2351	6193	32,700	700	324
1,500,000	.1250	2352	5380	28,400	850	324
1,250,000	.1250	2353	4508	23,800	1000	324
1,000,000	.1250	2354	3674	19,400	1320	324
900,000	.1094	2357	3332	17,600	1320	324
800,000	.1094	2359	2992	15,800	1320	324
750,000	.1094	2360	2822	14,900	1320	333
700,000	.1094	2361	2650	14,000	1320	333
600,000	.1094	2363	2235	11,800	1320	333
500,000	.1094	2365	1894	10,000	1320	333
450,000	.0938	2367	1724	9,100	1320	333
400,000	.0938	2368	1553	8,200	1320	333
350,000	.0938	2369	1345	7,100	2640	333
300,000	.0938	2370	1174	6,200	2640	333
250,000	.0938	2371	985	5,200	2640	333
0000	.0781	2340	800	4,220	2000	315
000	.0781	2330	653	3,450	2000	315
00	.0781	2320	522	2,760	2640	315
0	.0781	2300	424	2,240	2640	315
1	.0781	2301	328	1,735	1000	302
2	.0625	2302	270	1,425	1300	302
3	.0625	2303	206	1,090	1600	302
4	.0625	2304	170	900	2100	302
5	.0625	2305	140	740	3000	322
6	.0625	2306	115	610	3400	322
8	.0469	2308	78	410	4000	322



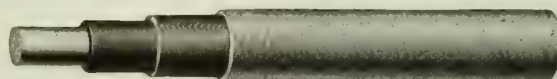
RELIANCE WEATHERPROOF IRON WIRE, DOUBLE BRAID



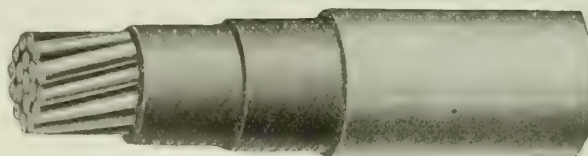
RELIANCE WEATHERPROOF IRON WIRE, TRIPLE BRAID

For fire alarm, telephone, telegraph and burglar alarm construction where danger of short circuits with other wires or trees exists

**RELIANCE SLOW BURNING WIRES AND CABLES—**  
Have insulation that will not carry flame. Especially useful in hot, dry places, and where wires are brought together, as on the back of a large switchboard or in a wire tower. Each insulating braid completely saturated with white slow burning compound, and outside thoroughly slicked down and given a hard, smooth, white surface.



RELIANCE SLOW BURNING WIRE, NATIONAL CODE STANDARD  
Solid conductor, triple braid, white finish



RELIANCE SLOW BURNING CABLE  
Stranded copper conductor, triple braid, white finish

**SPECIAL WEATHERPROOF AND SLOW BURNING WIRES—**A combined insulation of black weatherproof and white slow burning coverings is often required. The wires may have a single coating of each kind of 3 coatings, 2 of slow burning and 1 of weatherproof, or conversely. When weatherproof covering is inside, the conductor is known as "white finish weatherproof"; and when flameproof covering is inside, it is called "black finish slow burning." Outside surfaces are finished smooth and hard. The white finish weatherproof wire only is approved by National Electrical Code.

Any of these weatherproof or slow burning wires furnished twisted into pairs, or formed into cables having any number of conductors, the conductors so



formed being incased in 1 or more finished braids or with tape.

### RELIANCE SLOW BURNING WIRE, NATIONAL CODE STANDARD

Solid conductor, triple braid, white finish

*Size	STRANDED		SOLID		Standard packages, amounts, ft.	Shipped on reel number
	List number	Weights	List number	Weights		
		Lbs. per 1000 ft.		Lbs. per 1000 ft.		
2000000	2400A	7540	39800	.....	600	.....
1750000	2401A	6700	35400	.....	700	.....
1500000	2402A	5830	30800	.....	850	.....
1250000	2403A	4940	26100	.....	1000	.....
1000000	2404A	3980	21000	.....	1320	324
900000	2406A	3640	19200	.....	1320	324
800000	2408A	3280	17300	.....	1320	324
700000	2410A	2920	15400	.....	1320	333
600000	2412A	2460	13000	.....	1320	333
500000	2414A	2080	11000	.....	1320	333
450000	2415A	1900	10000	.....	1320	333
400000	2416A	1700	9000	.....	1320	333
350000	2417A	1500	7900	.....	2640	333
300000	2418A	1310	6900	.....	2640	333
250000	2419A	1120	5900	.....	2640	333
0000	2640	960	5070	2440 925	4890	2000
000	2630	785	4150	2430 760	4020	2000
00	2620	625	3300	2420 600	3170	2640
0	2600	510	2700	2400 495	2610	2640
1	2601	380	2000	2401 365	1930	1000
2	2602	335	1770	2402 320	1690	1300
3	2603	280	1480	2403 270	1425	1600
4	2604	230	1220	2404 220	1160	2100
5	2605	195	1030	2405 190	1000	2500
6	2606	165	870	2406 160	845	3400
8	2608	105	555	2408 100	530	40-60 lbs. Coils
10	.....	.....	.....	2410 80	420	35-50 lbs. Coils
12	.....	.....	.....	2412 55	290	25-50 lbs. Coils
14	.....	.....	.....	2414 40	210	25-40 lbs. Coils
16	.....	.....	.....	2416 30	160	25-40 lbs. Coils
18	.....	.....	.....	2418 24	130	20-30 lbs. Coils

\*Size and number of wires in strands same as in weatherproof cables

*Type P., for Portables*—Flexible cord for portable use, except in offices, dwellings or similar places where cord is not liable to rough usage and where good appearance is an essential feature, must meet all the requirements for flexible cord for pendants, and in addition must have a tough braided cover over the whole. There must also be an extra layer of rubber between the outer cover and the flexible cord. All sizes (except No. 14 and larger) are insulated with  $\frac{1}{32}$ -in. rubber; No. 14 and larger have  $\frac{3}{64}$ -in. rubber.



PORTABLE CORD

*Type P. W. P., for Portables in Damp Places*—(Same as type P except must be furnished with a saturated braid.) For use in damp places, the insulation must be  $\frac{3}{64}$ -in. thick on sizes No. 14 and larger, and  $\frac{1}{32}$ -in. on sizes No. 16 and smaller, and the cord must have an outer covering saturated with a moistureproof preservative compound thoroughly slicked down, or a filler of approved material instead of an extra layer of rubber, and have two outer braids saturated with a moistureproof compound with an exterior surface thoroughly slicked down.

*Type P. S., for Portables in Dwellings, Offices, etc.*—In offices, dwellings or similar places where cords are not liable to rough usage and where good appearance is essential, flexible cord for portable use must meet all of the requirements for flexible or for pendant lamps, both as to construction and thickness of insulation, and in addition must have a tough braided cover over the whole; or providing there is an extra layer of rubber between the flexible cord and the outer cover, the insulation proper on each stranded conductor of cord may be  $\frac{1}{64}$  in. in thickness instead of as required for pendant cords.

Note: This cord has only  $\frac{1}{64}$ -in. rubber on each conductor, sizes Nos. 16 and 18, approved by underwriters. The supplementary insulation is same as on other portable cords.

### Americore Lamp Cord and Reinforced Cord, National Electrical Code Standard.

The lamp cord shown is used in short lengths for exposed wiring in offices and residences to connect the concealed wiring with drop lights, brackets and portables.

Also used for automobile lighting, trouble lamps, spot light and many other purposes where a short flexible conductor is desired.



TWISTED LAMP CORD

**SPECIFICATIONS**—The following data is an extract from the National Board of Underwriters' Specifications dated 1911, and covers our Americore (new code) lamp cord and portable cord.

*Type C, for Pendant Lamps*—In this class is included all flexible cord, which, under usual conditions, hangs freely in the air and not likely to be moved sufficiently to come in contact with surrounding objects. Pendant lamps provided with long cords, so that they can be carried about or hung over nails or on machinery, etc., are not included in this class, even though they are usually allowed to hang freely. Each conductor must have an approved braided covering, so put on and sealed in place that when cut it will not fray out.

This type is insulated with  $\frac{3}{64}$ -in. rubber on sizes Nos. 8 to 14 and  $\frac{1}{32}$  on Nos. 16 to 22.

*Type C. W. P., for Pendant Lamps*—(Same as above, except must have saturated braid and  $\frac{3}{64}$ -in. rubber.) For use in damp places.

*Type P. O., for Pendant Lamps*—Parallel cord—each conductor type C, two such conductors laid parallel and covered with one silk or cotton braid.

### DATA, AMERICORE LAMP CORD, TYPES C. AND P. O.

Size, AW. gage B. & S.	No. wires	Rubber, in.	TWISTED PAIR (TYPE C)				DUPLEX PARALLEL (TYPE P.O.)			
			Cotton covered		Silk covered		Cotton covered		Silk covered	
			List number	Weight per 1000 ft., lbs.	List number	Weight per 1000 ft., lbs.	List number	Weight per 1000 ft., lbs.	List number	Weight per 1000 ft., lbs.
10	104	3-64	1100	122.00	1120	116.71	1400	120.0	1420	117.0
12	65	3-64	1102	89.36	1122	84.77	1402	88.9	1422	86.1
14	41	3-64	1104	65.49	1124	61.53	1404	66.1	1424	63.6
16	26	1-32	1106	37.70	1126	34.61	1406	38.7	1426	36.8
18	16	1-32	1108	29.33	1128	26.47	1408	30.2	1428	28.5
20	10	1-32	1110	23.44	1130	20.83	1410	24.5	1430	22.9
22	6	1-32	1112	20.15	1132	17.50	1412	20.9	1432	19.3

### DATA, REINFORCED PORTABLE CORD, TYPES P. AND P. W. P.

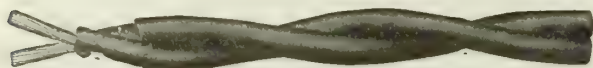
Size	No. wires	Rubber, in.	TYPE P.				TYPE P.W.P. Saturated Braid	
			Dry Cotton Braid		Silk Braid		List number	Weight per 1000 ft., lbs.
			List number	Weight per 1000 ft., lbs.	List number	Weight per 1000 ft., lbs.		
10	104	3-64x1-64	.....	214.7	.....	204.0	.....	222.4
12	65	3-64x1-64	1162	169.2	1172	159.8	1182	175.6
14	41	3-64x1-64	1164	131.2	1174	125.9	1184	135.9
16	26	1-32x1-64	1166	77.9	1176	73.9	1186	81.4
18	16	1-32x1-64	1168	67.4	1178	62.7	1188	69.9
20	10	1-32x1-64	1170	58.2	1180	53.3	1190	59.8
22	6	1-32x1-64	.....	53.2	.....	48.5	.....	54.3

### DATA, REINFORCED PORTABLE CORD, TYPE P. S.

Size	No. wires	Rubber, in.	Dry Cotton Braid		Silk Braid	
			List number	Weight per 1000 ft., lbs.	List number	Weight per 1000 ft., lbs.
			.....	.....	.....	.....
10	104	1-64x1-64	.....	142.4	.....	135.1
12	65	1-64x1-64	.....	104.2	1152	98.0
14	41	1-64x1-64	.....	75.3	1154	70.2
16	26	1-64x1-64	1146	56.0	1156	51.7
18	16	1-64x1-64	1148	46.0	1158	41.9
20	10	1-64x1-64	.....	38.2	1160	34.5
22	6	1-64x1-64	.....	33.8	.....	30.3

**Americore Brewery, Packing House and Canvasite Cords.**

**BREWERY CORD (TYPE C. B., CLASS A)**—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a weatherproof braid; 2 such conductors twisted together (no braid over all).



BREWERY CORD

List number	Construction of conductor	Thickness of rubber insulation, in.	Size, B. & S. gage	Weight per 1000 ft., lbs.
8930L	104-30 B. & S. wires	3-64	10	125
8932L	65-30 " "	3-64	12	93
8934L	41-30 " "	3-64	14	70
8936L	26-30 " "	1-32	16	40
8938L	16-30 " "	1-32	18	32
8940L	10-30 " "	1-32	20	25

**CANVASITE CORD (TYPE C. C.)**—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a weatherproof braid; 2 such conductors twisted together with 1 weatherproof braid over all.

This is the same as brewery cord except that there is a weatherproof braid over both conductors.



CANVASITE CORD

List number	Construction of conductor	Thickness of rubber insulation, in.	Equal in capacity to	Weight per 1000 ft., lbs.
8910	104-30 B. & S. wires	3-64	10 B. & S.	140
8912	65-30 " "	3-64	12 " "	105
8914	41-30 " "	3-64	14 " "	85
8916	26-30 " "	1-32	16 " "	48
8918	16-30 " "	1-32	18 " "	39
8920	10-30 " "	1-32	20 " "	32
8922	6-30 " "	1-32	22 " "	29

**PACKING HOUSE CORD (TYPE P. K. W. P.)**—Each conductor is lamp cord strand, cotton wound, insulated with Americore rubber and covered with a dry braid; 2 such conductors twisted together, jute filled, and covered with 2 weatherproof braids.



PACKING HOUSE CORD

List number	Construction of conductor	Thickness of rubber insulation, in.	Size, B. & S. gage	Weight per 1000 ft., lbs.
8950L	104-30 B. & S. wires	3-64	10	217
8952L	65-30 " "	3-64	12	170
8954L	41-30 " "	3-64	14	134
8956L	26-30 " "	1-32	16	79
8958L	16-30 " "	1-32	18	65
8960L	10-30 " "	1-32	20	56

**Americore Theater or Stage Cable.**

**SIZES NOS. 10 TO 16, TYPE T**—Each conductor regular lamp cord strand, cotton wrapped, insulated with code thickness of rubber and covered with single weatherproof braid; 2 or 3 such conductors twisted together with jute fillers and covered with 2 weatherproof braids.

**SIZES NOS. 2 TO 8**—Same as above, except have standard rubber covered tinned copper concentric strand and are not covered by type T.



THEATER OR STAGE CABLE

Size, B. & S.	Number of wires in strand	Thickness of rubber insulation, in.	List number	Weight per 1000 ft., lbs.
2	210	4-64	8972	...
3	151	4-64	8973	...
4	133	4-64	8974	654
6	49	4-64	8976	468
8	49	3-64	8978	286
10	104	3-64	8980L	196
12	65	3-64	8982L	153
14	41	3-64	8984L	118
16	26	3-64	8986L	70

**Border Light and Elevator Lighting and Control Cables.**

Furnished to National Code specifications.

**Rubber Covered Copper Telephone Wire.**

NO. 14 B. &amp; S. TWISTED PAIR "OUTSIDE DISTRIBUTION WIRE"



NO. 18 B. &amp; S. TWISTED PAIR "BRIDLE WIRE"



NO. 19 B. &amp; S. SINGLE CONDUCTOR TWISTED PAIR, AND TRIPLE CONDUCTOR "INSIDE" OR "SUBSTATION" WIRE



"POT HEAD" WIRE, PLAIN TELEPHONE CONDUCTOR

**Americore Rubber Covered Wires and Cables.**

These wires and cables as used for general purposes must possess three essentials: the conductor, the wall of rubber insulation and the braid, tape and braid or other form of protection. The conductor consists of uniformly soft annealed commercially pure copper wire. It may be used in the solid form up to size 1/0 American wire gage (B. & S.), or in special cases even to 4/0, or in the stranded form. All conductors are thoroughly and evenly coated with tin to protect the copper from any injurious effect from the sulphur in the rubber insulation.

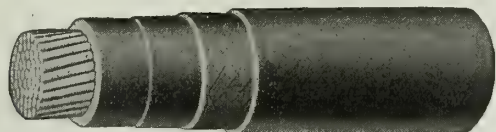
**KINDS OF RUBBER INSULATION**—We make two standard grades of rubber compound for rubber covered conductors: Americore compound, meeting the code requirements; and Amerite, a high grade 30% compound. In addition, wire is insulated to any specifications covering particular requirements, such as 20% or 40% rubber compounds. We also make a high grade compound for lead incased rubber covered cables.

**AMERICORE RUBBER**—This rubber has all the desirable qualities of a new code wire. It is a high grade compound, meeting all National Electrical Code requirements and can be recommended for all service conditions in which the working pressure is 7000 volts or under.



**AMERITE RUBBER**—This brand contains only the best grade of pure Para rubber, and is used for high voltage circuits. This makes an unsurpassed dielectric for all high voltages and for exacting service conditions; it has great strength and elasticity, high insulation qualities and long life.

Every wire insulated with our standard compounds has a distinguishing woolen *tracer thread* placed lengthwise of the conductor between the rubber and the braid. In Americore this tracer thread is uncolored and in Amerite it is crimson.



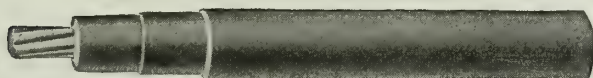
AMERICORE FEEDER CABLE

Capacity, in., cir. mils.	Number and diam. of wires in strand, in.	Thick- ness of rubber, in.	Diam. over tape and braid, in.	List number single braid	Weight per 1000 ft., lbs.	Shipped on reel number
250,000	37x.0822	3-32	56-64	340	1018	1013
300,000	37x.0901	3-32	59-64	341	1194	1013
350,000	37x.0973	3-32	62-64	342	1368	1013
400,000	37x.1040	3-32	65-64	343	1541	1013
450,000	37x.1103	3-32	68-64	344	1714	1020
500,000	37x.1162	3-32	72-64	345	1894	1020
600,000	61x.0992	7-64	79-64	346	2282	1020
750,000	61x.1109	7-64	86-64	347	2795	1020
1,000,000	61x.1280	7-64	96-64	348	3640	1021
1,250,000	91x.1172	8-64	107-64	348A	4534	1021
1,500,000	91x.1284	8-64	115-64	349	5406	1015
2,000,000	127x.1255	8-64	129-64	349A	7062	.....

Shipped in reels containing 1000 ft. lengths.



AMERICORE WIRE, SOLID TINNED COPPER CONDUCTOR



AMERICORE CABLE, STRANDED TINNED COPPER CONDUCTOR

DATA, AMERICORE RUBBER COVERED WIRES AND CABLES

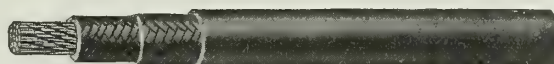
Size, B. & S.	Thickness of rubber, in.	SOLID		STRANDED		Standard packages, amounts, ft.	
		List number	Weight per 1000 ft., lbs.	Number wires in strand	List number		Weight per 1000 ft., lbs.
SINGLE BRAID							
4/0	5-64	810C	784	19	557	832	1000 Reels
3/0	5-64	810B	633	19	558	678	1000 Reels
2/0	5-64	810A	517	19	559	550	1000 Reels
1/0	5-64	810	423	19	560	454	1000 Reels
1	5-64	811	348	19	561	372	1000 Reels
2	4-64	812	268	7	562	289	1000 Reels
3	4-64	813	221	7	563	237	1000 Reels
4	4-64	814	183	7	564	197	1000 Reels
5	4-64	815	152	7	.....	.....	1000 Reels
6	4-64	816	127	7	566	137	1000 Reels
8	3-64	818	80	7	568	86	500 Coils
10	3-64	820	57	7	570	61	500 Coils
12	3-64	822	42	7	572	45	500 Coils
14	3-64	824	32	7	574	34	500 Coils
16	2-64	826	19	.....	.....	.....	500 Coils
18	2-64	828	15	.....	.....	.....	500 Coils
DOUBLE BRAID							
4/0	5-64	850C	820	19	867	871	1000 Reels
3/0	5-64	850B	666	19	868A	715	1000 Reels
2/0	5-64	850A	547	19	869	583	1000 Reels
1/0	5-64	850	450	19	870	485	1000 Reels
1	5-64	851	374	19	871	400	1000 Reels
2	4-64	852	291	7	872	314	1000 Reels
3	4-64	853	242	7	873	260	1000 Reels
4	4-64	854	201	7	874	218	1000 Reels
5	4-64	855	169	7	.....	.....	1000 Reels
6	4-64	856	144	7	876	155	1000 Reels
8	3-64	858	94	7	878	101	500 Coils
10	3-64	860	69	7	880	74	500 Coils
12	3-64	862	53	7	882	57	500 Coils
14	3-64	864	42.2	7	884	44.8	500 Coils
16	2-64	866	25	.....	.....	.....	500 Coils
18	2-64	868	20	.....	.....	.....	500 Coils

**AMERICORE LIGHT INSULATION FIXTURE WIRE**  
Solid tinned copper conductor, rubber insulation, single braid, black finish

Size, B. & S.	Thickness of rubber, in.	List number	Weight per 1000 ft., lbs.
14	1-64	.....	20
16	1-64	.....	14
18	1-64	8008	10

### Americore Rubber Covered Switchboard Cables.

**SPECIFICATIONS**—Tinned annealed extra flexible strand of highest conductivity, insulated with code thickness of high grade vulcanized rubber, protected with 1 or 2 smooth closely woven cotton braids, saturated in black weatherproof compound and smoothly finished. For switchboard, brush holder and similar connections where very flexible cables are required.

AMERICORE RUBBER COVERED SWITCHBOARD CABLE  
National Electrical Code Standard; low potential, 0-600 volts; Class A

Size, B. & S.	Number of wires in strand, in.	Thick- ness of rubber, in.	Diam. over single braid, in.	Diam. over double braid, in.	List number		Weight per 1000 ft.		Standard pack- ages, amounts, ft.
					Single braid	Double braid	Single braid	Double braid	
1	259	5-64	37-64	40-64	221	271	376	406	1000
2	210	4-64	33-64	36-64	222	272	302	329	1000
3	151	4-64	30-64	33-64	223	273	231	255	1000
4	133	4-64	27-64	30-64	224	274	210	231	1000
6	82	4-64	23-64	26-64	226	276	144	163	1000
6	49	4-64	23-64	26-64	226	276	145	164	1000
8	49	3-64	19-64	22-64	228	278	87	101	500
9	40	3-64	18-64	21-64	229	279	73	87	500
10	19	3-64	17-64	20-64	230	280	61	74	500
12	19	3-64	15-64	18-64	232	282	45	57	500
14	19	3-64	14-64	17-64	234	284	34	45	500

### Americore Twin Rubber Covered Wire and Cable.

**SPECIFICATIONS**—Tinned annealed copper wires or strands of highest conductivity, each conductor insulated with code thickness of high grade vulcanized rubber, protected by saturated braid; 2 such finished conductors laid parallel and covered with heavy cotton braid over all, saturated in black weatherproof compound. Special finish for conduit work.



AMERICORE TWIN RUBBER COVERED WIRE



AMERICORE TWIN RUBBER COVERED CABLE

DATA, AMERICORE TWIN RUBBER COVERED WIRES  
AND CABLES

Size, B. & S.	Thickness of rubber, in.	SOLID CONDUCTOR		STRANDED CONDUCTOR		Shipped on reel number
		List number	Weight per 1000 ft., lbs.	Number wires	List number	Weight per 1000 ft., lbs.
0000	5-64	917	1653	19	687	1762
000	5-64	918	1328	19	688	1444
00	5-64	919	1091	19	689	1176
0	5-64	920	896	19	690	966
1	5-64	921	743	19	691	796
2	4-64	922	576	7	692	622
3	4-64	923	479	7	693	513
4	4-64	924	399	7	694	431
5	4-64	925	334	7	695	362
6	4-64	926	280	7	696	301
8	3-64	928	181	7	698	195
10	3-64	930	123	7	700	141
12	3-64	932	92	7	702	107
14	3-64	934	71	7	704	83
16	2-64	.....	.....	.....	.....	.....
18	2-64	.....	.....	.....	.....	.....

Underwriters' rules permit use of above in sizes No. 14 and larger. No. 6 and larger shipped on reels containing 100-ft. lengths; smaller sizes shipped in coils containing 500-ft. lengths.

## ATLANTIC INSULATED WIRE &amp; CABLE CO.

TELEPHONE:  
VANDERBILT 260752 Vanderbilt Avenue  
NEW YORK, N. Y.FACTORY  
STAMFORD, CONN.

## BRANCH OFFICES

CHICAGO, 557 West Monroe Street  
BOSTON, 156 Purchase Street  
BALTIMORE, 2 East German StreetPITTSBURGH, Union Arcade  
LOUISVILLE, Keller Building  
ST. LOUIS, 1413 Pine Street  
ST. PAUL, 906 Merchants' Bank Building

## Products.

INSULATED WIRES and CABLES—INTERIOR, AERIAL, UNDERGROUND, LEAD INCASED and SUBMARINE, in the following brands: "Neptune," "Triton," and "Dolphin." All sizes and for every service.

## Trade-Names.

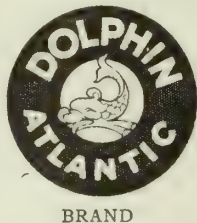
The trade-names under which Atlantic wires and cables are sold indicate definite grades of quality, which are absolutely maintained by us. These brands of wire have established standards for high class rubber insulation for the purposes for which they are intended, and



BRAND



BRAND



BRAND

should not be classed with wire sold under named brands whose specifications are not definitely fixed. The following extracts cover essential points of complete specifications for these brands, which will be forwarded on request.

## "Neptune."

"Neptune," extra high grade insulation, is the best commercial product of this company. Compounded of 30% Para rubber and ingredients selected after years of tests and trial which our experience, and not a technical specification, dictates.

"Neptune" insulation is recommended as most enduring and economical for every condition and service, guaranteeing every foot of wire manufactured under this brand to meet the following test:

TEST—A sample of vulcanized compound, 4 ins. in length, shall be cut from the wire and marks placed on it 2 ins. apart; stretched until the marks are 6 ins. apart, and immediately released; 1 minute after such release the marks shall be not more than  $2\frac{3}{4}$  ins. apart; then stretched until the marks are 12 ins. apart, before breaking.

Tensile strength, 1,200 lbs. per sq. in.

Insulation resistance at 60° Fahr., 2,000 megohms per mile for No. 14 B & S. Other sizes in proportion.

## "Triton."

"Triton," a high grade insulation, to meet the requirements of engineers, architects and contractors, for a high grade, long service insulation of moderate cost.

"Triton" insulation contains 25% of Para rubber, and it is guaranteed that every foot of this wire is of

uniform quality that measures, under rigid tests, to established standards, as follows:

TEST—A sample of vulcanized compound, 4 ins. in length, shall be cut from the wire and marks placed on it 2 ins. apart; stretched until the marks are 6 ins. apart, and then immediately released; 1 minute after such release the marks shall be not more than  $2\frac{3}{4}$  ins. apart; then stretched until the marks are 10 ins. apart, before breaking.

Tensile strength 900 lbs. per sq. in.

Insulation resistance at 60° Fahr., 1,500 megohms per mile for No. 14 B & S. Other sizes in proportion.

## "Dolphin."

"Dolphin," a dependable high grade commercial code wire meeting the new rules of the National Board of Fire Underwriters and passing all requirements by a wide margin. Contains 25% of India rubber.

The same care in its manufacture is guaranteed as in our higher grade products.

TEST—A sample of vulcanized compound, 4 ins. in length, shall be cut from the wire and marks placed on it 2 ins. apart; then stretched until the marks are 5 ins. apart, and immediately released; 1 minute after such release the marks shall be not more than  $2\frac{3}{8}$  ins. apart; then stretched until the marks are 8 ins. apart, before breaking.

Tensile strength 600 lbs. per sq. in.

Insulation resistance at 60° Fahr., 800 megohms per mile for No. 14 B & S. Other sizes in proportion.

## Underwriters' Stamps.

All Atlantic insulated wire is approved by the underwriters and carries underwriters' test stamps.

## References.

Architect, or electrical engineer, and building.

Limited space allows only single installations and prevents listing of many notable references.

Ashley, A. E., New York, N. Y., Third National Bank Building, Springfield, Mass.

Atterbury, Grosvenor, New York, N. Y., E. C. Jamison Residence, New York, N. Y.

Ballinger & Perrot, Philadelphia, Pa., Atlantic & Pacific Tea Company Buildings, Jersey City, N. J.

Barber, Donn, New York, N. Y., Travellers Insurance Co., Hartford, Conn.

Barnett, Haynes & Barnett, St. Louis, Mo., Jefferson Hotel, St. Louis, Mo.

Blackall, C. H., Boston, Mass., Hotel Avery, Boston, Mass.

Bonsack, F. C., St. Louis, Mo., American Theater, St. Louis, Mo.

Bosworth, W. W., New York, N. Y., J. D. Rockefeller, Jr., Residence, New York, N. Y.

Bruggeman, G. F. A., St. Louis, Mo., Warwick Hotel, St. Louis, Mo.

Brunner, Arnold, New York, N. Y., Mt. Sinai Hospital, New York, N. Y.

Carrère & Hastings, New York, N. Y., A. I. DuPont Residence, Roslyn, L. I.

Chambers, Walter, New York, N. Y., O. G. Jennings Residence, New York, N. Y.

Chappell, Geo. S., New York, N. Y., T. A. Howell Residence, Sands Point, L. I., N. Y.



- Clark, MacMullen & Riley, New York, N. Y., Phoenix Life Insurance Building, Hartford, Conn.
- Clinton & Russell, New York, N. Y., Carteret Club, Jersey City, N. J.
- Collin, D. R., New York, N. Y., New York Central Station, Glenwood, N. Y.
- Cook, Walter, & Welch, Winthrop, New York, N. Y., Choir School, St. John the Divine, New York, N. Y.
- Cory, Russell G., New York, N. Y., Durkee Mfg. Co. Building, Elmhurst, L. I.
- Cross & Cross, New York, N. Y., Guaranty Trust Building, Madison Avenue, New York, N. Y.
- Davis, Capt. Brinton B., Louisville, Ky., Inter-Southern Life Building, Louisville, Ky.
- Delano & Aldrich, New York, N. Y., Brown Bros. Bank Building, New York, N. Y.
- Eadie, Freund & Campbell, New York, N. Y., Prince George Hotel Addition, New York, N. Y.
- Eames & Young, St. Louis, Mo., Warner & Werner Building, St. Louis, Mo.
- Essenwein-Johnson, Buffalo, N. Y., Penn-Harris Hotel, Harrisburg, Pa.
- Flagg, Ernest, New York, N. Y., Scribner Building, New York, N. Y.
- Flagg, Montague, New York, N. Y., Astor Trust Building, New York, N. Y.
- Gilbert, Cass, New York, N. Y., Rodin Studio, New York, N. Y.
- Gilbert, C. P. H., New York, N. Y., F. W. Woolworth Residence, Glen Cove, L. I.
- Goldschmidt, Otto, New York, N. Y., Hotel Farragut, Knoxville, Tenn.
- Guilbert & Betelle, Newark, N. J., North Seventh Street School, Newark, N. J.
- Hellmuth & Hellmuth, St. Louis, Mo., Soulard Library, St. Louis, Mo.
- Holabird & Roche, Chicago, Ill., Lane-Bryant Building, New York, N. Y.
- Holbrook, J. Byers, New York, N. Y., West Side Y. M. C. A., New York, N. Y.
- Horn & Sons, E. C., New York, N. Y., Orpheum Theater, Allentown, Pa.
- Hutchins & Sons, John Bacon, Louisville, Ky., Journal-Courier Building, Louisville, Ky.
- Hyland, Paul V., Chicago, Ill., Terminal Building, Lincoln, Neb.
- Ittner, W. B., St. Louis, Mo., Central High School, St. Louis, Mo.
- Jallade, L. E., New York, N. Y., Brandegee Building, New York, N. Y.
- Jansen & Abbott, Pittsburgh, Pa., H. W. Croft Residence, Greenwich, Conn.
- Jensen, Mundy & Jensen, Chicago, Ill., Jefferson Building, Peoria, Ill.
- Joannes, Francis Y., New York, N. Y., Robt. J. Eidlitz Residence, Ardsley-on-Hudson, N. Y.
- Jones & Taylor, Houston, Tex., Cotton Hotel, Houston, Tex.
- Kahn, Albert, Detroit, Mich., Ford Building, St. Louis, Mo.
- Kendall & Smith, Washington, D. C., Masonic & Eastern Star Home, Washington, D. C.
- Kimball, R. D., New York, N. Y., Missouri State Capitol, Jefferson City, Mo.
- Knox, C. E., New York, N. Y., Students Building, Barnard College, New York, N. Y.
- La Farge & Morris, New York, N. Y., Astor Warehouse, New York, N. Y.
- Lamb, Thomas W., New York, N. Y., Garden Theater, Baltimore, Md.
- Lang & Wittchell, Dallas, Tex., Southwestern Life Building, Dallas, Tex.
- Larkin, Edward L., New York, N. Y., Printing Crafts Building, New York, N. Y.
- Layton, Hawke & Smith, Oklahoma City, Okla., Levy Bros. Building, Oklahoma City, Okla.
- Link, Theo. C., St. Louis, Mo., Washington Medical College, St. Louis, Mo.
- Long, M. A., Baltimore, Md., Baltimore & Ohio Warehouse, New York, N. Y.
- Lowell, Guy, New York, N. Y., Phillips-Andover Building, Andover, Mass.
- McKenzie, Voorhees & Gmelin, New York, N. Y., Knickerbocker Theater Building, New York, N. Y.
- McKim, Mead & White, New York, N. Y., Racquet and Tennis Club, New York, N. Y.
- Mann & McNeil, New York, N. Y., Paul Starrett Residence, South Orange, N. J.
- Marshall & Fox, Chicago, Ill., Lyon & Healy Office Building, Chicago, Ill.
- Mauran, Russell & Crowell, St. Louis, Mo., Rice Hotel, Houston, Tex.
- Maynicke & Franke, New York, N. Y., Bradish Johnson Building, New York, N. Y.
- Meyer, Henry C., New York, N. Y., Orthopaedic Hospital, New York, N. Y.
- Milburn, Heister & Co., Washington, D. C., Southern Railway Building, Washington, D. C.
- Moore, James Robert, New York, N. Y., Y. M. C. A. Building, Greenwich, Conn.
- Morse, H. G., New York, N. Y., Engineering Societies' Building Addition, New York, N. Y.
- Moses, P. R., New York, N. Y., Reisenweber's Restaurant, New York, N. Y.
- Murchison, Kenneth, New York, N. Y., Columbia Club, New York, N. Y.
- Murphy & Bro., D. X., Louisville, Ky., Nazareth Academy, Louisville, Ky.
- Murphy & Dana, New York, N. Y., Loomis Institute, Windsor, Conn.
- Nolan, Thomas J., Louisville, Ky., Eagles Nest, Louisville, Ky.
- Osterling, F. J., Pittsburgh, Pa., Union Arcade Building, Pittsburgh, Pa.
- Parish & Schroder, New York, N. Y., Osborne Hall, New York, N. Y.
- Parker, Thomas & Rice, Boston, Mass., Lexington Avenue Building, Baltimore, Md.
- Pattison Bros., New York, N. Y., De Jonge Factory, Clifton, S. I., N. Y.
- Pelton, H. C., New York, N. Y., Susquehanna Silk Building, New York, N. Y.
- Pilcher, Lewis F., Albany, N. Y., Hospital for Acute Diseases, New York, N. Y.
- Place, Clyde, New York, N. Y., 45th Street-Madison Avenue Building, New York, N. Y.
- Platt, Chas. A., New York, N. Y., Astor Court Apartment, New York, N. Y.
- Pope, John R., New York, N. Y., Robert Bacon Residence, Westbury, N. Y.
- Post & Sons, Geo. B., New York, N. Y., Statler Hotel, Cleveland, Ohio.
- Renwick, Aspinwall & Tucker, New York, N. Y., Baker Williams Building, New York, N. Y.
- Rich & Fitz Simons, Washington, D. C., Harrington Hotel, Washington, D. C.
- Richer, A. A., Reading, Pa., Lebanon High School, Lebanon, Pa.
- Rogers, James Gamble, New York, N. Y., E. S. Harkness Residence, New London, Conn.
- Schloss, Milton, New York, N. Y., Robert Treat Hotel, Newark, N. J.
- Schmidt, Garden & Martin, Chicago, Ill., Illinois Central R. R. Hospital, Chicago, Ill.
- Snooks Sons, John B., New York, N. Y., W. & J. Sloane Building, New York, N. Y.
- Snyder, C. B., New York, N. Y., Manhattan Trade School, New York, N. Y.
- Starrett & Van Vleck, New York, N. Y., Court and Remsen Street Building, Brooklyn, N. Y.
- Stoddard, Wm. L., New York, N. Y., Hotel Henry, Greensboro, N. C.
- Taylor, Isaac S., St. Louis, Mo., Jefferson Memorial Building, St. Louis, Mo.
- Thomas, John H., Louisville, Ky., Louisville Herald Building, Louisville, Ky.
- Timmis & Chapman, New York, N. Y., H. O. Chapman Residence, Stamford, Conn.
- Tracy & Swartwout, New York, N. Y., Nurses Home, New York, N. Y.
- Trumbauer, Horace, Philadelphia, Pa., H. C. Brockaw Residence, Brookville, L. I.
- Walker & Gillette, New York, N. Y., H. P. Davison Residence, New York, N. Y.
- Walker & Weeks, Cleveland, Ohio, Union National Bank, Cleveland, Ohio.
- Wallis & Goodwillie, New York, N. Y., Remsen Building, New York, N. Y.
- Warren & Wetmore, New York, N. Y., Hotel Chatham, New York, N. Y.
- Wells, G., Oklahoma City, Okla., Terminal Building, Oklahoma City, Okla.
- Wenderoth, Oscar, Washington, D. C., U. S. Appraisers' Warehouse, New York, N. Y.
- Wight, Oliver B., Baltimore, Md., Parkway Theater, Baltimore, Md.
- York & Sawyer, New York, N. Y., Brooklyn Trust Co., Brooklyn, N. Y.

# THE ELECTRIC CABLE COMPANY

## Insulated Wire and Cable

10 East 43rd Street  
NEW YORK, N. Y.

### BRANCH OFFICES

CHICAGO, ILL.

PHILADELPHIA, PA.

BOSTON, MASS.

SAN FRANCISCO, CAL.

FACTORY: BRIDGEPORT, CONN.

### Products.

#### INSULATED WIRE and CABLE:

House Wire	Theater Cable
Fixture Wire	Insulating Var-
Drop Wire	nishes
Lamp Cord	Insulating Com-
Elevator Cable	pounds
Heater Cord	Insulating Tapes
Slow Burning Wire	Voltax Paints
Brewery Cord	Packing House Cord
Automobile Cable	Pot Head Wire
Bridle Wire	Signal Wire
Car Wire	Switchboard Cable
Deck Cable	Lighting Cable
Dredger Cable	Power Cable
Mining Machine Cable	Telephone Cable
Motor Boat Wire	Submarine Cable
Basket Weave Cable	

**ECCO**  
Insulated Wire

TRADE-MARK

or any of our other products will be gladly sent on request.

"Ecco" wire is made for every purpose where rubber covered wire is used.

Our booklet "Facts" deals with wire and wiring; also contains valuable

tables. Will be sent on request.

The responsibility rests upon this company, but that is not enough. Architects also should be able to know what kind of wire they are getting. That is why, on request, a certified copy is furnished of the actual tests made on each coil of "Ecco" wire. A record is kept of every foot made.

### Tests Required on "Ecco" Wire.

All "Ecco" wire must pass nine different tests before it leaves our factory:

Test 1—Analysis of all raw materials.

Test 2—Copper wire tested for physical and electrical qualities.

Test 3—Electrical test of insulation during manufacture.

Test 4—Tensile strength of insulation.

Test 5—Stretch of insulation.

Test 6—Chemical analysis.

Test 7—Continuity.

Test 8—Insulation resistance.

Test 9—Voltage.

### Purpose of The Electric Cable Company.

FIRST—To produce rubber insulated wire of superior quality and absolute security.

SECOND—By unusual efficiency in manufacturing, to sell quality wire at no higher price than inferior wire.

THIRD—To retain our customers' confidence by fair, courteous and honest business relations.

"Ecco" wire is the expression of this purpose.

FOURTH—It is the further purpose of THE ELECTRIC CABLE COMPANY, through its magazine and other forms of publicity, to direct the public to the architects as the proper men to plan for electricity. Attention is called to the fact that architects have the advantage of professional training in both the art and construction phases of architecture and are the ones who bear the responsibility of making the home livable or the place of business efficient.

The company is asking the client to allow a liberal electrical budget for present day electrical advantages and an installation that will anticipate the rapidly expanding application of electric current and power to domestic uses.

### Services.

Architects are invited to consult the Engineering Department of THE ELECTRIC CABLE COMPANY in relation to any electrical problems.

More detailed information concerning house wire

### Certified Copy of Tests on Each Coil.

"Ecco" is made to perform its duty without the possibility of doubt.

### Identification Mark.

"Ecco" is marked every 3 ft. on the surface of the braid.



SECTION OF MARKED WIRE, "ECCO" ON BRAID EVERY 3 FT.

Each grade is likewise indicated. Architects can be sure of getting the wire specified.

Heretofore there has been no readily recognized means of identifying wire. "Ecco" marking provides the means—both before and after the wire has been installed.



**Grades.**

Three grades of house wire are made.

**"Ecco Security" 30% Pure Beni Para.**

The highest grade of low voltage wire made. Every year more architects are specifying this 30% wire on their finer work.

The company is strongly in favor of using 30% wire in all cases. The difference in cost is insignificant in comparison with the absolute security from leaking current. Furthermore, the longer life means no labor or material cost for renewal for years. This gives 30% a real dollars-and-cents superiority over cheaper grades.

**SPECIFICATION**—This grade should be specified by its trade name: "Ecco Security"—30% Pure Beni Para.

"Manufacturers to furnish certified copy of test on each coil, on request. The name and grade shall be stamped visibly on the outer surface of the braid, at points 3 ft. apart."

**"Ecco Engineers" Wire.**

Made in one grade of "intermediate" specification. This wire is usually selected by architects and engineers for intermediate purposes instead of special specifications, where 30% is not required. It fills a purpose between 30% and code wire.

**SPECIFICATION**—"Ecco Engineers" should be specified.

"Manufacturers to furnish certified copy of test on each coil, on request. The name and grade shall be stamped visibly on the outer surface of the braid, at points 3 ft. apart."

**"Ecco Invincible" Wire.**

Made to specifications higher than the Underwriters' Code. Few architects, engineers or owners are satisfied with house wire that barely passes code requirements. There should be a wider margin of safety, and that is why "Ecco" is made better than code in these important characteristics:

(1) Ecco is tested to 2,000 volts. (Underwriters require 1,500.)

(2) Insulation resistance, 1,800 megohms per 1,000 ft. (Underwriters require 1,500.)

(3) 4-in. strip of insulation with marks 2 ins. apart, stretches until marks are 7 ins. apart without rupture. (Underwriters require 6 ins.)

**SPECIFICATION**—This grade should be specified as follows: "Ecco Invincible."

"Manufacturers to furnish certified copy of test on each coil, on request. The name and grade shall be stamped visibly on the outer surface of the braid, at points 3 ft. apart."



ELECTRICAL TESTING LABORATORY OF THE ELECTRIC CABLE COMPANY

Entrance to research and analytical laboratories shows in the background

**Tests.**

All our house wires bear the approval of the National Board of Fire Underwriters, and must pass our own tests which are in excess of those usually required.

**Buildings in Which The Electric Cable Company's Wire Has Been Installed.**

"Ecco" insulated wire has been used in notable buildings all over the country. A few are listed below for reference:

**NEW YORK, N. Y.**

42nd Street Building  
N. Y. Edison Buildings  
Bonwit-Teller Building  
Hearst Building  
7th Regiment Armory  
N. Y. Edison Substations  
Consolidated Gas Building  
Heckscher Building  
American Express Building  
Y. W. C. A. Building

**LONG ISLAND CITY, N. Y.**

Ford Motor Car Works  
Long Island State Hospital

**NEWARK, N. J.**

Auditorium  
Banister Shoe Factory

**BALTIMORE, MD.**

Coca-Cola Building

**DETROIT, MICH.**

Wayne County Bank

**CLEVELAND, OHIO**

Peerless Motor Car Co.  
NEW HAVEN, CONN.

New Haven Theater

**HARTFORD, CONN.**

Bond Hotel

**BRIDGEPORT, CONN.**

Remington Arms Building  
Bridgeport Bank Building

**WILMINGTON, DEL.**

Wilmington Municipal Building

**BROOKLYN, N. Y.**

Bush Terminal Buildings  
Schraders Sons Factory

**MILWAUKEE, WIS.**

Plankinton Building

**CINCINNATI, OHIO**

Pogue Addition

**SAN FRANCISCO, CAL.**

Harrison Building

**ALLENTOWN, PA.**

Allentown Court House

**ATLANTA, GA.**

Connolly Building

# BOSTON INSULATED WIRE & CABLE CO.

MAIN OFFICE AND FACTORY

BOSTON, MASS.

CANADIAN OFFICE AND FACTORY, HAMILTON, ONT., CAN.

## Products.

RUBBER COVERED WIRE, LAMP CORD, SPECIAL ELECTRICAL CORDS and CABLES.

## Rubber Covered Wires.

This company manufactures solid and stranded conductors for general electric wiring of buildings, for railroad signal work, and for car wiring, motor leads, etc.

**REGULATION GRADE**—This wire is made to not only meet the National Electrical Code requirements, but great care is taken regarding the lasting qualities of the rubber insulation and to the grade of weatherproof finish of the wire.

**30 PER CENT PARA**—This grade is made to meet specifications often issued for 30 Per Cent Para insulation.

**BOSTON HIGH GRADE**—In this grade is offered a rubber compound of the highest standard that this company is capable of producing. It is the result of careful study, many tests and long experience. The compound is the same as they have used in high tension cables for automobiles to meet the severe service. While the cost of this grade is no more than that of the 30 Per Cent specification, it is recommended as being superior.

**IDENTIFICATION MARKINGS**—For the rubber covered braided wires, a single coarse uncolored thread is woven clockwise spirally in the braid.

## Wires for High Voltage.

The BOSTON INSULATED WIRE & CABLE Co. has



TRADE-MARK



TRADE-MARK



TRADE-MARK



TRADE-MARK

given special study to meet the severe requirements and produce wire of superior quality for withstanding high voltages. Consult the company for specific data on such wires.

## Special Cords and Cables.

These comprise mainly: Lamp cords and reinforced cords with cotton or silk braid for pendant or portable lamps. Canvasite cord of two wires twisted together with braid over all, weatherproof, for pendant lamps in wet rooms. Deck cable, two or three wires twisted with jute filler with rubber sheath and weatherproof braid over all. Packing house cord or stage cable made of two or three conductors twisted with jute filler and tape and tough weatherproof braid over all; border light cable of four or more wires twisted together, with tape and braid over all.

STRANDING TABLES

Sizes	CONCENTRIC ROPE STRANDS				CONCENTRIC STRANDS			
	Number of Wires				Number of Wires			
	427	259	133	49	61	37	19	7
	Size of each wire				Diameter of each wire			
0000	23	21	18	14	.0589	.0756	.1055	.1739
000	24	22	19	15	.0525	.0673	.0940	.1550
00	25	23	20	16	.0468	.0600	.0837	.1380
0	26	24	21	17	.0416	.0534	.0745	.1228
1	27	25	22	18	.0370	.0475	.0664	.1093
2	28	26	23	19	.0330	.0424	.0592	.0974
3	29	27	24	20	.0294	.0377	.0525	.0866
4	30	28	25	21	.0262	.0336	.0468	.0775
5		29	26	22	.0233	.0299	.0416	.0688
6		30	27	23	.0208	.0266	.0370	.0612
8			29	25	.0165	.0211	.0294	.0486
10				27	.0131	.0168	.0233	.0386
12				29		.0133	.0186	.0306

Approx. as to circular mils.

Correct as to circular mils.

COPPER WIRE TABLE

Size B. & S. gage	Diameter, in.	Circular mils.	Amperes (rubber covered)	Weight, lbs. per 1,000 ft.
0000	.460	211,600	225	640
000	.4096	167,800	175	508
00	.3648	133,100	150	403
0	.3249	105,500	125	320
1	.2893	83,690	100	253
2	.2576	66,370	90	201
3	.2294	52,630	80	159
4	.2043	41,740	70	126
5	.1819	33,100	55	100
6	.1620	26,250	50	79.5
8	.1285	16,510	35	50.0
10	.1019	10,380	25	31.4
12	.0808	6,530	20	19.8
14	.0641	4,107	15	12.4
16	.0508	2,583	6	7.82
18	.0403	1,624	3	4.92

OTHER COMMON STRANDINGS

Size	No. of wires	Size each	No. of wires	Size each	No. of wires	Size each	No. of wires	Size each	No. of wires	Size each
00	524	26	415	25	207	22	130	20	82	18
0	660	28	415	26	329	25	103	20		
1	524	28	329	26	261	25	82	20		
2	415	28	261	26	207	25	103	22	65	20
3	329	28	207	26	164	25	82	22	52	20
4	261	28	130	25	82	23	52	21		
5	207	28	130	26	103	25	52	22		
6	164	28	103	26	82	25	52	23		
8	103	28	65	26						
10	164	32	103	30	65	28	41	26		
12	103	32	65	30	41	28				
14	65	32	41	30	26	28				
16	65	34	41	32	26	30	16	28		

Correct within 1% as to circular mils.



# HABIRSHAW ELECTRIC CABLE CO., INC.

Manufacturers of Rubber Covered Wire and Cables

10 East 43rd Street  
NEW YORK, N. Y.

WORKS: YONKERS, N. Y.

## Products.

All forms of RUBBER INSULATED WIRES and CABLES, including: House Wire, Fixture Wire, Elevator Cable, Brewery Cord, Theater and Stage Cable, Telephone Wire, Telegraph Wire, Signal Cord, Packing House Cord, Mining Machinery Cables, Car Wire, Deck Cable, Dredger Cable, Tree Wire, Park and Suburban Cables, Automobile Cable, Motor Boat Wire, Aerial Cables, Underground Cables, Armored Submarine Cables, Mine and Torpedo Cables, High Tension Wire and Cables, Paper and Cambric Cables, Lead Encased Cables for all voltages.



of the finest residences in the country.

For your convenience in seeking information as to Habitshaw quality, we will send, on request, our booklet containing information and data with a list of the important installations in your city.

Our booklet "Reputation," containing valuable data on wiring, will be sent on request.

A few prominent buildings in which Habitshaw

## Experience and Reputation.

The HABIRSHAW ELECTRIC CABLE CO., INC., is one of the pioneers in the rubber insulated wire industry. For more than a quarter of a century it has had an unparalleled record. It has supplied wires and cables that have operated successfully for 30 years and are operating successfully today, with every indication that they will continue to do so well into the future. With such a record, Habitshaw wire has become recognized as the "standard of wire quality" and is used the world over in installations where the best is demanded.

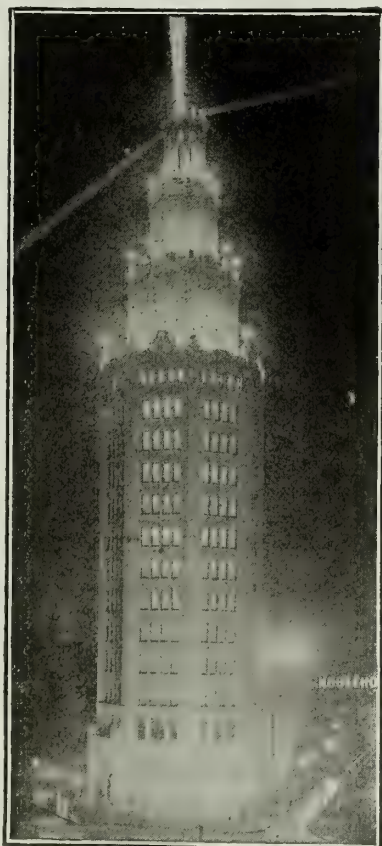
## Installations.

We are proud of the long list of important buildings in which Habitshaw has been used during the last 30 years, including over 25,000, comprising some of the most prominent federal, state, municipal, hotel commercial and business buildings as well as many



BILTMORE HOTEL, NEW YORK, N. Y.

WARREN & WETMORE, Architects  
C. R. PLACE, Electrical Engineer  
J. LIVINGSTON & Co., Electrical Contractors  
Habitshaw wire installation



BUFFALO GENERAL ELECTRIC BUILDING, BUFFALO, N. Y.

WATSON FLAGG ENG. CO., Electrical Contractors

Habitshaw wire installation

products have been used are listed and shown herewith for immediate reference purposes.

The following list is but a suggestion of the character of work where Habirshaw quality is appreciated.

#### A FEW PROMINENT BUILDINGS IN WHICH HABIRSHAW WIRE PRODUCTS WERE INSTALLED—

BUILDINGS	ARCHITECT
Bankers' Trust Building, New York, N. Y.	Trowbridge & Livingston
Buffalo General Electric Building, Buffalo, N. Y.	
Boston Store, Chicago, Ill.	
City Hall Building, Chicago, Ill.	McKim, Mead & White
duPont Building, Wilmington, Del.	
Hudson Terminal Building, New York, N. Y.	
J. P. Morgan Building, New York, N. Y.	Trowbridge & Livingston
New Municipal Building, New York, N. Y.	
United States Express Building, New York, N. Y.	
Watertown Arsenal, Watertown, Mass.	

HOTELS	
Hotel Astor, New York, N. Y.	Clinton & Russell
Biltmore Hotel, New York, N. Y.	Warren & Wetmore
La Salle Hotel, Chicago, Ill.	
Ritz Carlton, New York, N. Y.	Warren & Wetmore
Taft Hotel, New Haven, Conn.	F. Andrews
Vanderbilt Hotel, New York, N. Y.	Warren & Wetmore
Waldorf-Astoria, New York, N. Y.	

RESIDENCES	
J. P. Morgan, New York, N. Y.	
White House, Washington, D. C.	

#### Merchandising Policy.

The HABIRSHAW ELECTRIC CABLE CO., INC., as manufacturers, and the Western Electric Company, as distributors, have established a definite working policy, designed to deliver complete electrical equipment to the ultimate consumer at the lowest possible cost consistent with dependable materials and skilled workmanship.

The execution of this policy involves:

**FIRST**—The preparation and distribution of reliable data to guide the architect in his designing and specification work.

**SECOND**—Having a practical duplication of this data in the hands of reliable electrical contractors.

**THIRD**—A practical working plan of distribution and a standardized basis of cost from which contractors and architects can closely estimate the investment for materials and appliances in each installation.

On the following pages, specification datum is given and complete plans are shown as an example of an installation for "The Home Electrical" and the relation of electric wire and cable to this kind of work, and, in the pages of the Western Electric Company's catalogue which follows, further data are given relative to equipment suggested by these plans.

#### Tests.

All our house wires bear the approval of the National Board of Fire Underwriters, and must pass our own tests, which are in excess of those usually required.

#### Guarantee.

The best guarantee of quality to come is quality produced in the past. The record of Habirshaw is in itself a guarantee; and, of course, we stand back of Habirshaw wire to the limit of excellence.

Architects and engineers are invited and urged to visit the Habirshaw plant, where every facility and opportunity will be afforded to inspect the wires we make.

#### Prices and Service.

Catalogues and further information concerning any grade of Habirshaw wire will be sent on application. Our engineers will gladly be of service on any question that may arise regarding rubber covered wire or its installation.

#### Grades of House Wire.

Habirshaw wires are made in the following grades:

**HABIRSHAW "30%"**—It has been found that Habirshaw "30%" pays decidedly in the long run. The tendency toward Habirshaw "30%" is shown by the constantly increasing number of architects and engineers who insist upon its use.

A certified copy of tests on each coil will be furnished by the manufacturers on request.

Complete specifications for Habirshaw "30%" will be sent to any architect or engineer on request.

**HABIRSHAW "RED CORE," INTERMEDIATE**—This grade is well known as meeting the needs of installations requiring better quality than code, and yet not quite so high as "30%." Habirshaw "Red Core," intermediate grade, has to pass tests much higher than N. E. C. requirements before leaving our factory.

This grade should be specified: "Habirshaw 'Red Core'—a certified copy of tests on each coil will be furnished by the manufacturer on request."

Note: This company is the sole manufacturer of Habirshaw "Red Core" wires and cables. Unless made by us, the wire is not genuine "Red Core."

**HABIRSHAW "BLACK CORE"**—Conforms to new code requirements in every respect and exceeds them in all essentials. Habirshaw "Black Core" stands out among code wires. Its reputation and the name behind it are well considered by architects as is shown by its almost universal adoption.

A certified copy of tests on each coil will be furnished by manufacturers on request.

#### Special Wire Made to Specifications.

Many architects, electrical contractors and engineers prefer their own specifications for insulated wires. We are prepared to meet any special requirements.

#### The Home Electrical.

There are two highly important things that should be considered in the arrangements for house wiring:

**FIRST**—Has ample provision been made to meet, not only the present, but the future requirements?

**SECOND**—Is the job to be one that has a substantial factor of safety or one that will just pass the requirements?



If the job is to be of the better class, there are two important things to ascertain:

FIRST—Is the wire itself the best that can be obtained?

SECOND—Is it to be correctly installed?

### Test and Security of Insulated Wire.

Neither the architect, the engineer, the contractor, nor the public has any practical means of testing wire. They must rely largely on the integrity of the manufacturer.

It is the purpose of the HABIRSHAW ELECTRIC CABLE CO., INC., to accomplish the following results:

FIRST—Produce rubber insulated wires and cables of a superior quality.

SECOND—To accept full responsibility for every foot of wire leaving the plant.

Every coil of wire made by this company is tested in every practical way from raw material to completed wire and must meet the most rigid inspection.

A certified copy of tests on any particular wire can be furnished if the tag attached to the coil in question is forwarded with the request.

Habitshaw wire can always be identified even after installation by the 3 blue threads woven in the braid.

### Wire and Insulation.

Insulated wire consists of a tinned copper conductor, covered with rubber insulation and protected by a closely woven braid.



COPPER WIRE, INSULATION AND BRAID  
Showing end of wire stripped



DUPLEX WIRE  
Two braided insulated wires held together by an outer braid

Good wire, properly installed, is absolutely safe.

Poor wire is unsafe, regardless of the installation.

Wire can be up to standard in most requirements, but fail in one or more important features.

There are certain standards below which wire is declared unsafe by the National Board of Fire Underwriters. Some manufacturers barely meet requirements.

Good wire should not only meet the Underwriters' requirements in every particular, but should exceed them in certain important details, as follows:

FIRST—It should have the ability to withstand voltages many times higher than ordinary usage. The finished wire should stand a voltage test of 2250 volts (the Underwriters' requirements are 1500 volts), for although the voltage of the circuit is normally only 110 or 220 volts, yet, should the transformer fail, it might receive the full voltage of the central station of 1100 or 2200 volts.

SECOND—The insulation must contain at least 20% pure rubber. It must have great strength to prevent rupture while it is being installed. It must have suffi-

cient elasticity to stretch in bending corners. It must be of certain uniform thickness throughout, without weak spots. It must have a smooth surface to be easily pulled through conduit.

THIRD—The insulation should have an insulation resistance of at least 1800 megohms (the Underwriters require 1500 megohms). This means that the insulation will prevent the current from leaking.

FOURTH—A 2-in. length of insulation without the braid should stretch 7 ins. before breaking (the Underwriters require 6 ins.). The stretch suggests the amount of pure rubber used, as sufficient rubber is essential to obtain proper elasticity, and give minimum deterioration and long life.

### General Suggestions.

Good wire, poorly installed, is not safe. It invites trouble.

In all wiring, special attention should be paid to the mechanical execution of the work. Careful and neat running, connecting, soldering, taping of conductors, and securing and attaching of fittings are especially conducive to security and efficiency.

In designing the electrical equipment of a building, it is desirable that ample provision be made for future requirements. The convenience of switches, tell-tale or pilot lights and various labor and money saving electrical devices is a permanent convenience; while the saving in first cost by their omission is comparatively small and a source of much annoyance later on.

The accompanying floor plans are shown to indicate adequate wiring outlets for the average well electrically equipped, up-to-date home.

In laying out an installation, every effort should be made to secure distribution centers located in easily accessible places, at which points the cut-outs and switches controlling the branch circuits can be grouped for convenience and safety of operation. The load should be divided as evenly as possible among the branches and all complicated and unnecessary wiring avoided.

Architects are urged, when drawing plans and specifications, to make provision for the channelling and pocketing of the building for electric light and power wires and also for district messenger call, inter-phone and other signaling system wiring.

It is advisable to consult the local Electric Company in all cases of doubt as to the requirements for the installation of various appliances for which definite data are not at hand.

### Outlets on Walls.

Outlets for vacuum cleaners, floor polishers and fans should be placed waist high on the walls for convenience in attachment. Outlets for permanent or for semipermanent fixtures should be in the baseboards where possible.

Convenient height for wall light outlets in living rooms is 5 ft. 6 ins.; in bedrooms, 5 ft.; in halls, 6 ft. 3 ins.

### Outlets in Ceilings.

These should be located as nearly as possible in the center of equal areas. The greater the number of outlets, the more uniform will be the illumination.

Ceiling outlets should be spaced with reference to ceiling panels and, if ceiling beams are deep, there should be at least one outlet for each panel, preferably in the center.

### Illumination.

The amount of electrical current in general to illuminate various rooms for residences is as follows:

Bedrooms .....	0.3	watts per sq. ft. of floor space
Dining rooms.....	0.9 to 1.0	watts per sq. ft. of floor space
Halls .....	0.2	watts per sq. ft. of floor space
Living rooms.....	0.9 to 1.0	watts per sq. ft. of floor space
Kitchens .....	1.2 to 1.3	watts per sq. ft. of floor space

Each outlet should be checked up with reference to its particular use and to see that it is clear from obstacles and the layout incorporated into the building plans, using the standard symbols; and a schedule of the outlets incorporated into the specifications, giving the wattage required for each outlet, the number of lights for which each is designed, and the switch or switches controlling it.

### Wire Installation.

Probably 80% of interior wiring is installed in conduits. This is the best practice. Wherever practicable, conduit wiring should be specified.

For a regular conduit system, only mild steel piping of same thickness as ordinary gas piping is approved by the underwriters. The conduit must be continuous from outlet to outlet or junction boxes or cabinets, and must properly enter and be secured to all fittings, and the entire system must be mechanically secured in position.



**RIGID CONDUIT**  
Similar in appearance to gas pipe

Mild steel pipe may be galvanized, coated or enameled on the outside, but it must be enameled on the inside. The lining consists of a thin coat of enamel which must be impervious to water, sulphuric, acetic and hydrochloric acids and carbonate of soda solutions.

Rigid conduits are installed in the same manner as a good job of gas fitting, except that for conduit the pipe may be bent to a curve and no elbow can be used having less than 3½-in. radius for the inner edge. Wherever branches are taken off, junction boxes must be provided; and every outlet must have an approved outlet box or plate.

Conduit systems should be grounded by connecting the steel pipe with a conductor to the water system.

Flexible armored conduit (B. X.) is made of metal ribbon wound spirally about the conductors and is particularly adaptable to wiring old houses because it is easier to install.

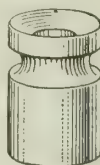
Circular loom is flexible woven tubing, treated with insulating material that makes it hold its shape. This may be used in dry places.



**FLEXIBLE CONDUIT (B. X.)**  
Flexible overlapping bands of steel

When the conduit system is not used throughout, suitable insulators of porcelain must be used. The wire must be held away from wood or plaster.

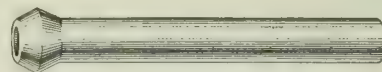
Rubber covered wires can not be run in brick, terra cotta or concrete floors or in brick or masonry walls without some protection other than the covering of the wires, and it is necessary in such places to run wires in tubes or conduits. Short sections of conduit or porcelain tubes must be used where there is danger of contact in passing the wires through walls, partitions, floors or ceilings; through or across beams; where one wire crosses another, etc. No wire should be installed in loose loop, but should be drawn taut and kept clear of contact or else incased in conduit.



**KNOB**  
Wires are bound to groove

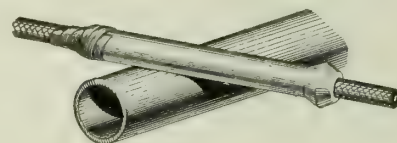


**CLEAT**  
Wires are held in grooved slots



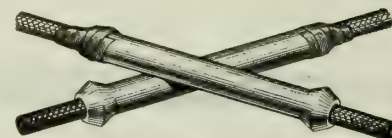
**PORCELAIN TUBE**

It is not permissible to put up or fasten electric wires, even temporarily, by hooks, staples or nails; the very best wire is unsafe if so fastened.



**TUBE PROTECTING WIRE**  
In crossing pipe

When splices are necessary the insulation and braid are stripped back, the conductor scraped clean, the copper wires twisted together and the joint securely soldered; the whole is then wound thoroughly with tape for insulation.



**TUBES PROTECTING CROSSING WIRES**  
Tubes held in place by adhesive tape

All bare ends for attaching fixtures should be taped. When installing fixtures it is essential to make a properly soldered and taped joint as described above. A good tape should be used.



**WIRES CONNECTED**

It is essential that good wire like Habirshaw be specified for the fixtures as well as for the house wiring.

**BRIEF TABLE OF WIRE AND CONDUIT CAPACITIES FOR HOUSE WORK**

Allowable approx. diam.			Sizes of conduits in inches for the installation of wires					
Size of wire	Carrying capacity in amperes	In $\frac{3}{4}$ of an in. solid single braid	Permissible number of wires in one conduit					
			2	3	4	6	8	10
14	15	13	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$
12	20	14	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
10	25	15	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
8	35	17	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$
6	50	22	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2
Number of Duplex wires								
14 Duplex.....			1	2	3	6	8	
			$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	



### Current Supply.

In designing the installation of house wiring, the architect should ascertain whether the current is direct or alternating and the voltage of the supply service; if the current is alternating, the phase and cycle.

Direct current is used in many large cities and in private generating plants. In smaller cities and suburbs the current is generally alternating.

In practically all residential work, alternating current is delivered in single-phase requiring but one transformer.

The transformer for a residence supply is ordinarily located on a pole or in an underground vault near or inside the building, and the transformer is designed with two or three wires for the house or service side, according to the system used.

The code rules give definite data as to location, enclosures, grounding, etc.

In equipment with not more than 50 lights and outlets, many lighting companies deliver the current from the transformer to the building on a 2-wire system at 110 volts and without the use of a third or neutral wire.

### Service Feeders.

In large cities feed wires generally come directly into the cellar from underground. In many cases, where the wires are overhead on poles, the wires are brought into the house, underground, from the nearest pole. In most cases the cost of this underground work is paid by the owner.

Where a lighting company's pole on a highway is not more than 60 to 70 ft. from a residence, the company will generally bring its service wires overhead to the house; it is good practice in such cases to have the wires enter the building through the cellar wall by means of rigid iron conduit with service head, from the overhead wiring to the inside of the cellar wall.

### Main Switch and Meters.

These should be located in an easily accessible place, preferably in the cellar, to avoid the necessity of the meter reader's entrance to the living portions of the house.

Where different rates are charged for different classes of service, there should be a separate meter for each class. The service company should be consulted as to meter arrangements.

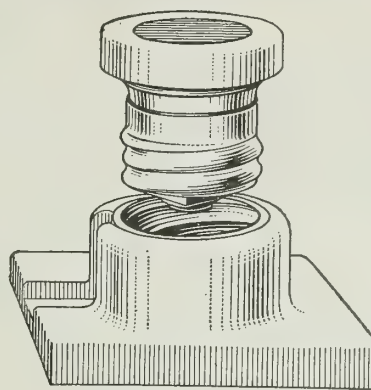
### Grounding.

This requires a solid, permanent connection to the earth or ground by means of connection to water pipes or plates buried in the ground. This is a protection against abnormal voltage on the wiring circuit.

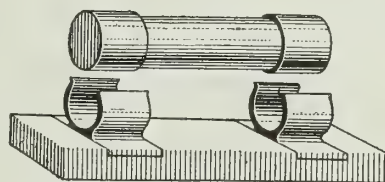
### Fuses.

The fuse acts as a safety valve between the outside wires and the house circuits. If for any reason too much current passes over the wires, a fuse blows out—that is, it melts and automatically cuts off the current. Each light circuit in a dwelling is designed to carry not more than 6 amperes and should only have adequate fuse protection. Over fusing is dangerous practice.

Of the types of fuses shown herewith, the plug fuse is most commonly used; the top screws down into the socket to make connection. The cartridge type, where the cylinder fits down between the spring clips, is not so generally used for residential wiring.



PLUG FUSE



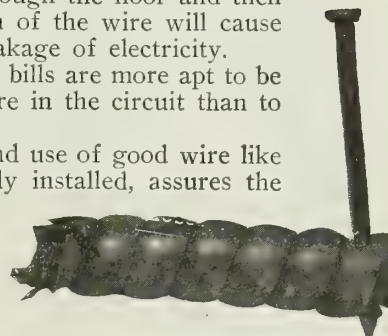
CARTRIDGE FUSE

### Warning.

A nail driven through the floor and then through the insulation of the wire will cause a short circuit and leakage of electricity.

Excessive electric bills are more apt to be due to fault somewhere in the circuit than to fault in the meter.

The specifying and use of good wire like "Habitshaw," properly installed, assures the owner that he is paying only for the current used and not for that which is lost through leakage.



NAIL THROUGH CONDUIT

### Specification Data.

Wiring should be installed in accordance with the latest rules and requirements of the National Board of Fire Underwriters, all local ordinances, and the rules and regulations of the local electric company where current is to be taken from the public service circuit.

No electric wire should be used that does not meet all the tests for the same gauge as that manufactured by the HABIRSHAW ELECTRIC CABLE CO., INC.

The contractor should furnish, on request, certified copies of the manufacturer's tests on all wire used in the installation before the final acceptance of the work.

All wire delivered on the job should be marked by the manufacturer for identification by the architect or the owner; wire that can not be identified and the particular coil certified to should not be accepted.

Contractors should furnish satisfactory certificates of inspection from the local Board of Fire Underwriters and the city Inspector, where required.

No electric device or appliance should be provided for that is not approved by the underwriters.

The best method is to specify the size and make of wires. All wires must be of such size that the drop of potential at the farthest light outlet shall not exceed 2% under maximum load.

Locate cut-out cabinets and specify location of cut-outs and fuses.

Consult the "National Electrical Code" regulations of the National Board of Fire Underwriters for data pertaining to electric wiring.

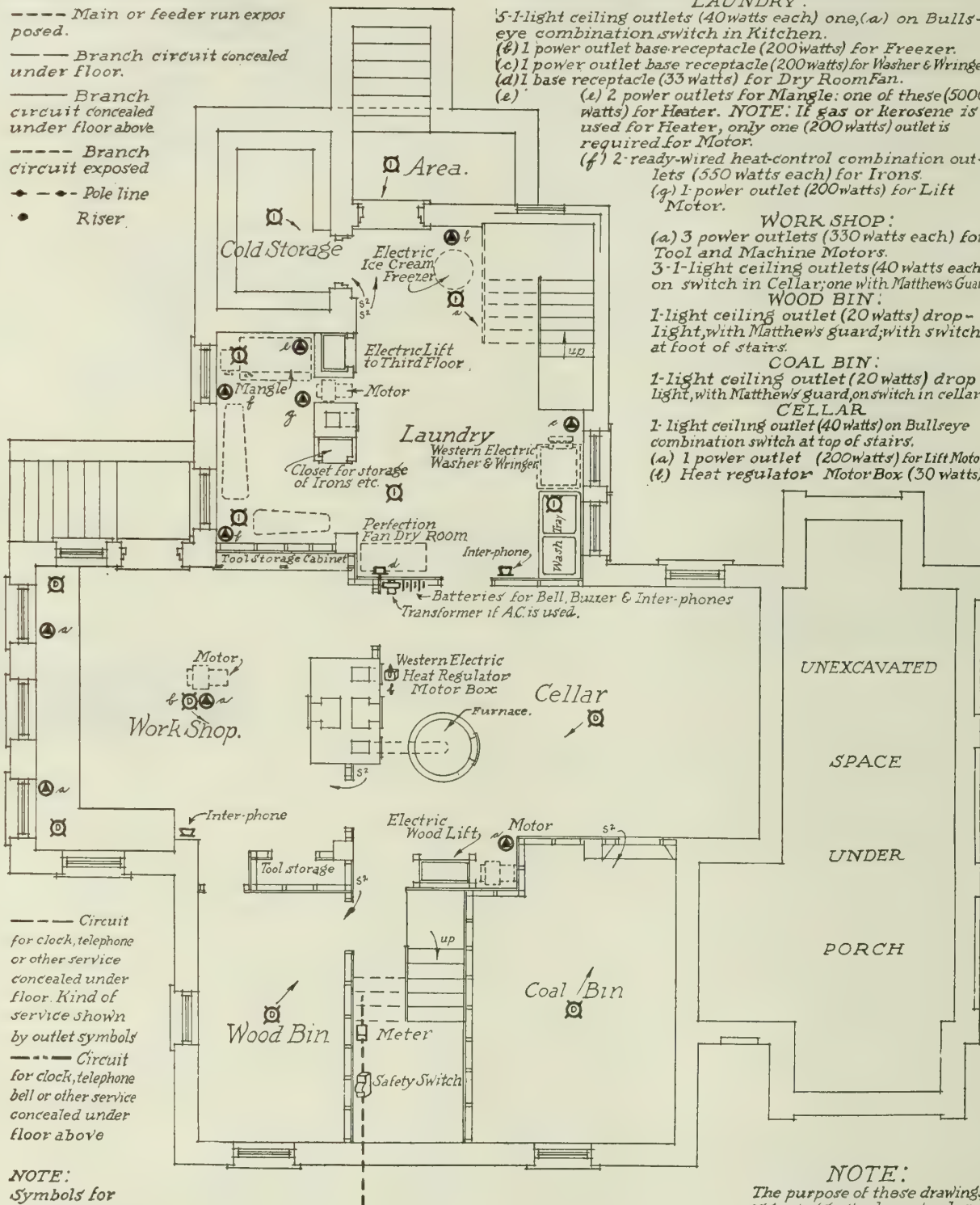
Consult the Engineering Department of the HABIRSHAW ELECTRIC CABLE CO., INC., for any wiring information not at hand or for any advice in any wiring problem.

## SYMBOLS FOR WIRING:

- Main or feeder run concealed under floor.  
 — Main or feeder run concealed under floor above.  
 - - - Main or feeder run exposed.  
 — Branch circuit concealed under floor.  
 — Branch circuit concealed under floor above.  
 - - - Branch circuit exposed.  
 • • • Pole line  
 • Riser

SCHEDULE OF OUTLETS  
AREA:

- 1-light ceiling outlet (20 watts) on switch in Laundry.  
 COLD STORAGE  
 1-light ceiling outlet (20 watts) on switch in Laundry.  
 LAUNDRY:  
 5-1-light ceiling outlets (40 watts each) one, (a) on Bulls-eye combination switch in Kitchen.  
 (b) 1 power outlet base-receptacle (200 watts) for Freezer.  
 (c) 1 power outlet base receptacle (200 watts) for Washer & Wringer.  
 (d) 1 base receptacle (33 watts) for Dry Room Fan.  
 (e) 2 power outlets for Mangle; one of these (5000 watts) for Heater. NOTE: If gas or kerosene is used for Heater, only one (200 watts) outlet is required for Motor.  
 (f) 2 ready-wired heat-control combination outlets (350 watts each) for Irons.  
 (g) 1 power outlet (200 watts) for Lift Motor.  
 WORK SHOP:  
 (a) 3 power outlets (330 watts each) for Tool and Machine Motors.  
 3-1-light ceiling outlets (40 watts each) on switch in Cellar; one with Matthews Guard (h)  
 WOOD BIN:  
 1-light ceiling outlet (20 watts) drop-light, with Matthews guard, with switch at foot of stairs.  
 COAL BIN:  
 1-light ceiling outlet (20 watts) drop light, with Matthews guard, on switch in cellar.  
 CELLAR:  
 1-light ceiling outlet (40 watts) on Bulls-eye combination switch at top of stairs.  
 (a) 1 power outlet (200 watts) for Lift Motor  
 (b) Heat regulator Motor Box (30 watts)



- - - Circuit for clock, telephone or other service concealed under floor. Kind of service shown by outlet symbols  
 - - - Circuit for clock, telephone bell or other service concealed under floor above

NOTE:  
 Symbols for outlets are shown on Third Floor Plan

NOTE:  
 The purpose of these drawings is to suggest adequate electric wiring, location of outlets and satisfactory equipment for the Home Electrical. They are not intended to suggest a type of architecture.

BASEMENT PLAN  
 Scale 1/8 inch = 1 foot



# SCHEDULE OF OUTLETS:

## LIVING ROOM

- (a) 1 base receptacle (60 watts) for Piano Player
- (b) 1 base receptacle (40 watts) for Piano Lamp
- (c) 1 floor receptacle (40 watts) for Table Lamp
- (d) 1 base receptacle (40 watts) for Desk Lamp
- (e) 1 power outlet (150 watts) for Vacuum Cleaner and Floor Polisher
- (f) 1 base receptacle (90 watts) for 16 inch oscillating Fan
- (g) W.E. Heat Regulator Thermostat

## HALL

- (a) 1 power outlet (150 watts) for Vacuum Cleaner and Floor Polisher
- 1 two-light ceiling outlet (80 watts) one light on 3-way switches in First & Second Story Halls

# STAIR PLATFORM:

- (a) 1 floor receptacle (40 watts) for Table Lamp
- 1 one-light ceiling outlet (40 watts) on switch

## VESTIBULE:

- 1 ceiling outlet (40 watts) on switch in Hall

## LAVATORY

- 1 ceiling outlet (20 watts)

## REAR PORCH:

- 1 ceiling outlet (20 watts) on switch in Entry

## SERVANTS' DINING ROOM:

- 1 two-light ceiling outlet (80 watts)

## KITCHEN:

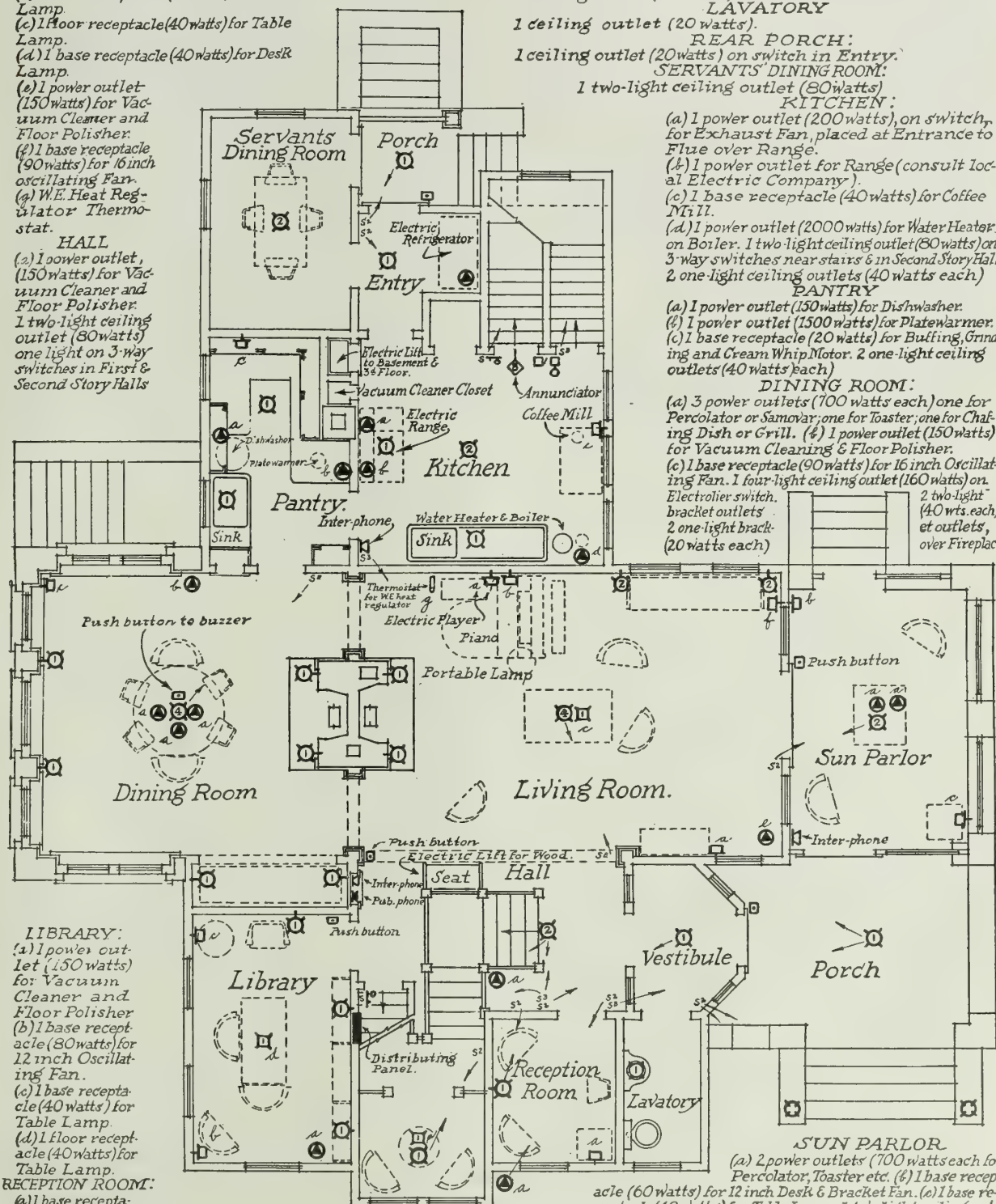
- (a) 1 power outlet (200 watts) on switch, for Exhaust Fan, placed at Entrance to Flue over Range
- (b) 1 power outlet for Range (consult local Electric Company)
- (c) 1 base receptacle (40 watts) for Coffee Mill
- (d) 1 power outlet (2000 watts) for Water Heater on Boiler
- 1 two-light ceiling outlet (80 watts) on 3-way switches near stairs & in Second Story Hall
- 2 one-light ceiling outlets (40 watts each)

## PANTRY

- (a) 1 power outlet (150 watts) for Dishwasher
- (b) 1 power outlet (1500 watts) for Platemaker
- (c) 1 base receptacle (20 watts) for Buffering, Grinding and Cream Whip Motor
- 2 one-light ceiling outlets (40 watts each)

## DINING ROOM:

- (a) 3 power outlets (700 watts each) one for Percolator or Samovar; one for Toaster; one for Chafing Dish or Grill
- (b) 1 power outlet (150 watts) for Vacuum Cleaning & Floor Polisher
- (c) 1 base receptacle (90 watts) for 16 inch Oscillating Fan
- 1 four-light ceiling outlet (160 watts) on Electrolier switch
- 2 one-light bracket outlets (20 watts each)
- 2 two-light (40 wts. each) et outlets, over Fireplace



FIRST FLOOR PLAN  
Scale 1/4 inch = 1 foot

**SCHEDULE OF OUTLETS:****SUITE BATH:**

1 ceiling outlet (40 watts) on switch (a); 1 corner outlet (300 watts) for Shaving Water Heater; (c) 1 power outlet (600 w.) for Radiant Radiator.

**MASTERS' ROOM:**

1 4-light ceiling outlet (160 watts) on Electrolier switch; 1 ceiling outlet (40w) 1 ceiling outlet (20w) in Closet on automatic door switch. 3 base receptacles (40w each) for Table, (c), Desk (a) and Bed (c); Lamps; 2 bracket outlets (20w each) candelabra. (f) 1 power outlet (150w) for Vacuum Cleaner & Floor Polisher. (g) 1 base receptacle (80w) for 12" Desk & Bracket Fan. (k) 1 base receptacle (60 w.) for Heating Pad

**SERVANTS' BED ROOM:**

1 ceiling outlet (40w) on switch; 1 ceiling outlet (20w) in Closet, on automatic door switch. 1 bracket outlet (20w).

**SERVANTS' BATH:**

1 ceiling outlet (40w)

**SERVICE HALL:**

2 ceiling outlets (40w each) one on 3 way switches near stairs and in Kitchen; one on switch near Front Hall; (a) 1 power outlet (150w) for Vacuum Cleaner & Floor Polisher.

**NURSES' ROOM:**

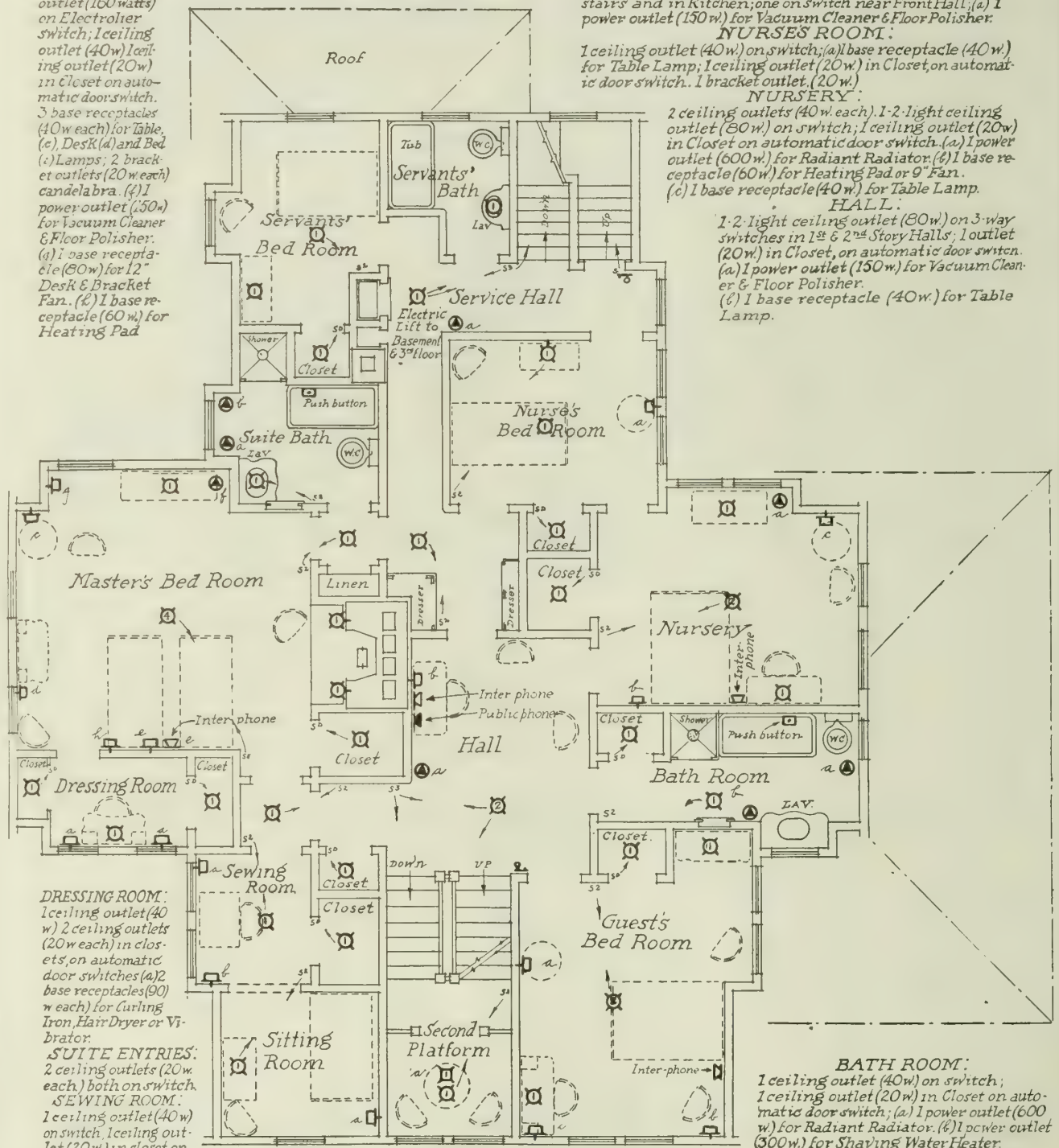
1 ceiling outlet (40w) on switch; (a) 1 base receptacle (40w) for Table Lamp; 1 ceiling outlet (20w) in Closet, on automatic door switch. 1 bracket outlet (20w).

**NURSERY:**

2 ceiling outlets (40w each). 1 2-light ceiling outlet (80w) on switch; 1 ceiling outlet (20w) in Closet on automatic door switch. (a) 1 power outlet (600w) for Radiant Radiator. (k) 1 base receptacle (60w) for Heating Pad or 9" Fan. (c) 1 base receptacle (40w) for Table Lamp.

**HALL:**

1 2-light ceiling outlet (80w) on 3 way switches in 1st & 2nd Story Halls; 1 outlet (20w) in Closet, on automatic door switch. (a) 1 power outlet (150w) for Vacuum Cleaner & Floor Polisher. (c) 1 base receptacle (40w) for Table Lamp.



**DRESSING ROOM:**  
1 ceiling outlet (40 w) 2 ceiling outlets (20w each) in closets, on automatic door switches (a) 2 base receptacles (90 w each) for Curling Iron, Hair Dryer or Vibrator.

**SUITE ENTRIES:**  
2 ceiling outlets (20w each) both on switch.

**SEWING ROOM:**  
1 ceiling outlet (40w) on switch. 1 ceiling outlet (20w) in closet, on automatic door switch; (a) 1 base receptacle (40w) for Table Lamp. (k) 1 base receptacle (40w) for Portable Sewing Machine

**SITTING ROOM:**

1 ceiling outlet (40w) on switch (a) 1 base receptacle (40w) for Table Lamp

**BATH ROOM:**

1 ceiling outlet (40w) on switch; 1 ceiling outlet (20w) in Closet on automatic door switch; (a) 1 power outlet (600 w) for Radiant Radiator. (k) 1 power outlet (300w) for Shaving Water Heater.

**GUESTS' ROOM:**

1 2-light ceiling outlet (80w) on switch. 2 ceiling outlets (40w each). (a) 1 base receptacle (40w) for Table Lamp; 1 ceiling outlet (20w) in closet, on automatic door switch. (k) 1 base receptacle (60w) for 9" D. & B. Fan or Pad. (c) 1 base receptacle (90w) for Curling Iron.

**STAIR PLATFORM (2nd)**

1 ceiling outlet (40w) on switch; (a) 1 floor receptacle (40w) for Table Lamp.

SECOND FLOOR PLAN  
Scale  $\frac{1}{8}$  inch = 1 foot



**NOTE:** The numeral in the following symbols indicates the number of lights for which the outlet is arranged. The basis of figuring is commonly on 16c.p. lamps, but better practice is to figure on the number of watts required for the specific purpose of each outlet.

# SYMBOLS USED ON DRAWINGS

- |  |  |
|--|--|
| Ceiling outlet for electric lights.                          | Bracket outlet for electric lights.          |
| Wall or baseboard receptacle outlet.                         | Floor outlet.                                |
| Outlet for outdoor standard or pedestal.                     | Drop cord outlet.                            |
| Power outlet for heat or power current as specified.         | Inter-phone outlet.                          |
| Bell outlet.   | Telephone outlet, public service.            |
| Push button outlet.  | Buzzer outlet.                               |
| Battery outlet.  | Annunciator.                                 |
| Bullseye combination switch and pilot symbol (not standard). | Safety switch (symbol not standard).         |
| S <sup>2</sup> D.P. switch outlet.                           | Meter outlet.                                |
| S <sup>3</sup> 3 way switch outlet.                          | Distributing panel.                          |
| S <sup>4</sup> 4 way switch outlet.                          | Transformer.                                 |
| W.E. heat regulator Motor Box.                               | S <sup>2</sup> Electrolier switch outlet.    |
|  | S <sup>3</sup> Automatic door switch outlet. |
|  | W.E. heat regulator Thermostat.              |

Note - Numerals in symbols indicate number of lights, push-buttons etc.

## SCHEDULE OF OUTLETS.

### HALL :

2-ceiling outlets (40 watts each) one on 3-way switches in Third and Second Story Halls

2 ceiling outlets (20 watts each) in closets on automatic door Sw.

### BILLIARD ROOM :

2-2 light ceiling outlets (80 watts each) on switch for Billiard Table

4-bracket outlets (20 watts each) two on 4-way switches near Hall Stairs and in Second Story Hall.

1 ceiling outlet (40 watts)

(a) base receptacle (40 watts) for Drink Mixer

(b) floor receptacle (40 watts) for Cigar Lighter

(c) 1 power outlet (150 watts) for Vacuum Cleaner and Floor Polisher

(d) base receptacle (90 watts) for 16 inch oscillating fan

1 ceiling outlet (20 watts) in closet on automatic switch

### PLAY ROOM :

2 ceiling outlets (40 watts each) both on switch near door.

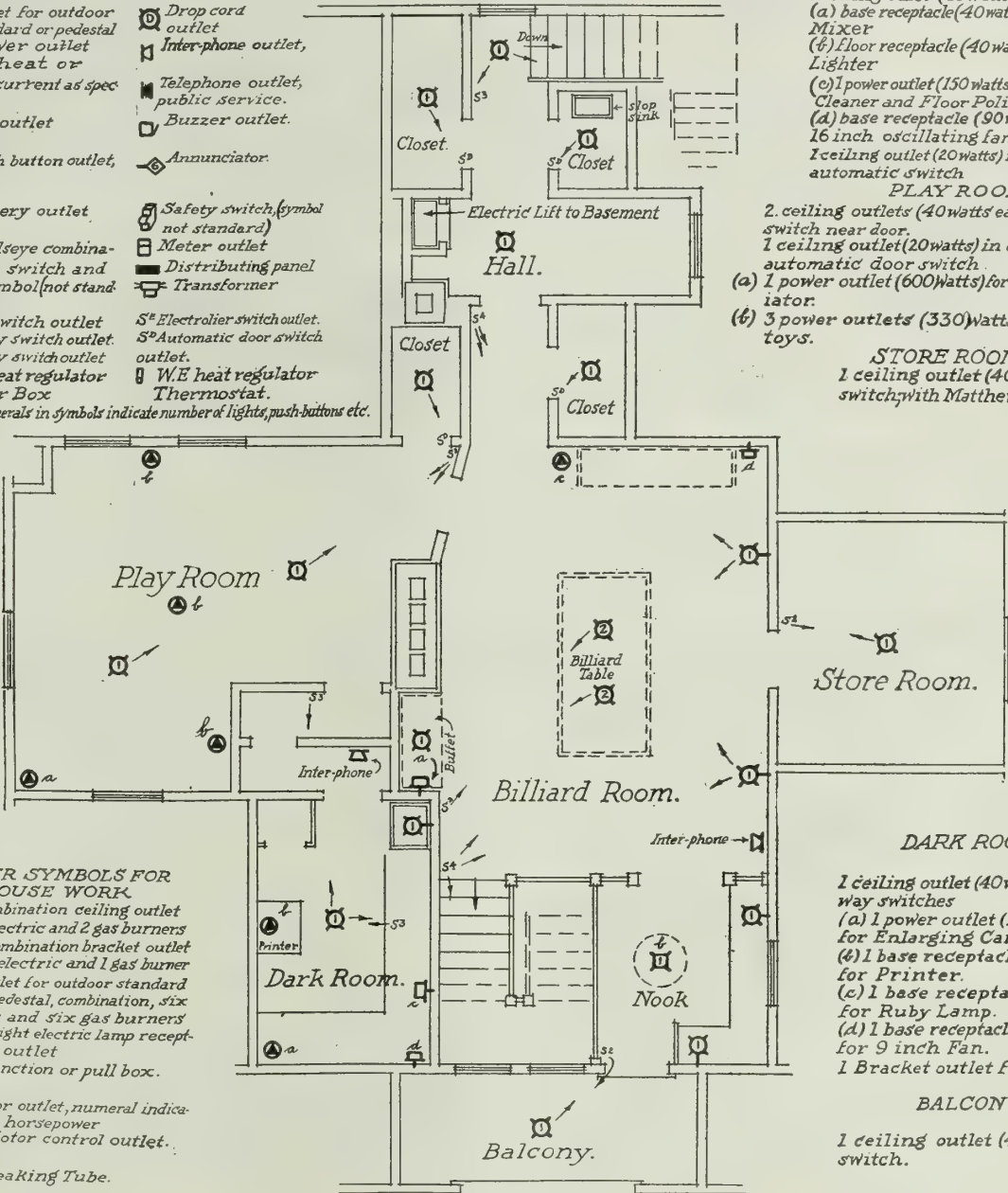
1 ceiling outlet (20 watts) in closet on automatic door switch.

(a) 1 power outlet (600 watts) for Radiant Radiator.

(b) 3 power outlets (330 watts each) for toys.

### STORE ROOM :

1 ceiling outlet (40 watts) on switch, with Matthews Guard.



## OTHER SYMBOLS FOR HOUSE WORK

- |  |
|--|
| Combination ceiling outlet 4 electric and 2 gas burners                                |
| Combination bracket outlet 2 electric and 1 gas burner                                 |
| Outlet for outdoor standard or pedestal, combination, six electric and six gas burners |
| One light electric lamp receptacle outlet  |
| Junction or pull box.  |
| Motor outlet, numeral indicates horsepower   |
| Motor control outlet.  |
| Speaking Tube.   |
| Door Opener  |

S<sup>1</sup> Single Pole Switch.  
— Knife Switch (symbol not standard)

## SYMBOLS FOR WIRING ARE SHOWN ON BASEMENT PLAN OF THIS SET

Specifications should describe capacity of lamps to be used (see data in preceding and succeeding pages)

THIRD FLOOR PLAN  
Scale 1/8 inch = 1 foot

# WESTERN ELECTRIC COMPANY

INCORPORATED

## Equipment for the Home Electrical

NEW YORK  
BUFFALO  
NEWARK  
BOSTON  
NEW HAVEN  
PHILADELPHIA  
PITTSBURGH

ATLANTA  
SAVANNAH  
BIRMINGHAM  
NEW ORLEANS  
CHARLOTTE  
BALTIMORE  
RICHMOND

CHICAGO  
CLEVELAND  
INDIANAPOLIS  
DETROIT  
MILWAUKEE  
MINNEAPOLIS  
ST. PAUL

ST. LOUIS  
CINCINNATI  
KANSAS CITY  
OMAHA  
OKLAHOMA CITY  
DALLAS  
HOUSTON

SAN FRANCISCO  
OAKLAND  
LOS ANGELES  
SEATTLE  
PORTLAND  
SALT LAKE CITY  
DENVER

### Products.

Equipment for Every Electrical Need, Including ELECTRIC HOUSEHOLD APPLIANCES, SUNBEAM MAZDA LAMPS, INTER-PHONES, FANS, MOTORS, GENERATORS, WIRING MATERIALS, COUNTRY HOME POWER and LIGHT OUTFITS, WIRE and CABLE.

### Western Electric Service.

In planning the wiring of a home there is need for careful consideration of the electrical equipment to be used. Correct equipment is as important as correct plumbing and heating appliances. Complete electrical convenience in the home can only be obtained through the use of the right kind and number of outlets, switches and other appliances.

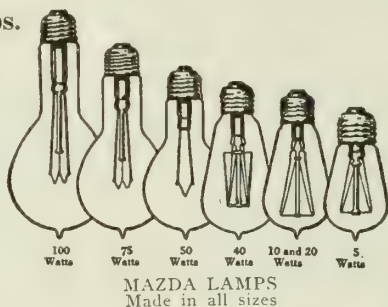
The WESTERN ELECTRIC COMPANY is prepared to place adequate data regarding electrical equipment in the hands of the architect to assist him in putting his case before the owner. In this work the WESTERN ELECTRIC COMPANY is co-operating with the Habirshaw Electric Cable Company, whose wire and cable it distributes.

### The Home Electrical.

The brief outlines on this and the succeeding page will indicate the nature of some of the Western Electric Quality Products that will qualify as equipment for "The Home Electrical" shown in the plans forming a part of the preceding pages of the Habirshaw Electric Company's catalogue.

### Sunbeam Mazda Lamps.

These lamps make it possible to introduce efficient and economical lighting into the home or other building. They give a brilliant white light, three times as much as that given by the old carbon filament lamps for the same amount of current. The different sizes available make it possible to give every kind of room scientifically correct illumination.



### Portable Lamps.

These lamps—No. 100 table portable and No. 200 floor portable—are new and different. They are artistically designed, beautifully finished in either verde antique or statuary bronze and will harmonize perfectly with any surroundings. They can be used anywhere, moved anywhere and adjusted to any angle.



### Western Electric

TRADE-MARK

### Western Electric Switches.

This new type of switch for electric lighting systems combines ruggedness with artistic design. It is unobtrusive, having a face plate only two-thirds the size of that of the push button type. A single lever operates it. This switch meets all underwriters' requirements and can be used in place of the



THREE STYLES OF WESTERN ELECTRIC SWITCHES

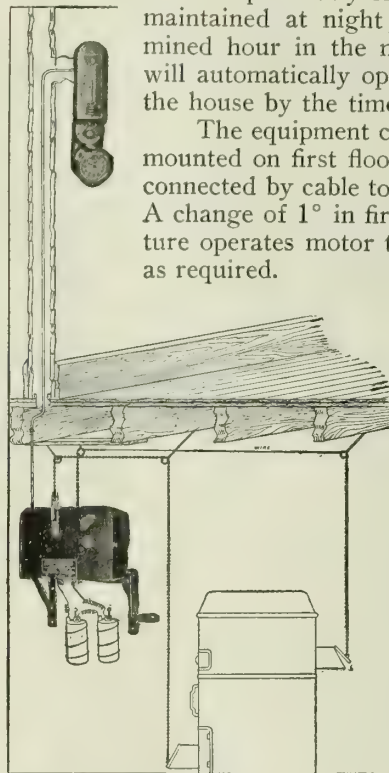
push button type everywhere in single pole, double pole, three-way and four-way types.

Face plates are available in a variety of styles, sizes and finishes to suit any taste.

### Heat Regulator.

This apparatus will maintain an even temperature in the house, prevent overheating and, therefore, save fuel. With it a comparatively low temperature can be maintained at night; then, at a predetermined hour in the morning, the regulator will automatically open the drafts and heat the house by the time the occupants arise.

The equipment consists of a thermostat mounted on first floor wall. Thermostat is connected by cable to a motor near furnace. A change of 1° in first floor room temperature operates motor to open or close drafts as required.



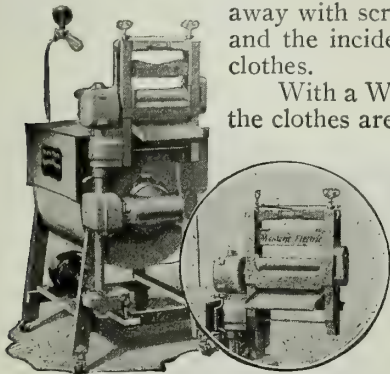
A TYPICAL HEAT REGULATOR INSTALLATION

The Western Electric Heat Regulator, a necessary convenience, will regulate the under-feed draft and check damper of hot air, steam or hot water furnaces. There are two outfits: one, No. 100, for homes not already wired; and another, No. 200, for homes in which electric current is available. No. 100 requires two dry batteries for its operation.



### Washing and Wringing Machines.

One of these electrically operated machines will take all of the tiring labor out of washday. It will also prolong the life of the clothes that are washed, as it does away with scrubbing-board drudgery and the incidental wear and tear on clothes.



WESTERN ELECTRIC WASHER  
WITH SWINGING WRINGER

With a Western Electric Washer the clothes are washed in a revolving cylinder and water and suds forced through. Then, with the newest feature, the swinging wringer swung out over the tubs, the wringing and rinsing can be done without any physical effort.

### Irons.

An electric iron in the house means an end to the hot stoves in the kitchen or laundry on ironing day. It means an end to dragging heavy irons back and forth.

The Western Electric No. 1 Iron is constructed on scientifically correct principles. The cord is unusually long lived as is the heating element. The iron is perfectly balanced and will not tire the user's wrist.



WESTERN ELECTRIC  
IRON

### Ranges.

Cooking with a Western Electric Range adds an element of cleanliness to cooking that is impossible with a coal or gas range. It is also safer because no matches are needed to light it and there is no flame.

The amount of heat needed in cooking can be controlled by means of snap switches conveniently placed. Three heats are obtainable.

There are small ranges and large ones for bungalows, apartments, large homes, restaurants, etc.



WESTERN  
ELECTRIC  
RANGE

### Toasters and Other Cooking Appliances.

The Western Electric Toaster makes a slice of crisp and golden brown toast a minute and enough for breakfast with very little current.

Other attractive and well made cooking appliances for the table include a complete line of electric grills, percolators, chafing dishes, samovars and disk stoves.



WESTERN  
ELECTRIC  
TOASTER

### Fans.

Western Electric Fans, for homes, offices and shops, are made in various styles to suit any service or taste and in a number of sizes, beginning with the 6-in. portable fan, a very satisfactory little breeze producer. Some are of the desk and bracket type; others are of the oscillating type. The 6-in. fan is finished in dark green enamel; the larger sizes, in black.



WESTERN  
ELECTRIC  
FAN

### Vacuum Cleaners.

The vacuum cleaner provides the only thoroughly clean way to clean the home. It cleans quickly and gets up every particle of dirt from carpets, upholstery and draperies without first stirring it up.

There is a sturdy efficient Western Electric Vacuum Cleaner for every cleaning requirement—for small and large homes, office and public buildings.

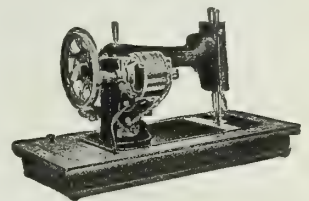


WESTERN ELECTRIC  
NO. 2 VACUUM  
CLEANER

### Portable Sewing Machines.

Western Electric Portable Sewing Machines are complete, electrically operated, high grade machines. They are no bigger than a typewriter, can be carried from room to room and operated from any electric light socket.

The user does no pedaling and therefore has no tiring work to do. A foot control regulates the speed.



WESTERN ELECTRIC  
PORTABLE SEWING  
MACHINE

### Heating Pads.

Western Electric Heating Pads for use in obtaining relief from aches and pains will outlast three hot water bags. The pad stays hot as long as the current is on, while a protective device makes it perfectly safe to use.

The pads are soft and flexible, readily conforming to any part of the body. Three heats are possible.



WESTERN  
ELECTRIC  
HEATING  
PAD

### Country Home Power and Light Outfits.

When a home is some distance from electric light and power lines of a public service company and, therefore, can not obtain current, a Western Electric Power and Light Outfit will remedy this deficiency economically and efficiently. It will provide current for lighting as well as for operating household appliances and motors for driving farm and other machinery.

There are two general types of plants, both of which are compact, easy to operate and require a minimum of attention.

**32-VOLT D. C. OUTFIT**—Best adapted to medium size country homes where it is desired to have electric lighting, but not a great amount of power; is available in several capacities to meet various requirements; consists of a generator, switchboard and storage batteries; and a separate gasoline or kerosene engine is required to furnish motive power for the generator.

**110-VOLT D. C. OUTFIT**—Recommended for use where 32-volt types are not applicable; is available in a wide range of sizes and will serve practically any electrical purpose.

### Other Western Electric Quality Products.

Consult the Western Electric Year Book for a complete listing of electrical household appliances and supplies, such as annunciators, conduit, dry batteries, dry battery lanterns, electric toys, flood lamps, floor polishers intercommunicating telephones, ironing machines, A. C. and D. C. motors, ornamental newel posts, outlet boxes, panel boxes, receptacles, safety "D" switches and two-way plugs.

# EDISON ELECTRIC APPLIANCE CO., INC.

HUGHES DIVISION

Manufacturers of Electric Ranges and Miscellaneous Heating Devices

Taylor Street and Waller Avenue  
CHICAGO, ILL.

## Products.

ELECTRIC RANGES and BAKER'S ELECTRIC OVENS.

Electric Hot Plates and Portable Electric Ovens, Electric Water Heaters, Electric Air Heaters, Laboratory Ovens, Enameling Ovens, Carburetor Heaters and Hotel Equipment including large Electric Toasters, Broilers, Plate Warmers, Frying Griddles and Coffee Urn Heaters.

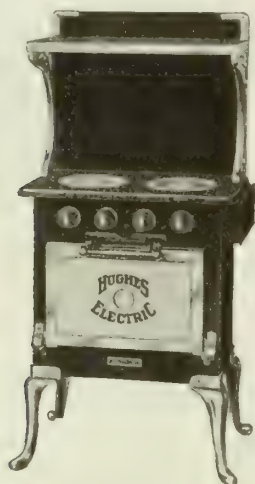
# HUGHES

TRADE-MARK



HUGHES RANGE NO. 50

Most popular electric range on the market. 4 surface burners, cabinet oven and warming compartment. Total height, 58 ins. Floor space, 51 x 27 ins.



HUGHES RANGE NO. 27

For small families with limited floor space. 2 surface burners and low oven. Height of cooking surface, 34 ins. Height of stove if warming shelf is used, 58 ins. Floor space, 20 x 27 ins.



HUGHES RANGE NO. 33

For small kitchens. 3 surface burners and elevated oven. Total height, 65 ins. Floor space, 30 x 30 ins. Also made with 4 surface burners



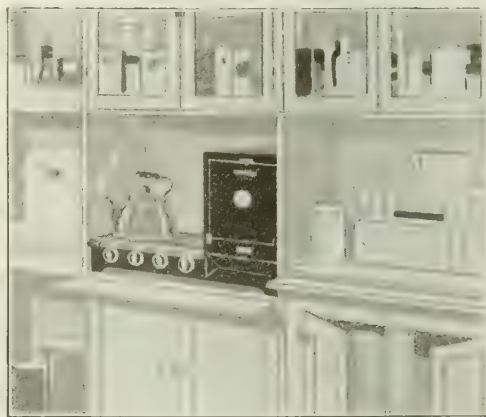
HUGHES RANGE NO. 60

For large families, boarding houses, clubs, restaurants, etc. 6 surface burners, cabinet oven, broiling compartment and warming closet. Total height, 67 ins. Floor space, 27 x 60 ins



HUGHES RANGE NO. C2

Plain black enamel range for small families. 2 surface burners and cabinet oven. Total height, 54 ins. Floor space, 37 x 20 ins.



KITCHENETTE RANGE NO. C1

For cabinet or "In-a-wall" type kitchen of 1-, 2- or 3-room apartment. 2 surface burners and oven with top and bottom burner, the top burner for broiling. Height, 22 ins.; length, 33 ins.; width, 16 ins.



BAKER'S OVEN NO. 220

For medium sized retail bakeries, hotels, restaurants, etc. Capacity, 120 1-lb. loaves. Height, 69 ins.; depth, 62 ins.; width, 45 ins. Maximum demand, 16 kw.



## HAMILTON, OHIO

## BENJAMIN ELECTRIC MFG. CO.

## Wiring Devices

120-128 S. Sangamon Street  
CHICAGO, ILL.

## BRANCH OFFICES

NEW YORK, 243-47 West 17th Street  
TORONTO, ONT., CANADASAN FRANCISCO, 590 Howard Street  
LONDON, ENG.

BOSTON

PITTSBURGH

DISTRICT OFFICES  
CINCINNATI

DETROIT

ST. LOUIS

## Products.

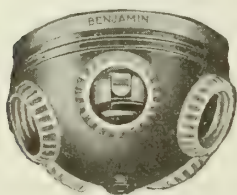
ELECTRIC LIGHTING SPECIALTIES, INDUSTRIAL LIGHTING EQUIPMENT, WIRING DEVICES and ENAMELED STEEL REFLECTORS.

Punch Press Efficiency and Safety Devices, Stampings and Drawn Work.

For Panelboards and Cabinets, see page 1177.

BENJAMIN  
PRODUCTS

TRADE-MARK

CAT. No. 15  
Type 1—Diameter 4 ins.CAT. No. 55K  
Type 5K—Diameter 4 ins.

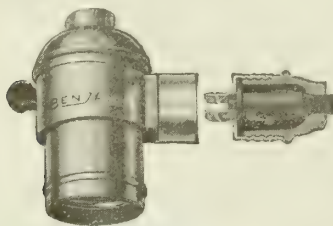
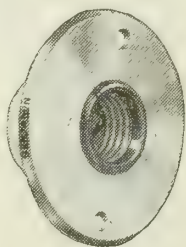
CLUSTER BODIES

CAT. No. 400.  
BENCO KEYLESS  
HEAVY DUTY  
SOCKET

Made in aluminum, brass and copper case

CAT. No. 4207.  
BENCO PULL  
CHAIN SOCKETCAT. No. 4210.  
BENCO MOGUL  
BASE HEAVY DUTY  
SOCKET

Made in aluminum, brass and copper case

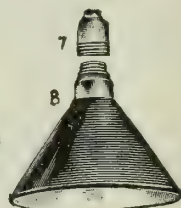
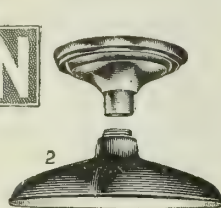
CAT. No. 496.  
CURRENT TAP SOCKETCAT. No. 455.  
TWIN SOCKETCAT. No. 7662  
BENJAMIN SAFETY FLUSH SCREW BASE RECEPTABLES

CAT. No. 7660



CAT. No. 7677

Accommodate all makes of attachment plugs. The receptacle is normally dead, and contacts become alive only after plug is screwed home

TYPE "S" SCREW THREAD SOCKETS AND FIXTURES  
All Benjamin Type "S" sockets, reflectors, holders and ceiling units are interchangeable.  
The screw thread connects them all.  
Any odd numbered piece will fit any even numbered piece

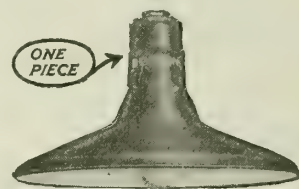
CAT. No. 11060N

SHADE HOLDER REFLECTORS

Scientifically designed reflectors. Porcelain enameled steel for weatherproof work; aluminized and paint enameled steel for interior installations

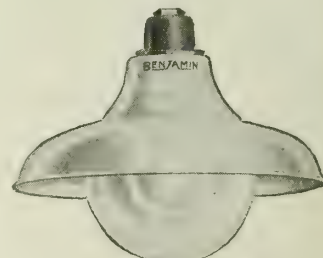


CAT. No. 12060B

CAT. No. 5527.  
ANGLE REFLECTORCAT. No. X 542B.  
SHALLOW BOWL REFLECTOR

Reflector sockets are fixtures which are used under heavy duty conditions everywhere.

Flat cone and deep bowl reflectors are also furnished

CAT. No. 1580.  
GASPROOF AND VAPORPROOF  
FIXTURE

## Gasproof and Vaporproof Fixtures.

Benjamin gasproof and vaporproof fixtures have the lamp sealed in an outer screw globe. They are protected lights for use in industrial plants, mines, etc., where gases accumulate, or where there is excess vapor.



# THE BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONN.

NEW YORK, 51 East 42nd Street CHICAGO, 317 West Jackson Boulevard SAN FRANCISCO, 149 New Montgomery Street

## Products.

ELECTRICAL WIRING DEVICES as follows:

Electric Lamp Sockets and Receptacles; Attachment or Extension Plugs; Baseboard and Floor Receptacles and Plugs; Bullseye Indicating Switches; Indicating Units for Controlling Electric Heating Devices; Switch Rosette; Flush, Surface, Snap, Pendant, Entrance, Panel, Ceiling and Wall Switches; Rosettes; The Bryant Silent Call Signalling System.

Electric Shade Holders; Fittings for Electric Lighting Fixtures; Door Switches; "Straight Through" Switches; Knife Blade Switches; Plug and Cartridge Enclosed Fuses, and Cutouts for same; Electric Outlet Box Covers.

## General.

The illustrations here shown represent only a part of our most comprehensive line of electrical wiring devices. As the largest manufacturers in the country of this class of apparatus, we are in a position to supply any legitimate demand for standard and approved devices of all kinds.

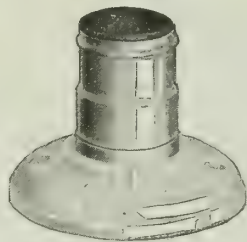
Due to the constant changes made to meet varying requirements and the improvements which are being made from day to day, it is impractical to provide here complete data on our full line.

Catalogue, describing the complete line, gladly sent on request.

Following is a brief explanation of the various subjects illustrated.



No. 602. BRYANT FLUSH SWITCH



No. 4095. MOGUL BASE LAMP RECEPTACLE



No. 2430. SINGLE POLE SURFACE SWITCH

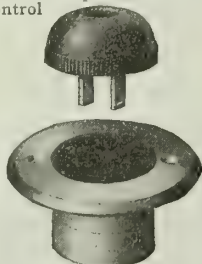
No. 602. The original and only switch with shallow base and deep cover, made entirely of moulded insulation. Dirtproof during and after installation. Groundproof and practically unbreakable.

No. 4095. Bryant Mogul sockets and receptacles, for high candle power lamps, made in various types—all porcelain with sealed-in connections; separable (two parts) lugged; or with brass shells.

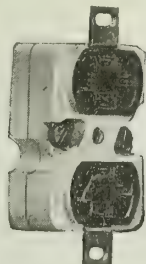
No. 2430. Bryant surface snap switch. One of a most complete line for lighting and heater control



No. 117. RECEPTACLE AND SWITCH COMBINATION



No. 115. RECEPTACLE AND PLUG AND KAPLUG  
10 amps., 250 volts.  
Plate 2 3/4 ins. in diam.



No. 122. DUPLEX FLUSH RECEPTACLE

No. 117. Combination of receptacle and D. P. type "O" indicating switch. One of various novel and convenient combinations in the Spartan line.

No. 122. Spartan duplex receptacle without surface plate. Fits standard single gang outlet box. Various types of plugs can be had to fit all Spartan receptacles



No. 16. "NEW WRINKLE" TWIN PULL SOCKETS

Both outlets operate "on" and "off" simultaneously. Also made with one outlet repeating "On" and "Off"; the other outlet, "On" continually

Nos. 10 and 16 are representative of the very complete line of "New Wrinkle" sockets, key and turn types, with interchangeable caps to meet conditions.



No. 10. "NEW WRINKLE" S. P. KEY SOCKET  
250 watt, 250 volt



INTERIOR CONSTRUCTION OF CANDELABRA AND MEDIUM BASE PULL SOCKETS



No. 465. TELL-TALE RECEPTACLE

No. 465. Tell-tale used to indicate whether a fan, remote light or electric range, etc., is using current



No. 75. PORCELAIN PULL SOCKETS



No. 81. "WRINKLE" S. P. PUSH BUTTON SOCKET  
660-watt, 250-volt

The Bryant line also includes standard and short keyless and key types



No. 2700. SAFETY (DEAD FRONT) SWITCH

Triple to double pole, double branch. 11 5/8 x 3 ins.

No. 2700. One of a complete line of "safety" (dead front) panels for residences and other uses. Switch units can be had with push button or rotary switches, and for cartridge or plug fuse—double pole or triple pole, and single branch or double branch

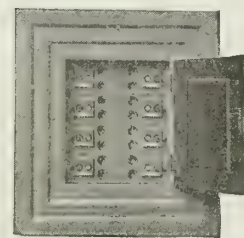
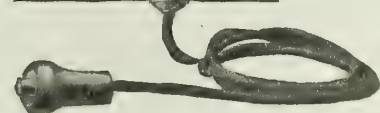
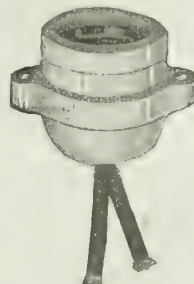


ILLUSTRATION SHOWING FOUR NO. 2700 IN A GUTTER BOX



No. 16. HOSPITAL CALLING STATION



No. 59107. WEATHERPROOF PORCELAIN SOCKET

No. 16. A calling station of the Bryant silent call system for hospitals, institutions, hotels, etc. Operates on 100-120 volts lighting circuit. Doubly fused to insure safety. Provides for emergency call, for heating pad and other connections. Over 10,000 stations already installed in leading hospitals

# THE CUTLER-HAMMER MFG. CO.

## Manufacturers of Electrical Specialties

GENERAL OFFICES AND WORKS

MILWAUKEE, WIS.

BRANCH OFFICES

NEW YORK

CHICAGO

PITTSBURGH

BOSTON

PHILADELPHIA

CLEVELAND

CINCINNATI

PACIFIC COAST AGENT

H. B. SQUIRES CO., SAN FRANCISCO, LOS ANGELES, SEATTLE

### Products.

C-H PUSH BUTTON SOCKETS, CANDLE LENGTH SOCKETS, PENDENT, PULL, FLUSH, DOOR, AUTOMOBILE, FIXTURE, HEATING APPLIANCE and SNAP SWITCHES, C-H RECEPTACLES and ATTACHMENT PLUGS, C-H REMOTE CONTROL SWITCHES.

Automatic motor controllers for blowers, compressors, fans and pumps. Electric Vehicle Battery Charging Apparatus, Conveyor Controllers, Elevator Controllers, Motor Speed Regulators, Motor Starters, Theater Dimmers, Rheostats of all kinds.

### C-H Push Button Sockets and Switches.

THE CUTLER-HAMMER MFG. CO., of Milwaukee, blazed the trail when, eleven years ago, it placed on the market its porcelain pendent push button switches. This line of push button specialties was made possible by the invention of an exceedingly ingenious snap switch mechanism which, by greatly reducing the number of moving parts, permitted a thoroughly substantial quick make-and-break switch of ample current carrying capacity to be installed in a pendent switch body or socket shell of small dimensions.

This line now includes candelabra and canopy switches, feed-through switches, tool handle switches, surface switches and automobile lighting switches, all operated by means of push buttons. In May, 1914, the long awaited brass shell push button socket was placed on the market and has come into extensive use.

### Characteristics of C-H Push Button Sockets.

Made in brass shell or porcelain provided with two push buttons, one black and the other white to indicate respectively the off and on positions.

These sockets are of 660-watt capacity, tested, rated and approved by the National Board of Fire Underwriters.

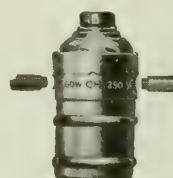
C-H push sockets of fixture type are designed for use on ceiling fixtures, wall brackets or table lamps.

C-H push sockets of the pendent type are designed for lamp cord suspension.

C-H porcelain sockets are particularly adapted for use in bathrooms, washrooms, laundries, hospitals, kitchens, basement rooms and other locations where moisture may be present.



C-H 7500 Standard



C-H 7510 Removable Buttons



C-H 7501 Keyless

C-H BRASS SHELL PUSH AND KEYLESS SOCKETS  
Made with  $\frac{1}{8}$ -,  $\frac{1}{4}$ -,  $\frac{3}{8}$ -in. caps



C-H 7400 Porcelain Socket



C-H 7550 Brass Shell Porcelain Base



C-H 7561 Short Keyless Porcelain Base Wall Socket

C-H PORCELAIN AND BRASS SHELL PUSH SOCKETS

### C-H Candle Length Sockets.

The C-H candle length socket has the advantage that it is a complete unit. The socket cap is screwed to the fixture in the same manner as the ordinary socket cap, and the candle shell is then snapped in place, giving a compact mechanical unit which will not wobble and present the appearance of built-up fixtures. This socket is made in both the push button and keyless types. Lengths, exclusive of cap, 4, 5 and 6 ins. are made.



C-H Candle Length Push Sockets on 4-Light Ceiling Fixture



C-H 7516 in Wall Bracket



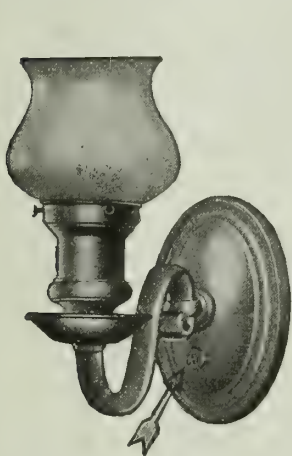
Phantom View of C-H Candle Length Socket

C-H PUSH SOCKETS CANDLE LENGTH TYPE  
Made in push button and keyless types,  $\frac{1}{2}$ -,  $\frac{3}{4}$ - and  $\frac{5}{8}$ -in. cap types



**C-H Fixture Canopy Switches.**

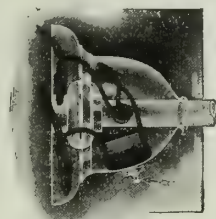
The C-H canopy switch is designed for installation particularly on wall brackets and has the advantage that while it is extremely neat in appearance and reliable in operation, it does not necessitate operating the light from the socket, which action has a tendency to pull the fixture out of line. These switches are used to a very large extent by the United States Government on fixtures for post offices and other public buildings.



WALL BRACKET EQUIPPED  
WITH NO. 7151 OR 7152  
CANOPY SWITCH



C-H 7151 FIXTURE  
CANOPY SWITCH



PHANTOM VIEW OF  
NO. 7151 FIXTURE  
SWITCH IN BRACKET  
CANOPY

**C-H Remote Control Switches.**

Designed for the control of lighting circuits located at a distance from controlling button or buttons. It is especially adapted for use in large buildings, libraries, theaters, halls, stores, etc., where control of some or all of the circuits of a certain floor or section of the building from a central point is desired.

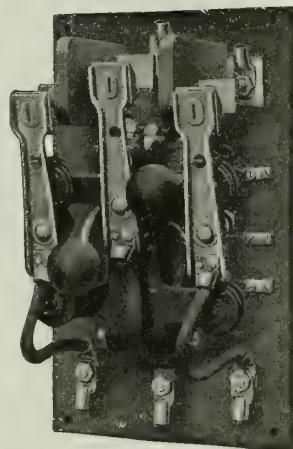
The use of these switches saves copper wire. A wiping effect given to contacts every time switch is closed, keeps the contact surfaces clean and insures a good contact at all times.

The switch is operated by two electromagnets, one for closing and one for opening, controlled by a special double throw push button switch which is normally in open position and remains closed only when held by the operator. No current is used when closed because the switch is mechanically held by a latch which is tripped when the opening coil is energized.

Remote control switches may be operated by means of one push button switch or by means of any one of a number of such switches placed at different locations and connected in multiple.

The standard finish of the contacts is polished copper. The mechanism and slate base are dull black.

Dimensions of the switch which are such as to permit its installation in a standard wall box. The depth of the switch open from the face of the slate panel is  $3\frac{7}{8}$  ins. and from the back of the panel  $4\frac{5}{8}$  ins.



C-H REMOTE CONTROL,  
ELECTRICALLY OPERATED  
SWITCH

Single pole switch: 100 amperes, 115 volts; 50 amperes, 230 volts.

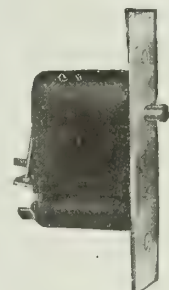
Double and triple pole: 100 amperes, 230 volts.

**C-H Automatic Door Switches.**

For bed chamber closets, hotel rooms, etc.

This type of switch is so designed that the light is switched on when door is opened and extinguished when door is closed. Suitable for installation in clothes closets, linen closets, pantries, entrances, halls and vaults.

The mechanism used in the C-H door switch has many points of advantage. The structure is such that the contacts are given two distinct wiping actions—one when the switch opens and the other when it closes, insuring at all times clean contacts. The design of the switch is such that an unusually long life is assured—much longer than that of the ordinary switching mechanism.



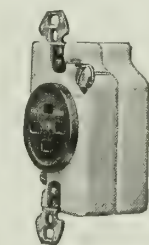
C-H 7240 DOOR  
SWITCH

**C-H Interchangeable Plugs and Receptacles.**

C-H standard straight pull attaching caps are interchangeable on all C-H standard plugs and receptacles and on the standard plugs and receptacles of six manufacturers. Contact blades remain in permanent alignment. The cap has no thin or weak sections, and the appearance of the knurled finish of the cap is not spoiled by use.



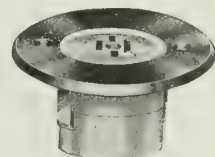
C-H 7700  
ATTACHMENT  
PLUG



C-H 7710 Using  
Rectangular Flush  
Plate



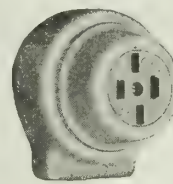
C-H 7720 Duplex  
Flush Receptacle



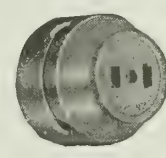
C-H 7733 with  $2\frac{7}{8}$ -in.  
Round Plate

**C-H "STANDARD" FLUSH RECEPTACLES**

C-H 7717 Surface  
Receptacle for  
Concealed Work  
Base,  $2\frac{7}{32}$  ins.



C-H 7760 For Metal  
Moulding  
Base,  $2\frac{7}{32}$  ins.



C-H 7730 For Conduit  
Box  
Base,  $1\frac{1}{4}$  ins.

**C-H "STANDARD" INTERCHANGEABLE PLUGS AND RECEPTACLES****C-H Snap Switches.**

The C-H snap switch is operated by push buttons which are a part of the mechanism and therefore can not be removed or lost. There is nothing protruding from the cap which makes this switch lay flat against the wall. It is very neat in appearance and is useful for all cases, except where flush switches are necessary. Bases are finished with this switch so that it may be used with concealed wiring or with metal moulding or conduit.



NO. 7108 WALL  
SNAP SWITCH

# COLD LIGHT MANUFACTURING COMPANY

Manufacturers of Marvelite, a Self-luminous Radium Compound

TELEPHONE:  
AUDUBON 8047

558 West 158th Street  
NEW YORK, N.Y.

## Products.

MARVELITE, a Self-luminous Compound, made with Radium; ATTACHABLE BUTTONS and SWITCH PENDANTS of MARVELITE.

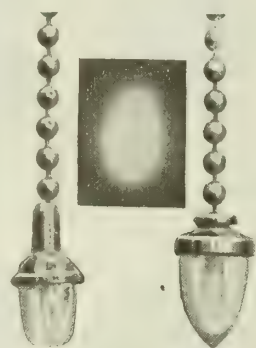
## Marvelite.

Marvelite is a compound prepared in two forms under the secret processes of the COLD LIGHT MANUFACTURING COMPANY who *guarantee* that the sole source of its luminosity is radium. In this respect it differs from the phosphorescent compounds, which can only give off for a few hours the daylight or artificial light previously absorbed. The luminosity of Marvelite is permanent for all practical purposes.

MARVELITE FLEXIBLE—Marvelite is made in flexible sheets, in any desired shape, for signs and various odd forms.

MARVELITE POWDER—Marvelite is also furnished in powder form, with necessary material for mixing it into a paint, and used by watch, clock and instrument manufacturers for applying on dials, etc. The company will do this work for the manufacturer on request.

GENERAL ADAPTABILITY—Marvelite is made up in attachable, luminous buttons; in pendants for any kind of chain pull switches, etc.; and, in its powder form, can be applied to dials, numbers, exit and danger signs or anything that needs to be visible in the dark. It is used on aircraft dials and other instruments by the United States Government and many prominent manufacturers.



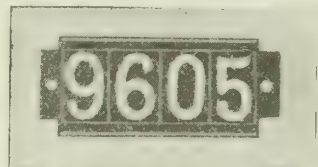
MARVELITE PENDANTS  
For chain pull switches

## Luminous Signs and Numbers.

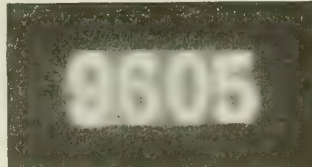
Made permanently luminous by application of Marvelite. Current for electric signs, in event of fire, may be cut off; but Marvelite signs do not depend on any foreign agency for illumination. Marvelite numbers can be attached to aisle seats in theaters, and used for various purposes.



Sign



Number in Daylight



Number at Night



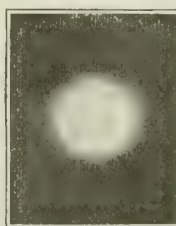
Dial

## Luminous Buttons.

Are made in form of a flat metal disk, to be fastened to any object required to be visible at night; attachable to flashlights, revolvers, sick room appliances, electric light keys, etc.



In Daylight



The Glow at Night



On Switch Plate

MARVELITE LUMINOUS BUTTONS

## Marvelite for Switch Plates.

A luminous button is furnished, which may be applied by removing upper screw in switch plate and inserting in its place a small metal disk through which a flathead screw is inserted; then the button is pressed into metal disk and permanently fastened on switch.

For new switch plates, luminous buttons may be supplied to the manufacturer to replace mother-of-pearl disks. Demonstrations made for manufacturers.

## Experiments, Demonstrations and Estimates.

Made without charge. Correspondence from manufacturers regarding Marvelite (for making their goods self-luminous) will receive prompt attention from the company.

Estimates furnished according to amount of work done and grade of material involved.

SHOWING A FEW OF THE VARIOUS USES OF MARVELITE



# THE GILLETTE-VIBBER CO.

Manufacturers of Electrical Fittings

NEW LONDON, CONN.

WESTERN DISTRIBUTOR: CHICAGO, ILL., M. B. AUSTIN & Co., 700 Jackson Boulevard

## Products.

GEE-VEE ELECTRICAL SPECIALTIES;  
ELECTRICAL WIRING DEVICES AND FITTINGS.



## Gee-Vee Service Cap.

Where feed wires are overhead (on poles) it is good practice to bring service wires overhead to the house and thence through rigid conduit capped with a service head, and to enter the building through the cellar wall.

Gee-Vee service cap is an approved galvanized threaded 2-part cap, with 2-piece insulator for 3 wires, the insulators for sizes 1-in. and under being of a moulded material that does not break like porcelain. Seal closes the unused hole when but 2 wires are used. Special insulator with any number of holes furnished for sizes above 1-in. Sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$  and 3 ins.



GEE-VEE SERVICE CAP

## Gee-Vee Terminal, Form "A."

For inside work. An approved, galvanized, 2-piece, cast iron terminal with 3-hole, 2-piece insulator with seal for unused hole. Insulators are moulded and same sizes as service cap.



GEE-VEE TERMINAL, FORM "A"

## Gee-Vee Pipe Caps.

GEE-VEE WEATHER-PROOF—A roomy, well ventilated, standard weatherproof galvanized cap for use on ends of conduit containing lead covered or signal wires. Standard pipe sizes to 6 ins.

GEE-VEE UNIVERSAL—Approved for outside or inside and especially convenient for heavy work. Either vertical or horizontal by a half-turn of the coupling. Insulators are in 2 parts, held in place by grooves. For 3 wires with seals as for service cap.

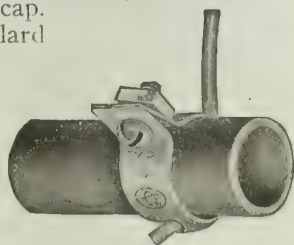
Galvanized and in standard pipe sizes to 4 ins.



GEE-VEE UNIVERSAL

## Gee-Vee Ground Clamps.

In 2- and 3-wire systems the incoming side of service switch is grounded by a copper wire connection with the water pipe.



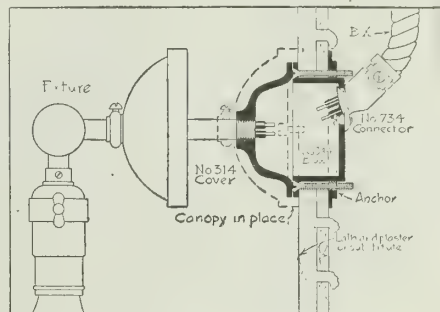
TYPE "S" GROUND CLAMP

Gee-Vee Type "S" is an approved galvanized steel clamp for No. 10 wire or larger, in which the wire can not slip and that binds the wire itself to the pipe without depending on a soldered connection for permanence.

Type "A" is an approved tinned copper clamp for No. 4 wire or smaller, contains no iron, and has a spur insuring permanent contact.

## Gee-Vee Outlet Boxes, Covers and Connections.

For use with B. X. and particularly practical and very simple of application in wiring outlets for old work. The ring shown at the upper part (or back) of the box is removed and provides a template for cutting lath and plaster or plasterboard. This ring (or anchor) is inserted in the hole (held by a handle while installing) and forms the inner flange holding the box rigidly in place. Box flange and the anchor grip the entire circumference of the hole and solidly reinforce the opening.



DETAILS OF GEE-VEE OUTLET BOX AND CONNECTOR INSTALLED IN OLD WORK

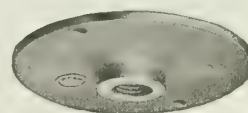
$\frac{7}{8}$ -in. diameter replaceable seals. Finish in galvanized iron.



NO. 355 BOX



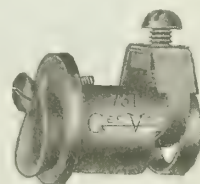
NO. 311 COVER



NO. 308 COVER

No. 311, covers for switches and receptacles.  
No. 314, tapped for  $\frac{1}{8}$ -,  $\frac{1}{4}$ - or  $\frac{3}{8}$ -in. pipe sizes.  
No. 308, cover, reversible, tapped for  $\frac{1}{8}$ -,  $\frac{1}{4}$ - or  $\frac{3}{8}$ -in. pipe sizes.  
No. 355, cast iron box with cast fixture stud.  
No. 344, without stud,  $3\frac{1}{2}$  ins. in diam. Takes all covers.  
No. 377, drilled for standard fixture stud,  $4\frac{1}{2}$  ins.  
No. 300, cast iron box  $\frac{5}{16}$  in. deep,  $3\frac{1}{2}$  ins. diam. Takes No. 314 cover.

OUTLET BOX CONNECTORS—For armored conductor  $\frac{1}{16}$  in. or smaller, three styles: No. 731, straight; No. 734,  $45^\circ$  and No. 738,  $90^\circ$ ; No. 731, cold rolled steel; No. 734 and 738, best gray iron casting.



NO. 371 CONNECTOR

# THE HART MANUFACTURING CO.

Manufacturers of Switches, Receptacles and Appliances

HARTFORD, CONN.

## BRANCH OFFICES

NEW YORK, N. Y., 30 Church Street  
BOSTON, MASS., 170 Summer Street  
CHICAGO, ILL., 411 South Jefferson Street  
DETROIT, MICH., 80 Washington Boulevard

DENVER, COLO., 2910 Huron Street  
SAN FRANCISCO, CAL., 143 Second Street  
SEATTLE, WASH., 617 Fourth Avenue  
TORONTO, ONT., 331 King Street, West  
LOS ANGELES, CAL., 253 South Broadway

LONDON, ENG., 77 Rochester Row, Westminster, S. W.

## Products.

"DIAMOND H" PUSH BUTTON SWITCHES, SURFACE SWITCHES, AUTOMATIC DOOR SWITCHES, AUTOMATIC FLUSH RECEPTACLES, REMOTE CONTROL SWITCHES, DOOR BOLT CONTROL SWITCHES.

Series Parallel Heater Switches; Feed Through and Pendent Switches; Momentary Contact Switches.

## In General.

"Diamond H" specialties are the original creations of Gerald W. Hart, the founder of THE HART MANUFACTURING CO., whose inventions and manufactures have for the past 25 years received general recognition as standards of efficiency and construction.

The "H," being an abbreviation of the name Hart, it is only necessary to call for "Diamond H" specialties in order to secure the very highest type of results in the art of making electrical appliances.

## "Diamond H" Push Button Switches.

"Diamond H" push button switches are radically different in construction from all other switches of this type, as the porcelain base entirely encloses the mechanism and is proof against dust and dirt. This construction is



TRADE-MARK

found only on "Diamond H" switches, and obviates the necessity of using temporary plates when the switch is installed before the walls are plastered. Binding screws are machined and of extra length, and are easily accessible. Sheet mica is used exclusively to insulate the mechanism from the current carrying parts.

All parts subject to wear are made of carbonized steel, drawn in oil. Contacts are made of spring temper phosphor bronze, and are of sufficient size to carry safely any reasonable overload. The make and break is accomplished with unusual rapidity.

An exclusive feature is the straight line movement of the push buttons, obviating the swinging motion common to other switches of this type. This is accomplished by a simple addition to the mechanism, which occupies no extra space but gives extra strength to the union of the buttons with the lever which throws the switch.

## "Diamond H" Receptacles.

Safety is an important consideration in the use of "Diamond H" receptacles, as it is impossible to ground or short circuit them with the plug. They can be operated without danger by a child or other person unfamiliar with their use.

The "Diamond H" receptacle is the only one that can be opened or closed automatically except by the respective insertion or withdrawal of the plug.

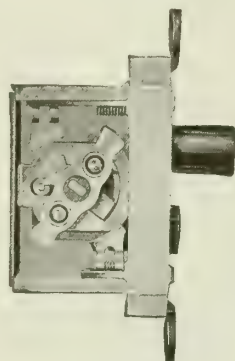
It is particularly adapted for use in residence work, hotels, apartment houses, etc., where children, servants, and others are likely to get a short circuit by inserting some article, such as a hairpin or other metallic substance, in the receptacle.



PUSH BUTTON SWITCH WITH PLATE

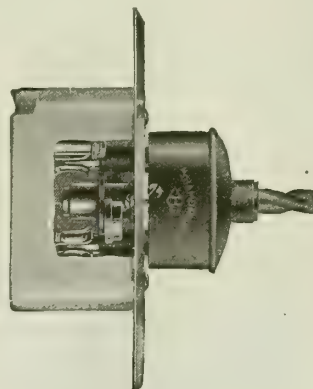


Front View, Mechanism Enclosed

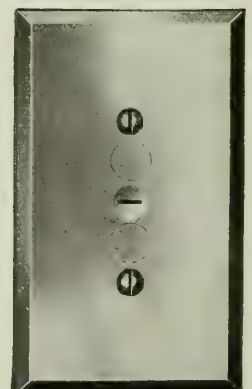


Side View, Showing Enclosed Mechanism

PUSH BUTTON SWITCH



RECEPTACLE WITH PLUG INSERTED



RECEPTACLE PLATE WITH PLUG WITHDRAWN

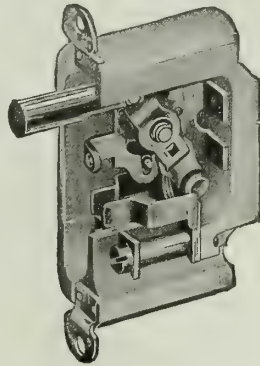


**"Diamond H" Automatic Door Switches.**

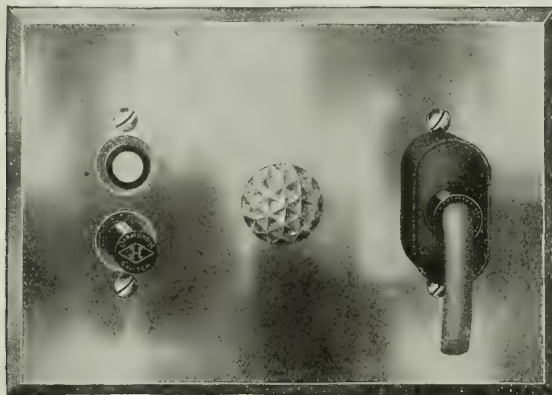
These switches are made in two types: No. 601 Light "On" with door open, and No. 602 Light "Off" with door open.



No. 602 with Face Plate

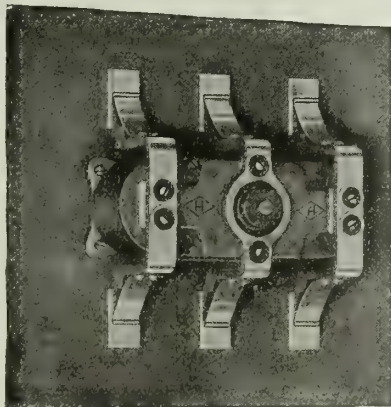
No. 602 Showing Mechanism  
AUTOMATIC DOOR SWITCHES**Combination Plates.**

Plates can be furnished in any combination style desired. The illustration shows plate mostly used where heating units are installed. The bullseye indicates by its light when current is entering the iron or other appliance attached.

Push Button Switch      Indicating Bullseye      Automatic Receptacle  
COMBINATION PLATE**"Diamond H" Remote Control Switches.**

Located where the circuit is to be opened and closed. Push button may be located wherever convenient at any distance from the switch; or, if desired, several push buttons may be used to operate the same switch from different locations. These switches are useful for controlling small motors, or groups of sign lamps, as well as for the service mentioned above, and are savers of time and trouble wherever used.

Sizes range from 25 to 300 amperes, 250-volt D. C. or 440-volt A. C. 2, 3 or 4 poles.



TYPE F "DIAMOND H" REMOTE CONTROL SWITCH

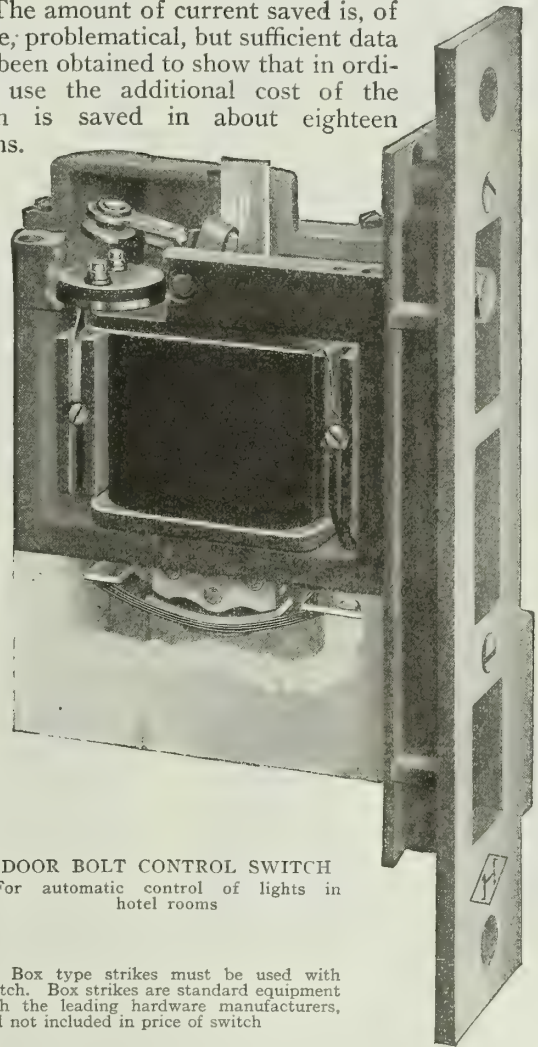
**"Diamond H" Door Bolt Control Switch.**

Hotel guests, when leaving their rooms, frequently leave lights burning. To stop this waste of current, the "Diamond H" hotel door switch was designed and its use adopted by many leading hotels throughout the country.

It is installed in a special conduit box in the jamb of the corridor door back of the lock strike, and is wired in series with a push button switch in the room. The jamb switch is operated by the bolt in the door lock, which is used when locking the door from the corridor side; but the door being locked from the room side does not operate the switch, as a separate bolt is used.

When the door is locked from the corridor side, the switch opens and all lights are extinguished, but unlocking the door immediately relights them. The lights are always under control of the occupant of the room when the door is not locked from the corridor side.

The amount of current saved is, of course, problematical, but sufficient data have been obtained to show that in ordinary use the additional cost of the switch is saved in about eighteen months.

DOOR BOLT CONTROL SWITCH  
For automatic control of lights in hotel rooms

Box type strikes must be used with switch. Box strikes are standard equipment with the leading hardware manufacturers, and not included in price of switch

**Installations.**

A few representative installations of door bolt control switches are as follows:

New Morrison, Chicago, Ill.	Hotel Statler, Detroit, Mich.
Blackstone, Chicago, Ill.	Hotel Statler, Cleveland, Ohio
St. Paul, St. Paul, Minn.	Endicott, New York, N. Y.
Hotel Tyler, Louisville, Ky.	St. Francis Hotel, San Francisco, Cal.
Post Tavern, Battle Creek, Mich.	Hotel Tuller, Detroit, Mich.
Phoenix Hotel, Lexington, Ky.	Davenport Hotel, Spokane, Wash.
Utah Hotel, Salt Lake City, Utah	Hyde Park Hotel, Chicago, Ill.
Claypool Hotel, Indianapolis, Ind.	

ESTABLISHED 1891

# THE HART & HEGEMAN MFG. CO.

## Electric Switches, Receptacles and Accessories

342 Capitol Avenue  
HARTFORD, CONN.

### Products.

"H & H" SWITCHES: Push Button, Rotary, Heater, 600-volt, Battery, Automatic Door, Pendent, Momentary Contact; FLUSH PLUG RECEPTACLES, PILOT LAMP RECEPTACLES.

"PAISTE" SOCKETS, RECEPTACLES, ROSETTES, PLUGS, CUT-OUTS.

Wall Cases; Panelboards and Panel Boxes; Fittings for iron conduit and for metal and wooden moulding.

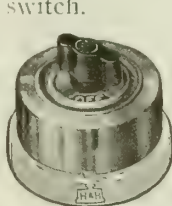


TRADE-MARKS

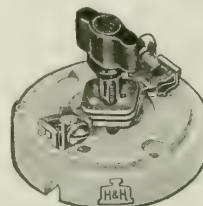
### "H & H" and "Hart" Snap Switches.

These snap switches have a heavy brass sleeve enclosing and protecting the spring and strengthening the entire mechanism. Very large metal plates on bottom and top of the base are used for supporting the spindle. This gives a wide bearing which takes from the porcelain the strain of the yanking and twisting received by the spindle.

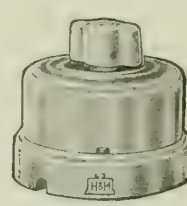
Where moisture or fumes will tarnish metal covers, specify "H & H" switches with porcelain covers. They also prevent users from getting shocked should moisture carry current to cover of switch.



"H & H" No. 220  
Single Pole Indicating  
Diam. 2 1/4 ins.  
5 amps., 125 volts



"H & H" No. 21  
Single Pole Plain  
Diam. 2 1/4 ins.  
10 amps., 125 volts



"H & H" No. 2626  
Single Pole Plain  
Diam. 2 3/4 ins.  
5 amps., 125 volts

### "H & H" SNAP SWITCHES

Made in single and double pole, 3-way, 4-way, triple pole, double pole, double throw and electrolier switches, giving a great many different controls. Types may be indicating or plain, with solid bases for concealed work or slotted for neat wiring. Special bases for wood moulding, conduit fittings, or metal moulding.

### "H & H" Push Button Switches.

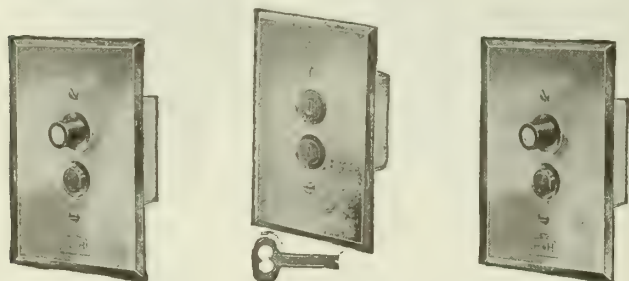
Push button switches are now made in types to secure all kinds of control. The "H & H" electrolier switches, which are used to light two or three circuits separately or at the same time, look exactly like standard switches, so that uniformity is secured on an installation. "H & H" plates for flush switches are solid with panel bevel, or pressed out of brass sheets. Specifications should state which are to be used.

"H & H" push switches have been installed in a large proportion of the finest office buildings, hotels, clubs, residences, and other edifices and have a splendid record for service and durability. They are regarded as a standard by most of the leading architects and engineers.

The initials "H & H" are on the top of the black button of all genuine "H & H" switches.

Where light is to be controlled from two different points, as when a hall light is to be controlled from both top and bottom of stairway, use 3-way switches. For each additional point of control, use a 4-way switch.

An electrolier switch is used to light several sets of lights, either separately or together.



"H &amp; H" No. 2081

"H &amp; H" No. 2081-L

"H &amp; H" Electrolier switch

### "H & H" PUSH BUTTON SWITCHES

Type	Standard	Lock	125 volts	250 volts	Electrolier switch
Single pole...	No. 2081	No. 2081-L	10 amps.	5 amps.	No. 2967 1, off; 1 and 2, off; 1 and 2 and 3, off
Double pole.	No. 2082	No. 2082-L	10 amps.	10 amps.	No. 2968 1, off; 1 and 2, off
3-way.	No. 2083	No. 2083-L	10 amps.	5 amps.	No. 3264 1, off; 2, off; 1 and 2, off
4-way	No. 2084	No. 2084-L	10 amps.	5 amps.	

Plates, 2 3/4 by 4 1/2 ins., or for new work only, 2 1/4 by 4 ins. For gang plates add 1 1/2 ins. to width for each switch.

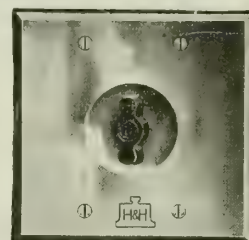
Special single pole switch (6 amps. 125 volts) has plates 1 3/8 by 2 1/2 ins. Plates are furnished either square or round corners.

Finish is brush brass. Small extra charge for other finishes to match hardware or background. White enamel is very attractive for tiled walls.

### "H & H" Rotary Flush Switches.

Rotary flush switches are furnished in standard sizes in all types. Plates are 2 3/4 by 4 1/2 ins. For finishes, see Push Button Switches.

30 - AMPERE, 250 - VOLT — These switches are used where an attractive switch is required for controlling a heavy current, as for a stationary vacuum cleaner. Plate is 4 1/2 by 4 9/16 ins., furnished single or double pole, plain or indicating.



"H & H" DOUBLE POLE PLAIN ROTARY FLUSH SWITCH  
30 amps., 250 volts

### "H & H" Automatic Door Switches.

Door switches automatically turn lights on and off in dark closets when doors are opened and closed. This gives light when it is needed and prevents wasted current from carelessness. The self-adjusting mechanism of "H & H" door switches keeps them working correctly when the doors shrink in dry weather.



### DATA, "H & H" DOOR SWITCH

Single pole, 6 amps., 125 volts; 3 amps., 250 volts.

No. 2022. Light on when door is open.

No. 2023. Light on when door is closed.

The shell of the switch is of sheet steel instead of porcelain.

Dimensions of plate, 3 3/4 by 1 1/4 ins. Mortise required, 2 3/8 by 1 1/8 ins. by 1 1/4 ins. deep

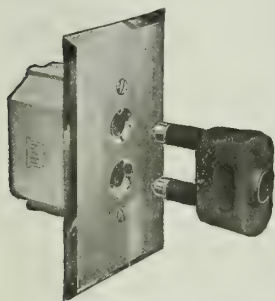
"H & H" DOOR SWITCH



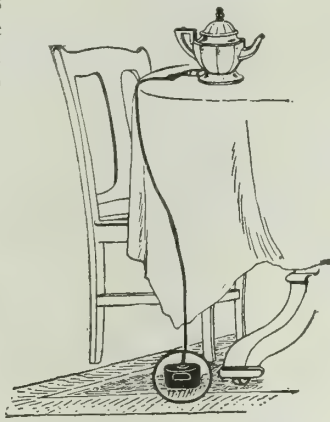
**"H & H" Plug Receptacles.**

Shutters automatically close the openings of "H & H" plug receptacles when the plug is out, preventing curious little children from injuring themselves. The shutters also prevent dust, water and other foreign matter from coating the contacts.

These receptacles are also used in the floor, under a rug or carpet. The weave in the carpet is opened sufficiently for the two prongs to be inserted. As the prongs are insulated down to the tips, there is no danger of short circuiting.



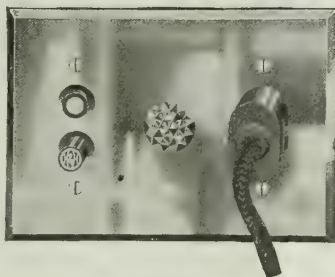
"H & H" NO. 2034 PLUG, "H & H" NO. 2034 RECEPTACLE PLATE AND RECEPTACLE



USED UNDER RUG OR CARPET

**"H & H" Warning Light Receptacle.**

The cut-glass bullseye glows red when the current is on. Where heating devices are connected, and on circuits where lights might be unnoticed for hours, as in attics or cellars, it pays to install an "H & H" warning light receptacle.



SWITCH, WARNING LIGHT AND ATTACHMENT PLUG

It may be installed in a "single" plate or with switches and receptacles as illustrated.

**"Paiste" Porcelain Sockets.**

"Paiste" porcelain sockets do not tarnish from dampness as do brass sockets, and are therefore especially adapted for use in bathrooms, laundries, lavatories, cellars, vaults, and other damp places. These sockets are exceptionally neat and attractive looking. They harmonize with glistening white tile and porcelain plumbing fixtures, and enhance the general appearance of brightness and cleanliness.

When porcelain sockets are used, there is no danger of getting shocked from stray currents if the hands and feet happen to be wet. In many cities, porcelain sockets are the only kind permitted in bathrooms, etc.

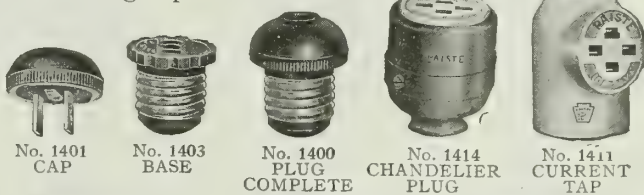


ILLUSTRATING "PAISTE" PORCELAIN SOCKET

**"Paiste" Standard Attachment Plugs and Receptacles.**

These are called standard, because they are the type adopted by a number of manufacturers, so that all makes of standard plugs will fit all standard receptacles. Many manufacturers of electric lamps, fans and heating devices using cord connections have also adopted these standard plugs. As the advantages of standardization become more widely known, these receptacles and plugs will be used almost universally. They are also popular with users, because it is so much easier to *push* a plug in than to *screw* it in.

To make an installation standard and most satisfactory, specify "Paiste" standard receptacles. "Paiste" plugs, as well as other makes of standard plugs, fit these receptacles. "Paiste" plugs have a fiber washer covering the interior of the cap, hiding wire ends and making a very neat looking cap.



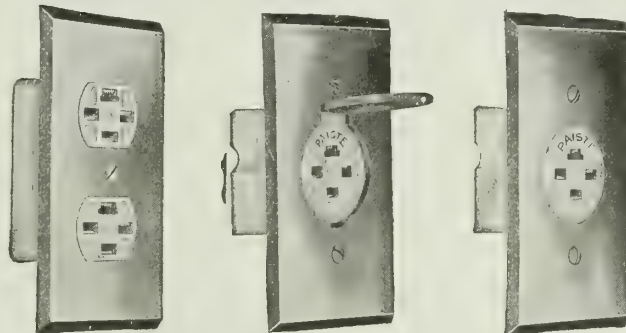
No. 1401 CAP

No. 1403 BASE

No. 1400 PLUG COMPLETE

No. 1414 CHANDELIER PLUG

No. 1411 CURRENT TAP



No. 1482 with No. 1485 Plate

No. 1440 with No. 1709 Plate

No. 1430 with No. 1710 Plate

"PAISTE" RECEPTACLES AND PLATES



No. 1454 ROUND PLUSH RECEPTACLE

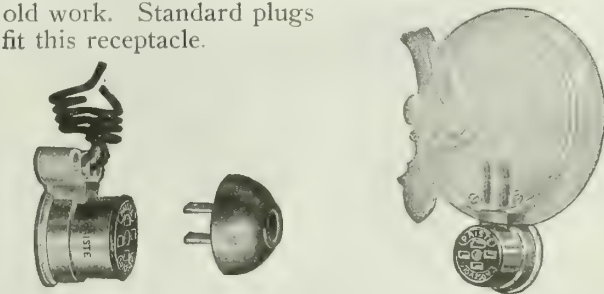
No. 1447 FOR OPEN CLEAT WIRING

No. 1449 FOR CONCEALED WIRING

**"Paiste" Canopy Plug Receptacle.**

This canopy receptacle is used to secure a neat looking plug outlet at any wall fixture. A small piece is cut from the edge of the canopy for the neck of the receptacle. The wires of the receptacle are connected to the bracket wires.

Any finish can be obtained to match the fixtures. It is the easiest plug receptacle that can be installed on old work. Standard plugs fit this receptacle.



"PAISTE" CANOPY RECEPTACLE NO. 1416, COMPLETE WITH PLUG

CANOPY RECEPTACLE UNDER CANOPY OF WALL BRACKET

# HARVEY HUBBELL, INC.

## Manufacturers of Electrical Specialties

MAIN OFFICE AND FACTORY  
BRIDGEPORT, CONN.

### BRANCH OFFICES

NEW YORK, 30 East 42d Street  
CHICAGO, ILL., 318 West Washington Street  
MONTREAL, TORONTO, VANCOUVER AND WINNIPEG, R. E. T. PRINGLE, LTD.

SAN FRANCISCO, CAL., 612 Howard Street  
DENVER, COLO., 231 Fifteenth Street

### Products.

Approved WIRING DEVICES, including HUBBELL PLUGS, RECEPTACLES and SOCKETS.

### Hubbell Interchangeable Plugs and Receptacles.

All Hubbell receptacles of every size and shape have the same form of slots to take both polarized and non-polarized caps.

Any Hubbell cap will fit any Hubbell receptacle. The Hubbell line constitutes a completely interchangeable system of electrical connections, suited to buildings of any size or character. Years from now, Hubbell receptacles will be as efficient and modern, mechanically and electrically, as they are today, as the line is permanently standardized. Approval by architects and building owners has made Hubbell plugs and receptacles the universal standard. They have a longer record of service and are installed in more buildings than any other make. The line is complete: flush receptacles for wall and baseboard; porcelain types for cleat, concealed and moulding wiring; special bases for lighting fixtures, etc.

CONCEALED CONTACTS FOR SAFETY—Safety is the



first essential in a plug or receptacle. Hubbell safety is assured by the following original and patented features: Narrow blade slots, to exclude everything but the cap blades; separate arcing chambers; concealed con-



CONCEALED CONTACTS

tacts, deeply buried in porcelain, hidden from sight and touch. Arcing, shocks and short circuits are impossible when making or breaking connections.



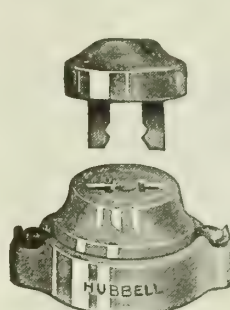
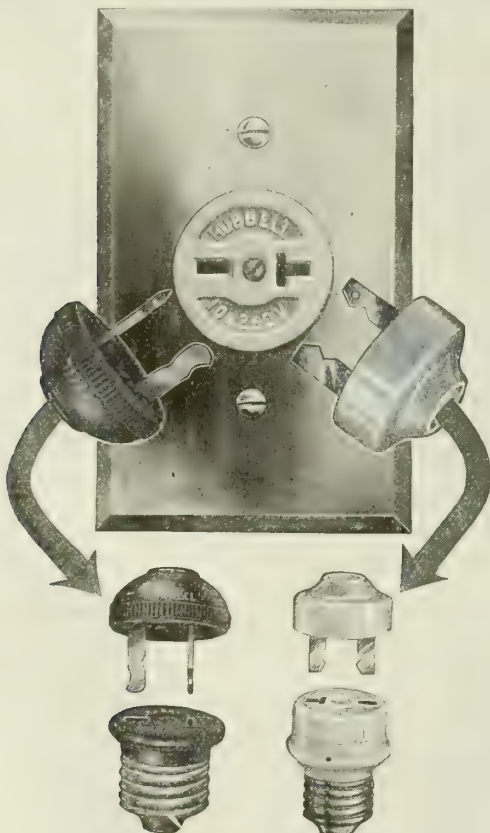
DUPLEX RECEPTACLE  
No. 6257  
Plate No. 6258



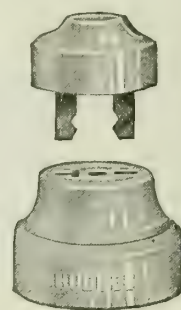
RECEPTACLE WITH LIFT COVER  
No. 5498



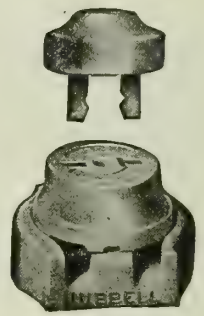
THREE-WIRE RECEPTACLE  
No. 6148



Cleat Base  
No. 5512



Concealed Base  
No. 5426  
WALL RECEPTACLES  
6 amperes, 250 volts



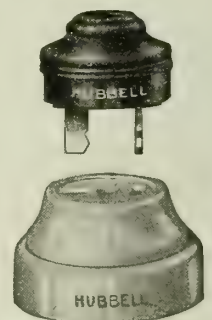
Moulding Base  
No. 5540



No. 5551



POLARIZED RECEPTACLES  
20 amperes, 250 volts



No. 5557

Plug No. 6915

Plug No. 5406

HUBBELL INTERCHANGEABLE PLUGS AND RECEPTACLES  
The Standard Line



**Hubbell Sockets.**

Easy wiring, simplicity, rugged strength, variety and beauty of finishes are prominent advantages of Hubbell sockets.

Standard pull, key and keyless sockets are assembled in three types of interchangeable shells. The interchangeable features enable quick, perfect attachment of any type of Hubbell shell to any corresponding class of ceiling, wall or fixture base, or pendent cap.

For twenty-one years we have specialized in producing the highest quality sockets for fixture, surface and outlet work.

All Hubbell sockets are thoroughly tested and have current capacity in excess of established requirements and ratings.

The pull socket is a Hubbell invention and is recognized and approved as standard of its class.

**STRAIN RESISTANCE OF HUBBELL SOCKETS**—In actual test, Hubbell sockets have sustained a dead weight of over 800 lbs. without damaging the shells.

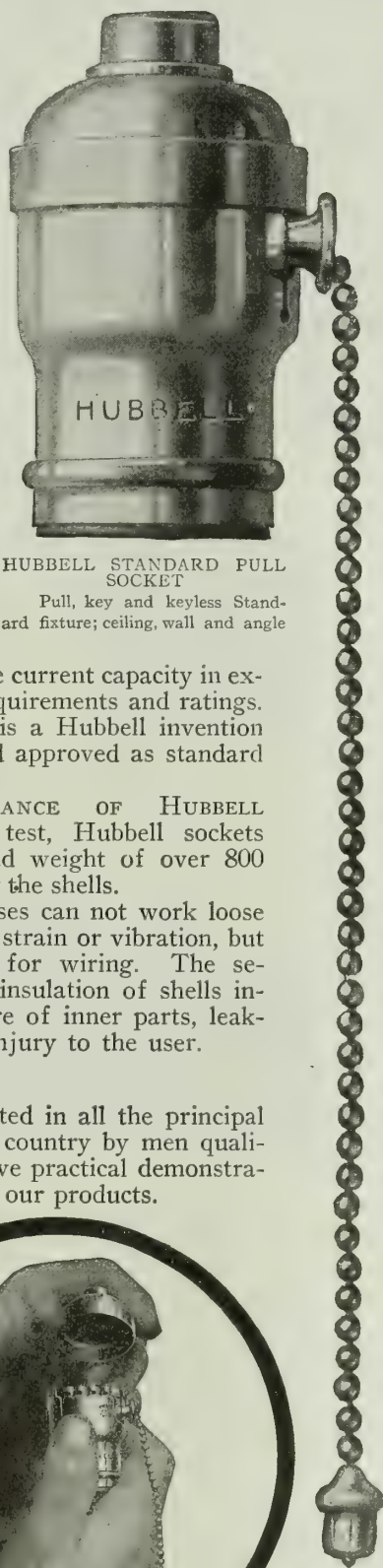
The caps and bases can not work loose or part under weight, strain or vibration, but are easily separated for wiring. The security and thorough insulation of shells insures against exposure of inner parts, leakage of current, and injury to the user.

**Co-operative Service.**

We are represented in all the principal cities throughout the country by men qualified to explain and give practical demonstrations of the merits of our products.



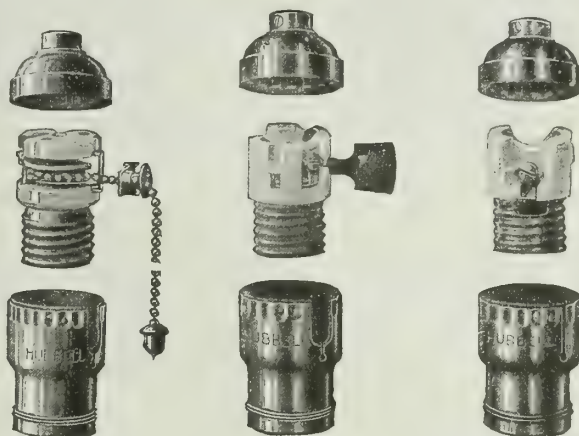
**HUBBELL INTERCHANGEABLE SOCKETS**  
Showing simple method of attaching shell to any corresponding class of cap



**HUBBELL STANDARD PULL SOCKET**

Pull, key and keyless Standard fixture; ceiling, wall and angle

We shall be glad to confer either directly or through our representatives with architects, engineers and contractors on any phases of the use of Hubbell wiring devices.



Pull Socket  
No. 3618

Key Socket  
No. 3664

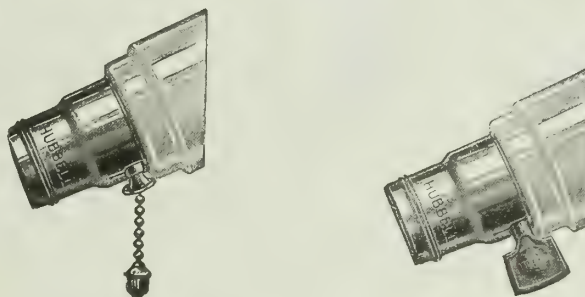
Keyless Socket  
No. 3667

**HUBBELL STANDARD SOCKETS**

No. 3731

No. 3732

No. 3736

**WALL SOCKETS**

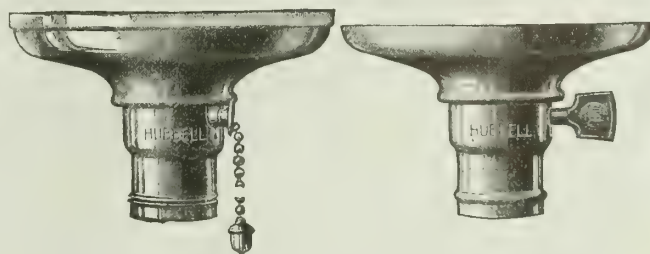
No. 3746

No. 3747

**ANGLE SOCKETS**

No. 3885

No. 3740



No. 3880

No. 3878

**CEILING SOCKETS**

# THE TRUMBULL ELECTRIC MFG. CO.

PLAINVILLE, CONN.

## SALES OFFICES

BOSTON, MASS., 76-78 Pearl Street  
NEW YORK, N. Y., 114 Liberty Street  
Telephone, Rector 5321

PHILADELPHIA, PA., 1017-19 Race Street  
SAN FRANCISCO, CAL., 595 Mission Street  
CHICAGO, ILL., 40 South Clinton Street

### Products.

KNIFE SWITCHES (all types enclosed and otherwise), PUSH and SNAP SWITCHES, PANEL-BOARDS and CABINETS, SWITCHBOARDS.

Cut-outs, Rosettes and various Wiring Accessories.

Members of the Rice Leaders of the World Association.

### Knife Switches.

The general design of a knife switch and its conforming to the recommendations of the National Board of Underwriters is but a part of its efficiency.

The real quality of a switch lies in its workmanship and adjustment. The underwriters specify the size of copper and the spacings necessary, but it is up to the manufacturer to design and incorporate certain refinements that give strength to the hinge posts, handle, blade ends, clips and other parts throughout, and to adjust the current carrying parts so a perfect contact is made and no current is lost.

All our current carrying parts are of pure hard drawn copper, having a current density rating of 1000 amperes per sq. in. of copper, sliding contacts being rated 75 ampere per sq. in.

Our switches because of careful adjustment and the use of more than ample metal will carry 100% overload.

SPECIFICATION DATA—(1) Knife switches should meet all the requirements of the National Board of Fire Underwriters.

(2) Switch blades should be ground in.

(3) Blades should have strong reinforcing blocks at ends fastened in grooves in fiber cross bar.

(4) Contact surface of all lugs should be milled.

(5) Contact posts should be equipped with an auxiliary split spring washer which provides a yielding though firm pressure of post against blade, assuring a positive contact on entire area.

(6) Switch handles should have a ferrule of heavy steel extending over tenon of handle so the strain will not come on the handle stud or screw and cause it to bend or break.

Handles should be of solid composition, not of wood; and the screw should be embedded in the handle with shoulder of stud acting as a stop, insuring a uniform length of projecting stud and acting as lock washer to prevent crew from backing out of handle.

Handle should be tested at 2000 volts for leaks.

(7) Hinge rivets on all switches 100 amperes and below should be spun over; above 100 amperes should be provided with a nut having a cross set screw. A



TRADE-MARK

finely tempered spring washer should be used.

POINTS TO NOTE—Switches rated 800 amperes and above have multiple blades. Single blades on such switches are special.

The 250-volt D. C. and 500-volt A. C. fuseless switches are identical (except 30 amperes). All have low jaws.

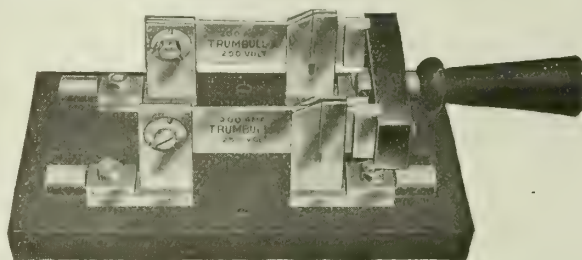
The 500-volt fusible switches take 600-volt fuses. All N. E. C. standard fusible and all double throw front connection switches have high jaw.

Back connection fusible switches with low jaws are largely used on switchboard work, but high jaws can be furnished.

The national code requires that switches designed for over 250-volt D. C. be provided with quick break attachments above 100 amperes and recommend them on 100 amperes and below.

Double break provided for all of the above switches when specified.

The 1-, 2- and 3-pole switches, 800 amperes and above, and all 4-pole switches are regularly equipped with spade handles.



FRONT CONNECTION, TYPE "A" SWITCH



SPLIT  
SPRING  
WASHER  
IN POST

Volts	Current	SINGLE AND DOUBLE THROW										Fuse	
		Pole				Finish							
		Direct	Alternate	Single	Double	3-way	4-way	Plain	Polished	None	Top	Bottom	N.E.C. Std.
250	x	x	x	x	x	x	x	x	x	x	x	x	
500	x	x	x	x	x	x	x	x	x	x	x	x	
251-600	x	x	x	x	x	x	x	x	x	x	x	x	

NOTES

Alternating Current Switches

(1) No fuse—250-volt D. C. and 500-volt A. C. switches are identical except 30 ampere, which requires lugs for 500-volt A. C. and no lugs for 250-volt D. C.

(2) Fusible—500-volt A. C. switches have separate lists (250-volt switches, 600-volt fuses). 501-600-volt A. C. switches are same as 251-600-volt D. C. switches.

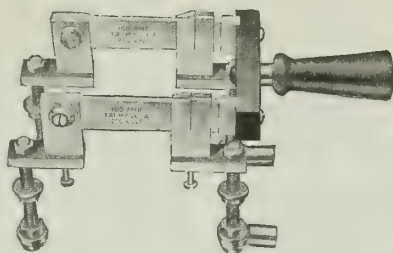
Volts	D. C.	A. C.	AMPERAGE OF SWITCHES LISTED ABOVE											
			30	60	100	200	*300	400	600	800	1000	1200	1600	2000
250, no fuse.	x		x	x	x	x	x	x	x	x	x	x	x	x
500, no fuse.	x		x	x	x	x	x	x	x	x	x	x	x	x
250, fusible..	x		x	x	x	x	x	x	x	x	x			
500 fusible.	x		x	x	x	x	x	x	x	x	x			
251-600...	x		x	x	x	x	x	x	x					

\*No fuse only.

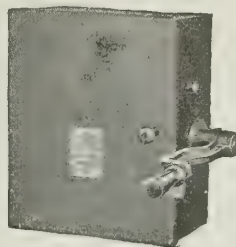


BACK CONNECTION TYPE "A" SWITCHES—Made in exact duplication of front connection line.

SPECIAL SWITCHES—Made to specification. Back or front connection.

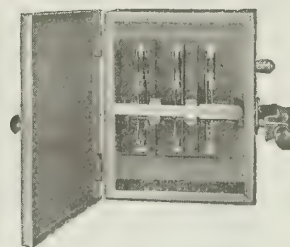


BACK CONNECTION, TYPE "A" SWITCH



Box Closed

"SAFETY SERVICE"



Box Opened

"SAFETY SERVICE" EXTERNALLY OPERATED MOTOR STARTING SWITCHES

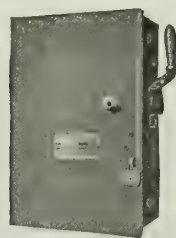
### "Circle T" "Safety Service" Switches.

This is the name under which our knife switches in externally operated boxes are classified.

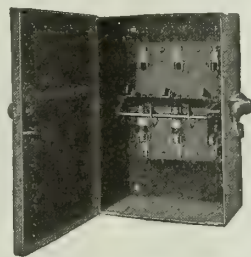
Exposed knife switches present a great danger from inexperienced handling.

A switch in an ordinary iron or steel box is safe as long as box is closed, but should be opened only by an experienced person.

Externally operated switches can be opened and closed by any one and when so constructed that the box can never be opened on a live closed switch it is possible for any one to renew fuses without danger.



Box Closed



Box Open

"CIRCLE T" "SAFETY SERVICE" EXTERNALLY OPERATED ENTRANCE SWITCH

SPECIAL POINTS—These special points make our externally operated switches safe:

(a) Box can not be opened until switch is in "off" position.

(b) A catch prevents switch from being connected when box is open. The closing of box releases catch and switch can be closed. Catch can be manipulated when necessary to test line with cover open.

(c) Box can be locked and sealed when switch is in open position.

(d) Box is fully equipped with knockouts on each end and side and in 30-ampere sizes on back for rear wiring.

(e) All are quick break (except 30 amperes 125 volts, which are furnished with or without quick break).

### Types of "Safety Service" Switches.

(1) SLATE BASE—Regular service line, fusible top or bottom (all for N. E. C. Standard fuses.) 30-400 amperes. 250 volts, 600 volts, 500 volts, A. C. 1-, 2-, 3- and 4-pole. Fusible and unfused. Single and double throw.

(2) PORCELAIN BASE—30 amperes only. 125 volts, for plug fuses. 250 volts for N. E. C. standard fuses. 1-, 2-, 3- and 4-pole. Fusible top or bottom.

(3) MOTOR STARTING—Starting end unfused. Running end fusible. 30-100 amperes. 2-, 3- and 4-pole. 250 volts, 600 volts, and 500 volts, A. C.

Handle is held by operator in starting or in fused end until speed is up. When handle is released a strong spring automatically throws handles into running or fused end.

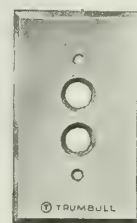
Box can not be opened until switch is in "off" position. Quick break prevents any danger of arc regardless of how slowly operator may open the switch.

### Push Button Switches.

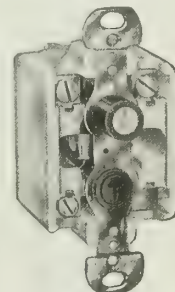
"Fewpart," 5 amperes 250 volts, 10 amperes 250 volts, single pole and 3-way. Standard line in same voltage in single or double pole, 3- and 4-way.

The "Fewpart" switch is equally as good as the standard line, but is not made in 2-pole or 4-way. It costs considerably less and is guaranteed by this company as second to none of its class in action and strength both electrically and mechanically.

Plates are single ( $4\frac{1}{2}$  by  $2\frac{3}{4}$  ins.), or in gangs for two ( $4\frac{1}{2}$  by  $4\frac{3}{16}$  ins.), three ( $4\frac{1}{2}$  by  $6\frac{3}{8}$  ins.) or four ( $4\frac{1}{2}$  by  $8\frac{3}{16}$  ins.) switches.



NO. 211. PLATE



NO. 223. THE "FEWPART" PUSH BUTTON SWITCH

### Snap Switches.

Made 1- and 2-pole, 3- and 4-way, indicating and non-indicating pony, medium, large sizes, wing or round handles.

Metal or porcelain covers. Lock attachments can be furnished.



NO. 404. ALL-METAL COVER SNAP SWITCH



NO. 427. PORCELAIN COVER SNAP SWITCH

DATA, TRUMBULL SNAP SWITCHES

Sizes and types	Diam. of base	Single pole	Double pole	3-way	4-way	Amperes					Volts	
						1	2	3	5	10	125	250
Pony size	2 ins.	x							x		x	
		x						x			x	
				x				x			x	
Medium size	2 1/4 ins.	x							x		x	
		x						x			x	
			x					x			x	
Large size	2 1/2 ins.	x							x		x	
		x							x		x	
			x						x		x	
Metal covered base	1 13/16 ins.	x							x		x	
		x						x			x	
			x					x			x	

**Electrolier Switches.**

In 2 and 3 circuits, 5 amperes, 125 volts; 3 amperes, 250 volts. Outside diameter of base,  $2\frac{1}{4}$  ins.

DATA, ELECTROLIER SWITCHES

Electrolier switches	First turn connects current	Second turn connects	Third turn connects	Fourth turn off
2-circuit.....	1	2	1 and 2	off
3-circuit.....	1	1 and 2	1, 2 and 3	off

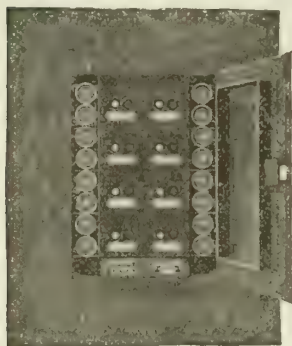
**Flush Receptacles, Plates and Attachment Plugs.**

Edison base flush receptacle or "standard" receptacle for "standard" plugs.

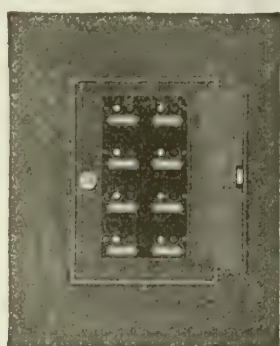
Standard plug caps are interchangeable with any "standard" receptacles or fittings.

RECEPTACLE  
COMPLETE WITH  
PLATENO. 792.  
STANDARD  
ATTACHMENT  
PLUGNO. 795.  
STANDARD FLUSH  
RECEPTACLE**"Safety Service" Panels and Cabinets.**

From the standpoint of safety and convenience Safety material should be specified in all electrical installation and particularly such as have to do with light and power control, whether in public or private buildings or in factories.



Both Doors Open



Safety Door Closed

"SAFETY SERVICE" PANELS AND CABINETS

Safety panels having no live parts at any time exposed can be opened by a child without danger to person or service.

These panels are equipped with two doors (door within a door). The inner door opens upon the push switches and need not be locked. The outer door opens upon the plug fuses and is to be locked, being accessible only to certain persons.

The base of the panel is of moulded, heatproof composition with a backing of  $\frac{1}{4}$ -in. "Transite," which has a much higher insulation resistance than any grade of slate or marble and is non-absorptive.

All copper parts are enclosed between the base

and back. The main lugs are covered by a remarkably efficient moulded section.

OFFICIAL APPROVAL—All "Circle T" panels and cabinets are examined and labeled under direction of the Underwriters' Laboratories, Inc.

**Standard Panels.**

Our catalogue lists a comprehensive line of standard panels. 3-2 and 3-3 wire of various types, 2 to 30 circuits.

Any sort of special panels will be built to specifications.

The company has a large box department and makes all boxes, fronts and cabinets.

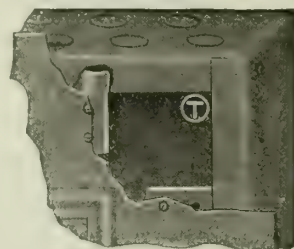
Our regular panelboards are made *with* or *without* fuses in branches or *with* or *without* switches in branches. If fuses are used, they can be plug or N. E. C. standard. If switches are used, they can be knife switches, push switches or snap switches.

The mains can be made (a) with lugs only (where fuses are not needed at the panel); (b) with fuses (protecting mains at the panel); (c) with switch fused or not fused (where it is desirable to cut off the line at the panel).

**Cabinets, Boxes and Fronts.**

Special attention is called to the time saving devices on panels and cabinets.

SWING CLAMP—Note the adjustable feature of the front by means of a swing clamp in place of screws. This permits interchange of fronts of same size and allows for adjusting a reasonable amount of deviation from perpendicular in installing box.



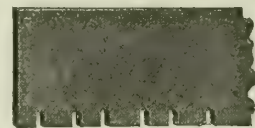
SWING CLAMP

ADJUSTABLE CORNER IRON—Panel and slate barriers are fastened together as a unit, and the slot in the foot of the corner iron allows the panel and barriers to be adjusted to front irrespective of box.

SLOTTED BARRIERS—The slate barriers instead of being drilled are slotted on the bottom so that wires can be connected and the barrier then set down over the wires. This reduces the labor, as barriers are not in position and can not interfere with terminals while connections are being made.



CORNER IRON



SLOTTED BARRIER

PATENTED CONDUIT HOLE CLOSER—The drilling of holes larger than  $\frac{1}{2}$ -in. on the job is a tedious proposition, so all boxes are regularly equipped for standard panels with our conduit hole closer as illustrated. By loosening two screws and placing the proper half circles together the box may be arranged for  $\frac{3}{4}$ -in., 1-in.,  $1\frac{1}{4}$ -in., or  $1\frac{1}{2}$ -in. steel conduit, or the hole may be closed entirely by placing blank ends together.

CONDUIT HOLE  
CLOSER

KNOCKOUTS—One end of each box is provided with a conduit hole closer (see preceding paragraph)



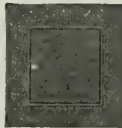
and from 4 to 8 knockouts for 1/2-in. steel conduit. The other end is equipped with as many knockouts as the greatest number of circuits on a panel that box will hold (i. e., a box that will hold a 10-circuit panel has 10 knockouts, etc.) Extra knockouts 2¢ each, net.

These last two features permit the shipment of boxes without giving thought to the conduit until they are received on the work.

Cabinets are made flush or surface type with or without gutter, fronts being of either steel or wood.



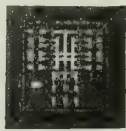
KNOCKOUTS



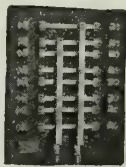
STEEL FRONT CABINET



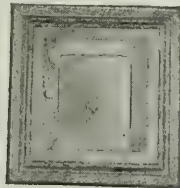
GRADE "C" BOX



GRADE "C" BOX AND PANEL



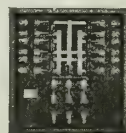
TYPE "E" PANEL



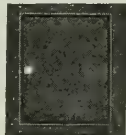
WOOD FRONT CABINET



GRADE "K" CABINET



GRADE "K" CABINET SHOWING PANEL



GRADE "M" CABINET



GRADE "M" CABINET SHOWING PANEL

DIMENSIONS IN INCHES OF BOXES AND PANELS

Heights .....	Box.....	13	14	15	17	18	19	20	21	22	24	25	27	28
	Panel.....	7	8	9	11	12	13	14	15	16	18	19	21	22
Heights .....	Box.....	29	30	32	33	34	36	37	38	39	40	42	43	44
	Panel.....	23	24	26	27	28	30	31	32	33	34	36	37	38
Heights .....	Box.....	46	47	48	50	52	54	56	58	60	62	64	66	
	Panel.....	40	41	42	44	46	48	50	52	54	56	58	60	
Widths.....	Box.....	15	17	19	21	23	25	26	28	30	32	34		
	Panel.....	9	11	13	15	17	19	20	22	24	26	28		

Depths, 4 1/2, 5 1/2 and 6 1/2 ins.

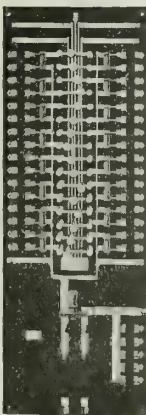
### Metering Panels.

Manufactured under the McWilliams and other patents. The Trumbull metering panels meet the most exacting requirements. They are made in all types, both 2 and 3 wires, with as many meter bars as required. All changes of meter control can be made without the use of any tool whatever, by unskilled help.

This is accomplished by unscrewing the insulated knob corresponding to the circuit number to be changed, and moving it along the circuit bar to the proper meter bar, where it should be tightened.

Quotations promptly furnished on receipt of complete data: number of circuits, number of metal loops, style of fuses and switching requirements.

In requesting quotations for cabinets to enclose meters and panel, a sketch should be furnished, showing general type required and size of meters.



METERING PANEL

### Panel Switches and Circuits.

Below are shown the various types of switches and

circuits used on our standard as well as all specially designed panelboards.

They point out the types of switches used and general construction.



Type "E," for N. E. C. Fuses, 3-30 Amp., Two-to-two Wire



Type "ES," for N. E. C. Standard Fusible Knife Switches, Three-to-two Wire



Type "P," for Plug Fuses, 3-30 Amp., Three-to-two Wire



Type "PS," for Plug Fusible Knife Switches, Two-to-two Wire



Type "H," for N. E. C. Standard Fusible Snap Switches, Three-to-two Wire



Type "T," for Plug Fusible Snap Switches, Three-to-two Wire

### TYPES OF PANEL SWITCHES

Also similarly arranged with push switches

### Push Switch for Panelboards.

Black composition cover. Distance between centers of branch bar contacts 1 3/8 in. in length, 1 1/2 ins. in width. Outside dimensions of cover, 3 ins. long, 2 ins. wide, 1 3/8 ins. high.



NO. 7478 PUSH SWITCH

### Switchboards.

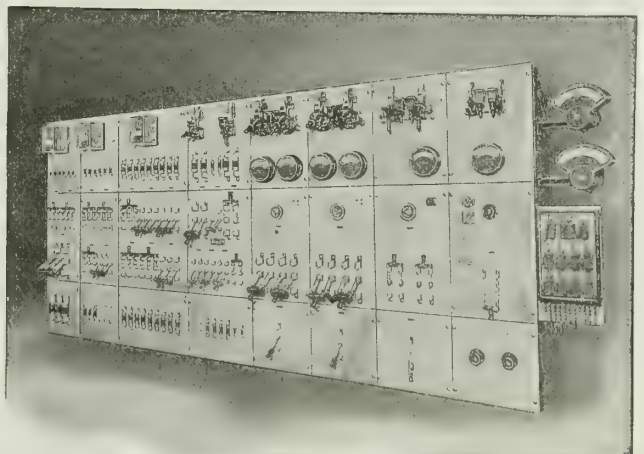
Owing to the great diversity of design in switchboard construction it is impracticable to present comprehensive data on the subject, further than the statement that this company is thoroughly equipped to design, build and erect any kind of switchboard desired for either direct or alternating current.

An efficient engineering department is maintained and our factory equipment is of the best.

Knife switches used are our regular type "A." Any make of indicating instruments, circuit breakers and oil switches can be supplied.

When drawings of switchboards are requested with quotations, they are charged for at actual cost and this charge is credited if the order is later placed with this company.

"Switchboard Bulletins" are published, that include a series of combined generator and feeder panels, covering combinations for ordinary use, which are of assistance in designing or figuring small boards. These will be sent to architects or engineers on request.



SWITCHBOARD AT CITY HALL ANNEX, BOSTON, MASS.  
Built for Hixon Electric Co., Boston, Mass.



# STEEL CITY ELECTRIC CO.

1207-1219 Columbus Avenue  
PITTSBURGH, PA.

## Products.

STEEL OUTLET BOXES and COVERS; CONDUIT BUSHINGS and LOCKNUTS; FLOOR OUTLETS; SECTIONAL and SOLID SWITCH BOXES.

Star Fixture Stems; Concrete Outlet Boxes; Campbell Plugs and Receptacles; Universal Insulator Supports.

All products are "National Code Standard."



TRADE-MARK

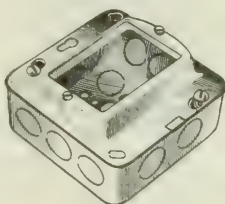
"box body" is frequently disturbed or set out of level; but this condition is taken care of automatically, as the "adjusting ring" simply dips deeper in groove in upper side of "box body," as shown in illustrations.

Another important feature is the universal application and adaptability of this principle of adjustment.

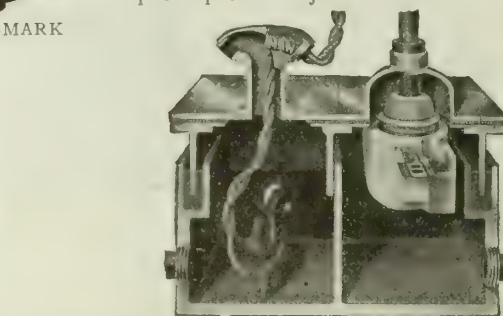
## Steel City Drawn Steel Outlet Boxes and Covers.

The line is complete, and designs embody all practical labor saving features, particularly the knockout plug, which is clean cut from box, except at the connecting neck or tie. This plug is securely held in place, but is easily removed and leaves a clean opening for the conduit. Gang boxes and covers are made in all sizes, of drawn steel instead of cast iron, making a stronger and neater equipment.

FINISH—Galvanizing is done *right* by the *sherardizing process*, insuring perfect protection against rust. Enameled finish also furnished.



OUTLET BOX AND SWITCH COVER



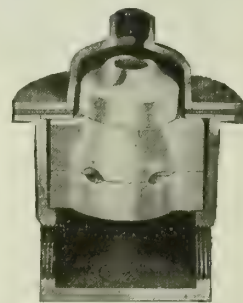
SECTIONAL VIEW OF NO. 442. FLOOR OUTLET WITH NO. 465 AND NO. 466 NOZZLES

The left section shows permanent connection and the right section is fitted with Freeman receptacle No. 4354 and Benjamin plug No. 903. Boxes up to six sections are furnished

RECTANGULAR GANG OUTLETS—These outlets are also designed to meet the necessity of furnishing several varieties of service from one source or outlet. They are furnished in 2 to 6 sections and with several styles of cover equipment. See illustration above.

NON-ADJUSTABLE TYPE—The No. 477 outlet successfully meets an urgent demand for a small outlet for residence and office requirements, especially where wood floors are laid. Can also be used in cement or similar floors.

FINISH—The iron and steel parts of all styles of floor outlets are galvanized *right* by the *sherardizing process*, insuring perfect protection against rust. All brass cover parts are polished.



SECTIONAL VIEW OF NO. 477. NON-ADJUSTABLE OUTLET

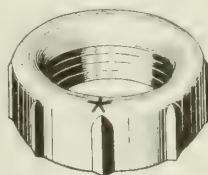
Showing special Hubbell receptacle, which eliminates use of strap and screws

## Fullman Star Conduit Bushings and Locknuts:

Fullman Star bushings are of original "rib" design for easy turning and tightening on conduit; made of malleable iron for strength, and will not break. Rounded edge protects insulation on wires. Extra thread gives secure hold on conduit.

LOCKNUTS— $\frac{3}{8}$ -in. to 1-in. sizes made of special composition steel. Larger sizes made of malleable iron with "ribs."

FINISH—All sizes of bushings and locknuts are galvanized *right* by the *sherardizing process*, insuring perfect protection against rust.



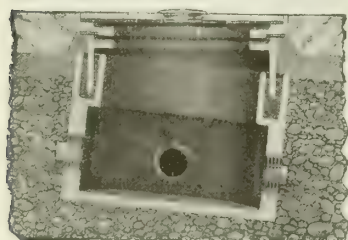
$\frac{1}{2}$ -INCH BUSHING



$\frac{1}{2}$ -INCH LOCKNUT

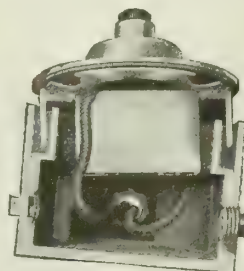
## Fullman Watertight Floor Outlets.

ADJUSTABLE TYPES—The main feature of the adjustable types is method of adjusting cover quickly and accurately, so that it aligns with finished floor. The



SECTIONAL VIEW OF NO. 400 OUTLET AND NO. 413 BRASS FLANGE RING

Installed in a modern fireproof floor. Note how the cover plate aligns perfectly with the finished floor



SECTIONAL VIEW OF NO. 401 OUTLET AND NO. 466 BELL NOZZLE WITH BRYANT RECEPTACLE NO. 1363 AND PLUG NO. 1110 MOUNTED ON LUGS OF ADJUSTING RING

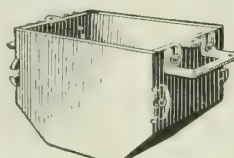
## Steel City Switch Boxes.

Sectional and solid types. Interlocking lugs hold sides secure and rigid and provide for quick removal of sides or assembling into gangs.

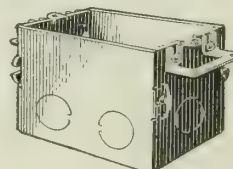
Provided with clean cut knockouts, which are removable *inwardly* or *outwardly*.

Both side walls of sectional boxes are removable, and when assembled into gangs there are no obstructing partitions between sections.

Our loom clamps are guaranteed to grip the loom securely, and they do not obstruct interior of boxes.



NO. 750 SECTIONAL SWITCH BOX



NO. 810 SECTIONAL SWITCH BOX

## Catalogue.

Write for complete catalogue.



## ECONOMY FUSE & MFG. CO.

Manufacturers of Renewable Cartridge and Plug Fuses and Non-Renewable Indicating Fuses

Kinzie and Orleans Streets  
CHICAGO, ILL.

Complete Stock Carried by All Leading Jobbers

### Products.

ECONOMY RENEWABLE CARTRIDGE and PLUG FUSES.

"ARKLESS" NON-RENEWABLE INDICATING FUSES.

### Economy Renewable Fuses.

Economy fuses are made in three general types (ferrule, knife blade and plug) with a full line of capacity ranges for all commercial voltages. The fusible elements are of the "drop-out" renewal link type, accurately rated and of definite design. Every part of an Economy fuse is built on the "safety first" principle, which means that the design is right from an electrical standpoint, and that material entering into the construction of the completed fuse is the best that money can buy.

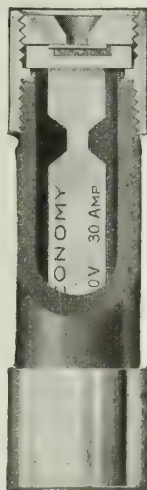
**ECONOMY FUSE SAVINGS**—There is 80% of fuse maintenance cost saved yearly, as compared to the cost of securing adequate protection by the use of old style, non-renewable fuses.

**ECONOMY FUSE USERS**—Users include industrial plants, large corporations, light and power companies, arms and munitions plants, powder mills, mining and smelting companies, department and large stores, publishing companies, flour mills, food product plants, hotels, theaters, public buildings, steamships, wireless stations ashore and afloat, and various departments of the United States Government.

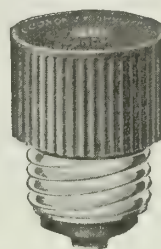
**WHY ECONOMY FUSES ARE USED**—Because Economy fuses cut yearly fuse costs 80% and furnish proper protection under all conditions of service. Unlike "one-time" fuses, which are discarded after having blown, Economy fuses are used over and over again to obtain complete protection against the fire and accident hazards of overloads, short circuits, and the effects of lightning discharges on electrical circuits.



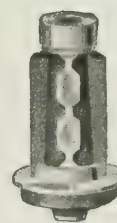
ECONOMY  
KNIFE BLADE  
FUSE  
Sectional view  
"Drop-out" re-  
newal link in  
place



ECONOMY  
FERRULE  
TYPE FUSE  
Sectional view



Full View



Unassembled  
View



"Drop-  
out"  
Renewal  
Link

### ECONOMY RENEWABLE PLUG FUSE

Of same standard of high quality as Economy renewable cartridge fuses

**"DROP-OUT" RENEWAL LINK**—It is the heart of an Economy fuse. It instantly restores a blown Economy fuse to its original efficiency. A stock of "drop-out" links, always on hand, represents only a small investment.



FERRULE TYPE "DROP-OUT" RENEWAL LINK



KNIFE BLADE TYPE "DROP-OUT" RENEWAL LINK

**SAFETY**—The use of Economy fuses in establishments where the fire hazard is great (powder factories, arms and munitions plants, chemical works, flour mills, etc.) and where "safety first" is the highest consideration (department stores, hospitals, schools, hotels, theaters, institutions, ships, railway cars, etc.) is the proof of their safety in use.

### "Arkless" Non-renewable Indicating Fuses.

We are also sole manufacturers of "Arkless," the non-renewable fuse with the "100% guaranteed indicator." For use on circuits not subject to frequent overloads.

### Samples.

Any capacities sent on request, provided they are to be used for comparison and tests. Ask for Catalogue 51 when ordering samples.

## EDISON LAMP WORKS

OF GENERAL ELECTRIC COMPANY

GENERAL SALES OFFICE

HARRISON, N. J.

DISTRICT SALES OFFICES

ATLANTA, GA.  
BOSTON, MASS.CHICAGO, ILL.  
CINCINNATI, OHIODENVER, COLO.  
NEW YORK, N. Y.

ST. LOUIS, MO.

PHILADELPHIA, PA.  
SAN FRANCISCO, CAL.

DALLAS, TEX., SOUTHWEST GENERAL ELECTRIC CO.

For other Sales Offices see General Electric Company's Sales Offices on Page 1167

**Product.**

EDISON MAZDA LAMPS.

**Lamps of Known Quality.**

Into every Edison Mazda lamp is built the cumulative results of 38 years' experience in the manufacture of nearly 1,000,000,000 lamps. Each Edison Mazda lamp is backed by Mazda Service, the world-wide, scientific service of the Research Laboratories of the General Electric Company, to lamp manufacturers maintaining the Mazda standard of quality.

**Types of Lamps and Their Applications.**

**EDISON MAZDA B LAMP**—Made in the familiar straight-side bulb, in sizes from 10 to 100 watts. This is the type used for all utility lighting where relatively low candlepower sources are required.

**EDISON MAZDA C LAMP**—Made in the pear-shaped bulb with the long neck, is more efficient than the *Mazda B* lamp in the larger sizes. It has practically replaced these for all classes of lighting where high or medium candlepower lamps are necessary. Sizes range from 75 to 1000 watts.

**EDISON MAZDA C-2 LAMPS**—Similar to the *Edison Mazda C* save that a specially determined blue-glass bulb is employed. This has the effect of modifying the emitted light to approximate daylight quality. These lamps, in sizes from 75 to 500 watts, find a special application where color comparisons under artificial light are essential. Store interiors and windows, art galleries, medical diagnoses, printing and lithographing plants, paint mixing, tobacco sorting, and similar industries demand such a quality of light.

**FOR ORNAMENTAL LIGHTING**—For ornamental lighting the *Edison Mazda B* lamps are made in *round bulb* and *tubular* shapes. These lamps, as well as any others, when used exposed should be frosted.

**CANDELABRA MAZDA LAMPS**—Made to imitate candle flames of various contours, fit in well with certain decorative interiors and operate satisfactorily on the ordinary house lighting circuits.

**CHRISTMAS TREE MAZDA LAMPS**—Many other decorative effects can be obtained by using the *Miniature Christmas Tree Mazda* lamps. These have specially shaped bulbs and are brightly colored to imitate birds, flowers, fruits, nuts, animals, etc.

**EDISON MAZDA FLOOD-LIGHTING**—One of the most recent innovations in lighting is the illumination of building exteriors, statues, open air fields, skating rinks, and the like, by projecting light from concealed sources. This has been popularly termed "flood-lighting." The Edison Mazda lamp with a specially constructed filament is especially well adapted for such service, requiring but little attention. When these are equipped with suitable parabolic reflectors they emit a very powerful beam of light. Several sizes of Edison Mazda Flood-lighting lamps are available.

**MISCELLANEOUS**—Very complete lines of lamps are standard for special classes of lighting, such as electric signs, street car and steam railway car interiors and headlights, street series circuits, automobiles, both gasoline and electric, stereopticons and moving picture machines.

**Prices, etc.**

Price data and other information on any of these lamps may be obtained from the most convenient district office noted above.

**Engineering Services Available.**

A corps of lighting experts is maintained by the EDISON LAMP WORKS of the General Electric Company at their main office, Harrison, N. J., and specialists on incandescent lamps are also to be found in the district and local offices. The business of the Illuminating Engineering Department is to co-operate with all customers on questions relating to lighting. The engineers have had wide experience in all fields of illumination, and the result of this experience is at all times available upon request.

There is no charge for this advice, as it is a part of the Edison Mazda Service.



# WESTINGHOUSE LAMP CO.

## Manufacturers of Incandescent Lamps

165 Broadway  
NEW YORK, N. Y.

FACTORIES: BLOOMFIELD, N. J.; NEW YORK, N. Y.; MILWAUKEE, WIS.; TRENTON, N. J.

### SALES OFFICES AND WAREHOUSES

ATLANTA, GA., Candler Building  
BALTIMORE, MD., 121 East Baltimore Street  
BOSTON, MASS., 10 High Street  
BUFFALO, N. Y., Ellicott Square  
CHICAGO, ILL., 111 West Washington Street  
CINCINNATI, OHIO, Traction Building  
CLEVELAND, OHIO, Sweetland Building  
COLUMBUS, OHIO, Interurban Building  
DALLAS, TEX., WESTINGHOUSE LAMP CORP., Cotton Exchange Building  
DENVER, COLO., Gas and Electric Building  
DETROIT, MICH., Dime Savings Bank Building

KANSAS CITY, MO., 1012 Baltimore Avenue  
LOS ANGELES, CAL., 815 Van Nuys Building  
MILWAUKEE, WIS., 3100 Center Street  
MINNEAPOLIS, MINN., Metropolitan Life Building  
NEW ORLEANS, LA., Maison-Blanche Building  
NEW YORK, N. Y., City Investing Building  
PHILADELPHIA, PA., Widener Building  
PITTSBURGH, PA., Union National Bank Building  
ST. LOUIS, MO., Boatmens Bank Building  
SAN FRANCISCO, CAL., First National Bank Building  
SEATTLE, WASH., Alaska Building  
SYRACUSE, N. Y., University Building

EXPORT SALES OFFICE: NEW YORK, N. Y., 165 Broadway

CANADA: CANADIAN WESTINGHOUSE COMPANY, LTD., Hamilton, Ont.

### Products.

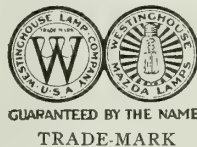
WESTINGHOUSE MAZDA LAMPS in every size and style for all lighting requirements.

### Description.

WESTINGHOUSE MAZDA incandescent lamps represent the highest attainment in the art of lamp manufacture, and have maintained that reputation for 38 years. They can be depended upon for satisfactory service under conditions of all kinds. They are the most efficient lighting units available, furnishing the maximum light at minimum cost for current.

### Sizes and Uses.

WESTINGHOUSE MAZDA lamps are made in all sizes from 2½ to 1000 watts for every standard voltage and ampere range. There are lamps for every conceivable use, including home lighting, store lighting, office lighting, factory and mill lighting, street lighting, steam and electric railway service, stereopticon service, and flood lighting.

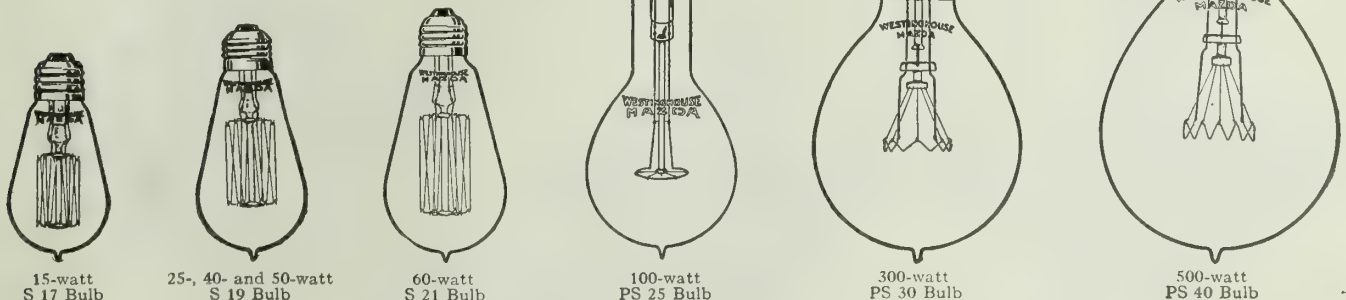


### Special Lighting Service.

The Commercial Engineering Department of the WESTINGHOUSE LAMP CO. has data and information on all kinds of lighting, and the services of this organization are available without charge. Special material covering different phases of lighting and decoration, in convenient form for architects, is prepared and can be supplied on request. The Westinghouse Incandescent Lamp Data Book contains definite information on dimensions of lamps, sizes and styles, with drawings to scale. This book is sent free on request.

### Prices and Discounts.

Complete information as to prices and discounts will be found in the Data Book, and further details may be obtained by application to the nearest sales office or to the general office of the company.



A FEW POPULAR SIZES OF WESTINGHOUSE MAZDA LAMPS  
(One-quarter actual size)

# BEARDSLEE CHANDELIER MANUFACTURING COMPANY

218 South Jefferson Street  
CHICAGO, ILL.

## Products and Services.

A complete line of CHANDELIERS and ORNAMENTAL BRONZES for every lighting requirement.

A staff of engineers, designers and metal workers is employed to plan and suggest suitable lighting equipment to conform to the motif of every requirement in architectural treatment. The designers and metal workers are exceptionally skillful in producing replicas of period designs and in creating appropriate forms to harmonize with unusual and exclusive architectural and decorative features.

## The Denzar.

The Denzar is made in a variety of styles and sizes to carry out a complete and harmonious plan of illumination for office buildings, public buildings, manufacturing plants, hotels, apartment buildings, hospitals, churches, assembly halls, lodge rooms, stores, etc. Adaptable to a wide range of heights and spacings, extreme variations in lighting requirements may be satisfactorily accommodated, while preserving absolute uniformity in appearance of a highly complex lighting installation.

Where the lighting problem involves areas of irregular outline and of many different dimensions, with demands for light intensities to provide correct illumination for operations of widely varying character, the Denzar range will undoubtedly provide the solution.

The Denzar design is scientifically correct. Full advantage may be taken of the high efficiency of the most modern light sources. The high intrinsic light values of these primary sources of illumination are concentrated and redirected so that maximum visual acuity is secured. The choice of materials of construction is such that all mechanical strains incident to the use of these modern lamps are compensated for, insuring maximum life of the entire equipment, with a minimum cost for maintenance. Canopies, stems, chain supports and bowls are interchangeable in plain and ornamented forms, thus affording means for satisfying any discrimination in taste to suit all practical and ornamental requirements. Reflecting surfaces and glassware are made from the finest ma-



terials obtainable; are of superior workmanship, and guaranteed against deterioration incident to the severest service.

All parts are carefully proportioned, insuring a handsome and dignified appearance.

Exterior finish is dust resistant and as easily kept clean as a bare lamp.

## Construction of the Denzar.

(1) METAL HOUSING—Made of steel. White porcelain enameled. Covers socket and holder, enclosing the upper part of the unit.

(2) YOKE—Made of heavy spring steel. Supports metal holder.

(3) METAL HOLDER—The reflecting dome and lower bowl are supported in this section. Outlets provided in its upper rim for the exit of superheated air.

(4) REFLECTING DOME—Made of opal glass. Gathers the upward rays of light, softens and distributes them. Permits just the right amount of light to filter through to the ceilings, preventing shadows, black rings and bright spots.

(5) AIR INTAKE—Permits plenty of cool air to circulate around the lamp. The interior of the bowl is highly polished and so shaped that any foreign matter entering will immediately gravitate toward the air intake and drop out.

(6) LOWER PART OF BOWL—Of the same glass as the upper part but finished with a hard, smooth, white, translucent, diffusing enamel. This diffuses the rays with practically no loss of light and eliminates all glare of the lamp.

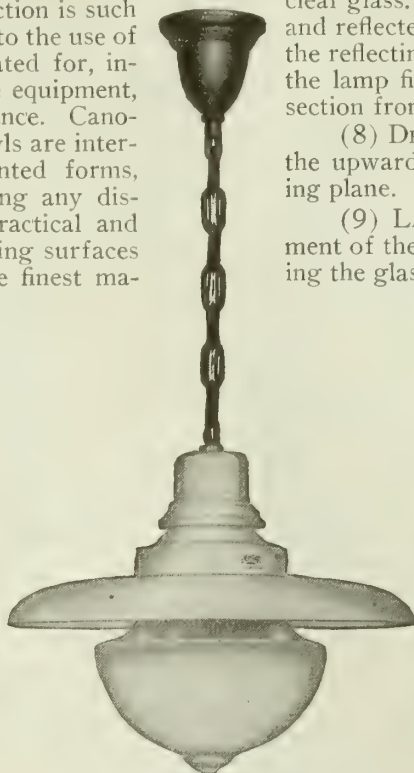
(7) UPPER PART OF BOWL—Of highly polished clear glass. This permits all upward rays from the lamp and reflected rays from lower part of the bowl to reach the reflecting dome in their full strength. No portion of the lamp filament can be seen through this clear glass section from any position.

(8) DEFLECTOR—Checks all wasteful light. Catches the upward rays and redirects them toward the working plane. Held in correct position by the yoke.

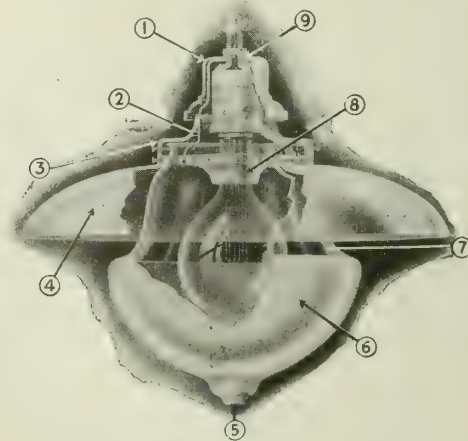
(9) LAMP ADJUSTMENT—Allows the easy adjustment of the lamp to the proper position, without removing the glassware or any part of the unit.



CEILING TYPE DENZAR



PENDANT TYPE DENZAR



CONSTRUCTION OF THE DENZAR



# LUMINOUS UNIT CO.

Manufacturers of Lighting Fixtures

ST. LOUIS, MO.

BRANCH OFFICES

NEW YORK, N. Y., 30 Church Street  
CHICAGO, ILL., 19 South Wells Street  
PHILADELPHIA, PA., 1007 Land Title Building  
BOSTON, MASS., 217 Old South Building

SAN FRANCISCO, CAL., 132 Lick Building  
ATLANTA, GA., 1313 Healey Building  
MINNEAPOLIS, MINN., Building Exchange Building  
CINCINNATI, OHIO, 515 Johnston Building

## Products.

LIGHTING FIXTURES.

### Brascolite Semi-indirect Lighting Fixture.

A fixture which does not rely upon the ceiling for reflection. Numerous types made in more or less ornate design, in metal and composition, for mounting directly on ceiling and for suspension by one or more chains.



DESCRIPTION—The Brascolite consists of two essential parts: a bowl of white diffusing glass of sufficient density to protect the eyes from the direct rays of the lamp (and yet transmit diffusely a liberal proportion of light), and a flat reflector, presenting a white depolished surface from which the light is diffusely reflected. The light given is shadowless, white, uniform and soft, and photometric tests show the remarkable efficiency of 80%. Construction and ventilation is such that dust does not readily accumulate, but, when necessary, fixture and lamp may be efficiently cleaned with a dry cloth without detaching any part of the fixture or removing the lamp. A switch may be installed in any type of Brascolite, thus rendering unnecessary the wall switches customarily required.



Type CE



Type TE



Type OD



Type BC



Type WD

BRASCOLITE FIXTURES

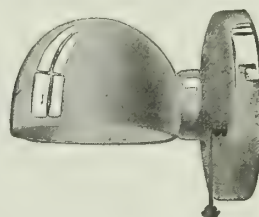
ECONOMY—With the Brascolite system of illumination, it is possible to provide illumination which does not produce eyestrain, at the same expenditure for current as with direct lighting, and with 33% less current than with ordinary semi-indirect lighting, or 50% less than indirect. This economy is effected by eliminating to a large extent the absorption of light by the ceiling of the room to be illuminated. This ceiling at best is a poor reflector, and is not to be compared in efficiency with the specially designed reflector of the Brascolite.

### Aglite All Glass Fixture.

The Aglite is a fixture made entirely of white glass. No exposed metal parts. Especially adapted for use in bathrooms and hospitals, or wherever sanitation or cleanliness are essential. Finish is absolutely permanent. May be cleaned with a damp cloth without injury of any sort.



DESCRIPTION—The Aglite fixture is made of pressed white glass, marblelike in appearance. All surfaces are perfectly smooth. Made in a variety of types for both bracket and ceiling outlets, to which it is attached by means of a bridge furnished with the unit. No insulating joint is required, as the fixture itself is a perfect insulator. Brackets and ceiling units are available with or without shades and with one or two lights.



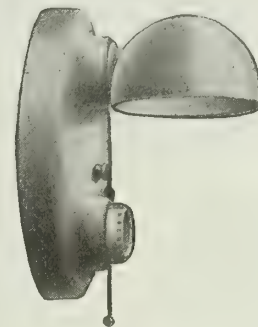
S10805. Base, 6 ins. diam.



S10489. Base, 6 by 6 ins.



S10497. Base, 10 by 4½ ins.



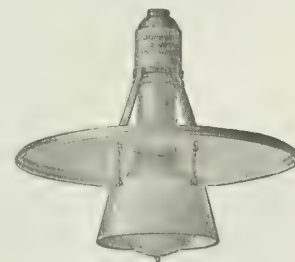
S10916. Base, 10½ by 4½ ins.

AGLITE ALL GLASS FIXTURES

### Industrolite.

A lighting fixture designed to attach to sockets on drop cords or fixtures, eliminating the necessity of electrical changes or added expense for additional wiring. Industrolite produces a maximum of soft diffused light for operating purposes in all types of industrial plants where efficient illumination is required. The necessity of individual lamps for local lighting is unnecessary, and the eyes of industrial workmen are protected.

DESCRIPTION—The Industrolite is composed of two elements: an upper reflector of porcelain enameled steel, and a white porcelain enameled steel cone suspended below the upper reflector in such a manner that all light above the angle of 40° is intercepted and reflected to the working plane. Made in 3 sizes:



INDUSTROLITE

F1205	12-in. Reflector	100, 150 and 200 watts
F1207	14½-in. Reflector	300, 400 and 500 watts
F1209	17½-in. Reflector	750 to 1000 watts

## IVANHOE-REGENT WORKS

OF GENERAL ELECTRIC COMPANY

Manufacturers of Regent Illuminating Glassware

CLEVELAND, OHIO

**Products.**

REGENT OPAL BOWLS and SHADES for Decorative and Commercial Lighting. The name REGENT includes all glass manufactured by the IVANHOE-REGENT WORKS under the specific trade names of Veluria, Druid, Sudan, Ivre, Yural and Genco.

Ivanhoe Metal Reflectors, Ivanhoe Reflecto-Cap Diffusers and Holophane Reflectors.



TRADE-MARK

a true pink opal "fire" when lighted. It is a blown glass with a velvet surface.

Druid is an opal of somewhat heavier density. It has a smooth surface and is furnished either pressed or blown.

Sudan is a heavy density opal. It is white, uniform in texture, and gives splendid diffusion for semi-indirect lighting.

Regent ornamental glass in these 3 textures is shown in Catalogue No. 108.

**Regent Ornamental Glassware (Veluria, Druid, Sudan).**

Regent ornamental glassware is designed to harmonize with artistic interiors. It is made in a variety of architectural styles and in several textures.

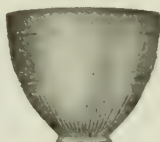
Veluria glass is a light density opal which shows

**Regent Commercial Glassware (Veluria, Druid, Sudan).**

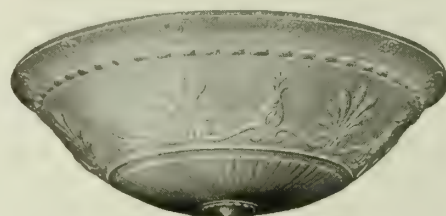
This line of glass is well adapted for the illumination of stores, offices, waiting rooms and similar interiors. It is shown complete in Catalogue No. 257.



No. 1209 x 17 Veluria 134



No. 3040 Druid



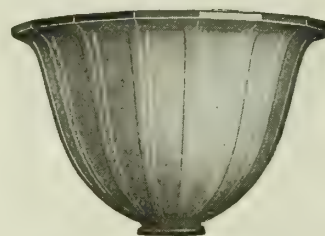
No. 3037 x 16 Druid or Sudan



No. 1276 x 9 Veluria 122



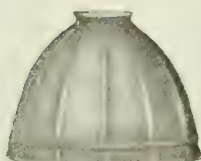
No. 01206 Veluria



No. 3031 Druid or Sudan

**REGENT ORNAMENTAL GLASSWARE—VELURIA, DRUID AND SUDAN**

No. 01213 Sudan



No. 01225 Sudan



No. 3067 Sudan



No. 3024 Druid



No. 3043 Sudan



No. 01140 Veluria

**REGENT COMMERCIAL GLASSWARE—VELURIA, DRUID AND SUDAN**



**Regent Ornamental Glassware (Rozelle Color Decorations).**

Rozelle colors are applied to Veluria and Ivre glass by a method which produces the harmonious color effects of the best hand painted work. The colors are fired, and permanent.

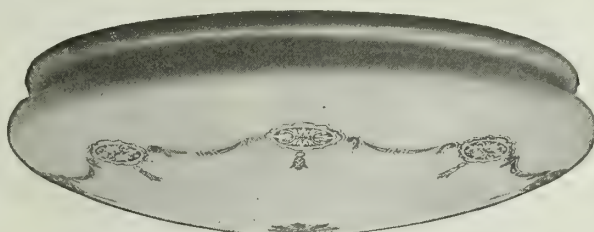
The Rozelle catalogue shows the entire line in process colors.

**Regent Ornamental Bowls and Shades in Ivre Glass.**

For residence lighting, Ivre glass marks the most recent attainment in the Regent ornamental line. Its ivory tint is not produced by surface treatment, but is a component part of the glass itself. The value of Ivre lies in the homelike quality of the soft, rich illumination which it gives. Ivre is furnished plain, in etched designs, and in colors applied by the Rozelle process. The Ivre line is illustrated in color in Catalogue No. 260.



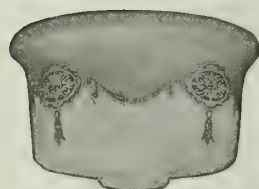
No. 1339  
Rozelle 291



No. 1209 x 17 Rozelle 291



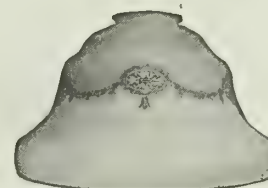
No. 1328  
Rozelle 291



No. 1340 Rozelle 291



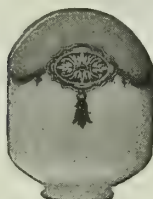
No. 1324 x 12 Rozelle 291



No. 1325 Rozelle 291



No. 1160  
Rozelle 291



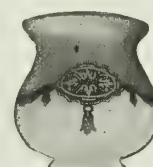
No. 01331  
Rozelle 291



No. 1311 Rozelle 291



No. 1329  
Rozelle 291



No. 1280  
Rozelle 291

**REGENT ORNAMENTAL GLASSWARE—ROZELLE COLOR DECORATIONS**

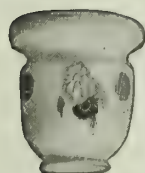
No. 1340 Ivre Rozelle 293



No. 1311 Ivre Rozelle 293



No. 1326 Ivre Rozelle 293



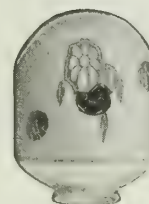
No. 1328  
Ivre Rozelle 294



No. 1329  
Ivre Rozelle 294



No. 1311 Ivre Rozelle 294



No. 01331  
Ivre Rozelle 294



No. 1339  
Ivre Rozelle 294

**REGENT ORNAMENTAL BOWLS AND SHADES IN IVRE GLASS WITH ROZELLE COLOR DECORATIONS**

# EDWARD MILLER & CO.

Manufacturers of Lighting Fixtures

MERIDEN, CONN.

## SALESROOMS

NEW YORK, N. Y., 68 and 70 Park Place  
PHILADELPHIA, PA., 1727 Chestnut Street

BOSTON, MASS., 201 Congress Street  
MERIDEN, CONN., 99 Center Street, at Factory

### Products and Services.

"MILLER" LAMPS and LIGHTING FIXTURES of every description: Chandeliers; Brackets; Pendants; Table, Desk or Piano Lamps; Standards, etc.

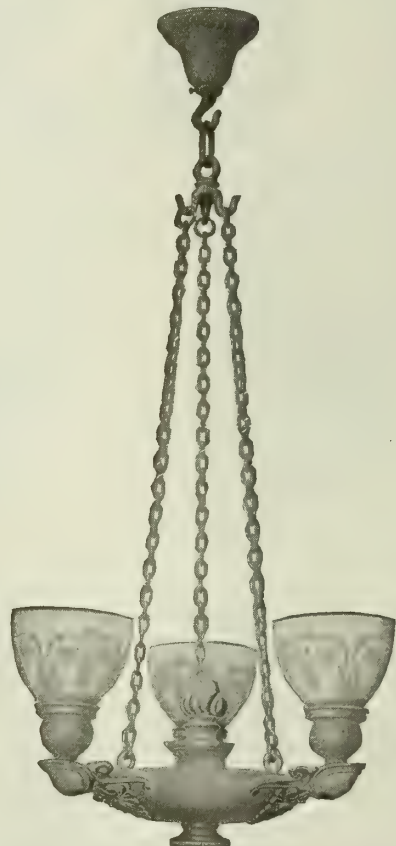
The company makes Period and other attractive designs. Architects and decorators can find in "Miller" Lighting Products the latest devices and furnishings for illuminating homes, public buildings and rooms of every description. Equipments that are complete are supplied, which assure purchasers of a satisfactory service.



NO. S14503 FRENCH RENAISSANCE BRACKET



NO. S15473 GEORGIAN CHANDELIER



NO. S14796A ROMAN HANGING LAMP



# NATIONAL X-RAY REFLECTOR CO.

Lighting from Concealed Sources. Illuminating Engineers  
and Manufacturers

235 W. Jackson Boulevard  
CHICAGO, ILL.

TELEPHONE, WABASH 2982

31 West 46th Street  
NEW YORK, N. Y.

TELEPHONE, BRYANT 6843

## RESIDENT ENGINEERS AND AGENCIES

BOSTON, MASS., PETTINGELL-ANDREWS Co., 160 Pearl Street  
COLUMBUS, OHIO, G. F. EVANS, 825 Columbus Savings & Trust Building

INDIANAPOLIS, IND., J. R. HENRY, Altenburg Hotel  
KANSAS CITY, MO., H. B. WHEELER, 120 West 11th Street

LOS ANGELES, CAL., F. S. MILLS, 501 Haas Building

MILWAUKEE, WIS., L. G. MORGAN, 530 Wells Building

MINNEAPOLIS, MINN., I. M. KIRLAN, Builders' Exchange

TORONTO, ONT., GEO. J. BEATTIE, 72 Victoria Street

NEW ORLEANS, LA., INTERSTATE ELECTRIC Co., Baronne and Perdido Streets

PHILADELPHIA, PA., THE BROWN-WHITE Co., Colonial Trust Building

SAN FRANCISCO, CAL., F. S. MILLS, 234 Bankers Investment Building

TOLEDO, OHIO, E. R. GILLET, 226 Huron Street

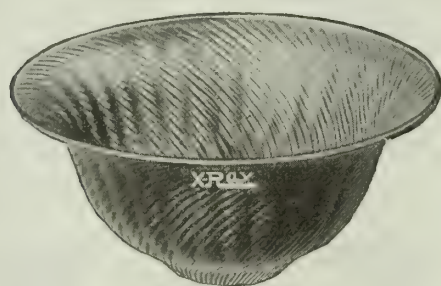
WASHINGTON, D. C., H. D. BUTLER, 720 Thirteenth Street, N. W.

## Products and Services.

The business of this company is to perfectly illuminate, from the artistic, hygienic and utilitarian viewpoints, any and every kind of interior using artificial light, by means of scientifically designed silvered mirror corrugated glass REFLECTORS trade-marked X-RAY.

## X-Ray Reflectors.

Every illuminating need is met by X-Ray reflectors, which are designed for the indirect lighting of buildings of all classes: For show windows; for showcases; industrial plants, and exterior floor lighting. The X-Ray reflectors which produce the perfect lighting may be hidden in coves, cornices, pedestals, urns, columns, hanging bowls, art lamps, etc. The variety of unique effects obtainable is limited only by the will and ingenuity of the designer.



X-RAY REFLECTOR

One of the 58 scientifically correct X-Ray reflectors, used for specific purposes

## Store Window Lighting.

The most attractive shop windows seen are equipped with these powerful and efficient reflectors, the only silvered mirror reflectors which last indefinitely.

## Indirect Art Lamps.

These are the most novel lighting fixtures ever devised for the home. The entire room is flooded with actual sunlight, while the lamp shade is lighted with a rich glow.

## Industrial Plants.

X-Ray reflectors light the whole shop uniformly and brilliantly from concealed sources. No light can get in the workmen's eyes, and accidents are prevented and efficiency is raised remarkably.

## Flood Lighting.

The illumination of building exteriors for the purpose of revealing architectural beauties after nightfall, is rapidly becoming popular. This type of lighting is also in extensive use for protection of vital industrial points and to facilitate outdoor night construction and manufacture.

## Our New Book, "Lighting," Free to Architects.

To give architects concise and usable information, we have published a new book entitled "Lighting," which covers the whole field of correct illumination. Every application of artificial lighting has been taken up separately and typical installations cited, in most cases, through the courtesy of some prominent architect. This new book consists of almost 200 pages, half of which are taken up with descriptions of particular lighting problems, and the other half of which are actual reproductions of detailed drawings illustrating the application of the correct lighting principle contained in the X-Ray system. As new developments in lighting are perfected new detail plates are sent to architects. Ask for this new book. It is free to architects; to others \$2.00.

## Co-operative Services.

Let us help plan the lighting system before the building is started. We have many times saved thousands of dollars in the wiring cost of large buildings, and proportionate sums in smaller ones, and the illumination invariably reflects great credit on the architect. Our corps of twenty illuminating engineers is at the service of architects or others in the preparation of correct lighting systems. Take advantage of the knowledge of these lighting specialists. Their aid is gratis.

X-Ray reflectors and fixtures are sold by the electrical trade generally. There is an X-Ray reflector for every lighting need. We have lighted buildings similar to those contemplated, and we will gladly tell about it.

# THE REFLECTOLYTE COMPANY

914 Pine Street  
ST. LOUIS, MO.

## Products.

REFLECTOLYTE LIGHTING FIXTURES (Patented).

### Reflectolyte Reflector.

The reflector is stamped of one-piece heavy enameling steel, after which successive coats of porcelain are fired-on layer by layer, at a temperature of 1800° to 2000° Fahr. This produces a white, glasslike finish like that on the finest white bathtubs, and makes possible our guarantee of 25 years of fully efficient service.

### Standard Finishes.

Types P, C, G, B, PM, CM and GM, also brackets FP, FD, CO and GO are dull brass finish.

Types A and D in stained brush brass finish.

10% additional for finishes other than specified.

Types ETOC, HTOC, HI, EM, HM and all compo brackets are of rich gold finish. Other standard sprayed-on metallic finishes, no extra charge.

### Sizes and Equipment.

Reflectolytes are made in the following unit sizes, and in multiple fixtures made up of a combination of these units:

Diameter, ins.	Lamps required, Watts.
13, Junior.....	75, 100, 150, 200
16, Junior.....	200, 300, 400, 500
12, Standard.....	100, 150
16, Standard.....	200
20, Standard.....	300, 400, 500
24, Standard.....	750, 1000

For combinations see following pages and Reflectolyte Catalogue No. 4.

### The Reflectolyte Junior.

With opal glass reflector.

This Junior type is made in 2 sizes—13 and 16 ins.; has a white opal glass reflector (instead of our standard pressed steel fired-on porcelain-enamel reflector). This reflector is made of the highest quality pot opal glass, slowly annealed, carefully ground and etched to a fine satin finish to prevent glare.



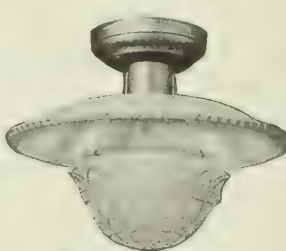
JR—Base or Close Type  
JOC—One-chain Type



JE—Base or Close Type  
JEOC—One-chain Type



JR—Base or Close Type  
JROC—One-chain Type

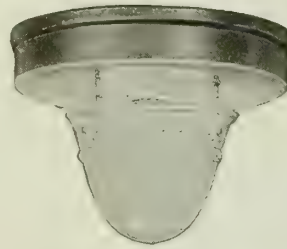


JG—Base or Close Type  
JGOC—One-chain Type

REFLECTOLYTE JUNIOR TYPES

### Standard Reflectolytes.

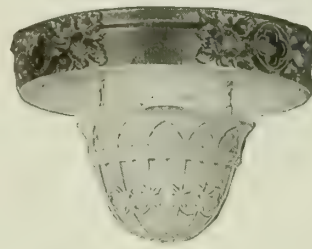
Made in 4 sizes, 12, 16, 20 and 24 ins.; also in combination with Junior types for multiple fixtures. The ornamental bowls are blown of the finest white glass of low absorption and high reflecting power. All three-chain standard types, whether plain or ornamental, are supplied with the Ceiling-Bright equipment which illuminates the ceiling. "Soft light above; full light below."



PF—Base Type  
POC—One-chain Type  
PTC—Three-chain Type



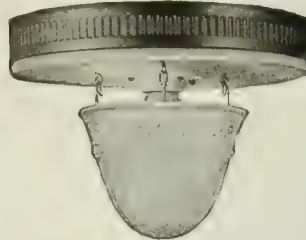
CF—Base Type  
COC—One-chain Type  
CTC—Three-chain Type



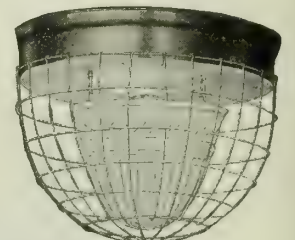
GF—Base Type  
GOC—One-chain Type  
GTC—Three-chain Type



BF—Base Type  
BOC—One-chain Type  
BTC—Three-chain Type



DF—Base Type  
DOC—One-chain Type  
DTC—Three-chain Type



PWG—Base Type  
P—Type with Wire Guard



DN—Base Type  
Neck and top length, 28 ins.  
DNOC—One-chain Extension  
Hanger



AN—Base Type  
Neck and top length, 28 ins.  
ANOC—One-chain Extension  
Hanger

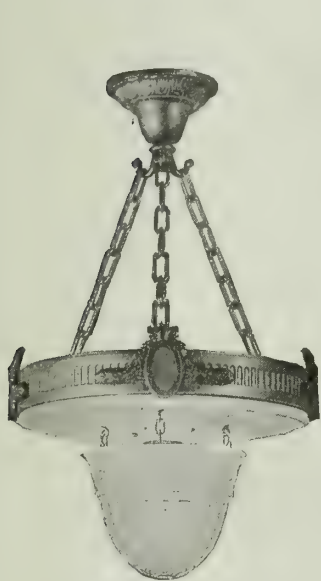
STANDARD REFLECTOLYTES



**Compo Units.**

The Compo units and brackets on this and the following page are correct in design, exquisitely modeled, and are carefully cast of a special mixture. After care-

ful preparation of the surface, the latest methods are employed to apply the rich gold finish, insuring a beautiful and metal-like surface.



A.O.C.—One-chain Type  
A.T.C.—Three-chain Type  
Ceiling-Bright Type



ETOC—With Chains  
Ceiling-Bright, Body Compo  
EF—Base Type  
20, 24, 28 ins. diam.



HTOC—With Chains  
Ceiling-Bright, Body Compo  
HF—Base Type  
20, 24, 28 ins. diam.



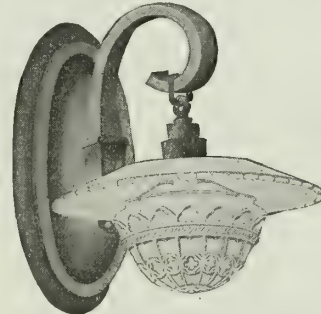
HI—Body Compo, with Candles  
26 ins. diam., 3 candles  
34 ins. diam., 6 candles



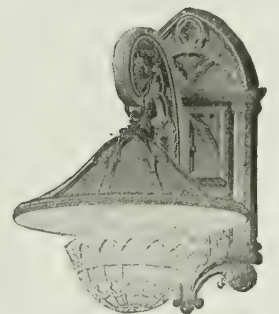
FP—Metal  
Extends 16 ins.  
Back plate  $14\frac{1}{4} \times 8\frac{1}{4}$  ins.  
75, 100, 150 watts



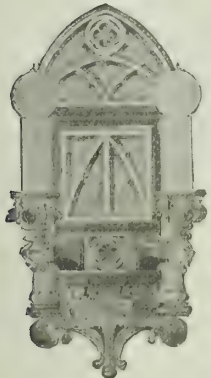
FC—Metal and Compo  
Extends 16 ins.  
Back plate,  $15 \times 8\frac{1}{2}$  ins.  
75, 100, 150 watts



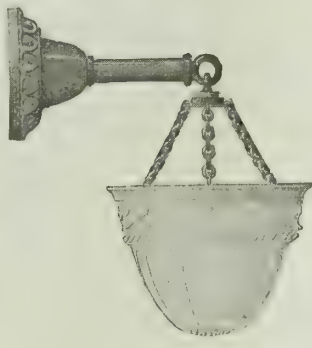
FD—Metal Back, Opal Glass  
Reflector  
Extends 16 ins.  
Back plate  $14\frac{1}{4} \times 8\frac{1}{4}$  ins.  
75, 100, 150 watts



FG—Metal and Compo,  
White Porcelain Enamel Re-  
flector  
Extends 16 ins. Back plate  
 $17 \times 8$  ins.  
75, 100, 150 watts



FI—Bracket, Compo.  
One to Three Lights.  
Back  $17 \times 8$  ins.



CO—Metal  
Extends 12 ins.  
Bowl  $8\frac{3}{4}$  ins. Canopy 6 ins.  
75, 100, 150, 200 watts.  
GO—Same as above  
Gothic glass and canopy



JC—Metal and Compo, White  
Porcelain Enamel Reflector.  
Diam. 13 ins. Length 18 ins.  
75, 100, 150 watts



JD—Metal and Compo, White  
Porcelain Enamel Reflector.  
Diam. 13 ins. Length 18 ins.  
75, 100, 150 watts

## REFLECTOLYTE COMPO UNITS AND BRACKETS

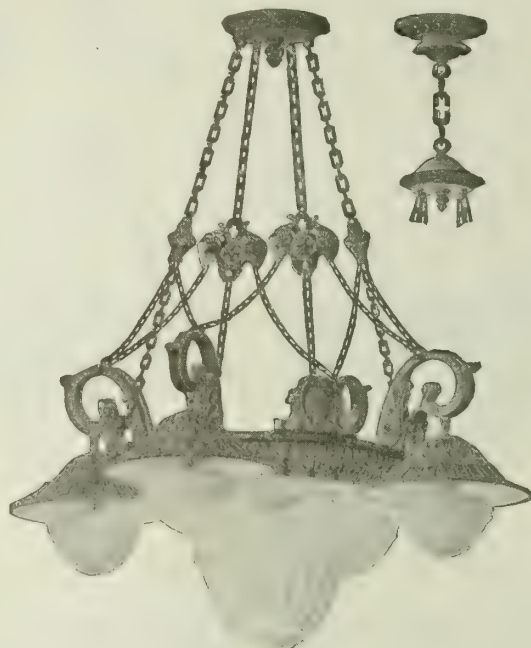
**Multiple Units.**

The multiple units shown on this page are a combination of our standard and Junior types. Types PM, CM and GM can be supplied in four-light to seven-light multiples; types EM and HM, in five-light to seven-

light multiples. The arms supporting the Junior units are gracefully curved; chains are draped with an eye to securely supporting the combination, as well as producing an artistic effect. All of these types illuminate the ceiling.



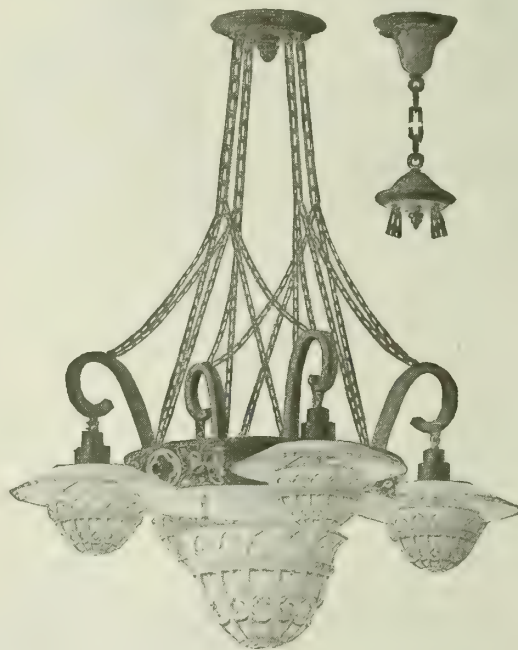
CM—Combination of Standard C and JE Units.  
4- to 7-light capacity. Dull brass finish.  
PM—Combination of Standard P and JE Units.  
4- to 7-light capacity. Dull brass finish



EM—Consists of Compo Body as on ETOC, with Ornamental Reflector Covers, Arms and Trimmings to Match.  
5- to 7-light capacity. Rich gold finish



HM—Consists of Compo Body as on HTOC, with Ornamental Reflector Covers, Arms and Trimmings to Match.  
5- to 7-light capacity. Rich gold finish



GM—Combination of Standard G and JG Units.  
4- to 7-light capacity. Dull brass finish.  
PGM—Combination of Standard P and JG Units with Gothic Glass-ware.  
4- to 7-light capacity. Dull brass finish

**REFLECTOLYTE MULTIPLE UNITS**

Types CM, PM, EM, HM, GM, and PGM made in two sizes—47 and 50 ins. outside diameters



## UNIVERSAL ELECTRIC STAGE LIGHTING CO.

KIEGL BROS., PROPRIETORS

240 West 50th Street  
NEW YORK, N. Y.TELEPHONE: { 94 CIRCLE  
95**Products.**

ELECTRIC STAGE FITTINGS and LIGHTING APPARATUS: Spot, Flood, Foot, Bunch, Border, Strip and Proscenium Lights; Arc Lamps; Glass Lined Reflectors; Act Announcers; Exit and Monogram Signs; Carriage Calls; Stage Pockets and Plugs, Receptacles, Waterproof Pockets, Balcony Panel Pockets; Connectors; Music Stands.

Stereopticons, Switchboards, Fireplaces, Illuminated Wood Logs, etc.

**Spot Lights and Stage Lamps.**

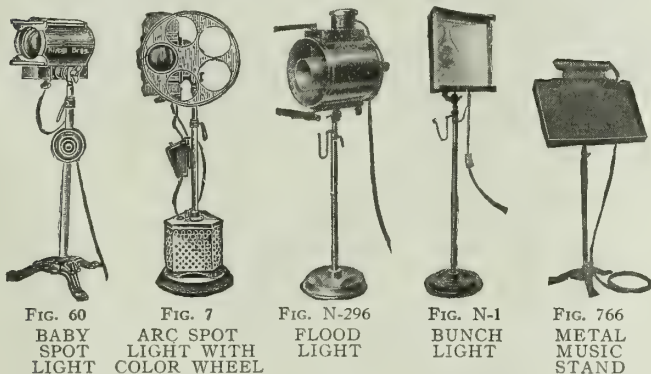
Kliegl spot lights, flood lights and glass lined reflectors are furnished with either 1000-watt nitrogen filled incandescent lamps or arc lamps and can be operated on either alternating or direct current.

**Bunch Lights.**

Fig. N-1, furnished with adjustable hood for twelve 40-watt lamps, or for one 500- or 1000-watt nitrogen lamp, adjustable stand and 25-ft. cable complete.

**Music Stands.**

Adjustable stand, iron base, wood or iron top, together with light fixture and 8-ft. cable.

FIG. 60  
BABY  
SPOT  
LIGHTFIG. 7  
ARC SPOT  
LIGHT WITH  
COLOR WHEELFIG. N-296  
FLOOD  
LIGHTFIG. N-1  
BUNCH  
LIGHTFIG. 766  
METAL  
MUSIC  
STAND**Footlights.**

Footlights, Fig. 622, in the several designs, are furnished with No. 20 galvanized iron troughs and hoods which extend 3 ins. above the stage level. The footlight strip with receptacle and enclosed wiring is removable.

DISAPPEARING FOOTLIGHTS — Fig. 829, furnished in sections, complete, ready to be installed, for either straight or curved footlights. When closed are flush with floor.

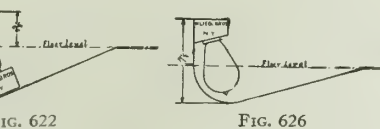


FIG. 622

FIG. 626



FIG. 624

STANDARD FOOTLIGHTS

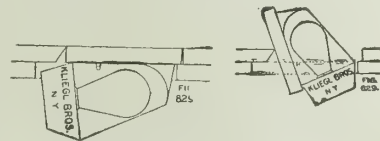


FIG. 829

DISAPPEARING FOOTLIGHTS

**Strip Lights.**

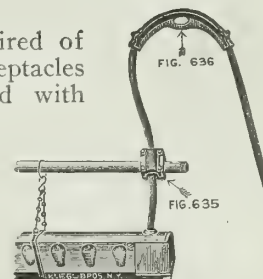
Stock sizes, 5 ft., 6 lights; 8 ft., 10 lights; other sizes made to order.

**Border Lights.**

Made in any length required of No. 20 galvanized iron with receptacles and wiring enclosed; provided with cable splicing box and furnished with 1¼-in. piping for hanging (Fig. 600).

Lamp spacing—four 16 c.p. or three 32 c.p. to the foot.

Fig. 612 type for 500-watt nitrogen lamps.

FIG. 600. BORDER LIGHT  
WITH CABLE SUPPORT  
AND CRADLE**Act Announcers.**

Used without programs. The various announcements are painted on glass slides and lighted when in use.

FIG. 685  
EXIT SIGN**Exit Signs.**

Exit signs with 3-in., 5-in. and 8-in. letters carried in stock.

FIG. 700  
MONOGRAM SIGN**Monogram Signs.**

Announce the program and show letters from A to O with X. Operated by a switch in the wings.

**Carriage Call.**

Constructed entirely of metal, 29 ins. high and 72 ins. wide. Each number is distinctly outlined by incandescent lamps.

**Stage Pockets and Receptacles.**

All types of stage pockets, charging receptacles, plugging boxes, flush wall, flush floor and waterproof receptacles in iron and brass, with and without lock and key. Made for 2-wire and 3-wire circuits, capacities up to 200 amperes. All approved under National Electrical Code Standard.

FIG. 350  
STAGE POCKET AND  
FIBER PLUG

FIG. 301

FIG. 372  
PANEL  
POCKETFIG. 305  
AUTOMOBILE  
POCKET

## CAPACITIES, STAGE POCKET AND RECEPTACLES

2-wire 50 amperes, 250 volt	3-wire 50 amperes, 125-250 volt
2-wire 50 amperes, 500 volt	3-wire 100 amperes, 125-250 volt
2-wire 100 amperes, 125 volt	4-wire 50 amperes, 250 volt
2-wire 200 amperes, 125 volt	

Made in one, two, three or four sections

**Connectors.**

Made for 5, 15, 30, 60, 100 and 200 amperes, 2-wire, and 5, 15, 30 and 60 amperes, 3-wire. Of a solid block of fiber, practically unbreakable and provided with cable clamp to hold cable firmly by outer installation.



FIG. 955

FIG. 965.  
CONNECTORS**Catalogue.**

Send for complete illustrated catalogue H, on Stage and Studio Lighting Apparatus and Electric Effects.

# WINKLER-REICHMANN CO.

Loud Speaking Telephone Systems for All Purposes

5 South Wabash Avenue  
CHICAGO, ILL.

## Products.

PAGING SYSTEMS, for business houses and railway stations; "STILL SMALL VOICE" DOCTORS' CALL SYSTEM, for Hospitals; ELECTRICAL PAGE BOY, for hotels, clubs, etc.; LOUD SPEAKING TELEPHONES, for all purposes.



## The "Electrical Page Boy" for Hotels, etc.

The "Electrical Page Boy," for business houses, hotels, etc., locates heads of departments, salesmen, customers, etc. Used as order systems where it is necessary to give orders to stockroom or various departments; eliminates the necessity for those receiving the orders to first answer the telephone. Used to locate guests, etc., in hotels.

## Description.

SYSTEMS—The system generally installed consists of a talking station located at some central point—such as the telephone switchboard—and reproducer horns located throughout building, all repeating simultaneously what is spoken at talking station. The system is very *flexible*, and any selective switching of reproducer horn circuits is very simple to arrange. Simplicity of equipment and circuits, perfect articulation, and any desired volume, from a very loud maximum down to a whisper, are features of the system.

All equipment of this kind in use is manufactured by this company, who will handle installations of any size.

STYLES—WINKLER-REICHMANN Co. systems are designed to use either concealed or exposed reproducer horns. The concealed type is in a cabinet with grille door, and set in, flush with the wall.



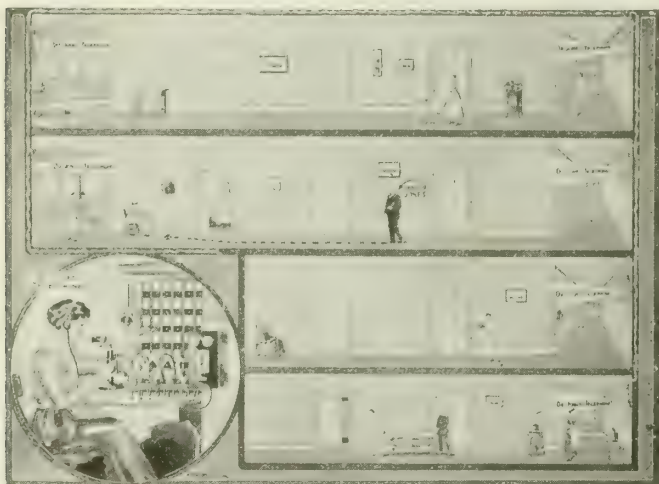
No. B-503  
CONCEALED TYPE RE-  
PRODUCER HORN

No. 400. Special horn for concealing in walls of new buildings. This size suitable for hospitals.

No. B-503. Special flush type, containing cabinet to hold special horn No. 400. A steel cabinet with a grilled door on hinges. Dimensions of cabinet: front—height 21", width 9 1/2"; back—height 19", width 7 1/2"; depth 6"

## "Still Small Voice" Doctors' Call System for Hospitals.

Installed in hospitals built or in process of erection. A perfect paging system, instantly locating any doctor, interne, or nurse who is in the hospital, whether there be one building or a dozen. Call is arranged to be just audible. Full information and data on request.



TYPICAL INSTALLATION IN A HOSPITAL

This gives an excellent idea as to installations for various purposes

## Specifications.

MOUNTING REPRODUCER HORNS—The reproducer horns should be located at the most advantageous points, about 8 ft. above the floor.

WIRING TO REPRODUCER HORNS—The wiring to reproducer horns should be made with rubber covered twisted pair telephone wire, either No. 16 or No. 19 B. & S. gauge. Where wiring is in conduit, as in new buildings, use No. 16 wire. Where wiring is exposed, use No. 19 interior telephone wire.

CIRCUITS—Reproducer horns are connected in multiple from 5 to 10 on a circuit, depending on conditions.

TALKING STATION EQUIPMENT—The apparatus at talking station (that used by the operator) varies according to size of the installation and conditions surrounding the installation.

CURRENT FOR ENERGIZING SYSTEM—If 110 volts *direct current* are available, provide an outlet of same near the talking station location (generally near the telephone switchboard). If this current is not available, let the company advise on this.

FULL INFORMATION—Complete and specific information on any architect's problem on request.

## Guarantee.

The apparatus is guaranteed to be electrically and mechanically perfect when shipped, and the company will cheerfully replace defective parts within one year from date of purchase. Every reproducer horn is absolutely guaranteed to give any volume up to the same volume as a loud talking voice with perfect articulation, when properly installed and used.

## References.

BUSINESS HOUSES—Lord & Thomas; Carson, Pirie, Scott & Co.; D. B. Fisk & Co.; Gage Bros.; Albert Pick & Co.; John M. Smyth & Co.; Bunte Bros.; Beckley-Ralston Co. and Cadillac Automobile Co., Chicago, Ill.; Walker, Stetson & Co., Boston, Mass.; N. J. Rich & Co., Cleveland, Ohio; Kohn, Adler & Co., Philadelphia, Pa.

RAILROADS—Pennsylvania Railroad Stations, Cleveland, Ohio, Pittsburgh, Pa., Piqua, Ohio, Ft. Wayne, Ind., etc.

CLUBS—Chicago Athletic Club, Hamilton Club, Chicago, Ill.; Davenport Commercial Club, Davenport, Iowa.

HOTELS—Windermere Hotel, Chicago, Ill.; Hotel Tuller, Detroit, Mich.; Lee Huckins, Oklahoma City, Okla.

THEATERS—B. F. Keith's Theater, Jersey City, N. J.; Harlem Opera House, New York, N. Y.

HOSPITALS—Johns Hopkins Hospital, Baltimore, Md.; Massachusetts General Hospital, Boston, Mass.; Presbyterian Hospitals in Chicago, Ill., New York, N. Y., and Pittsburgh, Pa.; Mercy Hospital, Wesley Hospital, German Hospital, Chicago, Ill.; Elizabeth Steele McGee Hospital, Pittsburgh, Pa.; St. Louis Children's Hospital, St. Louis, Mo.; Allegheny General Hospital, Pittsburgh, Pa.; Cleveland City Hospital, Cleveland, Ohio; Philippine General Hospital, Manila, P. I.; University of California Hospital, San Francisco, Cal.; City and County Hospitals, St. Paul, Minn., and San Francisco, Cal.; Mount Sinai Hospital, Cleveland, Ohio, and many others—names furnished on request.



# AMERICAN TELEPHONE AND TELEGRAPH COMPANY

## AND ASSOCIATED COMPANIES

### Telephone Service.

The engineers of the Bell System will be glad at any time to give architects, owners or builders, the benefit of their experience in connection with the provision of facilities in buildings to accommodate cables and wires for telephone service, and to assist them in planning the best system for each individual case.

In modern office buildings, hotels and apartment houses, large numbers of telephones are required. It would be inconvenient and impracticable to run a pair of wires through these large buildings each time a telephone was installed, as is ordinarily done in residences or small business buildings, in order to establish a connection with the outside wire plant of the telephone system. To overcome this difficulty, when the plans are prepared for office buildings, hotels or apartment houses, a forecast should be made of the probable future requirements of the building as a whole for telephone service, and facilities should be provided for a certain amount of cabling with the necessary terminals and subsidiary wiring. All large cities contain many buildings that are cabled and wired for telephone service according to a comprehensive plan, and of the smaller places there are few that do not have some buildings of a character requiring more or less provision of this kind.

The extensive use of the telephone at the present time, in hotels, apartment houses and office buildings, renders it essential that some provision be made in the plans for new buildings of these types to care for the large numbers of wires necessary in connection with furnishing telephone service. When it is realized that in a number of buildings there are as many as a thousand telephones in service, and that it is necessary to carry two wires from each telephone to some central point in



SYMBOL OF SERVICE

the building, the importance of making adequate provision for this service is apparent.

Owing to the type of building construction generally employed and the large number of telephones to be served, unless suitable facilities are provided in advance for accommodating the cables and wires and for running them through walls and floors, the work will be

unsightly, in spite of all precautions to the contrary, or costly alterations will be required after the completion of the building to admit of effectively concealing the wires. It is therefore of great importance to owners and architects that in preparing plans and specifications for office buildings, hotels, apartment houses or other buildings requiring extensive telephone service, suitable arrangements should be made for such telephone wiring and terminal boxes as the character and use of the building will demand. While the general manner of wiring buildings of the same class will be similar, the particular requirements may differ considerably on account of special conditions. It is therefore desirable that the probable needs of the building with respect to its telephone service be forecast as closely as possible.

As every large building to a certain extent presents problems of its own, advantageous and economical arrangements can frequently be suggested by those who are especially familiar with work of this kind. The engineers of the Bell System have gained experience in these matters which peculiarly fits them to assist architects, owners or builders in planning the best system for each individual case.

Before the plans are finally completed, communicate with the engineers of the Associated Bell Telephone Company, operating in your city.



WIRING PROBLEMS OF THE SPECIFICATION WRITER QUICKLY SOLVED THROUGH BELL SYSTEM SERVICE

# AUTOMATIC ELECTRIC COMPANY

## Automatic Telephone Equipments

1001 West Van Buren Street  
CHICAGO, ILL.

### BRANCH OFFICES

NEW YORK, 46 West Broadway  
PHILADELPHIA, Bourse Exhibition Building  
BOSTON, Tremont Building  
ROCHESTER, Arlington Building  
ST. LOUIS, Wright Building

PITTSBURGH, First National Bank Building  
MINNEAPOLIS, McKnight Building  
DETROIT, Ford Building  
COLUMBUS, Columbus Trust & Savings Bank  
TOLEDO, Second National Bank Building

### FOREIGN BRANCHES

WINNIPEG, CANADA, AUTOMATIC TELEPHONE MFG. CO., LTD.  
LIVERPOOL, ENGLAND, AUTOMATIC TELEPHONE MFG. CO., LTD.

SYDNEY, AUSTRALIA, AUTOMATIC TELEPHONES (Australia), LTD.  
PARIS, FRANCE, THOMPSON-HOUSTON CO.

### Products and Services.

Manufacturers and installers of AUTOMATIC TELEPHONE SYSTEMS for private and public service.

### History and Adoption.

The Automatic system was first utilized for city exchanges and has been thus serving in more than 200 different cities in America and abroad for over 25 years.

During the past 15 years, this equipment has been adopted extensively for private interior exchange service, and is now in operation in many of the most representative organizations throughout the world.

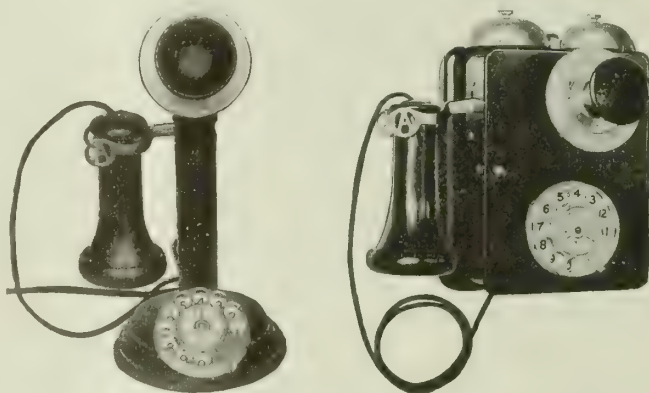
Among these users may be mentioned, as typical, the Federal Reserve Bank of New York, Sears-Roebuck & Co., The Goodyear Tire and Rubber Co., The Bellevue Hospital of New York, James Deering's residence at Miami, Fla., and every important Government munition plant in America.

### Instruments.

The instruments in this system are similar to those of the ordinary telephone system, with the exception of raised dial  $2\frac{1}{4}$  ins. in diameter, which has around its rim 10 holes numbered from 1 to 0, and is revolved by means of the finger. Of the instruments there are various types: wall, desk, hand, mine, and others specially designed for particular purposes.

### Automatic Exchange.

This apparatus takes the place of the manual switchboard and the operator, and is placed in any convenient or available space, the size of which depends on the size of the



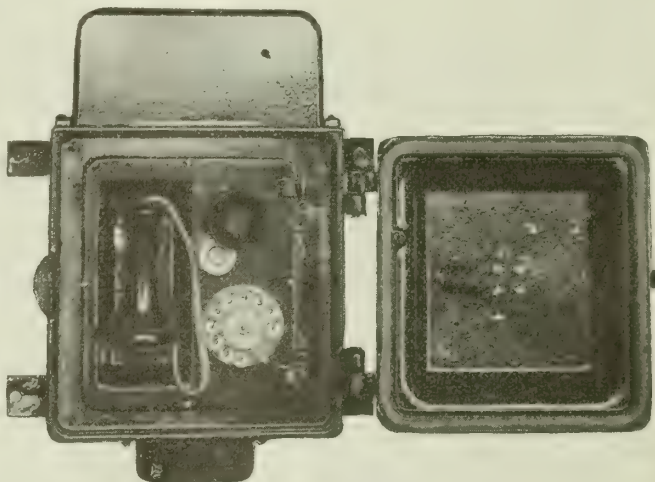
AUTOMATIC DESK TELEPHONE    AUTOMATIC WALL TELEPHONE  
No larger and no heavier than the manual     $6\frac{1}{4}$  by  $7\frac{1}{2}$  by 4 ins. Ebony finish

system. Neither natural light nor ventilation is essential.

The apparatus is entirely self-contained, enclosed in a glass cabinet, and sufficiently attractive in design

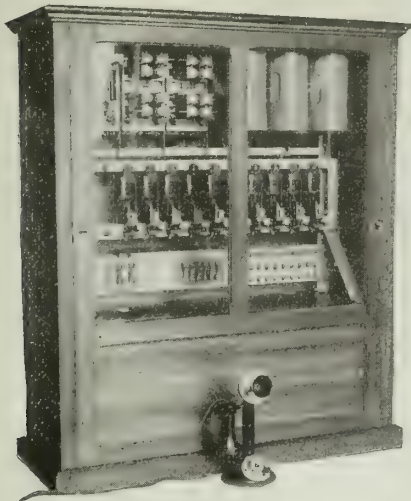


HAND TELEPHONE  
Light, compact, handy; 9 ins., long. When not in use hangs from hook under desk.



THE AUTOMATIC MINE TELEPHONE  
Enclosed in an iron weatherproof box and used in exposed places such as mines, railroad yards, etc.





COMPLETE AUTOMATIC EQUIPMENT  
FOR 10 TELEPHONES

Enclosed in a glass front cabinet 39 by 14  
by 45 ins.

and finish to be installed in a conspicuous place.

It is built in units of 10 stations, 22 stations, 50, 100 and multiples thereof, and from these any desired capacity can be built up.

The apparatus is equipped with an automatic charging device, and is always charged and ready for service.

Alarm signals are provided, which call attention to any abnormal condition in the system, such as the breaking of power wires or the accidental leaving of a receiver off the hook.

Two or more automatic exchanges, located in the same building or in different cities, have been connected and operated together as one.

#### Wires.

Exposed wires in dry interiors should be waterproof No. 19 B & S gage and twisted in pairs. For damp places or conduits No. 22 B & S gage lead incased wires should be used. A single circuit is run from each instrument to the automatic exchange. In new buildings where conduits are not used sleeves should be inserted in floors and partitions to provide for passage of wires.

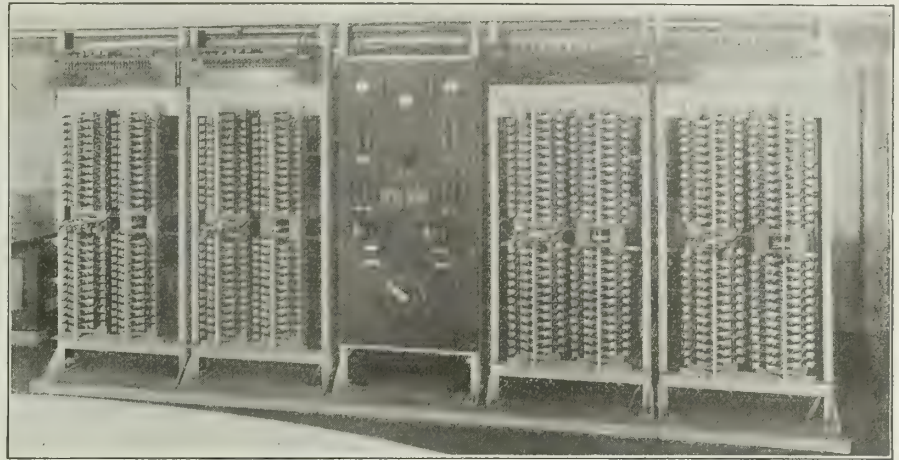
#### Batteries.

Any standard make of storage battery is used.

For the 10-line and 22-line systems, 12 volts are required. For larger capacities, 48 volts. These batteries are isolated from the automatic central, to avoid acid fumes.

#### Method of Operation.

The person who is calling lifts the receiver in the customary manner, and connection is then made by



THE AUTOMATIC EXCHANGE IN THE LARKIN COMPANY,  
BUFFALO, N. Y.

This equipment is serving 400 telephones, and is located in the main lobby of the Administration Building

rotating the dial. If station 65 is wanted the finger is placed on the dial hole over 6 and draws around to the finger stop. Then the finger is removed, and the dial revolves back to its original position. The operation is repeated for the number 5. This completes the connection and rings the bell at Station 65. It requires but two seconds to make such a call.

The system is so flexible that those who do not wish to make their own calls can have their telephones so arranged that a clerk or stenographer can dial the connections for them.

The ring is heard in the receiver of the calling station, and is repeated at intervals until the called station answers or the receiver is hung up at the calling station.

If the station wanted is engaged, a distinct buzz is heard by the person calling.

The hanging of the receiver on the hook breaks the connection, and another call can be made immediately.

#### Code Call Systems.

In connection with the automatic telephone system, a code call system may be installed at slight extra expense. By means of this, dialling a designated number causes a code signal of bells or horns to sound throughout the premises thus equipped. A man, upon hearing his code, goes to the nearest telephone, calls an established number and is instantly connected with the person desiring to speak to him.

#### Guarantee.

The Automatic system is warranted to give absolutely satisfactory service and is guaranteed against defects of material or workmanship for one year.

Full and precise data and specifications gladly furnished on request.

# CONNECTICUT TELEPHONE & ELECTRIC CO., INC.

MERIDEN, CONN.

## Products.

CONNECTICUT AUTOMATIC TELEPHONES: Intercommunicating Telephones for schools, hotels, banks, hospitals, residences, etc.; Apartment House Telephones, Telephone Switchboards and Annunciators.

Manufacturers of Telephone Accessories, Weather-proof Mine and Police Telephones, Portable Telephones and Push Button Specialties.

Manufacturers of the well-known Connecticut Automobile Ignition and Lighting Specialties.

## Experience and Facilities.

This company has been manufacturing telephones and the highest grade electrical instruments for twenty-four years, and has gained a reputation for careful design, high grade material, and skilled workmanship.

## Combinations.

Various combinations of the different types of telephones here shown can be made. The following chart shows the different arrangements that are possible to produce the desired result.

With a common talking system, only one conversation can be held at one time; while with the non-interfering system, any number may converse without interference at a time.

CHART SHOWING ADAPTABILITY AND COMBINATIONS

NOTE—N Non-interfering.      C=Common Talking.

Number and style	Hospitals, schools and banks		Hotels	Apartment houses				Residences
	Center phone	Inter-commu-nicating		Vestibule	Suite	Jani-tor	Trades-man	
25A—Desk.....	CN	N	N		CN		N	N
35B—Wall.....		N						
38B—Flush or desk.....	CN	N			CN			N
40—Wall.....	CN		N		CN			C
41—Wall.....	CN		N		CN			C
52—Wall.....	C							C
52B—Desk.....	C	C						C
54A—Flush.....		C						
56A—Flush or wall.....		N	N					N
59A—Flush.....		N	N					N
60—Flush.....	CN				CN			
64—Wall.....	CN				CN			
74—Flush.....				C				
83—Flush.....				C				
84—Flush.....				C				
85—Flush.....				C				
86—Flush.....				C				
330—Wall.....						C	C	
332—Wall.....								
Duplex Wall.....	CN		N		CN			C
Type A—Switch-board.....	N	N	N					
Annunciator Type D—Wall.....						C		
Annunciator Type J—Wall.....						N		
Annunciator Type T—Wall.....	N	N	N			N		

## Batteries.

For all telephone systems, except where special note is made, the dry batteries required will be two for talking, and three or more for ringing, according to distance between stations. All batteries are centrally located.

CONNECTICUT

TRADE-MARK

## Cable.

This company furnishes braided cable for interior dry places, and cable with lead sheath for outdoors or wet places.

Specify Connecticut intercommunicating cable.

## Finish of Apparatus.

The standard finish of woodwork is dark golden oak. Flush metal phones are brush brass. Special finishes to harmonize with rooms will be made to order at slight additional charge.

## Guarantee.

Connecticut apparatus is guaranteed for one year to be free from mechanical or electrical defects.

## Catalogue and Wiring Specifications.

Complete catalogue and booklet of wiring specifications mailed on request.



No. 25A  
Desk Type



No. 35B  
Wall Type



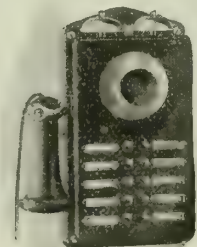
No. 38B  
Desk Set



No. 40  
Wall Type



Intercommunicating  
Cable



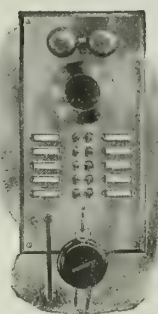
No. 52  
Wall Type

CONNECTICUT TELEPHONE APPARATUS





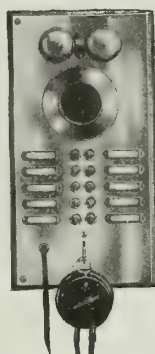
No. 52B  
DESK TYPE  
TELEPHONE



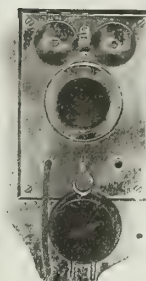
No. 54A  
FLUSH WALL  
TELEPHONE



No. 56A  
FLUSH  
TELEPHONE



No. 59A  
FLUSH WALL  
TELEPHONE



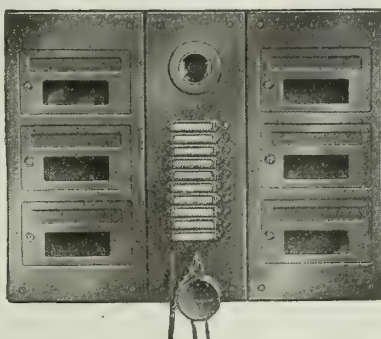
No. 60  
FLUSH  
TELEPHONE



No. 64  
WALL TYPE  
TELEPHONE



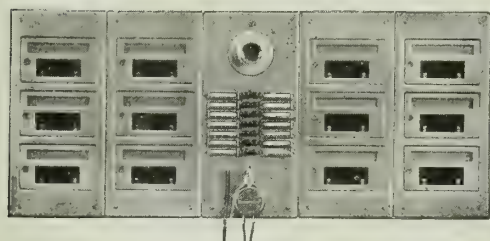
No. 86 CORDLESS VESTIBULE  
TELEPHONE SET



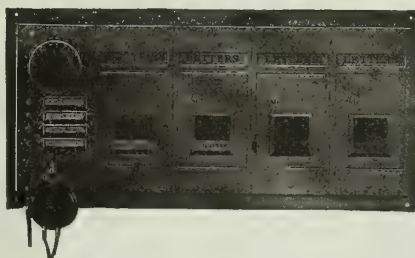
No. 83 VESTIBULE TELEPHONE SET



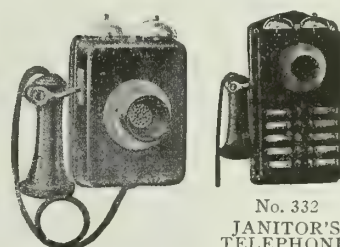
TYPE S ANNUNCIATOR  
Electric re-set



No. 85 VESTIBULE TELEPHONE SET

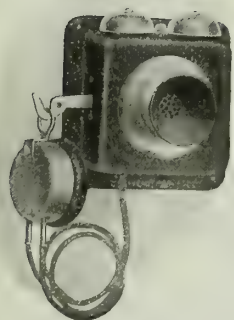


No. 74 VESTIBULE TELEPHONE

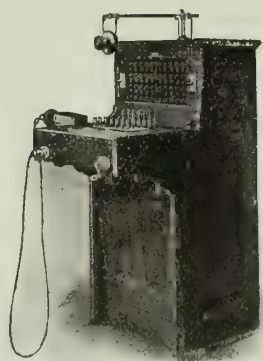


No. 332  
JANITOR'S  
TELEPHONE

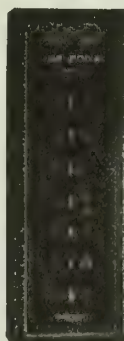
No. 41  
WALL TYPE  
TELEPHONE



DUPLEX  
SUITE TELEPHONE



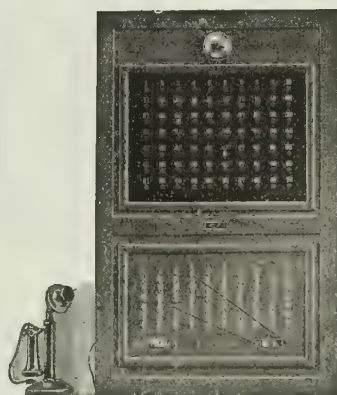
TYPE A SWITCHBOARD



Type D



Type J



Type T

ELECTRIC RESET-ANNUNCIATORS

# THE HOLTZER-CABOT ELECTRIC CO.

## Electric Signaling Systems

HOME OFFICE AND FACTORY

125 Amory Street  
BOSTON, MASS.

BRANCH OFFICES

CHICAGO, ILL., 6161-65 State Street

NEW YORK, N. Y., 101 Park Avenue

BALTIMORE, MD., 1104 Union Trust Building

### Products.

HOSPITAL SILENT CALL SYSTEMS.  
INTERIOR TELEPHONES.  
ANNUNCIATORS, BELLS, BUZZERS, and  
PUSH BUTTONS.  
SCHOOL and FACTORY FIRE ALARM SYSTEMS.  
WATCHMAN'S CLOCKS.  
MOTORS; DYNAMOS.  
MOTOR GENERATORS for battery charging, bell ringing, etc.



TRADE-MARK

Any number of buzzers or pilot lamps can be added, also a superintendent's annunciator or an elapsed time recorder, or both.

SYSTEM B—Patient pressing button lights lamp over the door in the corridor, lights private room or ward pilot, and sounds the buzzers momentarily in duty room and diet kitchen.

When call is made from a ward, a light is also lighted over the bed of the patient calling.

If two or more calls are made simultaneously in same ward, the releasing of one button will extinguish only the lamp over the bed, and corridor lamp and ward pilot lamps will continue to burn until all calls in the ward have been answered.

Superintendent's annunciator and elapsed time recorder can be added to the apparatus above mentioned.

### Features of Hospital Silent Call System.

(1) A complete, silent lamp signal system, as perfect as it is possible for a system to be made. The signal can be re-set only at the calling station.

(2) An audible signal, if desired, in addition to the silent signal, as the most attentive of nurses can not always keep her eyes on the lamps. Signals audible only in their immediate vicinity may be employed.

(3) A system in which the audible signal is sounded momentarily and at the will of the patient.

(4) A system in which the audible signal as a whole, or the audible signal from any particular station, may be cut off without the knowledge of the patient who abuses his privilege.

(5) A system having all working or moving parts contained in a unit comprising a cord, plug and locking push button.

(6) A system in which this working unit may be instantly displaced by another, should necessity require it, by the nurse or any attendant. No workman with his tools and confusion is required.

(7) A working unit complying with all insulation requirements for standard lighting service and having ten times its factor of safety when used with 10 volts.

### Hospital Specimen Systems.

All systems are silent except when buzzer is placed in nurse's duty room, diet kitchen, etc.

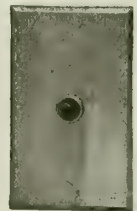
Signals in each of these specimen systems can be re-set only at the bedside by nurse answering the call.

SYSTEM A—Patient presses button which lights corridor door lamp, also a pilot lamp and sounds buzzer momentarily in duty room and diet kitchen.



LIST NO. 162007 CALL  
AND RE-SET STATION  
WITH EMERGENCY  
BUTTON

For bathrooms, operating rooms, etc.



LIST NO. 162006 CALL  
AND RE-SET STATION  
For toilets, bath-  
rooms, etc.



LIST NO. 162002 CALL  
AND RE-SET STATION  
For private rooms



LIST NO. 162003 CALL  
AND RE-SET STATION  
WITH PILOT LAMP  
For wards



SYSTEM C—Patient pressing the calling button lights the lamp over the door in the corridor, lights the private room or ward pilot in the diet kitchen, and indicates by lighting of the lamp in annunciator in nurse's duty room which station is calling, also causes buzzers to sound momentarily in diet kitchen and duty room.

If call is made from a ward, a light is also lighted over bed of patient calling. In this system the nurse is able to locate the exact station calling directly from the duty room.

Release of button in private room extinguishes corridor lamp and annunciator lamp; and if no other private room call exists, the private room pilot lamp also.

This system provides individual wall lamps in wards and individual indication in nurse's and superintendent's annunciators.

SYSTEM D—Patient pressing the calling button in a private room lights the lamp outside of door; if in a ward, a lamp over the bed also, and sounds buzzers momentarily in nurse's duty room and diet kitchen.

The nurse hearing the buzzer or seeing pilot lamp lighted, locates calling station by lamp over door, and if in a ward by lamp over patient's bed.

Should patient be in critical condition and needing the doctor's attention, nurse presses emergency button located in calling plate, lighting emergency lamp outside of door, emergency pilot lamps in duty room and diet kitchen, sounding the bells momentarily.

Upon arrival of the doctor, locking device in emergency button is released by nurse.

Emergency calls are usually also registered on telephone board so that operator can call doctor by pressing button or operating doctor's call.

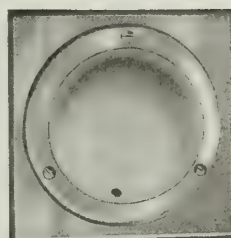
ACCESSORIES TO SYSTEMS—To enable proper supervision over service rendered by nurses, a master annunciator or elapsed time recorder (see illustration) may be installed. The latter registers permanently the exact time required to answer every call.

POWER REQUIRED—These systems can be operated from any 10-volt source of current having sufficient capacity, such as a transformer, motor generator set or storage battery.

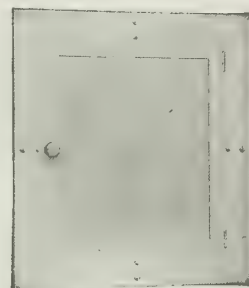
If A. C. is available, use transformer or motor generator.

If D. C. is the source, use motor generator.

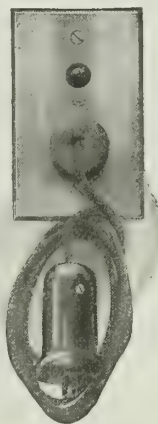
Both transformer and motor generator set are manufactured and supplied by this company.



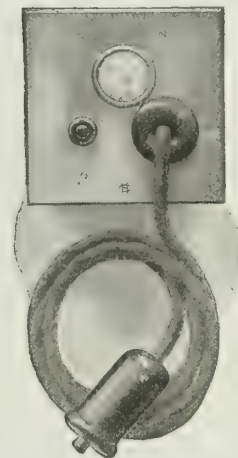
LIST NO. 162026 DOME  
PILOT STATION  
For use over doors in  
corridors



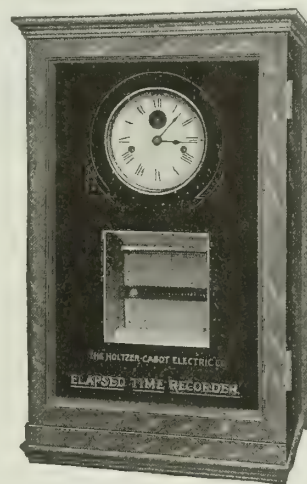
LIST NO. 162052 FLUSH  
LAMP ANNUNCIATOR  
For use in superintendent's  
office and duty rooms



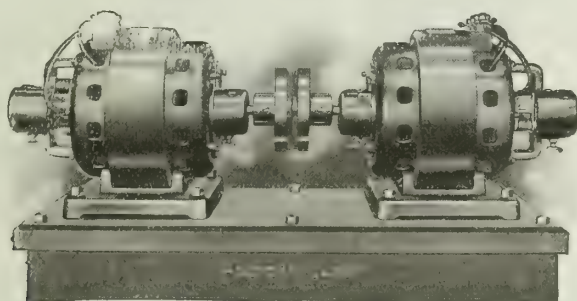
LIST NO. 162004 CALL  
AND RE-SET STATION  
WITH EMERGENCY  
BUTTON  
For private rooms



LIST NO. 162005 CALL  
AND RE-SET STATION  
WITH PILOT LAMP AND  
EMERGENCY BUTTON  
For wards



LIST NO. 162072 ELAPSED TIME RECORDER 25-STATION UNIT  
For superintendent's office



TYPICAL A. C. MOTOR GENERATOR SET

### Annunciators.

Holtzer-Cabot annunciators have long been well known for their superior quality, fine cabinet work and positive operation. They are to be found in the finest residences and public buildings in America.

Suggestions covering annunciators to meet unusual conditions will be submitted.

LIST No. 150020—Flush pattern for fine residence work. Either wood or metal trim. Gravity or French pattern drops. Finished to match woodwork or hardware.

LIST No. 150028—Pattern 27 house annunciator case extended at top to conceal bell. Equipped with gravity drops only. Made in any size up to 30 numbers. Standard finish, golden oak.

LIST No. 150024—Pattern "OO" residence annunciator. Gravity or French drops. Made in any size up to 30 drops. Standard finish, golden oak.

LIST No. 148160—Pattern 60 telephone annunciator. Extensively used in hotels, schools and apartment houses in connection with our various types of single point telephones, meeting a demand for an efficient low priced system of intercommunication. Can be furnished with auxiliary fire alarm attachment when required. Furnished for any number of indications from 12 up.

### Magneto Watchman's Clocks and Stations.

LIST No. 152001—Standard style "E" magneto clock. Several styles from which to select. Standard finish, golden oak.

LIST No. 152040—Metal case weather-proof magneto station; also made of wood, in box and flush patterns.

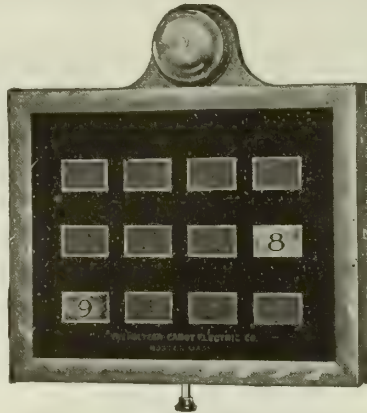
### Fire Alarm Systems.

A complete line of fire alarm boxes for school and factory fire alarm systems is offered, also bells, horns, motor generator sets and control panels to meet the requirements of state and city authorities and fire underwriters.

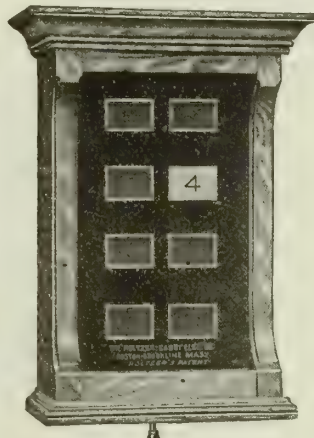
TYPE No. "N Y S"—A typical code signal fire station. Several patterns are made, meeting every requirement.

LIST No. 163001—A typical non-code break-glass fire alarm station.

Complete equipment can be supplied for closed or open circuit, plain or code signaling, also for auxiliarized systems.



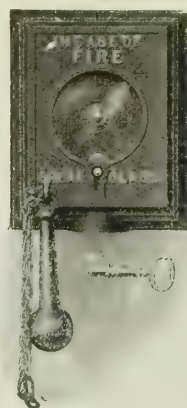
LIST NO. 150024 RESIDENCE ANNUNCIATOR



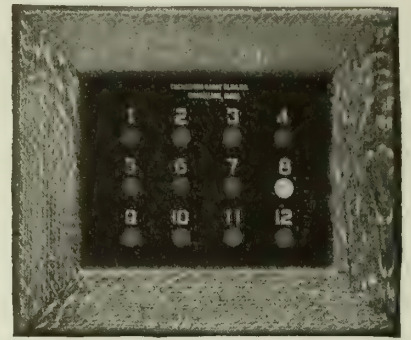
LIST NO. 150028 HOUSE ANNUNCIATOR



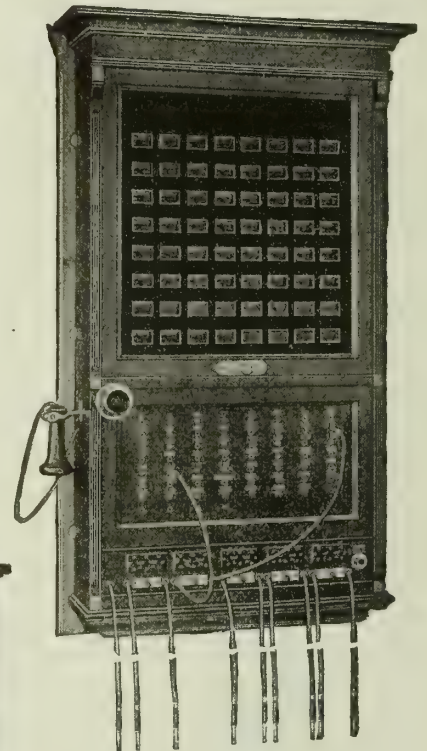
LIST NO. 152001 WATCHMAN'S MAGNETO CLOCK



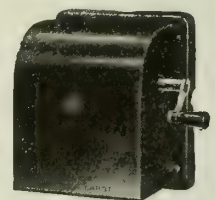
LIST NO. 163001 NON-CODE BREAK-GLASS FIRE STATION



LIST NO. 150020 RESIDENCE ANNUNCIATOR



LIST NO. 148160 TELEPHONE ANNUNCIATOR



LIST NO. 152040 MAGNETO STATION



TYPE "N Y S" CODE SINGLE FIRE STATION



**Electric Bell Systems.**

For schools, factories, etc.

The bells illustrated are specially designed for schools. They possess such features as dustproof construction, concealed terminals and durable finish to insure lasting service under most exacting conditions.

Holtzer-Cabot bells have long been recognized as standard by leading school architects.

LIST NO. 151020—Sizes 3 to 10 ins. also furnished with sleigh or cow gongs. An ideal corridor signal for schools.

Finish, black.

LIST NO. 151045—Type "S" burner, for classroom installations. Exceedingly efficient and reliable.

Finish, black.

LIST NO. 151035—Sizes 8 to 14 ins. A schoolyard gong. Absolutely watertight, mounted on a heavy mat and provided with heavy cage and hood to prevent birds from nesting and as a protection from missiles.

Finish, verde antique.

LIST NO. 151120—Sizes 6 to 12 ins. Designed for use with signaling system. A single stroke bell, without gears, clockwork, or electric contacts of any kind, yet giving the same signal as obtained by the use of electro-mechanical bells.

Finishes, black or fire alarm red.

LIST NO. 151110—6-in. gongs or 6-in. cast bell metal cow gongs. A loud ringing signal bell for noisy places.

A very satisfactory code signal bell. For alternating current up to and including 120 volts, 25 to 60 cycles. For direct current up to and including 240 volts.

Weatherproof, stamped steel base and cover, baked japan finish.

LIST NO. 151037—8- to 12-in. gongs. Electro-mechanical bell for fire alarm service in schools, hospitals, dormitories, hotels, factories, etc. Will strike 500 blows at one winding and give signal when three-quarters run down.

Finish, bell, black; base, fire alarm red.

LIST NO. 151125—A vibrator type horn for giving a sharp distinct signal, the tone being even and penetrating. Particularly adapted for use with code signal boxes for fire alarm and factory systems.

Finishes, black or fire alarm red.

**Telephones.**

LIST NO. 148015—A school classroom telephone. Made for surface or flush mounting. Finish, black oxidized.

LIST NO. 148060—A flush pattern residence telephone. Metal plate. Finish, brush brass or nickel-plated.

**Bulletins.**

148E—Interior Telephones.

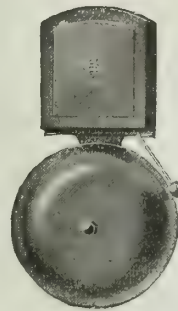
150F—Annunciators.

151F—Bells and Signaling Apparatus.

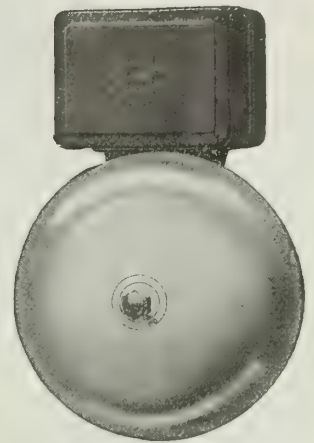
152F—Watchman's Clocks.

16201—Special Hospital Signaling Apparatus.

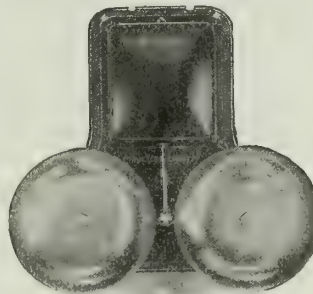
16301—School Signal Systems.



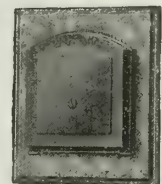
LIST NO. 151020 TYPE "S"  
DUSTPROOF BELL



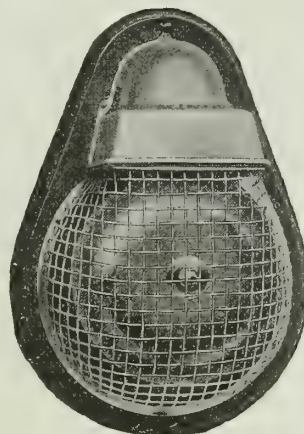
LIST NO. 151120 SINGLE  
STROKE GONG



LIST NO. 151110 SIGNAL BELL



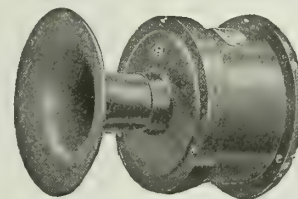
LIST NO. 151045 BUZZER



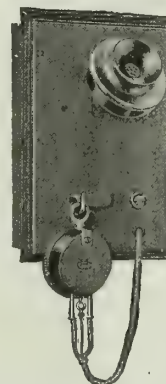
LIST NO. 151035 SCHOOL  
YARD GONG



LIST NO. 151037 ELECTRO-  
MECHANICAL GONG



LIST NO. 151125 VIBRATOR TYPE "REACTO" HORN



LIST NO. 148015 CLASSROOM  
TELEPHONE



LIST NO. 148060 FLUSH METAL  
TELEPHONE

# STANLEY & PATTERSON, INC.

Electric Signal Apparatus, Telephone Apparatus, Annunciators, Hospital Call Systems, Battery Sets, Interior Fire Alarm Systems and Floor Outlet Boxes

TELEPHONE:  
BARCLAY 5200

23 Murray Street and 141-145 West 36th Street  
NEW YORK, N. Y.

FACTORY AND WAREHOUSE, West and Hubert Streets

## AGENCIES

LOS ANGELES, RALPH B. CLAPP, 626 San Fernando Building    SAN FRANCISCO, H. B. SQUIRES Co., 583 Howard Street  
CHICAGO, DOHERTY-HAFNER Co., 618 West Jackson Boulevard    SEATTLE, H. B. SQUIRES Co., 522 First Avenue, South  
PHILADELPHIA, J. A. VAUGHAN, 539 Real Estate Building

## Products.

DeVEAU TELEPHONE APPARATUS.  
DeVEAU ANNUNCIATORS.  
DeVEAU HOSPITAL CALL SYSTEMS.  
FARADAY FIRE ALARM SYSTEMS.  
FARADAY ENCLOSED TYPE SIGNAL GONGS.  
P R BELLS (call-bells).  
PATTERSON BATTERY SETS.  
PATTERSON FLOOR OUTLET BOXES.

## DeVeau "Intertalk" Telephones.

Recommended wherever instantaneous and dependable means of communication is required. Instruments made in surface wall, flush wall, and desk or table types. Illustrations show 3 most popular sets.

Telephone service is divided up more or less into 4 classes, as follows:

(A) INTERCOMMUNICATING, COMMON RETURN SYSTEM—So arranged that any telephone can call and be called by any telephone on the system, and 2 or more conversations may be carried on at the same time. Adaptable where lines are not too long, and where numerous instruments will not be used.

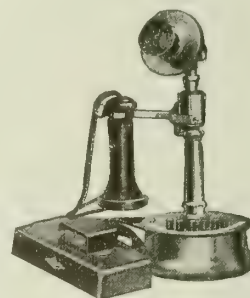
(B) INTERCOMMUNICATING, METALLIC CIRCUIT SYSTEM—So arranged that any telephone can call and be called by any telephone on the system, and 2 or more conversations may be carried on simultaneously without inductive cross talk. Adapted where lines are long, and many instruments used.

(C) INTERCOMMUNICATING, COMMON TALKING, SELECTIVE RINGING SYSTEM—So arranged that any tele-

phone can call and be called by any telephone on the system, but only one conversation can be carried on at one time. Adaptable where telephones are not likely to be busy, and where "common talking" is not objectionable.

(D) CENTERPHONE, OR MASTERPHONE SYSTEM—So arranged that centerphone can call and be called by all outlying, or single station telephones. Outlying telephones can not call each other, except through masterphone. Any number of instruments may be used.

All above systems require 2 sets of battery, arranged in "ringing" and "talking" sets. Usually 3 to 6 cells used for ringing, 2 to 5 cells for talking, depending upon number of instruments, length of line, etc.



DESK TYPE

Cat. No. 159, Common Return  
Cat. No. 159B, Metallic Circuit  
Cat. No. 1158, Common Talking or Centerphone

## DeVeau Apartment House "Intertalk" Telephones.

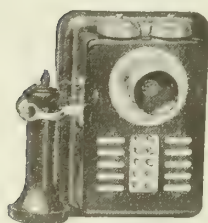
For use in all apartment houses, large or small. Furnishes quick and dependable means of communication from vestibule, entrance hall, tradesmen's entrance and janitor's quarters, and also permits of tenant calling janitor or superintendent.

Service is divided into 4 classes, as follows:

(A) COMMON TALKING—Designed for houses where there are not more than 2 or 3 points of calling, i. e., vestibule, janitor and tradesman. Only one conversation can be held at any one time.

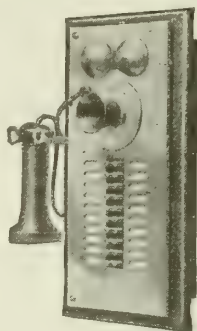
(B) SECTIONAL TALKING—Designed for houses with more than 1 vestibule. Each vestibule calls all telephones on its particular section. Tradesmen call all telephones in their particular sections. Janitor can call any telephone on any section, and receives calls from all.

Talking in any one section is common, but 2 or more sections can talk simultaneously without interfering with any other section.



SURFACE WALL TYPE

Cat. No. 157, Common Return  
Cat. No. 157B, Metallic Circuit  
Cat. No. 1157, Common Talking or Centerphone

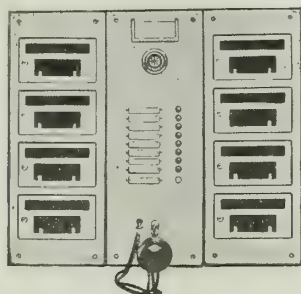


FLUSH WALL TYPE

Cat. No. 3250A, Common Return  
Cat. No. 3256B, Metallic Circuit  
Cat. No. 3250C, Common Talking or Centerphone

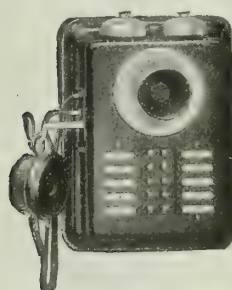


(C) SELECTIVE TALKING OR NON-INTERFERING—Designed for houses where there are several points of



VESTIBULE SET COMPLETE WITH LETTER BOXES  
Cat. No. 2509N

Made for any system with letter boxes arranged in units of 3 and 4



JANITOR'S OR TRADESMEN'S SET

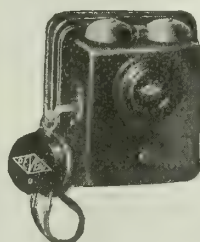
Made for any system.  
Annunciator necessary in conjunction with system (C) selective talking



VESTIBULE SET WITHOUT LETTER BOXES  
Cat. No. 2510  
Made for any system



FLUSH SUITE SET  
Cat. No. 2530  
For use with any system



SURFACE SUITE SET  
Cat. No. 129  
For use with any system

communication, and where common talking is objectionable. Any number of conversations may be carried on without interference.

Janitor is provided with telephone annunciator to notify him of origin of calls, so as to "plug in" to proper apartment.

(D) SWITCHBOARD — Designed for large apartment houses, and where tenants desire to communicate with each other.

All telephones can communicate with switchboard, and with each other through switchboard.

NOTE—This switchboard system is also used in schools, factories, warehouses, clubs, hospitals and all public and private institutions.



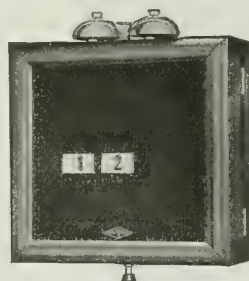
TABLE STYLE SWITCHBOARD  
Cat. No. 190R  
Switchboard System (D)

## DeVeau Annunciators and Push Buttons.

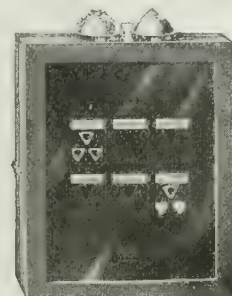
Recommended for use where reliable, dependable instruments are desired. Made in either lamp, electrical re-set or gravity type, flush or surface wall and desk styles, and for all other purposes.

DeVeau lamp annunciators are equipped with individually removable and interchangeable lamp units, which permit of markings or indications being interchanged at will. By using this new device, it is not necessary to have the entire glass front of the annunciator re-marked, as new unit glasses can be furnished at slight additional cost.

Illustrations show representative types for regular and elevator annunciator systems.



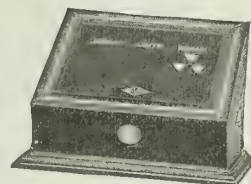
WALL SURFACE TYPE, GRAVITY  
Cat. No. 10G



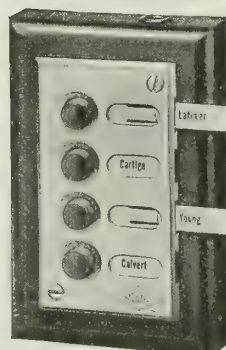
WALL SURFACE TYPE, ELECTRICAL RE-SET  
Cat. No. 10R



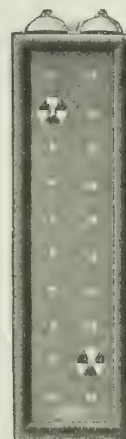
METAL SURFACE ANNUNCIATOR, GRAVITY  
Cat. No. 371  
Arranged for flush or surface mounting



DESK TYPE, ELECTRICAL RE-SET  
Cat. No. 2R



DESK PUSH BUTTON MAT WITH INDIVIDUAL NAME PLATES  
Cat. No. 1A  
Arranged for flush or surface mounting

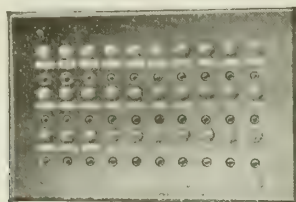


ELEVATOR TYPE, ELECTRICAL RE-SET  
Cat. No. 11RE  
Arranged for flush or surface mounting

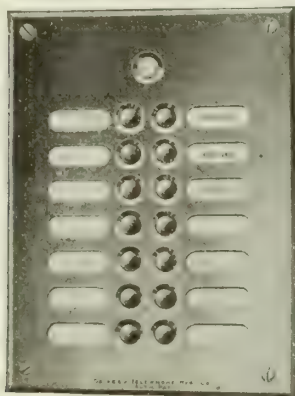
The following illustrations show apparatus designed especially for banks and commercial institutions, which has been installed in some of the leading banks throughout the United States and Canada.



BANK PIGEON HOLE DESK LAMP ANNUNCIATOR  
Cat. No. 2553A



BANK LAMP ANNUNCIATOR WITH INDIVIDUAL  
RESET BUTTONS  
Cat. No. 2554



BANK PUSH BUTTON WITH EMERGENCY BUTTON  
Cat. No. 2255

A new departure in annunciators is our new electrical re-set drop, installed in all annunciators arranged for this style of drop. The drop is locking, and when indicating or otherwise is firmly held by a mechanically operating lock, which is actuated by the electromagnet in the drop, thus overcoming the difficulties experienced with other drops, namely, having the target showing half-way.

Another decided improvement in our electrical re-set annunciators is the *individually removable name plates*. Names may be interchanged at will, and new names added at practically no expense.

Gravity type annunciators are furnished with positive lock drops, and no amount of vibration can affect the drop.

### DeVeau Silent Signal Hospital Systems.

**NURSE CALLING EQUIPMENT**—Recommended for all public or private hospitals or institutions, large or small, where reliable, dependable silent call signal systems are desired. It offers the best service of any hospital equipment on the market for the following reasons: (1) low voltage; perfect safety to patient; (2) direct or alternating current; (3) silent signal; no disturbance to other patients; (4) calls will indicate at any number of points desired; (5) emergency calls; additional help can be summoned without nurse having to leave patient; (6) signal can be re-set only at point of origin; (7) patient can not release call; (8) calls can be checked by superintendent or head nurse; (9) flexibility of apparatus permits of furnishing any system or combinations of systems desired; (10) all apparatus is standard and interchangeable for any of our systems.

This company uses a locking button for all calls, which is the most modern hospital calling unit on the market. It is perfect in operation and can not be re-set under any circumstances by the patient using it. Pressing the button locks it automatically. It can only be re-set by the nurse coming in answer to the call. It is optional whether a button or key is to be used for re-

setting, determined by preference of architect or hospital authorities.

The operation of this button is simplicity itself. Pressing the button makes a positive locking contact, which does not depend upon any relay or other electrically controlled device for making contacts. It is mechanically locked, and the re-set is controlled from the wall plate by button or key. The call can be re-set by the nurse without disturbing the patient.

Full information as to any system will be cheerfully furnished, together with blue prints and all necessary engineering and wiring data. This company is prepared to furnish systems of all types, including relay and high voltage systems; but the locking button system is recommended as the safest and most efficient.



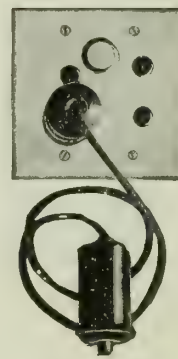
Calling Station  
Cat. No. 1502



Calling Station with  
Lamp and Opal  
Cat. No. 1506



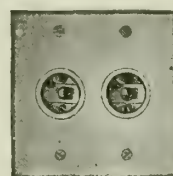
Calling Station with  
Emergency Button  
Cat. No. 1516



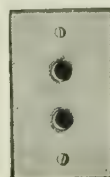
Calling Station with  
Lamp, Opal and  
Emergency Button  
Cat. No. 1520



Single Pilot Lamp  
Station, Less Lamp  
Cat. No. 1529



Double Pilot Lamp  
Station, Less Lamp  
Cat. No. 1530



Solarium Calling  
Station  
Cat. No. 1514



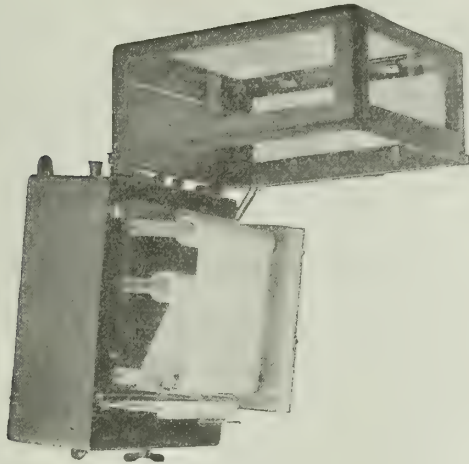
Buzzer Station with  
Emergency Bell  
Cat. No. 1551



Combination Buzzer  
and Pilot Station  
Cat. No. 1552

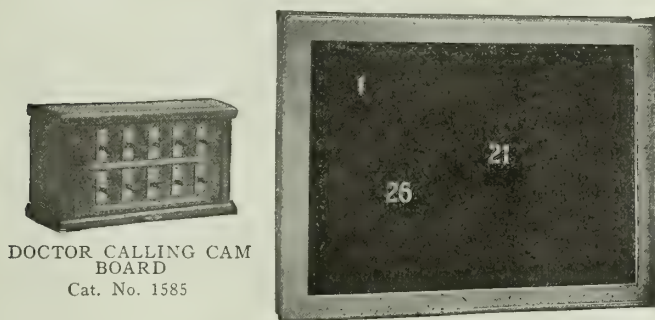
DEVEAU HOSPITAL EQUIPMENT



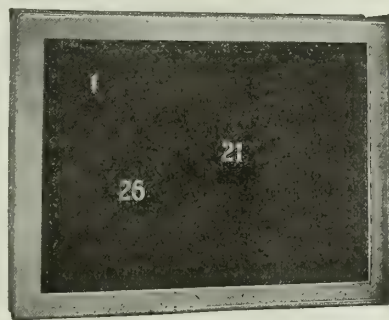


ELAPSED TIME RECORDER  
Cat. No. 1584

**DOCTOR CALLING EQUIPMENT**—In addition to the nurse calling equipment described above, the company also makes a complete doctor calling equipment. This consists of a number of lamp annunciators connected in multiple, located at different points in the building. The signals are controlled from a cam board usually located at the telephone operator's desk. When a doctor is wanted, throwing the proper cam lights the lamp corresponding to the doctor's name on the annunciators, causing this name to appear on all of the annunciators simultaneously. Releasing the cam extinguishes all lamps in connection with that call. The lamp annunciators are equipped with individually removable and interchangeable lamp units, which permit of names being added or interchanged at will. By using this new device, it is not necessary to have the entire glass front of the annunciator re-marked when any changes are made in the hospital staff, as new unit glasses with doctor's names can be furnished at slight additional cost.



DOCTOR CALLING CAM  
BOARD  
Cat. No. 1585



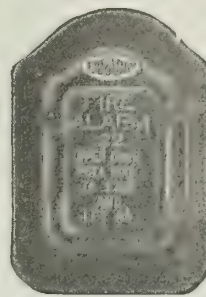
DOCTOR CALLING LAMP  
ANNUNCIATOR  
Cat. No. 1592

### Faraday Interior Fire Alarm Systems.

STANLEY & PATTERSON, INC., manufacture the largest line of interior fire alarm apparatus made in the United States for factories, schools, colleges, public institutions, hotels, hospitals, theaters, office buildings, department stores, warehouses, freight terminals, etc.

Their engineers are always prepared to furnish fire alarm engineering advice of absolutely unquestioned reliability; and this service is made without charge to all architects and engineers specifying Faraday fire alarm apparatus.

With the rapidly crystallizing public sentiment that every building of any size should have a fire alarm system to protect life and property, and the rapidly



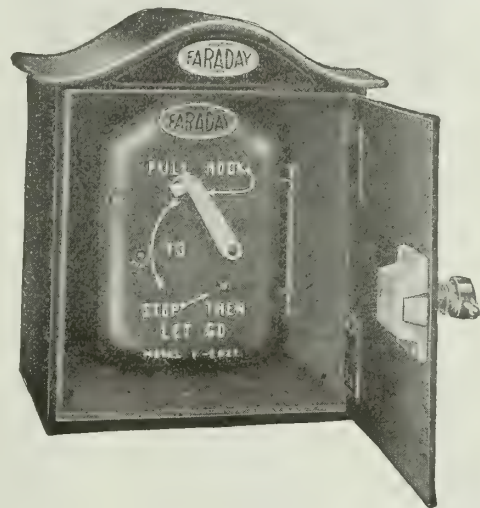
Model FF-2022  
ENCLOSED PULL-  
LEVER CODING-RING-  
ING TYPE FIRE  
ALARM BOX  
For flush work with  
conduit box back



Model 2040-2042  
"BREAK GLASS"  
NON-CODE-RINGING  
TYPE FIRE ALARM BOX  
WITH CONDUIT  
BOX BACK



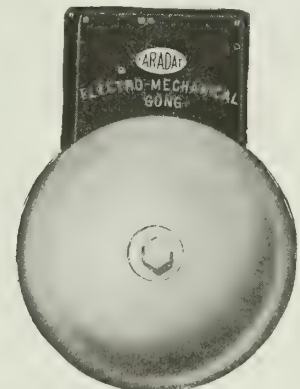
Model F-2022  
ENCLOSED PULL-  
LEVER CODING-RING-  
ING TYPE FIRE  
ALARM BOX  
For surface work with  
conduit box back



Model WF-2022  
WEATHERPROOF FIRE ALARM BOX



Model 2120  
SINGLE STROKE HALF-  
GUARDED GONG WITH  
CONDUIT BOX BACK



Model 2620-2625  
ELECTROMECHANICAL  
GONG WITH CONDUIT  
BOX BACK

spreading legislation making installation of fire alarm systems mandatory, architects and engineers will do well to include a Faraday fire alarm system in all their more important specifications at time of construction; because installation of these interior fire alarm systems can be very much more economically made during construction of the building than after the building is up and the walls closed in.

Faraday interior fire alarm systems are simple, serviceable and absolutely reliable for all building requirements. Broadly speaking, there are 2 types of systems:



(a) Closed circuit electrically supervised (see systems "SSP," "SSS," "SEM," etc.).

(b) Open circuit non-supervised (see system No. 1).

Faraday fire alarm systems are briefly described in following paragraphs; full and complete fire alarm data will be found in Catalogue No. 35, which will be promptly forwarded on application.



FARADAY FIRE ALARM CONTROL CABINET

### Faraday Fire Alarm Systems for Hotels, Hospitals and Similar Institutions.

"SSP" FARADAY FIRE ALARM SYSTEM—A closed circuit, electrically supervised, selective, code-ringing system operated from storage batteries. This system is designed especially for hotels, hospitals and similar institutions where it is not desirable to alarm all the occupants of the building immediately upon a fire being discovered, but where it is desired to notify the members of a previously trained fire brigade. The operation of the system is such that when any box is pulled, the code number is sounded on certain predetermined gongs located at points within hearing of the fire brigades, but not necessarily located so as to be a source of fright to the guests. Upon the signal being received on these gongs, members of a fire brigade immediately proceed to the point indicated, and in the majority of instances are able to put out the fire; however, should the fire brigade not be able to cope with the situation themselves, and it becomes necessary that the guests be alarmed, a second operation of the box by any member of the brigade will sound a general alarm on all the gongs in the building, thus advising all occupants of the fire.

Main circuits, box circuits and gong circuits are constantly under test. Trouble of any nature on any part of the system, or failure of operative current is automatically indicated by the ringing of the trouble bell.

This system employs selective, code-ringing Faraday fire alarm boxes Model PFF-2022 (flush type) or Model PF-2022 (surface type), indicating, by tap signals on single stroke Faraday gongs Models 2120 or 2100, location of box from which signal originates.

Complete specifications No. 351 will be sent on request.

"DSP" PRE-SIGNAL FARADAY FIRE ALARM SYSTEM—Similar to the "SSP" system, but operates from 110-220 volt D. C. electric light or power circuits in places where these circuits are absolutely dependable. It employs similar devices to the "SSP" system, but dispenses with the storage battery, motor generator and charging cabinet.

Complete specifications No. 352 will be sent on request.

### Faraday Fire Alarm Systems for Schools, Factories, Etc.

"SSS" FARADAY FIRE ALARM SYSTEM—A closed circuit, electrically supervised, selective, code-ringing system operated from storage batteries. This system is designed especially for schools, factories and similar institutions where it is desirable to drill the occupants. It employs selective, code-ringing Faraday fire alarm boxes Model FF-2022 (flush type), Model F-2022 (surface type) or WF-2022 (weatherproof type), indicating, by tap signals on single stroke Faraday gongs Models 2120 or 2100, location of box from which signal originates.

Complete specifications No. 353 will be sent on request.

"BSS" FARADAY FIRE ALARM SYSTEM—Similar to the "SSS" system, but operates from primary batteries instead of storage battery. It employs similar devices to the "SSS" system, but dispenses with the motor generator and the charging cabinet.

Complete specifications No. 354 will be sent on request.

"DSS" FARADAY FIRE ALARM SYSTEM—Similar to the "SSS" system, but operates from 110-220 volt D. C. electric light or power circuits in places where these circuits are absolutely dependable. It employs similar devices to the "SSS" system, but dispenses with the storage battery, motor generator and the charging cabinet.

Complete specifications No. 356 will be sent on request.

"SEM" FARADAY FIRE ALARM SYSTEM—A closed circuit, electrically supervised, selective, code-ringing system operated from storage batteries, very similar to the "SSS" system, but employs electromechanical Faraday fire alarm gongs Model 2620 in place of the single stroke Faraday fire alarm gongs Models 2120 or 2100. The boxes are the same as in the "SSS" system. This system is sometimes specified where large areas are to be covered, and it possesses the advantage over the other type, in that boxes and gongs may be wired in one straight series.

Complete specifications No. 357 will be sent on request.

"EEM" FARADAY FIRE ALARM SYSTEM—Similar to the "SEM" system, but operates from Edison BSCO primary batteries in places where it is not convenient to install storage batteries.

Complete specifications No. 357 will be sent on request.

"PEM" FARADAY FIRE ALARM SYSTEM—A closed circuit, electrically supervised, code-ringing system operated from Patterson battery sets. This system is recommended for small schools, etc., and employs electromechanical Faraday fire alarm gongs Model 2625. It also employs the same type of code-ringing fire alarm box as the "SSS" system. Model FA Patterson battery sets are provided with this system.

Complete specifications No. 358 will be sent on request.



**NO. 1 NON-SUPERVISED OPEN CIRCUIT FARADAY FIRE ALARM SYSTEM**—A simple open circuit, non-selective, non-code-ringing, non-supervised system. It does not indicate the location of the box from which signal originates and does not automatically indicate the failure of operative current or derangement of circuits or apparatus. This system employs Models 2040 or 2042 break glass, non-code-ringing Faraday fire alarm boxes, Model 2500 enclosed type Faraday vibrating gongs and FA Patterson battery sets.

Complete specifications No. 359 will be sent upon request.

**NO. 1A NON-SUPERVISED OPEN CIRCUIT FARADAY FIRE ALARM SYSTEM**—Similar to No. 1, but employs, in addition to the boxes and gongs, Faraday fire alarm annunciators Model 3004.

Complete specifications No. 360 will be sent on request.

### Faraday Enclosed Type Signal Gongs, National Code Standard.

Faraday enclosed type signal gongs are recommended for use wherever an electric signal gong is required that must be absolutely reliable and dependable.

All Faraday enclosed type gongs have been inspected and approved by Underwriters' Laboratories, and are "National Code Standard."

**GENERAL TYPES**—Faraday gongs are made in the following types:

(1) Standard type single gong vibrating for operation on battery (all voltages), and all D. C. electric light and power circuits from 60 to 600 volts.

(2) Transformer type single gong vibrating for operation through A. C. (18-volt) transformers connected to 25- to 60-cycle, 100- to 440-volt electric lighting and power circuits; also direct on A. C. light and power circuits of all voltages 100 to 440, without transformers.

(3) Double gong vibrating type, designed primarily for operation on A. C. 100- to 440-volt electric light and power circuits of 25- to 60-cycle frequency; also furnished for operation on A. C. transformers (not less than 18 volts secondary) and on all D. C. electric light and power circuits from 60 to 600 volts; also battery circuits.

(4) Electromechanical type, single stroke or continuous ringing, designed for use where a more powerful blow is required than can be obtained from the regular electric signal gong. Operative from all A. C., D. C. and battery circuits.

(5) "Single stroke" type for operation on battery and all D. C. electric light and power circuits from 60 to 600 volts (can not be operated on A. C. circuits). "Single stroke" gongs are generally used for code signaling.

### Standard Single Gong Faraday Gongs, Enclosed Vibrating Types.

Standard single gong, enclosed type Faraday vibrating gongs, shown top of second column, are the most generally used of any types made in the United States. They are furnished with 3 styles of housings, as shown in illustration. These 3 styles of housings are each furnished in various submodels for specific building conditions.

(1) For use where wires are not run in conduit, i.e., without conduit box backs. Operative from any

battery or D. C. electric light or power circuit. Not for use on A. C.

(2) For use where wires are to be run in conduit.



Model "A"  
Non-guarded Gong,  
1 1/4 to 18 ins.



Model "B"  
Half-guarded Gong,  
4 to 14 ins.



Model "C"  
Full-guarded Gong,  
5 to 12 ins.

### STANDARD SINGLE GONG ENCLOSED TYPE FARADAY VIBRATING GONGS

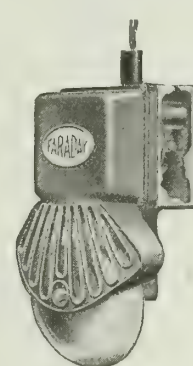
Where wires are not run in conduits

Operative from any battery or D. C. electric light or power circuit. Not for use on A. C.

Models "AP" (non-guarded gongs), "BP" (half-guarded gongs) and "CP" (full-guarded gongs) are for conduit installations. Conduit models are a great improvement over the ordinary type of gong, which have no outlet box provision for making conduit connections to bring the circuit wires from the conduit into the gong itself.



Model "AP"  
Gongs, 3 1/2 to 18 ins.



Model "BP"  
Gongs, 3 1/2 to 14 ins.



Model "CP"  
Gongs, 5 to 12 ins.

### STANDARD SINGLE GONG ENCLOSED TYPE FARADAY VIBRATING GONGS

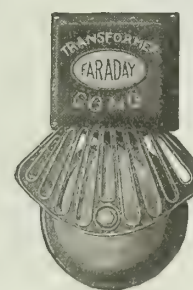
Where wires are run in conduits

### Transformer Type Single Gong, Enclosed Vibrating Gongs.

Transformer type single gong bells, vibrating pattern, shown below, are designed primarily for operation through A. C. 18-volt transformers or direct connected to 25- to 60-cycle 100- to 440-volt light and power circuits.



Model "AT"  
Model "ATP"  
(For places where conduit is not used)



Model "BT"  
Model "BTP"  
(For conduit)



Model "CT"  
Model "CTP"

### TRANSFORMER TYPE SINGLE GONG FARADAY BELLS



**Double Gong Faraday Bells.**

Double gong bells for operation from A. C. 18-volt 25- to 60-cycle transformers, and direct from A. C. lighting and power circuits 100 to 440 volts, 25 to 60 cycles; made also for use on battery and D. C. lighting and power circuits.

Double gong Faraday bells, shown below, are entirely different from any A. C. bells on the market, because of the new patented quick-break pole reversing commutator device, which completely overcomes the "dead-center" of other double gong bells.

All Faraday double gong bell models, both for conduit and open (non-conduit) work, are made for operation as follows:

(1) A. C. electric light and power circuits 100 to 440 volts, 25 to 60 cycles.

(2) A. C. 18-volt transformer circuits, 25 to 60 cycles.

(3) D. C. electric light and power circuits of all voltages from 60 to 600.

(4) Battery circuits of any voltage.

For double gong bell installations, the voltage should always be plainly specified and, if A. C., the frequency also.



DOUBLE GONG FARADAY BELL

Model "D" for D. C. and battery circuits in places where conduit is not used; Model "DT" for A. C. circuits in places where conduit is not used; Model "DP" for D. C. and battery circuits in places where conduit is used; Model "DTP" for A. C. circuits in places where conduit is used

**Electromechanical Faraday Gongs.**

Operative from all A. C., D. C., and battery circuits.

Electromechanical Faraday gongs are made for use where certain requirements demand a heavier and more powerful blow than is possible to obtain from an electric signal gong of regular design.

In an electromechanical Faraday gong, the blow is struck by a heavy ball on the end of a lever released by the electric current, but operated by a powerful clock spring.



Model "E"

ELECTROMECHANICAL FARADAY GONG

Model "E" for places where conduit is not used  
Model "EP" for places where exposed conduit is used  
Model "EFP" for places where conduit is run concealed  
Vibrating or single stroke gongs, 6 to 18 ins.

Cases are of cast iron, finely japanned; heavy soft rubber gaskets guard against dampness getting into the case; for conduit installations, cases are regularly drilled for 1/2- or 3/4-in. rigid iron conduit as specified, but entrances are plugged and provision made for wires entering from "open-work" type of wiring; when specially ordered, boxes will be drilled for any size conduit desired.

"Telltale" attachment furnished when specified at \$5.00 per bell extra; with "telltale" attachment, notification is insured whenever spring of the movement needs re-winding.

Electromechanical Faraday gongs will give approximately 700 blows to each winding. The following types of mechanisms are made and type desired must, of course, be specified:

- (a) Single stroke, for open circuit work
- (b) Single stroke, for closed circuit work
- (c) Continuous ringing, for open circuit work (rings as long as circuit is closed)
- (d) Continuous ringing, for closed circuit work (rings as long as circuit is open)
- (e) To ring continuously until run down, for open circuit work
- (f) To ring continuously till run down, for closed circuit work

**"Single Stroke" Enclosed Type Faraday Gongs.**

Operative from battery and all D. C. electric light and power circuits (can not be operated on A. C. circuits).

"Single stroke" enclosed type Faraday gongs, shown below, are the most powerful and longest movement single stroke gongs made; having no clockwork mechanism these gongs, of course, require no winding, as does the electromechanical type.

The long, slow, powerful movement in this mechanism is obtained by means of the Faraday multiple gear between armature and hammer rod, a feature that with a 3/8-in. movement of armature permits, for example, in a 10-in. size gong, a 3-in. movement of the hammer ball.

Semiflexible recoil type hammer rod guarantees a clear, unmuffled blow on the gong—a most valuable advantage over the usual hammer rod construction of other makes.



Model "AS"

Model "BS"

Model "CS"

(For places where conduit is not used)

Model "ASP"

Model "BSP"

Model "CSP"

(For conduit)

Gongs, 4 to 18 ins.

Gongs, 4 to 14 ins.

Gongs, 5 to 12 ins.

"SINGLE STROKE" ENCLOSED TYPE FARADAY GONGS

**P R Iron Box Bells and Buzzers.**

P R iron box bells and buzzers are a low priced line, designed for ordinary call-bell work—they are not recommended for important signals on account of their light construction; for first class, important signal installations, Faraday signal gongs or P R giant steel clad gongs should be used.

P R iron box bells, 2 1/2 to 4 ins., and buzzers are made for battery circuits. They are made in 3 grades: Eclipse (cheapest grade), XXX (second grade), and Marlo (highest grade).



All P R iron box bells and buzzers have drawn steel bases which are unbreakable; all working parts are firmly riveted to the base, which is heavily embossed, with the result that P R bells are practically a 1-piece bell.

The 3 types of bells described here are shown below. P R Marlo, XXX and Eclipse iron box bells are regularly furnished with nickelplated stamped steel gongs; bases and covers furnished in dull black enamel.

For first class house-call work, specifications calling for P R Marlo iron box bells and buzzers, in sizes



P R MARLO BELL



P R XXX BELL



P R ECLIPSE BELL

from 2½ to 4 ins., fancy gong types, and buzzers, will insure satisfactory installations.

Marlo bells and buzzers are made for 6- and 12-volt, 25- to 60-cycle A. C. bell ringing transformer circuits.

#### P R Giant Steel Clad Gongs.

P R giant steel clad gongs shown below have special, large, powerful mechanisms and are made to operate on battery, 100- to 125-volt D. C. light and power circuits, 12-volt, 25- to 60-cycle A. C. bell ringing transformer circuits, and 110-volt, 25- to 60-cycle A. C. light and power circuits.

P R giant steel clad gongs are made in sizes from 5 to 12 ins., inclusive, both in non-guarded type for interior use, as well as half-grid-guarded for inside and outside use.



P R MARLO  
GIANT STEEL  
CLAD GONG, COVER  
REMOVED  
Gongs 5 to 12 ins.



P R MARLO  
GIANT STEEL CLAD  
GONG, WITH COVER  
FOR INSIDE USE  
Gongs 5 to 12 ins.



P R MARLO  
GIANT STEEL  
CLAD W. P. GONG  
FOR OUTSIDE USE  
Gongs 5 to 12 ins.

#### Patterson Battery Sets and Their Usefulness.

Patterson battery sets are designed for the operation of electric signal apparatus, bells, annunciators, telephones, elevator signals, door openers, fire alarms, time stamps, program clocks, secondary dial clocks controlled by a master clock, etc., in every class of building work.

For the foregoing service, a Patterson battery set, of proper size, will (without attention or maintenance

expense) furnish a never failing supply of electric current for a period from 2 to 3 years.

*In all Patterson battery sets the renewal of cells is as easy as the renewal of an incandescent lamp; and, though done quickly by the most inexperienced person without tools or technical knowledge of any sort, can be done only in one way, and that the right way.*

#### General Types and Adaptability of Patterson Battery Sets.

Patterson battery sets are made in all voltages and all ampere capacities; some general type outfits are here noted:

"SERIES" SETS—Models "BB" and "BSC," shown below, are best adapted for use where current requirements are light and infrequent, i.e., fairly intermittent.



MODEL "BB-4" PATTERSON BATTERY SET  
Series box type  
4 volts—25 amperes



MODEL "BSC-6" PATTERSON BATTERY SET  
Series cabinet type. Flush steel cabinet  
6 volts—25 amperes

"MULTIPLE SERVICE" CABINETS—Model "BMC," shown below, are the best outfits for use where current requirements are heavy and the electrical equipment is frequently used. In "Multiple service cabi-



MODEL "BMC-36" PATTERSON BATTERY SET  
"Multiple service." Surface steel cabinet  
6 volts—75 amperes

nets, the current drain is distributed over the *entire bank of cells in the cabinet*, and the greatest economy is obtained by using battery cabinets of the "BMC" type. If, through any accidental cause, one of the series of cells in a "BMC" cabinet should fail, all other rows or series of cells in the cabinet will *automatically continue working without the manual operation of a "throw-over" switch or similar device.*

### Heavy Service Battery Cabinets.

"Multiple service 'BMC'" cabinets (shown on preceding page) will always save much more than they cost. These heavy service cabinets provide a battery power plant that will do the most severe work, *even that which has heretofore been thought to require a motor generator or storage battery, and do it with absolute satisfaction at a cost of approximately one-tenth the expense of motor generator operation.*

A 50-ampere Patterson battery cabinet will do the same work 4 times as long; 75-ampere Patterson battery set, 8 times as long; 100-ampere Patterson battery set, 10 times as long; 150-ampere Patterson battery set, 16 times as long as the old style battery installation; *never, of course, exceeding limit-life of a Patterson-Columbia Cartridge-Cell—2 to 3 years.*

### Protection Circuit Fuses.

"Series cabinets 'BSC'" and "multiple service cabinets 'BMC'" all have individual circuit fuses, automatically protecting battery set, in case of accidental short circuit, without disturbing operation of apparatus other than on the circuit in trouble.

### Once Connected, Never Has to Be Disconnected, or Re-connected.

In a Patterson battery set, whether it be the "Series," or the heavy duty "multiple service" wall-cabinet type, *circuit wires, once connected to the battery, never have to be disconnected or re-connected.*

### Long Service Life of Patterson Battery Sets.

The extreme long service life of a Patterson battery set suited to work in hand will, in a few years, save its entire cost. This is due to the following:

(1) Absolute "full carrying" capacity of the contacts, which completely does away with loss of battery power always present in "old style wired-up" battery set. (2) Housing of the "wax sealed" end of cell in practically an airtight cup, away from the effect of temperature change, etc. (3) Complete elimination of leakage due to dampness on bottom of cell or on cartons. (4) Positive prevention of accidental "getting together" of zinc terminals, as has always been most troublesome in the "old style wired-up" battery set.

### Battery Sets for Program Clocks and School Building Signal Work.

Specially designed Patterson battery sets for schoolhouse installation, in connection with program clocks, secondary dials operating from master clock, etc., are now in use in many up-to-date school buildings. Two types are furnished, viz.:

(a) For systems where 3 or 4 different voltages are required;

(b) For systems where operation is at one uniform voltage.

These Patterson battery sets for school building work are in the form of a single steel cabinet (flush or surface, as desired), and possess the following very desirable, but hitherto impossible, advantages:

(a) *Not a wire to be disconnected or re-connected after the set has been installed;*

(b) Cell renewal like that of an incandescent lamp, guaranteeing that, no matter how non-technical the school building employees are, in 5 minutes at the outside, once a year before term begins, the battery set can be made ready for the next year's work. *All Patterson battery sets for schoolwork are guaranteed to require attention but once a year, and that for only 5 minutes, if the circuits are clear and the proper type outfit is installed.*

### Telephone Battery Sets.

Intercommunicating telephone installations require a "split circuit" battery set, usually with 2, 3, 4, or 5 cells for "talking," and 4, 5, and 6 or more cells for "ringing." While this is a reasonably simple arrangement of circuits, still, in the old way of setting up batteries, a mistake was easily made.

*In a Patterson battery set for telephone work, the renewal of the entire battery can be done by anybody, yet can be done in only one way, and that the right way, all without the slightest technical knowledge, and without tools.*

No installation of interior telephones of any kind whatsoever is complete today without a Patterson battery set.

### How to Specify Patterson Battery Sets.

"The battery shall be a centralized Patterson battery cabinet [here insert 'Multiple Service,' '2-circuit-reserve,' or '4-circuit-reserve,' flush or surface, steel or oak, as desired] of proper voltage to satisfactorily operate all signal apparatus in the building and of sufficient ampere capacity to give 2 years' uninterrupted service; the cabinet shall be furnished with one complete equipment of Patterson-Columbia or Patterson Red Seal cells."

### Special Battery Sets.

Larger sizes and special cabinets with any combination of circuits required, both as to voltage and amperage, will be promptly made to order upon specification as to details.

Our engineering department will gladly figure out and recommend the best size and type outfits to suit specific requirements, if details of same are sent.

### Patterson Floor Outlet Boxes, National Code Standard.

*(Licensed under Fountain Patents).*

DESIRABILITY OF FLOOR BOX INSTALLATIONS—A specification for a liberal number of floor outlet boxes will, in modern, up-to-date building construction, save much more than the installation costs; after a building is closed in and floors laid, a single floor outlet, required, often entails many dollars expense, to say nothing of damage to floors and walls—all of which can be saved by liberal specifications for floor outlet boxes to be installed *during construction.*

USES—Floor outlet boxes are necessary to properly install desk lighting, office call systems, telephones, fan motors, portable lamps, etc.

GENERAL TYPES—Adjustable, for cement, tile and granolithic floors, Nos. "4000," "4003," "4000B,"



"4000BN" and "4003BN." Non-adjustable, for wood floors and installations where finished level of floor will not vary to any appreciable extent, Nos. "3000," "3000B," and "3000BN."

Both the adjustable and non-adjustable types are made in 2 classes: (a) Boxes with receptacles and detachable plugs, Nos. "3000," "4000," "4000BN," "4003." (b) Boxes without receptacles and detachable plugs, Nos. "3000B," and "3000BN."

**STANDARD CONSTRUCTION OF PATTERSON FLOOR BOXES**—Patterson floor boxes (both adjustable and non-adjustable) are thoroughly waterproof, double gasketed throughout; every part except box itself cast bronze; the floor box is galvanized iron.

Receptacles may be removed from boxes for easy wiring by simply loosening 2 screws.

Rubber gasket fits into "undercut" of bronze plate so that the gaskets do not fall out.

Hard rubber bushings in dome caps are sunk flush, overcoming entirely the annoyance of breakage so universally experienced in other floor boxes.

Both adjustable and non-adjustable type of Patterson floor boxes may be installed in much shorter time than competitive boxes.

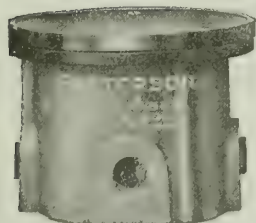
### Adjustable Patterson Floor Boxes.

These boxes afford, without additional machine work, connections to lighting circuit as follows:

(a) By portable cord through rubber bushed dome cap; (b) by  $\frac{5}{8}$ -in. brass tubing into dome cap when bushing is removed; (c) by  $\frac{1}{2}$ -in. conduit into flush disk when removable plug is taken out.



NO. "4000"  
ADJUSTABLE FLOOR OUTLET BOX  
No. "4000" with 2-wire, 10-ampere receptacle and plug  
No. "4003" with 3-wire, 10-ampere receptacle and plug



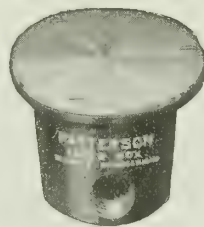
NO. "4000B"  
ADJUSTABLE FLOOR OUTLET BOX  
With blank bronze plate  
Receptacle and plug not regularly furnished, but can be mounted in "4000B" box



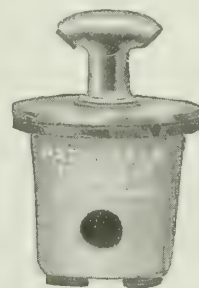
NO. "4000BN"  
ADJUSTABLE FLOOR OUTLET BOX  
With double-outlet nozzle  
No. "4000BN" with 2-wire, 10-ampere receptacle and plug  
No. "4003BN" with 3-wire, 10-ampere receptacle and plug



NO. "3000"  
NON-ADJUSTABLE OUTLET BOX  
With 2-wire, 10-ampere receptacle and plug



NO. "3000B"  
NON-ADJUSTABLE OUTLET BOX  
With blank bronze plate  
Receptacle and plug can not be used in "3000B"



NO. "3000BN"  
NON-ADJUSTABLE OUTLET BOX  
With double outlet nozzle  
Receptacle and plug can not be used

Universal template permits mounting of any make receptacle without additional machining. Floor plate can be taken off *without disturbing cemented edge of plate.*

In adjustable Patterson floor boxes, the vertical up-and-down adjustment of 1 in. is ample for any variation of floor height, and side or off level adjustment of  $\frac{5}{8}$  in. is ample to give full adjustment for variation in floor level.

Adjustable floor boxes are regularly tapped for four  $\frac{1}{2}$ -in. conduit entrances in sides and one in bottom.

### Non-adjustable Patterson Floor Boxes.

Non-adjustable Patterson floor boxes, No. "3000," have 10-ampere receptacles and detachable plugs; in Nos. "3000," and "3000BN" receptacles and plugs can not be used.

Non-adjustable type boxes are regularly drilled and tapped for four  $\frac{1}{2}$ -in. conduit entrances, two in side and two in bottom, adapting them to flexible or rigid conduit work without extra drilling and tapping.

Cardboard shims are furnished with each box, and with these shims bronze plate can be easily brought flush with floor. The setting of a Patterson floor box is thus made quicker and easier than any floor box on the market.

Non-adjustable boxes, with letter "A" in model number, are superior to those without, in that size of the plate is larger and box sets more satisfactorily.

NOTE—Both adjustable and non-adjustable boxes will be furnished when specially ordered, with any arrangement of conduit entrances. With all boxes removable plugs are furnished, closing all but one outlet.

### Catalogues.

Complete catalogue containing valuable technical and engineering data concerning Faraday enclosed type signal gongs, DeVeau telephone apparatus, DeVeau annunciators, DeVeau hospital call systems, P R bells, Patterson battery sets, Faraday fire alarm systems and Patterson floor-outlet boxes will be furnished to architects on request.

# THE SPENCER TURBINE CLEANER CO.

HARTFORD, CONN.

## Products.

SPENCER TURBINE VACUUM CLEANERS; SPENCER TURBINE FLUE CLEANER for return tubular boilers. Turbine Compressors and Exhausters.

## The Spencer System of Vacuum Cleaning.

The Spencer multistage turbine system has met with the approval of architects and engineers as well as other manufacturers.

The Spencer multistage turbine is a machine of great simplicity and durability. Its one moving part is the welded steel multistage impeller which revolves smoothly and quietly on ball bearings within its casing, with wide clearances on all sides. There are no pistons, valves, water seals, drive chains, belts, cloth bags or wet auxiliary tanks; no close adjustments to be disturbed by dirt. Without the use of complicated and troublesome governing apparatus, the multistage fan inherently maintains a constant vacuum under a varying volume and is so perfectly controlled that the turbine responds to, and co-operates with, every movement of the tool at the cleaning hose.

Simplicity in design and high grade construction insures low maintenance of cost.

Entire system designed to produce correct air steam conditions, to do universal vacuum cleaning with uniform efficiency, speed and thoroughness.

## Advantages of the Spencer System.

All dirt is sucked out through a tube and no foul exhaust air or any part of the dust is discharged back into the rooms.

There is nothing to handle in the rooms but the hose and cleaning tools, which are so light and easy to use that a maid, or even a child, enjoys using them.

All the machinery is in the basement where it is not moved or handled, and is therefore not skimped in size, weight or efficiency; hence supplies a strong, even vacuum, so well controlled as to avoid all possibility of injury to rugs or fabric, and removes all dust and grit from cracks or pores of bare floors.

## Spencer Turbine Vacuum Cleaners.

All Spencer cleaners are of the multistage low velocity turbine type, which adapts itself to the proportions of vacuum and volume required for vacuum cleaning work better than any other type of exhauster.

**TURBINE IMPELLERS OR FANS**—Securely fastened to the shaft, making one single moving element which revolves smoothly and quietly within the deflectors.

There is a wide clearance of from  $\frac{1}{8}$  to  $\frac{3}{8}$  in. between the stationary and moving elements throughout the entire turbine. The bearings are the highest grade ball bearings of liberal capacity.

**SEPARATORS**—Of the centrifugal type, of high efficiency and with dirt receptacles of large size.

On the  $\frac{1}{2}$  h. p.,  $\frac{3}{4}$  h. p., and  $1\frac{1}{2}$  h. p. machines the dirt receptacles are in the base of the machine, while the 3 h. p. and larger equipments have the dirt separators as a separate unit.

**MOTORS**—Are of the highest grade and the most approved makes.

**SIZES—Vertical Type**—Made in the following sizes:  $\frac{1}{2}$  h. p.,  $\frac{3}{4}$  h. p.,  $1\frac{1}{2}$  h. p., 3 h. p. and 5 h. p.

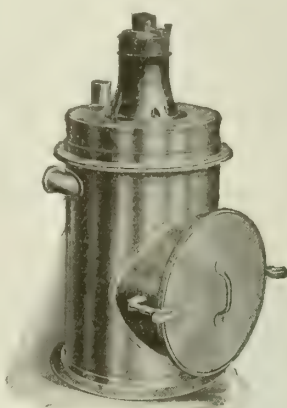
**Horizontal "Slow Speed" Type**—Made in the fol-

lowing sizes:  $7\frac{1}{2}$  h. p., 10 h. p., 15 h. p., 20 h. p. and 25 h. p.

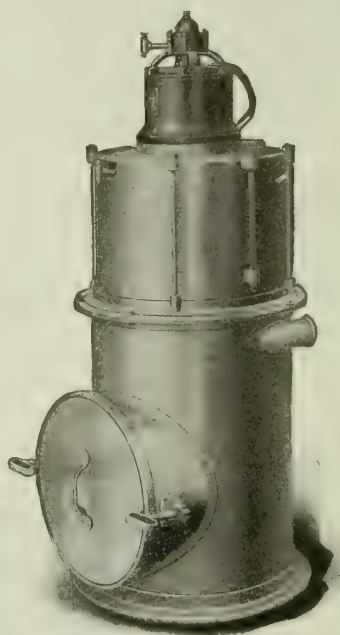
**SPENCER TURBINE EQUIPMENT**—Superiority of cleaning implements and accessories universally acknowledged. Spencer tools are designed with openings in correct proportion to the rest of the system; also with special consideration as to convenience and fitness of the various requirements. Strong in construction, light in weight, and shaped for fast and effective work. Tools are equipped with Spencer patented universal controllable swivel, which enables operator to remove dirt beyond the reach of the rigid tool.

All wearing surfaces are renewable. Tools are attached to handle by means of steel locking chuck.

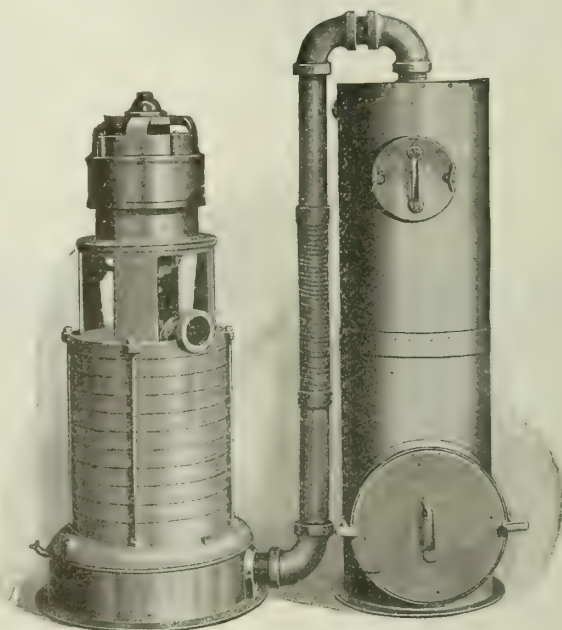
**SPECIFICATIONS**—While our engineering department prefers to examine each particular job before making definite recommendations regarding layouts or



No. 311— $\frac{1}{2}$  H. P.



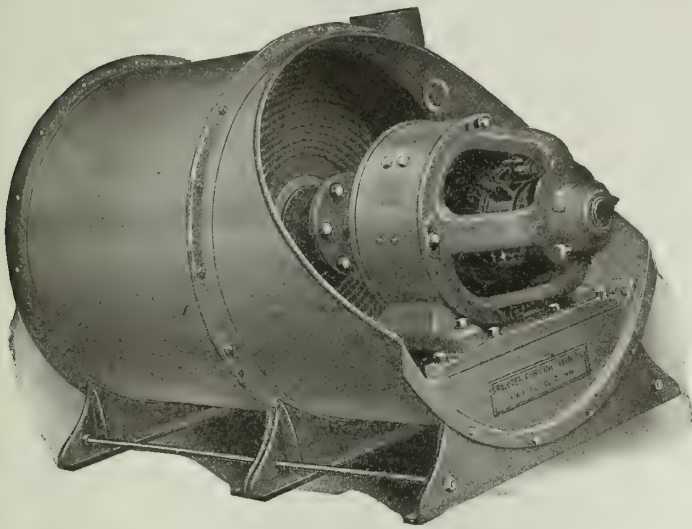
No. 613— $1\frac{1}{2}$  H. P.



No. 1113—5 H. P.  
SPENCER VERTICAL TURBINES



specifications, the following may serve as a general guide when this is not possible:



SPENCER HORIZONTAL TURBINE

For large installations the Spencer Company has developed a line of horizontal direct connected turbine equipments operating at a speed of 1750 r.p.m. as distinguished from the 3500 r.p.m. apparatus which has heretofore characterized all fan and turbine type vacuum cleaners. In addition to this desirable feature, this equipment retains all the superior features which have characterized the earlier Spencer models.

**Piping System**—Inasmuch as the hose causes greater vacuum loss than any other part of the system, requires labor in handling, and eventually wears out, while the stationary piping system possesses none of these characteristics, it is obvious that to secure permanent efficiency plenty of piping and short hose runs are necessary, and the most economical, besides rendering the entire equipment much more rapid, efficient and easily handled by the operator.

A dirt handling pipe system must be of smooth uniform bore throughout both pipe and fittings. Long turn "drainage" or Durham fittings with horizontally disposed clean-out plugs at the foot of risers have proved satisfactory. Long sweep pipe bends should, however, be used at points where the dirt is required to go from a horizontal pipe up a vertical one.

Piping should not be so small as to require too high vacuum, high velocity and low density with the accompanying reduction in carrying capacity and increase in "sand blast" wear; nor on the other hand so large as to reduce the velocity sufficiently to permit "dirt settling."

The curves shown on this page give the correct size of piping for any vacuum cleaning system.

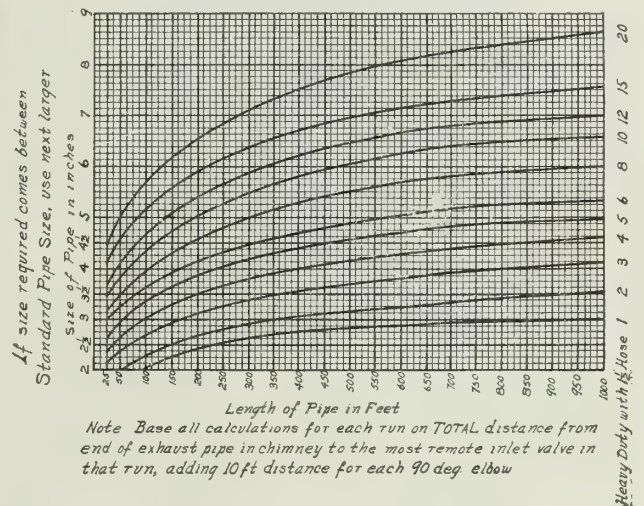
**Size of Machine to Install**—The following rules afford a reasonably accurate and definite method of determining the sweeper capacity of plant required for any given building, if heavy duty standards are used, i.e., a minimum vacuum of 2 ins. Hg. with  $\frac{7}{8}$ -in. round sharp edged open orifice for bare

floor sweeping and 3 ins. Hg. with a similar  $\frac{5}{8}$ -in. orifice for carpet cleaning, both at end of 50 ft. of hose with all sweepers working. Use following formula:

The square foot floor or carpet area divided by 7500 times the available hours for each cleaning equals the number of sweepers required.

**Capacity Test**—For heavy duty work specification should provide that the plant shall maintain a minimum vacuum of at least 2 ins. Hg. in back of each of as many  $\frac{7}{8}$ -in. round sharp edged orifices as the system is designed to operate simultaneously, and a vacuum of not less than 3 ins. Hg. in back of each of as many  $\frac{5}{8}$ -in. round sharp edged orifices as the system is designed to operate simultaneously. This test to be made at the end of 50 ft. of hose.

**Rules for Determining Pipe Sizes**—Size of pipe used for any vacuum cleaner installation should be that given at left of diagram, horizontally opposite the intersection of curve for the total number of sweepers to be operated simultaneously with vertical line above the number corresponding to total length of pipe from the end of exhaust pipe to the most remote inlet valve in the building.



PIPING DIAGRAM BASED ON USE OF 1 1/2-INCH HOSE FOR EACH SWEEPER

If fewer sweepers are to be operated simultaneously through part of piping system, the size pipe for such part can be reduced to that given in diagram for the number of sweepers that will actually be used simultaneously through that part of piping, based on same total length of pipe from end of exhaust pipe to most remote inlet valve in the building.

### Boiler Flue Cleaning Apparatus.

Spencer flue cleaning equipment for return tubular boilers insures large fuel savings, rapid and thorough cleaning with no tube corrosion, pitting or scale formation.



NEW BUILDINGS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

# THE UNITED ELECTRIC COMPANY

## Stationary Vacuum Cleaning Systems

FACTORIES AND GENERAL OFFICES

CANTON, OHIO

TORONTO, CAN.

CABLE ADDRESS, "TUEC, CANTON"

EXPORT REPRESENTATIVES

NEW YORK, N. Y., BERGER MANUFACTURING Co., 11th Avenue and 22d Street

SALES OFFICES IN ALL LARGE CITIES

### Products.

TUEC STATIONARY VACUUM CLEANERS and EQUIPMENT for every type of building.

### Patents.

Manufactured under patents owned by this company and licensed under the basic Kenny patent.

### Record.

The Tuec has won *first place* in all open National competitive engineering tests.

The Tuec was awarded the "Grand Prize"—"The Highest Award"—at the Panama-Pacific International Exposition in San Francisco, 1915.

### Various Uses.

Tuecs are designed for use in residences, apartments, offices, schools, churches, hotels, theaters, stores, clubs, banks, railway stations and terminals, car barns, stables, dairy barns, garages, flour mills, silk mills, rubber factories, telephone exchanges, laundries, carpet cleaning establishments, other factory work, and for many other special uses, including special equipment for cleaning swimming pools.

There are more than 10,000 installations in buildings as classified above.

### Design.

The Tuec has the 3 things necessary for efficiency—large volume, high velocity and sufficient vacuum.

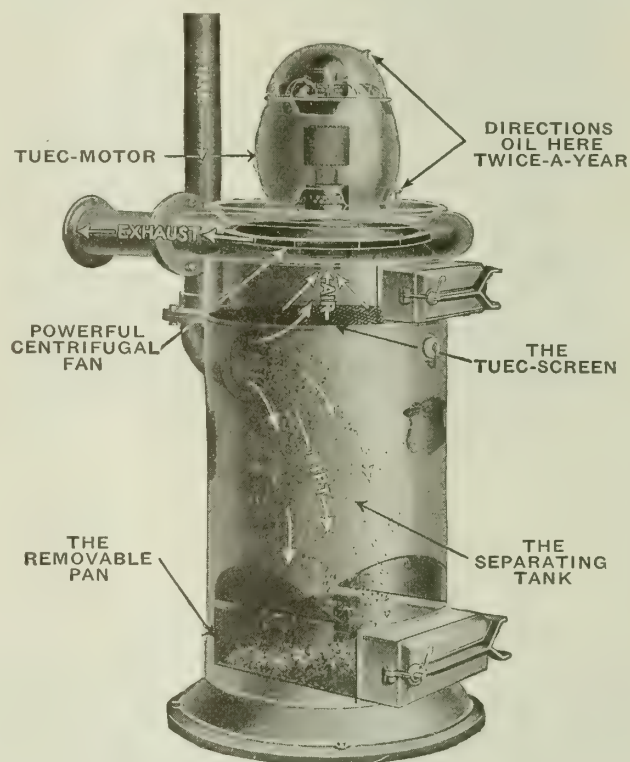
Simplicity is paramount in the design of the Tuec machine. The only moving parts are the motor shaft and the fan directly attached to it. The fan revolves without metallic contact in its snail or housing. The only two wearing surfaces are 2 self-aligning S. K. F. ball bearings, which run in a constant oil bath in dust-proof cavities. No cloth bags, baffle plates or screens to interfere with continuous air currents are used. The motor, specially designed for this work, is as simple as can be made, and runs at all times underloaded. No automatic relief valves or vacuum breakers are necessary. There is no necessity for vacuum control. The vacuum is constant under all conditions. The large air displacement permits of the use of tools of liberal sizes. Our tools are larger than others and can therefore do cleaning with less strokes and in a shorter time.

### Types and Sizes.

The Tuec is manufactured in 15 sizes and 265 different electric motor specifications.

Types in electrically driven apparatus in sizes from  $\frac{1}{2}$  h. p. to  $7\frac{1}{2}$  h. p., with capacities from 1 to 6 sweepers, are standard and carried in stock. Larger machines are made specially.

Independent power machines, to be driven from engines or other power, are listed in capacities from 1 to 6 sweepers. Larger machines made specially.



SECTIONAL VIEW OF STANDARD TUEC MACHINE

### Facilities.

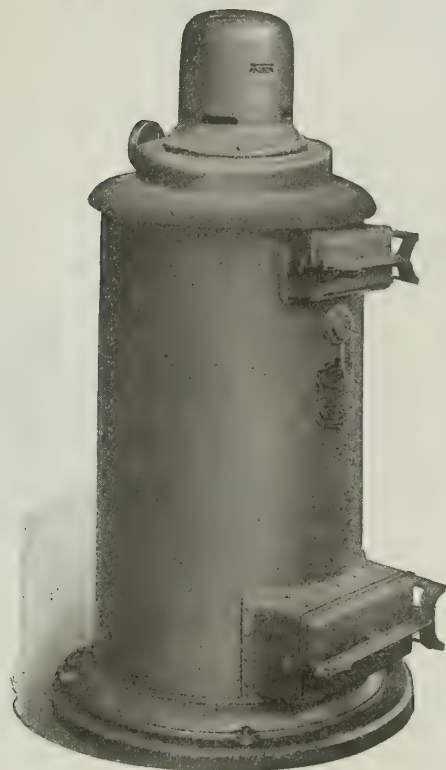
THE UNITED ELECTRIC COMPANY's factories are the largest in the world devoted to the manufacture of electric vacuum cleaners. Every part of the machine and motor is manufactured in these factories.

### Specifications Prepared.

The Sales and Co-operative Departments will send blank specifications and blue prints of typical piping layouts for any type of building, or piping layouts will be inserted on blue prints sent to the company.

Expert services offered without charge.





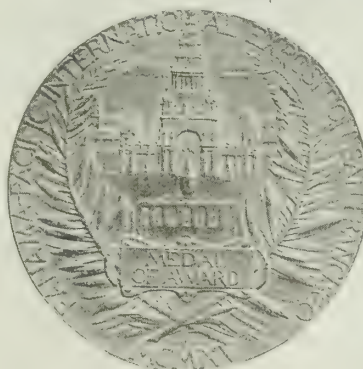
TUEC UNIVERSAL MOTOR,  $\frac{1}{2}$  TO 1 H.P.

Made in 2 sizes especially to meet the demand for a machine of high efficiency at a reasonable price, in large or small residences. Specially designed; light and efficient. Tools and  $\frac{1}{4}$ -in. hose made to be easily operated by a woman

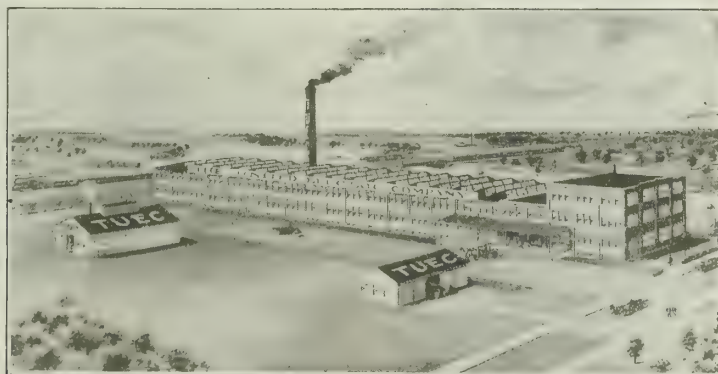


TUEC TRUCK

Made in several sizes to meet the demand for a highly efficient machine that can be moved from place to place where no pipes are installed. Easy to move and operate. Powerful suction



FAC-SIMILE OF GOLD MEDAL AWARDED THE TUEC AT THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION



FACTORY OF THE UNITED ELECTRIC COMPANY AT CANTON, OHIO

# INVINCIBLE VACUUM CLEANER MFG. CO.

DOVER, OHIO

## Products.

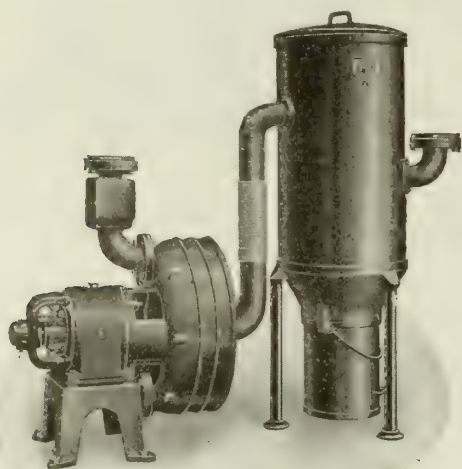
STATIONARY and PORTABLE VACUUM CLEANERS.

### Stationary Plants.

All plants built by this company are constructed by the highest grade of skilled labor, and of the finest material obtainable. The wide range of our product insures a machine which will exactly fit the needs of any particular building.

The dust receivers are of the "Invincible" government bag type in the  $\frac{1}{4}$  h.p. to  $1\frac{1}{2}$  h.p. sizes; of the combined screen and centrifugal type in  $\frac{1}{2}$  h.p. to 15 h.p. sizes and constructed with heavy sheet steel shell and with cast iron top and base.

Small units shipped assembled on base rails; larger



STATIONARY VACUUM CLEANER PLANT

units being shipped with motor and exhauster as one unit, the dust receiver being a separate unit and coupled with a flexible rubber sleeve which insures perfect alignment.

### Portable Machines.

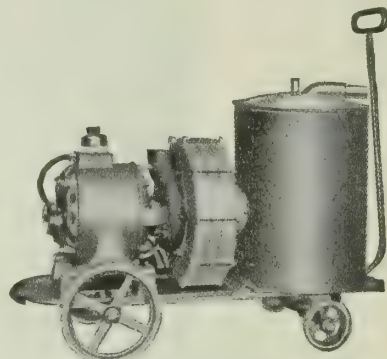
This company manufactures an absolutely complete line of vacuum cleaners. In the portable machines three different types for home use: the light "Invincible," the "Invincible" Two-stage Junior, and the "Invincible" Three-stage Junior Truck.

The first two of these are for use in small and medium sized homes. The Junior truck is largely employed in large homes, theaters, clubs, churches, office buildings or stores where there is no elevator service, owing to the fact that it can be readily moved from floor to floor.



JUNIOR TRUCK VACUUM CLEANER

Other portable machines are of the "Invincible" heavy duty truck type with rubber tired wheels, the machine for use in apartment houses, office buildings, factories, department stores, clubs and large buildings generally, where there is elevator service and where it is desired to avoid the expense of installing a stationary plant.



HEAVY DUTY TRUCK VACUUM CLEANER

**GUARANTEE**—"Invincible" portable machines represent the greatest efficiency in light substantial vacuum cleaning machines and are guaranteed to do more and better work per horsepower and for their weight than any other type of machine.

### General Specifications.

Stationary machines comprise sizes from  $\frac{1}{4}$  h.p. to 15 h.p.; motors in all cases being specially designed, constructed and tested for the purpose for which they are to be used. All machines from  $\frac{1}{2}$  h.p. up are provided with oil ring bearings, requiring only occasional oiling; smaller machines being provided with specially designed sleeve bearings assuring perfect lubrication.

Portable machines of from  $\frac{1}{10}$  h.p. to  $1\frac{1}{2}$  h.p. are also constructed by the company.

Exhausters are of aluminum centrifugal-turbo fan type; fans being mounted directly on motor shaft and enclosed in housings equipped with especially designed diverging vanes—an exclusive "Invincible" feature—insuring the highest efficiency obtainable.

"Invincible" vacuum cleaners will, according to size, maintain a vacuum of 17 to 75 ins. at the machine while displacing from 30 to 480 cu. ft. of air per minute.

The wonderful flexibility of the *turbo fan equipped with diverging vanes* can be appreciated when it is considered that an "Invincible" can be turned directly from cleaning the heaviest carpet to the renovating of the finest of silk hangings; the suction automatically adjusting itself to the varying textures.

### Catalogue and Co-operative Service.

The company issues a fully illustrated catalogue describing machines for every possible requirement, and its engineering department is at the constant service of members of the architectural and engineering professions.

Inquiries addressed to the department will receive immediate and detailed replies.



PAID UP CAPITAL \$250,000.00

**AMERICAN ELEVATOR & MACHINE CO.**

INCORPORATED

LOUISVILLE, KY.

## REPRESENTATIVES

FOR SOUTHWEST—J. PEYTON HUNTER, Dallas, Tex.  
 FOR WEST—C. L. COLBY, Hall Building, Kansas City, Mo.  
 FOR CUBA—C. H. THRALL ELECTRICAL CONTRACTING Co.,  
 Havana, Cuba  
 DETROIT, MICH., JOHN BRENNAN & Co.

KANSAS CITY, MO., KING SUPPLY & EQUIPMENT Co., Scar-  
 ritt Building  
 NEW ORLEANS, LA., AMERICAN ELEVATOR & ELECTRIC Co.  
 NASHVILLE, TENN., J. BOUCHARD & SONS Co.  
 PEORIA, ILL., H. F. KIRCHER & Co.

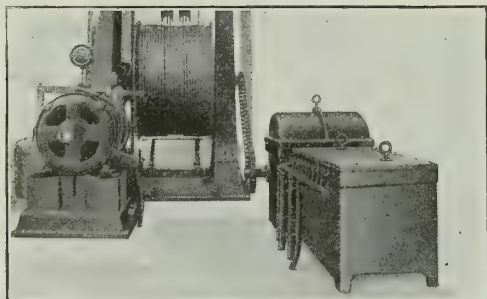
**Products.**

A complete line of ELECTRIC ELEVATORS for Direct or Alternating Current in Single or Tandem Drum, or Traction Types; ELEVATOR MOTORS and CONTROLLERS.

Belt and Hand Power Elevators, Automobile Elevators, Push Button Dumbwaiters and Passenger Elevators are a specialty.

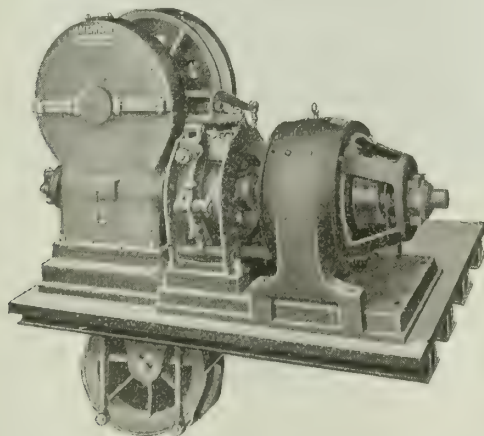
**Electric Passenger Elevators.**

The push button control, and other types of passenger elevators, for alternating current, are quiet in operation; controllers, electric brakes and other parts are immersed in oil to eliminate noise and pounding of switches, so noticeable with alternating current equipment.



**AUTOMATIC PUSH BUTTON TYPE, DIRECT OR ALTERNATING CURRENT**

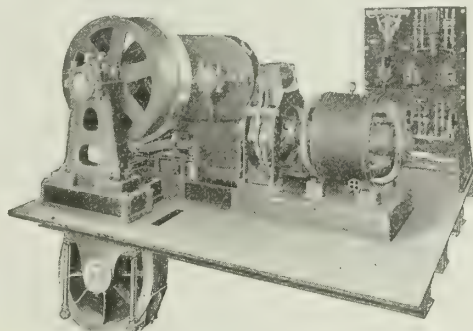
Showing alternating current type with brake and controller immersed in oil for quiet operation



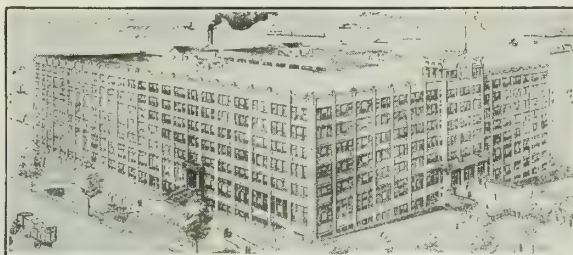
**TRACTION TYPE, SINGLE GEAR**  
 For high speed service, operated by switch in car

**Facilities.**

The company has one of the largest independent elevator plants in the United States, completely equipped for building elevators, elevator motors, controllers and other parts, thereby enabling it to execute orders promptly.



**TRACTION TYPE, TANDEM GEAR**  
 For high speed service, operated by switch in car



**MONTGOMERY WARD & CO., KANSAS CITY, MO.**  
 Ten tandem geared traction elevators



**IOWA STATE CAPITOL, DES MOINES, IOWA**  
 Two tandem geared traction elevators

# A. B. SEE ELECTRIC ELEVATOR COMPANY

NEW YORK, N. Y.

## OFFICES

NEW YORK, 220 Broadway  
BOSTON, Minot Building  
HARTFORD, 36 Pearl Street

PHILADELPHIA, Colonial Trust Building  
BALTIMORE, Lexington Street Building  
WASHINGTON, Real Estate Trust Building

CLEVELAND, Belmont Building  
MONTREAL, 70-74 Mansfield Street  
TORONTO, Sun Life Building

FACTORIES, JERSEY CITY, N. J., MONTREAL, QUE.

## Products.

Manufacturer of DIRECT CONNECTED ELECTRIC PASSENGER and FREIGHT ELEVATORS; ELECTRIC PUSH BUTTON ELEVATORS.

Dumbwaiters and Sidewalk Elevators.

## Traction Type Elevators.

The traction type elevator became a necessity with the increase in the height of buildings, and received its name because of the tractive force exerted on the car cables by passing them over the driving sheave without being fastened to it.

The cables, usually 6 in number, pass from their anchorage in the car over the drive sheave, then down under an idler, back up over the top of the drive sheave, and from there down to the counterweight where the fastening is made. As the size of the drive sheave bears no direct relation to the height of car travel, it makes the traction elevator ideal for high buildings.

## Gearless Traction Machines.

Because of simplicity of design, low depreciation and high efficiency, gearless traction machines are being installed in hotels, office buildings, and other buildings where high speed passenger service is desired.

In this type, the drive sheave is built integral with the armature of a slow speed shunt wound motor, operating on direct current power circuits only. Ideal self-aligning bearing conditions are obtained, as both drive sheave and armature are mounted on a common spider and revolve on roller bearings mounted on a non-rotating shaft. Thus each revolution of the armature carries the drive sheave at the same speed without the introduction of any gearing.

A magnetic brake is provided, and so designed that the admission of power to the motor immediately releases the brake shoes from a large brake drum. These shoes set again as soon as the power is released, and bring the car to smooth stop without jar.



A. B. SEE  
CONTROLLER USED  
ON DIRECT CURRENT  
CIRCUITS

## One-to-one Gearless Traction.

Where high speeds, such as 500 to 600 f.p.m. are desired, the lifting cables are attached directly to the car and counterweight. Because of the roping, their construction is known as the one-to-one gearless traction.

## Two-to-one Gearless Traction.

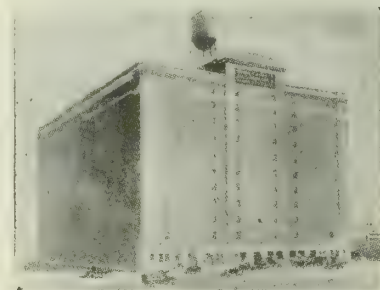
In department stores and buildings requiring speeds



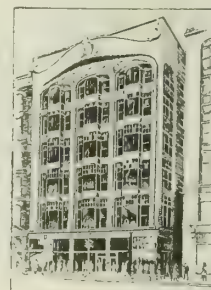
MICHIGAN STATE TELEPHONE BUILDING, DETROIT, MICH.  
SMITH, HINCHMAN & GRVLLS, Architects  
6 geared traction type A. B. See elevators



COMMERCIAL NATIONAL BANK BUILDING, WASHINGTON, D. C.  
WADDY B. WOOD, Architect  
7 geared traction and drum type A. B. See elevators



QUINCY MARKET COLD STORAGE AND WAREHOUSE CO.  
BUILDING, BOSTON, MASS.  
J. R. WORCESTER Co., Engineers  
6 geared traction and drum type A. B. See elevators



W. B. DAVIS COMPANY STORE BUILDING, CLEVELAND, OHIO  
THE MILLS AND MILLPAUGH COMPANY, Architects  
5 geared traction type A. B. See elevators



of 300 to 400 f.p.m., the one-to-one gearless traction machine is impracticable because of the armature speed.

To supply the demand for gearless traction machines with the reduction in car speed, it has been found necessary to devise a system of rope gearing or reduction called two-to-one roping.

By reducing the sheave diameter slightly and passing the lifting cables in loops under sheaves in the top of the car and counterweight, with the cable ends fastened at the top of the hatch, a rope gearing is obtained that reduces the car speed to that required.

### Geared Traction for both Direct and Alternating Current Circuits.

This type, while not quite as efficient as the gearless traction, but still possessing many of its advantages, can be used for practically any type of building where moderate speeds are desired.

In this form of traction equipment, the drive sheave is combined with a phosphor bronze worm gear, which meshes with a screw shaft driven by a moderate speed shunt wound motor. A magnetic brake operating on the screw shaft, similar to the gearless machine brake, is provided. An equipment known as the tandem worm gear traction, and consisting of a geared machine with a right- and left-hand worm screw meshing with each of two intermeshing spur gears, thereby eliminating end thrust, is also built by this company.

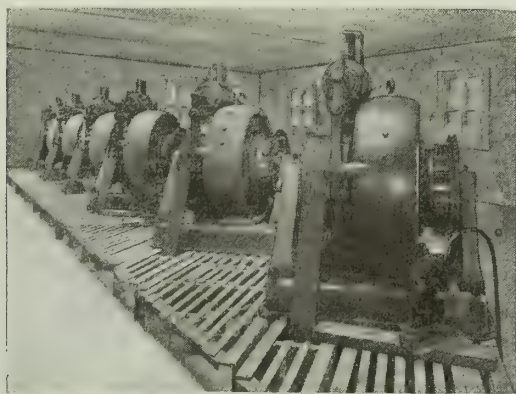
As the gear ratios of both types are variable, speeds from 150 to 450 f.p.m. are obtainable.

### Drum Machines for Direct and Alternating Current.

Drum machines are built in a number of different types for passenger and freight service. These may be of single or tandem worm gear drive and with internal spur gear reduction for extra heavy capacities.

Passenger speeds of from 100 to 400 f.p.m., with freight speeds of 25 to 150 f.p.m., and capacities up to 20,000 lbs., are included in the drum equipment.

Automatic push button drum type elevators, with a complete non-interference device, for residences, hospitals, apartment houses, public buildings, etc., are built also.



A. B. SEE TANDEM WORM GEAR DRUM MACHINE

### Drawings.

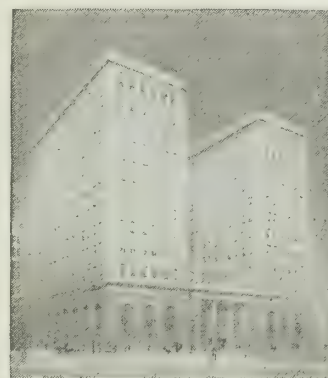
Communicate with the company's nearest office and the Engineering Department will be pleased to co-operate in the planning of such equipment and will provide all necessary layouts.

### Co-operation.

Specifications and estimates for prospective electric elevator installations will be furnished on request.



COURT AND REMSEN STREET BUILDING, BROOKLYN, N. Y.  
STARRETT & VAN VLECK, Architects  
4 one-to-one gearless traction A. B. See elevators



RHODE ISLAND HOSPITAL TRUST BUILDING, PROVIDENCE, R. I.  
YORK & SAWYER, Architects  
9 geared traction type A. B. See elevators



POSTAL LIFE INSURANCE COMPANY BUILDING, NEW YORK, N. Y.  
YORK & SAWYER, Architects  
6 one-to-one gearless and geared traction A. B. See elevators



FURNESS-WITHY BUILDING, NEW YORK, N. Y.  
WALTER B. CHAMBERS, Architect  
3 drum type passenger A. B. See elevators

# THE COHOES IRON FOUNDRY AND MACHINE CO.

## Elevator Equipments

COHOES, N. Y.

### Products.

ELEVATORS for all purposes:

Electric Passenger and Freight Elevators; Electric and Hand Power Garage Elevators; House Elevators; Belt Driven Elevators.

Hand Power Freight Elevators, Dumb-waiters, Sidewalk Lifts, Automatic Gates and Hatch Doors for hoistways.

### Efficiency, Facilities, Shipment and Materials.

During thirty years of study of problems in all kinds of elevator work, these products have been developed to high efficiency.

A competent force of engineers is maintained and the company is prepared to make complete layout of plans or to act in an advisory capacity.

Quotations on jobs installed complete or made up according to specifications and shipped f. o. b. our siding, for installation by customers' experts.

Materials used by us are of highest grade only and can be depended upon for absolute reliability.

### Information Required for Estimate.

FOR ALL TYPES—Capacity, speed, number and height of floors, size of car, or size of hatchway, location of winding engine, steel or wood for guides and sheave beams, style of car, value of cage, method of control, gates or hatchway doors if required, grating under sheaves.

FOR ELECTRIC DRIVEN TYPES—State whether current is direct or alternating and give voltage; if alternating, give phase and cycles. State type of winding engine, whether direct connected, chain driven, or single belt driven.

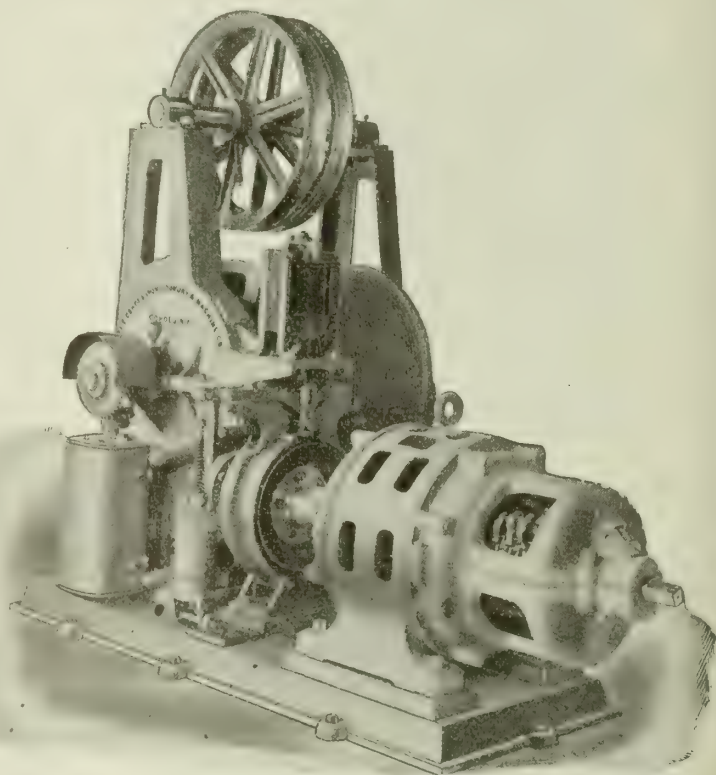
FOR BELT DRIVEN TYPES—State whether winding engine is to be driven from line shaft, countershaft, or other source of power. Give location of power with reference to hatchway.

If possible, send a sketch or blue print, showing hatchway, its location in building, entrances to car, and location or space prepared for the winding engine.

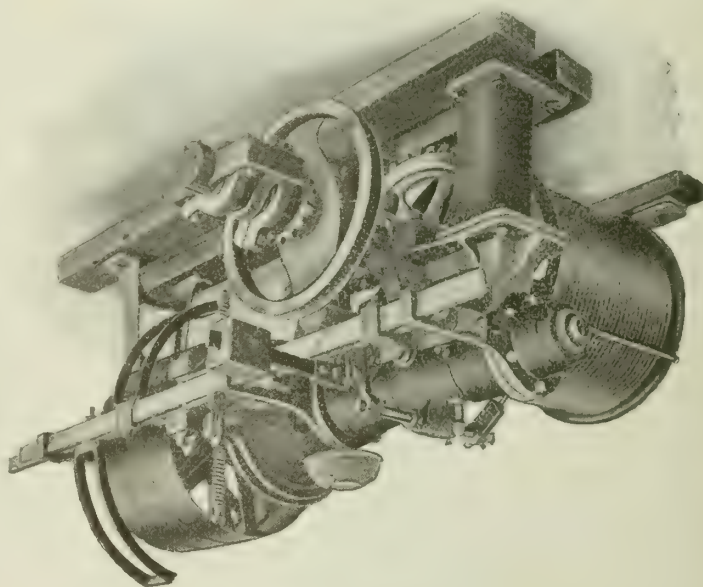
DETAIL SHEET—On request we will be glad to send our detail sheet, which gives a complete list of the information required for an accurate estimate.

### Estimates.

Estimates are gladly furnished, and specifications submitted on any equipment.



DIRECT CONNECTED ELECTRIC CONTROL PASSENGER CRAB



BELT DRIVEN ELEVATOR CRAB



# CHELSEA ELEVATOR CO.

TELEPHONE:  
CHELSEA 5448

332 West Twenty-sixth Street  
NEW YORK, N. Y.

BUSINESS ESTABLISHED 1876  
INCORPORATED 1912

## Products.

Manufacturers of all types of DRUM ELECTRIC and HAND OPERATED MACHINES used for Vertical Transportation, including DIRECT CONNECTED DRUM TYPE FREIGHT and PASSENGER ELEVATORS and ELECTRIC DUMBWAITERS; HAND OPERATED PASSENGER and FREIGHT STORE ELEVATORS and DUMBWAITERS for every purpose; HAND OPERATED INVALID, TRUNK, SIDEWALK, AUTOMOBILE and CARRIAGE ELEVATORS; HOSPITAL ELEVATORS; ASH HOISTS; COMPENSATING, UNDER-COUNTER, DISAPPEARING and FORM LIFT DUMBWAITERS; HOIST WHEELS; PRIVATE RESIDENCE, APARTMENT HOUSE, HOTEL, RESTAURANT, STORE, BANK, LIBRARY DUMBWAITERS.

Tellerwaiters, Film Conveyors, Abbatoir Lifts, Automatic and Semiautomatic Gates.

## Electric Drum Type Elevators and Dumbwaiters.

A line of machinery embracing the whole range of elevator requirements from the slow speed sidewalk lift to the massive freight and high speed passenger elevator.

## Hand Operated Elevators.

An experience of over 40 years in the manufacturing of hand operated elevators, with every modern improvement of merit incorporated, is a guarantee of satisfactory service. Such an experience insures elimination of friction and noise, ease of operation, simplicity, safety, durability and reliability.

## Invalid and Trunk Lifts.

For private residences, public buildings, hospitals, sanitariums, etc. The best engineering experience has been brought to bear so as to insure ease in operation and a factor of safety far in excess of ordinary practice. Safety attachment on invalid cars, omitted on trunk lifts if not desired.

## Store Elevators and Hoist Wheels.

Used in stores, lofts, bakeries, factories, banks, laundries, etc. The Nos. 8 and 9 elevators shown in Data Tables are strong, durable and safe, and are noted for their efficiency.

## Sidewalk Lifts.

For basement uses in stores, lofts, etc., operated by windlass set in cast iron frames, I-beam frames or Georgia pine frames. This machine is very substantial and special attention is given to brake for lowering loads.

## Automobile and Carriage Elevators.

For garage or stable use. Single or double geared machines. Four cable or center lift platforms. Extra heavy steel shafts and gears. Great purchase power to obtain ease of operation, strength and durability. Any size or capacity desired.

## Hand Operated Dumbwaiters.

Every type of hand dumbwaiter manufactured, including most modern designs obtainable:

**CHELSEA**  
TRADE-MARK

Traction, sheave type, band brake and automatic brake, geared automatic, patent iron frame geared, brass tube, compensating, under-counter, disappearing and form lift dumbwaiters.

## Traction Dumbwaiters.

The traction type of hand operated dumbwaiter is the most modern dumbwaiter manufactured; and where high speed is desired, it can be furnished in a one-to-one type or a two-to-one type. All wheels are of full diameters and set in iron frames fitted with powerful band brake. No leading sheaves are

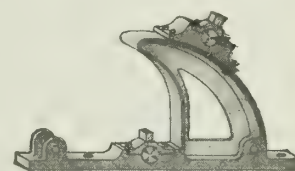


BAND BRAKE

used, the ropes passing over full diameter wheels. This insures long life for the rope and a machine almost silent. This dumbwaiter is especially adapted for private residence service.

## Geared Patent Frame Machines.

This type of machine is used for heavy duty hand operated dumbwaiter service. This frame is patented. The patent covers full diameter wheels in the machine. There is also a powerful band brake and loads may be lowered at any desired speed by the use of same.



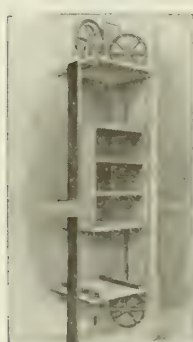
GEARED PATENT FRAME

## Double Automatic Brake Dumbwaiter.

This machine is the most modern of all automatic brake dumbwaiter machines. Patented in United States and Canada in 1915. The automatic brake is simple and compact and will not readily get out of order. It has a phosphor bronze brake shoe with large braking surface and the shaft has roller bearings. No brake line is required, the load being sustained by the automatic brake in the machine in both the up and down directions of the car. Patent covers this feature.



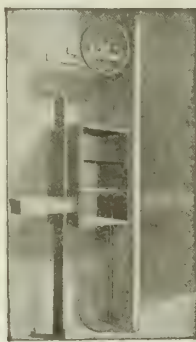
DOUBLE AUTOMATIC BRAKE



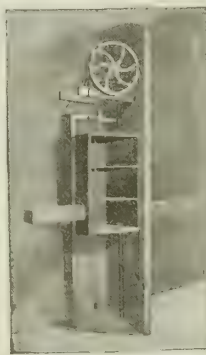
NO. 1. ONE-TO-ONE  
TRACTION DUMB-  
WAITER  
1 to 50 lbs. capacity



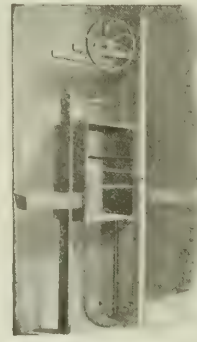
NO. 2. TWO-TO-ONE  
TRACTION DUMB-  
WAITER  
50 to 100 lbs. capacity



NO. 3. PLAIN  
SHEAVE DUMB-  
WAITER  
50 to 150 lbs. capacity



NO. 4. BAND BRAKE  
DUMBWAITER  
50 to 150 lbs. capacity



NO. 5. AUTOMATIC  
BRAKE DUMB-  
WAITER  
75 to 200 lbs. capacity



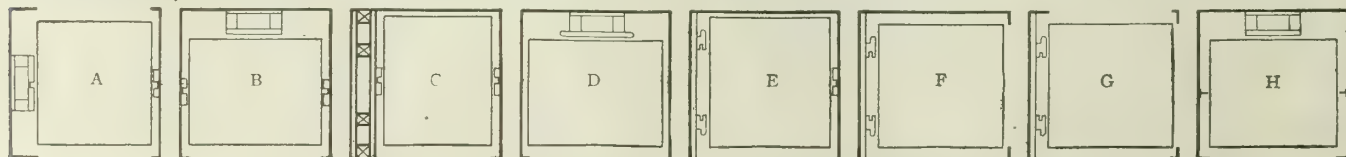
NO. 6. PATENT  
FRAME DUMB-  
WAITER  
100 to 500 lbs. capacity

DATA AND PRICES OF SOME OF THE CHELSEA HAND OPERATED DUMBWAITERS

Number	Type	Car size	Hatchway size, single face	Hatchway size, double face	Headroom required above door for mach.	Capacity in lbs.	Complete ship. wt., approx., lbs.	Price, machine only	Price, complete outfit, height 20 ft. or less	Price, machine, ex. double face	Add each extra ft., single face	Add each extra ft., double face	Service best adapted for	Outline Specifications
1-A	One-to-one Traction Brake	22"x 18"	26"x 21"	26"x 22"	2' 2"	50	400	\$37.00	\$76.00	\$19.00	\$0.40	\$0.55	High class residence work. Pantry service. Quick service. Small packages. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Iron wheels set in iron frames, with oil holes, rope guards, etc. All wheels full diameters between centers; weight wheel fitted with band and leather cushioned band brake. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes for ropes and guides for runs; manila hemp hand and check ropes; manila weight rope; heavy double groove hardwood runs; cast iron counterweight fitted with eye and guides; platform at bottom fitted with rubber bumpers; check weights, bullseyes, pulleys, etc.
1-B	One-to-one Traction Brake	26"x 22"	30"x 25"	30"x 26"	2' 6"	50	450	42.00	85.00	21.00	.40	.55	High class residence work where heavier duty is required than one-to-one. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Same as above with eye at top of shaft for hand rope fastening. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes for ropes and guides for runs and casting pieces with lignum vitae sheaves; manila hemp hand and check ropes; manila weight rope; heavy double groove hardwood runs; cast iron counterweight fitted with eye and guides; platform at bottom fitted with rubber bumpers and fastening for adjustment to hand rope; check weights, bullseyes, pulleys, etc.
2-A	Two-to-one Traction Brake	22"x 18"	26"x 21"		2' 8"	100	430	42.00	88.00		.45		High class residence work where heavier duty is required than one-to-one. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Steel shaft, fitted with proper diameter flywheel and weight wheel securely fastened; also, leading sheaves and boxes for shaft. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand rope; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, etc.
2-B	Two-to-one Traction Brake	26"x 22"	30"x 25"		3' 0"	100	475	44.00	98.00		.44		High class residence work where heavier duty is required than one-to-one. Almost noiseless in operation. Ropes very lasting, on account of full diameter wheels.	MACHINE—Steel shaft, fitted with proper diameter flywheel and weight wheel securely fastened; also, leading sheaves and boxes for shaft. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand rope; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, etc.
3-A	Plain Sheave Rig	22"x 18"	26"x 21"	26"x 22"	2' 2"	75	240	18.00	40.00	10.00	.40	.50	For general requirements where a moderate price good quality dumbwaiter is desired.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel and boxes for shaft; flywheel fitted with band and band brake. Necessary leading sheaves. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand and check ropes; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, check weights, etc.
3-B	Plain Sheave Rig	26"x 22"	30"x 25"	30"x 26"	2' 6"	100	300	20.00	47.00	10.50	.45	.55	For general requirements where a moderate price good quality dumbwaiter is desired.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel and boxes for shaft; flywheel fitted with band and band brake. Necessary leading sheaves. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand and check ropes; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, check weights, etc.
4-A	Brake Sheave Rig	22"x 18"	26"x 21"	26"x 22"	2' 6"	75	290	31.00	60.00	10.00	.45	.55	A serviceable dumbwaiter where it is desirable to lower loads, controlling speed with the brake rope.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel and boxes for shaft; flywheel fitted with band and band brake. Necessary leading sheaves. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand and check ropes; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, check weights, etc.
4-B	Brake Sheave Rig	26"x 22"	30"x 25"	30"x 26"	3' 0"	100	365	34.00	70.00	10.50	.46	.58	A serviceable dumbwaiter where it is desirable to lower loads, controlling speed with the brake rope.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel and boxes for shaft; flywheel fitted with band and band brake. Necessary leading sheaves. CAR—Ash, dovetailed, varnished, shelved as directed, fitted with eyes and guides; manila hemp hand and check ropes; manila weight rope; hardwood guide runs; cast iron counterweight, eyes and guides; crosspieces at bottom fitted with rubber bumpers; bullseyes, fair leaders, check weights, etc.
5-A	Automatic Brake	22"x 18"	26"x 21"	26"x 22"	2' 2"	75	275	27.00	54.00	10.00	.40	.50	Residence and apartment house work, where a number of different people have the use of car. No check line required, as automatic brake holds loads within the capacity of machine.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel, and boxes for shaft. To back timber there is fastened an automatic brake of first class construction, so designed as to eliminate as much lost motion, noise and friction as possible; lock to automatically hold car at any point without the use of check lines or fastenings; car to remain stationary with load within capacity of machine until released by a pull on hand rope. CAR—Same as for 3-A and 3-B, above.
5-B	Automatic Brake	26"x 22"	30"x 25"	30"x 26"	2' 6"	100	350	31.00	63.00	10.50	.45	.55	Residence and apartment house work, where a number of different people have the use of car. No check line required, as automatic brake holds loads within the capacity of machine.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel, and boxes for shaft. To back timber there is fastened an automatic brake of first class construction, so designed as to eliminate as much lost motion, noise and friction as possible; lock to automatically hold car at any point without the use of check lines or fastenings; car to remain stationary with load within capacity of machine until released by a pull on hand rope. CAR—Same as for 3-A and 3-B, above.
5-C	Automatic Brake	30"x 24"	35 1/2"x 27"	35 1/2"x 28"	2' 10"	150	450	34.50	77.00	13.50	.46	.57	Residence and apartment house work, where a number of different people have the use of car. No check line required, as automatic brake holds loads within the capacity of machine.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel, and boxes for shaft. To back timber there is fastened an automatic brake of first class construction, so designed as to eliminate as much lost motion, noise and friction as possible; lock to automatically hold car at any point without the use of check lines or fastenings; car to remain stationary with load within capacity of machine until released by a pull on hand rope. CAR—Same as for 3-A and 3-B, above.
5-D	Automatic Brake	34"x 28"	39 1/2"x 31"	39 1/2"x 32"	3' 2"	200	635	51.00	101.00	15.50	.48	.60	Residence and apartment house work, where a number of different people have the use of car. No check line required, as automatic brake holds loads within the capacity of machine.	MACHINE—Steel shaft fitted with proper diameter flywheel and weight wheel, and boxes for shaft. To back timber there is fastened an automatic brake of first class construction, so designed as to eliminate as much lost motion, noise and friction as possible; lock to automatically hold car at any point without the use of check lines or fastenings; car to remain stationary with load within capacity of machine until released by a pull on hand rope. CAR—Same as for 3-A and 3-B, above.
6-A	Patent Frame Geared Brake	34"x 28"	40"x 32"	40"x 33"	4' 0"	250	975	104.00	140.00	25.00	.60	.82	Strong and substantial. Store service. Heavy packages, etc. Good for lowering.	MACHINE—Shafts of steel; wheels of full diameters; gears of size to suit hatch and capacity of machine; flywheel proper diameter; band and leather cushioned band brake; heavy rabbitted boxes; necessary pulleys for check; lever for brake. CAR—As for 3-A and 3-B, above.

Notes—Enclosed weight box, add 50¢ each ft. of height. Steel guide rails for car, add \$3.00 per ft. of height. Brass guides for steel rails, \$9.00 a set. Automatic catch service for a 2-story dumbwaiter where brake and automatic lock are omitted, \$6.00. Rope clamps to fasten hand ropes, 90¢ each.

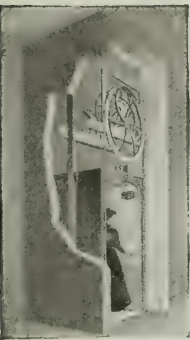
Steel cars are made special and prices are quoted on request. All prices given are f.o.b. New York City. A detailed plan and instructions are sent with each equipment. No extra charge if size varies slightly from these given. Ropes spliced before shipment, if requested.



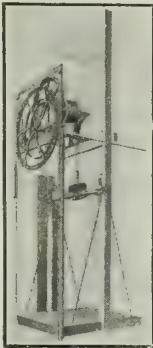
CHELSEA DUMBWAITER HATCHWAY ARRANGEMENTS FOR VARYING CONDITIONS

In ordering, state preferable arrangement, and give clear inside measurements and total height of hatchway; also, door size in height and width





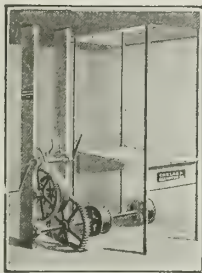
NO. 7. PATENT  
FRAME PASSENGER  
ELEVATOR  
500 to 1,000 lbs.  
capacity



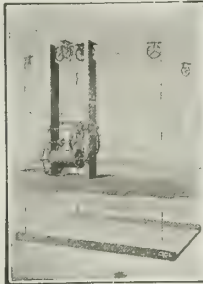
NO. 8. PATENT  
FRAME SIDE POST  
STORE ELEVATOR  
1,000 to 3,000 lbs.  
capacity



NO. 9. PATENT  
FRAME CORNER  
POST STORE  
ELEVATOR  
1,000 to 3,000 lbs.  
capacity



NO. 10. HAND  
POWER SIDEWALK  
ELEVATOR  
1,000 to 6,000 lbs.  
capacity



NO. 11. FOUR-  
CABLE WINDLASS  
ELEVATOR  
2,000 to 6,000 lbs.  
capacity

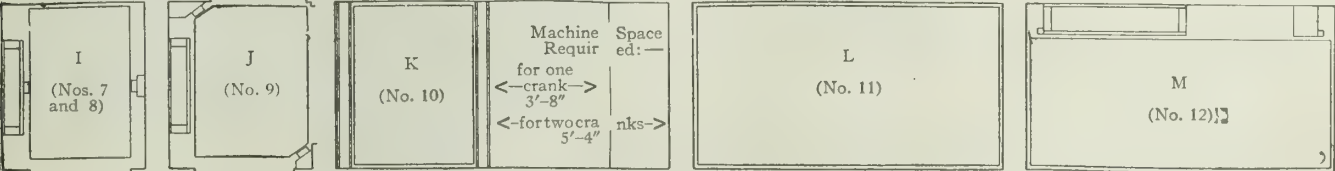


NO. 12. FOUR-  
CABLE HAND ROPE  
CARRIAGE ELE-  
VATOR  
2,000 to 6,000 lbs.  
capacity

DATA AND PRICES OF SOME OF THE CHELSEA HAND OPERATED ELEVATORS

Number	Type	Platform size, outside	Hatchway size, single face	Hatchway size, double face	Approx. head- room required above top land- ing for 6' 0" plat.	Capacity in lbs.	Complete ship. wgt, approx. lbs.	Price, machine only	Price, complete except weight box 20 ft.	Price, machine, ex. double face	Add each extra ft., single face	Add each extra ft., double face	Service best adapted for	Outline Specifications
7-A	Patent Frame Passenger Elevator	3'x3'	4'x3'-4"	4'x3'-6"	12'-0"	600	1800	\$182	\$468	\$27	\$1.10	\$1.45	General passenger service, invalids, hospitals, sanitariums, schools, public buildings, private residences, trunk lifts, etc.	MACHINE—Patent iron frames; steel shafts; drums, wheels and gears keyed to shafts. Steel keys; drums spirally grooved for cables; roller bearings; babbitted boxes; lubricating candles; finished brake; steel brake band, leather cushioned; wrought iron lever; iron pulleys and pulley supports. CAR—Ash or other hardwood, dovetailed, filled, varnished and rubbed, iron braced. Safety attachment; guide shoes; cushioned counterweight; car and counterweight cables Swedish iron; drop forged sockets; manila hemp hand and check ropes; fair leaders; check weights; maple guide runs.
7-B	Patent Frame Passenger Elevator	4'-6" x4'	5'-6"x 4'-4"	5'-6" x4'-6"	13'-0"	1000	1950	204	522	30	1.40	1.65	Stores,lofts, factories, banks, bakeries, laundries, etc., where ever used from one side or opposite sides.	MACHINE—Same as 7A and 7B above, except brake is not turned and brake band not leather cushioned. PLATFORM—Side post type. Shoes, post and crosshead, ash or other hardwood; flooring strongly lagged to shoes; crosshead and shoes tenoned and bolted to posts; posts braced with iron straps and rods and reinforced with iron brackets; safety attachment; guide shoes; cushioned counterweight; platform and counterweight cables Swedish iron; drop forged sockets; manila hand and check ropes; check weights; fair leaders; maple guide runs.
8-A	Patent Frame Store Elevator, Side Post	4'-6" x4'	5'-6"x 4'-4"	5'x 4'-6"	14'-0"	1500	2000	210	400	33	1.40	1.65	Stores,lofts, factories, banks, bakeries, laundries, etc., where ever used from one side or opposite sides.	MACHINE—Same as 7A and 7B above, except brake is not turned and brake band not leather cushioned. PLATFORM—Side post type. Shoes, post and crosshead, ash or other hardwood; flooring strongly lagged to shoes; crosshead and shoes tenoned and bolted to posts; posts braced with iron straps and rods and reinforced with iron brackets; safety attachment; guide shoes; cushioned counterweight; platform and counterweight cables Swedish iron; drop forged sockets; manila hand and check ropes; check weights; fair leaders; maple guide runs.
8-B	Patent Frame Store Elevator, Side Post	5'-6" x5'	6'-6"x 5'-4"	6'-6" x5'-6"	14'-6"	2000	2500	275	495	40	1.75	2.00	Stores,lofts, factories, banks, bakeries, laundries, etc., where ever used from one side or opposite sides.	MACHINE—Same as 8A and 8B above. PLATFORM—Corner post type. Floor framing post and cross-head of ash or other hardwood; frame for floor of platform tenoned and bolted securely fastened to posts; crosshead tenoned and bolted to posts; flooring North Carolina pine; posts braced with iron brackets; iron straps and rods secure floor frame to crosshead; safety attachment, etc., as for 8A and 8B above.
9-A	Patent Frame Store Ele- vator, Cor- ner Post	4'-6" x4'	4'-8"x 4'-4"	4'-8" x4'-6"	14'-6"	1500	2200	210	430	33	1.40	1.65	Stores,lofts, factories, banks, bakeries, laundries, etc., where ever used from one side or opposite sides.	MACHINE—Same as 8A and 8B above. PLATFORM—Corner post type. Floor framing post and cross-head of ash or other hardwood; frame for floor of platform tenoned and bolted securely fastened to posts; crosshead tenoned and bolted to posts; flooring North Carolina pine; posts braced with iron brackets; iron straps and rods secure floor frame to crosshead; safety attachment, etc., as for 8A and 8B above.
9-B	Patent Frame Store Ele- vator, Cor- ner Post	5'x 5'-4"	5'-8"x 5'-8"	5'-8" x5'-10"	15'-0"	2000	2800	275	525	40	1.75	2.00	Stores,lofts, factories, banks, bakeries, laundries, etc., where ever used from one side or opposite sides.	MACHINE—Same as 8A and 8B above. PLATFORM—Corner post type. Floor framing post and cross-head of ash or other hardwood; frame for floor of platform tenoned and bolted securely fastened to posts; crosshead tenoned and bolted to posts; flooring North Carolina pine; posts braced with iron brackets; iron straps and rods secure floor frame to crosshead; safety attachment, etc., as for 8A and 8B above.
10-A	Sidewalk Elevator or Ash Lift	3'x3'	3'-10"x 3'-2"	See hatchway, plan K for ma- chine room	Have no safety attachments	1000	1600	145	270	..	12-ft. rise or less		Stores,lofts, etc., base- ment service, ashes, boxes, etc. Operated from one floor only.	MACHINE—Frames; cast iron, I-beams or hardwood; steel shafts; iron drums, gears, pulleys keyed to shafts; steel keys; brake and steel brake band; wrought iron lever; pinion can be put out of mesh and loads lowered with brake lever; lip to hold pinion in mesh; pawl to hold loads; iron trough. PLATFORM—Hardwood, iron braced; iron guides; solid iron posts or T-iron guideways; proof chain to four corners of platform and to drums; iron overhead sheaves grooved for chains; wrought iron frames for sheaves; iron boxes; one or two cranks with maple handles.
10-B	Sidewalk Elevator or Ash Lift	4'x4'	4'-10"x 4'-2"	See hatchway, plan K for ma- chine room		2000	1800	165	298	..			Garage, sta- bles, etc., for short rise.	MACHINE—Same as for 10A and 10B above, except drum has back drum counterbalance and is grooved for cables. PLATFORM—Hardwood shoes; flooring lagged to shoes; hung from four corners with Swedish iron cables; leaded in steel sockets. Counterweight hung similar cable; overhead sheaves on steel shafts set in iron brackets; additional wrought iron safety straps; cushioned counterweight.
11	Carriage or Auto Elevator, Windlass Type	7'-6" x16'	7'-8"x 16'-2"	C. W. T. box outside of hatch about 6'x30'		2500	3800	300	510	..			Garage, sta- bles, etc., for short rise.	MACHINE—Frames hardwood; steel shafts; iron wheels, drum, gears keyed to shafts; steel keys; drums spirally grooved for cables; roller bearings; babbitted boxes; brake and steel brake band; wrought iron lever; pulleys and pulley supports; back drum counterbalance; babbitted wall box or bearing. PLATFORM—Same as 11 above, except fitted with iron guides; maple guide runs. 12 B same as 12A, except double geared for increased capacity.
12-A	Carriage or Auto Elevator, Hand rope Type	7'-6" x16'	8'-11"x 16'-3"	Counterweight box in hatch	Have no safety attachments	2500	4500	300	560	..	Each ex- tra foot, trussing, \$3.00 \$2.50		Garage, sta- bles, etc., for short rise.	MACHINE—Frames hardwood; steel shafts; iron wheels, drum, gears keyed to shafts; steel keys; drums spirally grooved for cables; roller bearings; babbitted boxes; brake and steel brake band; wrought iron lever; pulleys and pulley supports; back drum counterbalance; babbitted wall box or bearing. PLATFORM—Same as 11 above, except fitted with iron guides; maple guide runs. 12 B same as 12A, except double geared for increased capacity.
12-B	Carriage or Auto Elevator, Hand rope Type	8'x18'	8'-11"x 18'-3"	Counterweight box in hatch		5000	6600	485	800	..			Garage, sta- bles, etc., for short rise.	MACHINE—Frames hardwood; steel shafts; iron wheels, drum, gears keyed to shafts; steel keys; drums spirally grooved for cables; roller bearings; babbitted boxes; brake and steel brake band; wrought iron lever; pulleys and pulley supports; back drum counterbalance; babbitted wall box or bearing. PLATFORM—Same as 11 above, except fitted with iron guides; maple guide runs. 12 B same as 12A, except double geared for increased capacity.

Notes—In the above, stock sizes and capacities are given. No extra charge if size varies slightly. Prices quoted on request for outfits of any capacity; also on steel platforms and steel rails. Estimates quoted for erection anywhere. Above prices are for complete machines, including machine lumber and bolts. Weight boxes, blocking and supporting timbers not included. Detail plan and instructions sent with each outfit. Prices f.o.b. New York City.



CHELSEA HAND POWER ELEVATOR HATCHWAY ARRANGEMENTS FOR VARIOUS TYPES

In ordering send sketch showing location of hatchway in building, show entrance to platform, give size of hatchway, and total height

# THE EASTERN MACHINERY CO.

Manufacturers of Electric Elevators

NEW HAVEN, CONN.

## Products.

ELECTRIC PASSENGER and FREIGHT ELEVATORS; BELT POWER ELEVATORS; ELEVATOR CARS; ELEVATOR EQUIPMENT.

Friction Winding Drums, Friction Hoisting Machines, Friction Clutches, etc.; Automatic Safety Gates and Automatic Hatch Doors.

## Direct Connected Electric Elevator Machine.

**SCOPE OF USE**—The direct connected electric elevator machine is adapted for *first class* elevator service, passenger or freight, at all speeds.

**OPERATION**—Operated by push buttons or by full magnet control from switch in car, with direct or alternating current. Where direct current is provided, machine can be arranged for 2-speed operation; a heavy load at slow speed, and light load at high speed. For alternating current, speed should not exceed 200 ft. per minute. Design is good, construction is solid, and operation is smooth, reliable and safe.

**ACCURATE CONSTRUCTION**—All parts are built with jigs and templates, accurately made, correctly put together, and are interchangeable, thus assuring efficiency and satisfactory service.

**DRUM**—Mounted on turned steel drum shaft and bolted to heavy worm gear center.

**WORM**—The worm and worm shaft are one forging, made of high carbon steel and carefully turned.

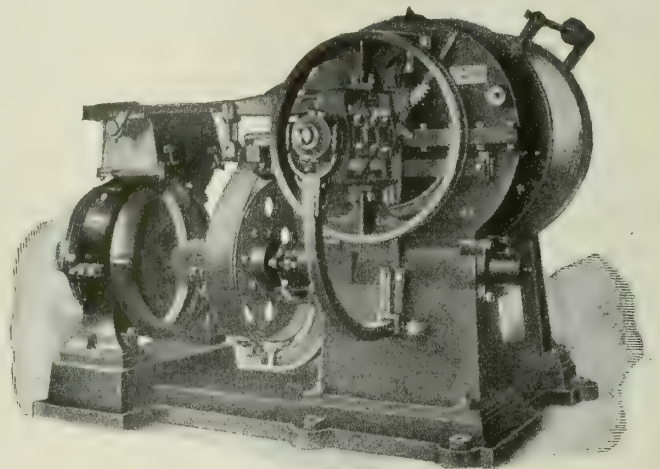
**GEAR CASE**—Worm gear, steel worm and ball thrust collars are enclosed in an oiltight, dustproof gear case and are completely submerged in oil.

**BRAKE**—A powerful compound lever gravity brake grips a wheel of large diameter forming part of motor coupling. Operated by strong lever connection to shipper yoke cam or by electric solenoid.

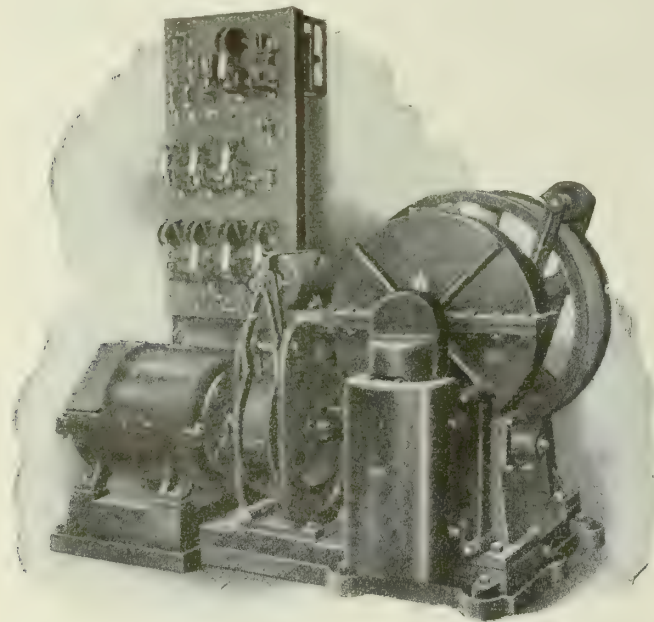
**CONTROLLER AND SWITCH**—Different types, of rugged construction, to suit current used and requirements of the service. Switches and contacts of ample capacity.

**MOTOR**—For direct current service, a compound wound, slow speed motor is coupled to worm shaft; and for alternating current service, a high torque, slip ring type alternating current motor is used.

**BASE PLATE**—These winding machines, whether located over well or on foundation in basement, are completely mounted on a substantial iron subbase having deep groove flanges on all sides to prevent oil from dripping on car or running over floor.



DIRECT CONNECTED ELECTRIC ELEVATOR MACHINE  
For freight or passenger service, with shipper rope control



DIRECT CONNECTED ELECTRIC ELEVATOR MACHINE  
AND CONTROLLER  
For full magnet and push button control

**WORM GEAR**—Made of gunmetal bronze, accurately cut, with deep wide face teeth, and securely fitted and bolted to substantial iron center having a hub passing through gear case and securely bolted to drum.

## Single Belt Electric Elevators.

**SCOPE OF USE**—For freight service, and where car speed is not over 70 ft. per minute.

**OPERATION**—Operating parts consist of usual worm gear winding machine, driven with one belt from compound wound reversing D. C. or A. C. motor, which runs only when elevator is in motion. An automatic electric controller is direct connected to shipper wheel on winding machine, for reversing and regulating current. Any of these parts may hang from ceiling or stand on floor. Car and wellhole construction is same as required with ordinary belt power elevators.

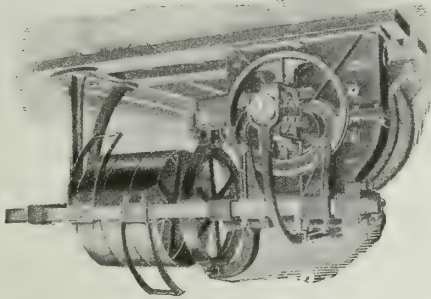
**COST**—This type is less expensive than the direct



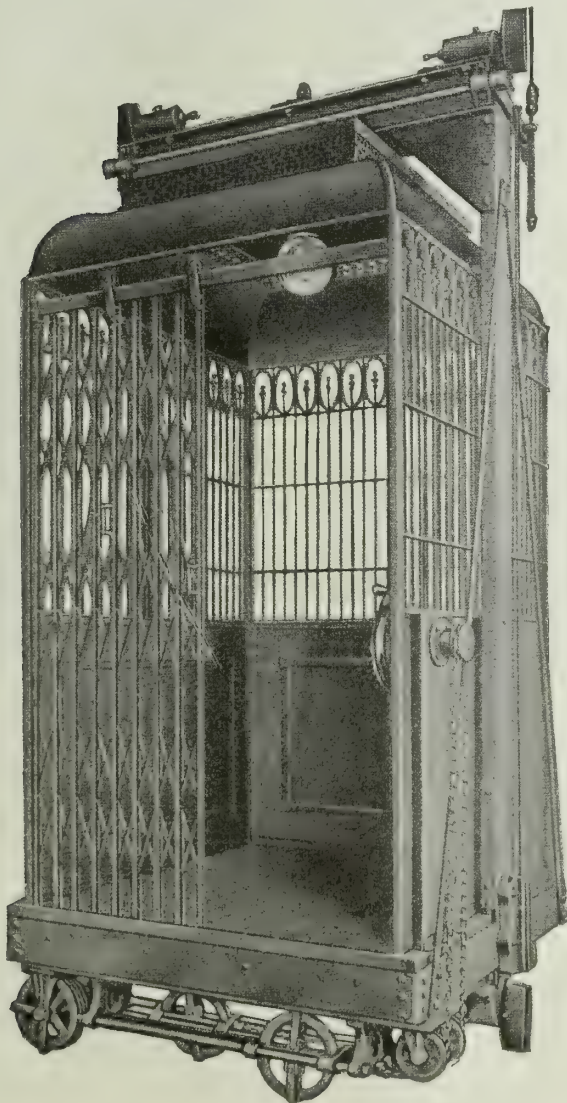
connected type above described. The accurately cut worm gearing and ball thrust collars in all these elevator machines, for reducing friction, *cause less power to be used in lifting load than is used by other similar apparatus on the market.*

### New Haven Worm Gear Elevator Machine.

The company also makes a worm gear, belt power elevator machine — built in several styles. These machines may be hung on ceiling or set on floor; made right hand or left hand, as required. All drums are scored in a lathe to fit cables. Worm gears have ample proportions, with deep wide face teeth, accurately cut. The worms are made of high carbon steel. Oiltight gear case protects gear, worm and thrust collars, all submerged in oil. Double



NEW HAVEN WORM GEAR ELEVATOR MACHINE



ELECTRIC PASSENGER ELEVATOR CAR

band gravity brake grips wheel of large diameter and sustains load at all points.

Equipped with large driving pulleys, automatic limitation stops and sensitive slack cable stops.

### Freight Elevator Cars.

Built for all purposes, to order only. Cars made in any size or style desired, to be used with the winding machines (described on preceding page) or others.

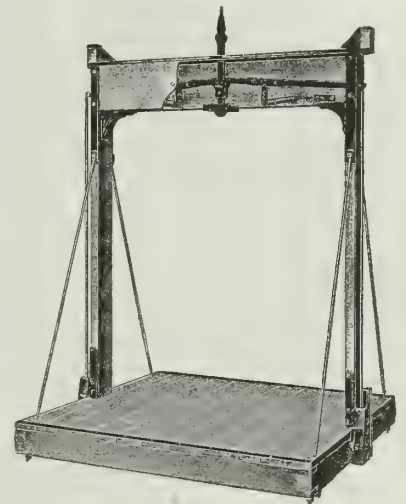
TYPES—Manufactured in 2 types: (1) Wood or steel frame and side posts; (2) Wood or steel frame and corner posts.

SAFETY MECHANISM—The safety stop is quick and positive. Safeties are at bottom of car.

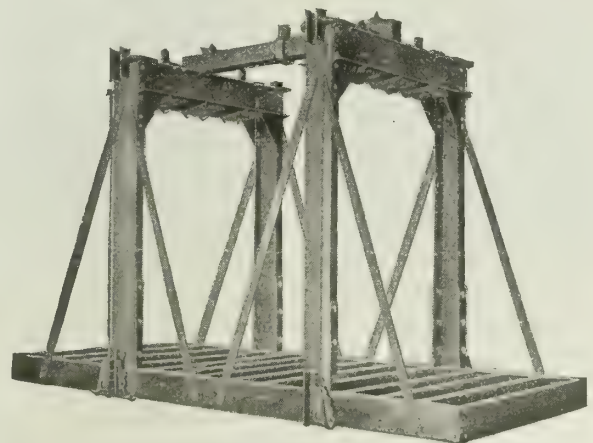
If cables break, or become slack, a powerful spring (held in tension) in car head operates the levers which raise wedges in guide cases. Then sharp teeth immediately grip the guides and bind car solidly to post. After cables have been replaced and car has started upward, wedges will be released by action of wedge guide and drop back into their normal position in the case.

With steel guide rails, hardened steel rollers are provided in place of wedges.

CAR SPEED GOVERNORS—These are provided for operating safety attachments on passenger or freight elevators, where required.



FREIGHT ELEVATOR CAR  
Position of wedges when hoisting cables are tight



FREIGHT ELEVATOR CAR  
Double head steel frame

### Estimates and Prices.

After the necessary data are obtained, this company is always pleased to make estimates and quote prices.

### References.

Any one having our elevators in use. List of users on request.

ESTABLISHED 1887

# ENERGY ELEVATOR COMPANY

PHILADELPHIA, PA.

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## Products.

HAND POWER and ELECTRIC DUMBWAITERS, all Types. HAND POWER ELEVATORS, INVALID ELEVATORS, BASEMENT or ASH ELEVATORS.

Automobile Elevators, Belt Driven and Electric Freight Elevators, Safety Gates, Automatic Hatch Doors.

### "Little Beauty" Dumbwaiter, 25-lb. Capacity.

SPECIFICATION—Operating gear of iron wheels mounted in guarded iron stands, revolving on steel roller bearings. Car of highly finished hardwood trays with polished brass fittings and adjustable guide shoes. It can be controlled from any floor by a self-holding band brake. Car runs on polished brass pipes; one contains the counterweight and the other is used as a speaking tube.

PRICE—For 10-ft. travel, \$100.00. \$3.00 for each additional foot of travel.

Shipment includes the box at top in which the wheel and brake are set ready for use, but does not include the closet at bottom nor enclosure around opening in top floor.

Car over 20 by 16 ins., extra.

### "Energy" or Residence Dumbwaiters, 100-lb. Capacity.

SPECIFICATION—Machine of the automatic type, which securely sustains the car at any point without the use of lines or cords. Shaft is polished turned steel, revolving on roller bearings, and all parts accurately bored and carefully fitted, resulting in a perfect machine. It is mounted in an iron frame, containing the entire mechanism including the wheels for deflecting the hoist rope.

Car of well-seasoned hardwood, finished with filler and varnish; it has adjustable guide shoes, reinforced back, and iron bound corners.

Hoist rope of wire cable; pull rope of hemp. Counterweight runs in open guides.

PRICE—For 10-ft. travel, \$45.00. 50¢ for each additional foot of travel.

Double fixtures, extra.

### "Little Giant" Dumbwaiters or Trunk Lifts, 300-lb. Capacity.

SPECIFICATION—Operating gear of the automatic self-retaining type, of 300-lb. capacity, mounted in an iron frame with the wheels and brake permanently fixed, the shafts revolving on steel roller bearings. Car of hardwood enclosed with lining on the back and sides (made any size up to 2 ft. 6 ins. wide by 3 ft. 6 ins. deep by 4 ft. high; this will receive large trunks). Car suspended by one Swedish iron hoist cable; weight to run in a closed box.

PRICE—For 10-ft. travel, \$80.00. 60¢ for each additional foot of travel.

Car can be the same as "Energy," and weight run in guides if preferred.

### Hand Power Invalid Elevator, 500-lb. Capacity.

SPECIFICATION—Operating gear of the automatic self-retaining type, of 500-lb. capacity, spur wheel machine cut, all bearings antifriction steel rollers, mounted in an iron frame containing the entire mechanism. Car of hardwood panels 4 ft. high on sides and back, with wire work above this and overhead; car equipped with spring-grip safety device and suspended by two Swedish iron hoist cables. Pull rope of hemp. Counterweight sufficient to balance one passenger.

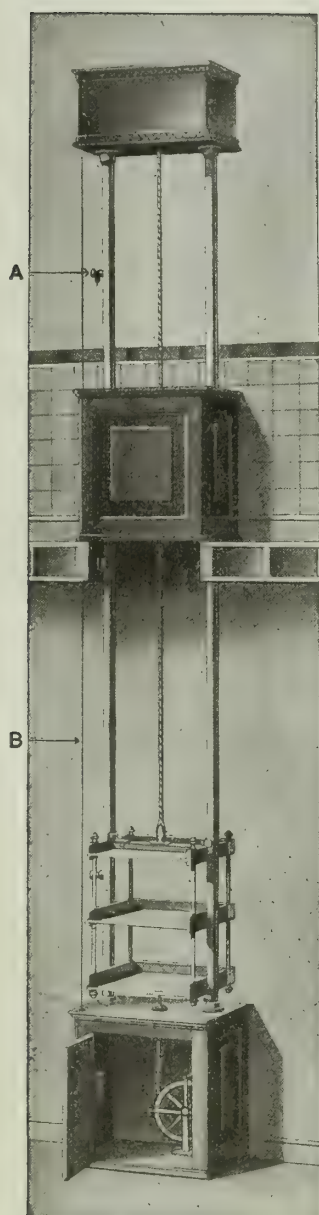
PRICE—For 10-ft. travel, \$250.00. \$2.00 for each additional foot of height.

## Plans.

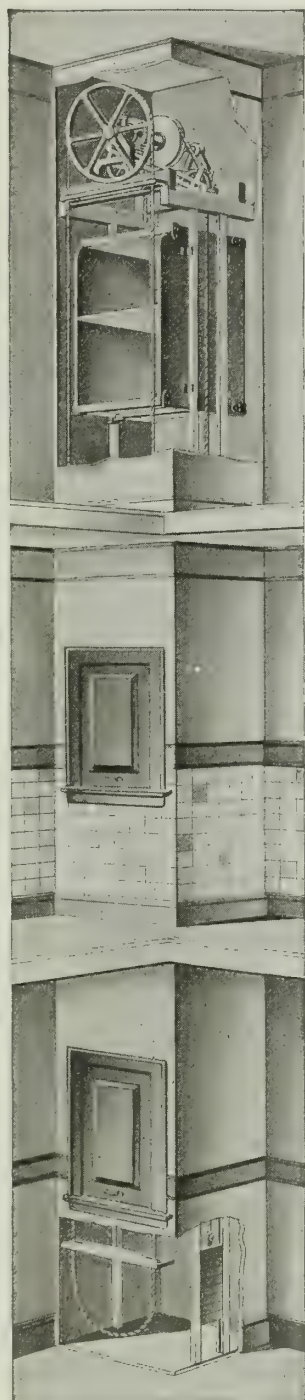
Working plans are furnished for installing these lifts.

Special plans will be supplied for special sizes, if stock sizes do not suit.

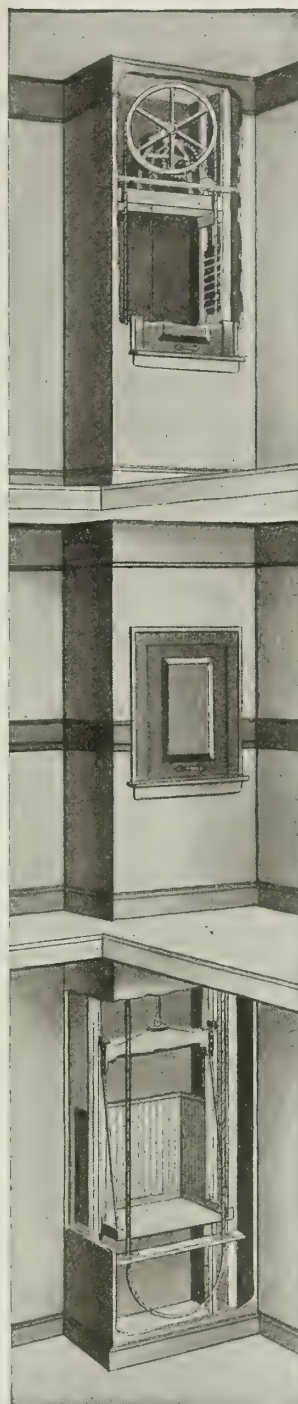




"LITTLE BEAUTY"  
DUMBWAITER  
A—Speaker  
B—Brake line



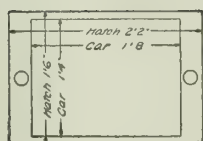
"ENERGY" OR RESIDENCE  
DUMBWAITER



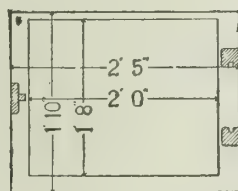
"LITTLE GIANT" DUMB-  
WAITER OR TRUNK LIFT



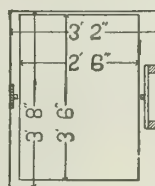
HAND POWER INVALID  
ELEVATOR



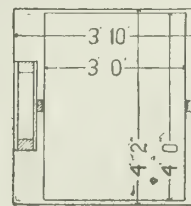
For car 20 x 16 in.



For car 24 x 20 in.



For car 2 ft. 6 in.  
x 3 ft. 6 in.



For car 3 x 4 ft.

PLANS OF SHAFTS SHOWING LOCATION OF WEIGHTS

**Hand Power Elevator.**

**MACHINE**—Machine with all wheels, steel shafts, keys, antifriction roller bearings, self-oiling boxes, powerful self-holding band brake, 4 ins. wide, and brake wheels on a plank.

**CAR WITH SAFETY CATCH**—Car of hardwood, equipped with our improved spring-grip safety device, to sustain the car in case hoisting cable should break.

**CABLE**—Cable of best Swedish iron, fitted with necessary attachments to connect it to the car and counterweight. This cable has a breaking strain five times greater than the rated capacity of the elevator.

**HAND ROPE**—Hand rope of best quality hemp and amply large and strong for its work.

**CHECK LINE**—Check line of proper diameter and length to operate brake.

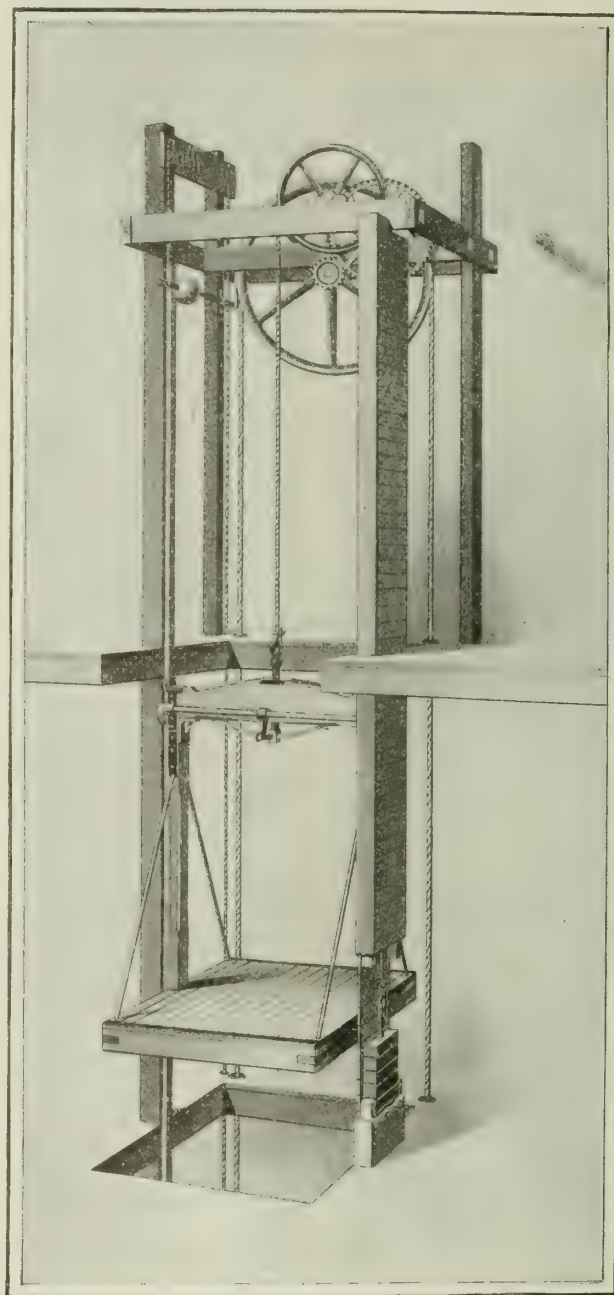
**COUNTERWEIGHT**—Counterweight adjustable and sufficient to lift empty car.

**GUIDE RUNS**—Guide runs of first quality hard maple, to fit the guides on the car, bored and counter-sunk for screws.

**FLOOR EYELETS**—Floor eyelets for the hand rope and checkline.

**DRAWINGS**—Drawings to direct the mechanic in setting the elevator in place.

The foregoing is a complete elevator except the guide posts, machine supports, weight box and bolts for setting it up.



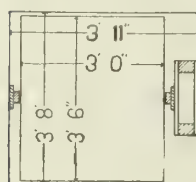
HAND POWER ELEVATOR

PRICES FOR 10-FT. TRAVEL—	SHIPPING WEIGHT, LBS.
500-lb. capacity, car not over 3 ft. wide by 3 ft. 6 ins. deep.....	\$110.00 1000
1000-lb. capacity, car not over 3 ft. 6 ins. wide by 4 ft. deep.....	135.00 1325
1500-lb. capacity, car not over 4 ft. wide by 4 ft. 6 ins. deep.....	160.00 1589
2000-lb. capacity, car not over 4 ft. 6 ins. wide by 5 ft. deep.....	185.00 1810
For travel over 10 ft., add, for each additional foot of height.....	1.00
500, 1000 and 1500-lb. cars are not made larger than sizes here given. 2000-lb. car will be made larger, for, per square foot of increased area.....	2.00
Note—The sizes of the cars are outside measurements.	

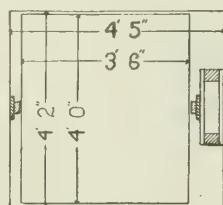
Bow irons for top of car (to operate one set of doors)..... 15.00

Irons to operate automatic hatch doors, in addition to bow irons, per floor..... 12.00

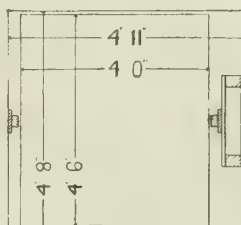
Note—If the safety device is left off the car, a reduction of \$10.00 will be made from the list price.



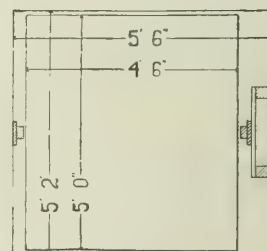
500 lbs.



1000 lbs.



1500 lbs.



2000 lbs.

SHAFT PLANS



### Basement Elevator, Type K-D 24.

The machine has compound gearing, steel shafts, iron drums, and powerful self-holding brake; all set in iron frame ready for bolting to floor.

The car is of wood, braced with iron, suspended by four  $\frac{3}{8}$ -in. chains of 36,000 lbs. ultimate strength.

The gearing disengages for rapid lowering. This cuts out the driving wheel, and it does not revolve.

The driving wheel is used instead of crank to give momentum, and as being safer for the operator.

The construction is strong throughout, with a good margin for safety allowed over rated capacity of 1500 lbs.

This elevator can be arranged for hatches that project from the building line.

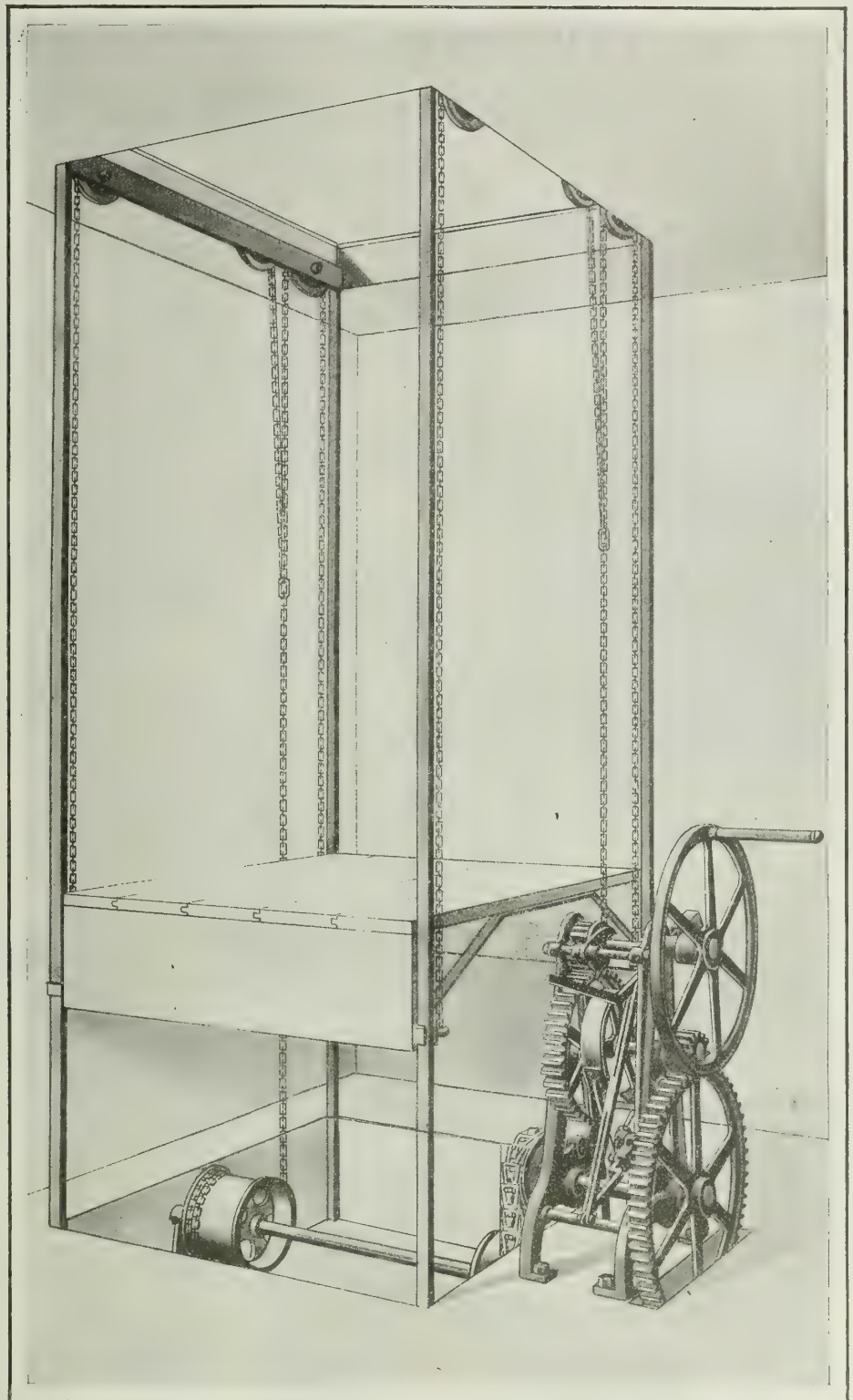
#### PRICES

Complete for 10-ft. travel,	
car not over 5 ft. by 5 ft.	\$180.00
For each extra foot of	
travel .....	5.00
For each extra square foot	
of car area.....	2.00

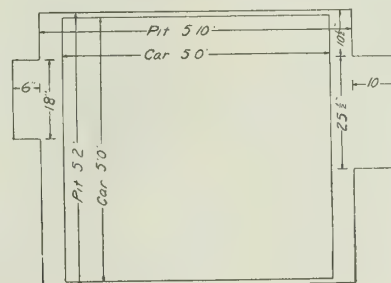
The shipment to consist of:

- Hoisting machine;
- Car;
- Top wheels in suspension irons;
- Chains;
- Steel guide runs;

All connections for the different parts. Shipping weight, 2000 lbs.



BASEMENT ELEVATOR



SHAFT PLAN

# HOLLISTER-WHITNEY COMPANY

Manufacturers of Elevators

QUINCY, ILL.

## Products.

Manufacturers of a complete line of STANDARD ELECTRIC, HYDRAULIC, POWER, and HAND OPERATED ELEVATORS.

Lifts and Hoists; Push Button or Automatic Electric Elevators and Dumbwaiters for stores, office buildings, hotels, hospitals and residences.

Automobile Elevators a specialty.

## Facilities.

This company maintains an energetic and capable management; has ample capital, a new factory equipped with modern high speed machinery, and a force of trained engineers and mechanics, thereby insuring clients a product of unusual merit.

## Co-operative Service.

HOLLISTER-WHITNEY COMPANY desires to co-operate with architects in furnishing preliminary plans and layouts, and other information necessary to the selection of apparatus suitable for the service required.

Data sheets, mailed promptly on request, will assist in the preliminary work.

## Illustration.

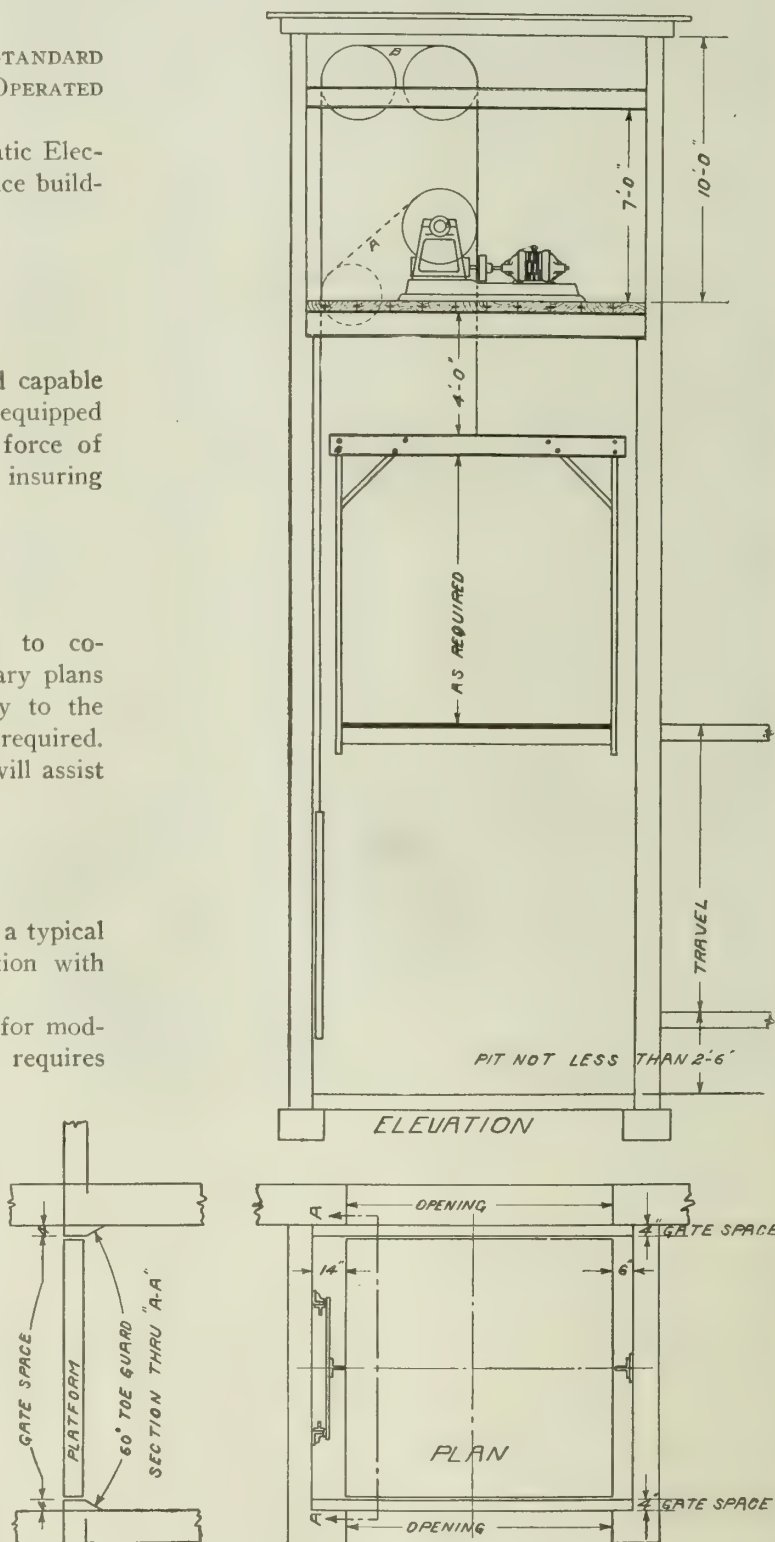
The construction detail at the right shows a typical layout of a modern freight elevator installation with machinery placed overhead.

"A" shows the method of cable rigging for moderate size platforms and ordinary service, and requires a penthouse 7 ft. between floor and ceiling.

"B" shows an extra set of beams recommended where the platforms are extra large and for severe duty. This method takes all the counterweight stress off of the machine bearings. It requires a penthouse 10 ft. between floor and ceiling.

Elevators of this class cost less, run easier, last longer, and subject the building to less stress than any other type.

Where conditions require it, however, the machinery may be placed on one of the lower floors or upon a concrete foundation in the basement.



TYPICAL LAYOUT MODERN FREIGHT ELEVATOR INSTALLATION



ESTABLISHED 1883

**KIMBALL BROTHERS COMPANY**

Passenger and Freight Elevators for all Purposes

1000 Ninth Street

COUNCIL BLUFFS, IOWA

TELEPHONE, 149

## AGENCIES

KANSAS CITY, MO., G. S. MONTGOMERY, 610 Delaware Street  
DENVER, COLO., WESTERN ENGINEERING & SPECIALTIES CO.OKLAHOMA CITY, OKLA., GUS TALIAFERRO  
SALT LAKE CITY, UTAH, WM. WATROUS**Products.**

PASSENGER, FREIGHT, HAND, ELECTRIC and BELT POWER ELEVATORS for public buildings, residences, stables, garages, factories; AUTOMATIC PUSH BUTTON ELEVATORS for apartment buildings, etc.; DUMBWAITERS; ELECTRIC WINDING MACHINES.

Automobile Elevators of many types for electric and hand powers; Full and Semiautomatic Gates.

**Statement.**

This is a strictly independent company, having no Trust affiliations, and enjoys the reputation of being of high financial standing in the elevator business.

Kimball elevators are in operation all over the country, from a house dumbwaiter to a 40,000-lb. electric.

**Co-operative Service and Detail Information.**

Co-operation with architects and builders is desired. In writing for estimates, please give the following information:

Weight to be handled; speed desired; size of platform; number of landings; distance from lower to upper landing; kind of power to be used. If electric, state whether direct or alternating current; also, number of phases, cycles and voltage.

Plan for hatchways, pent houses, etc., furnished free of cost.

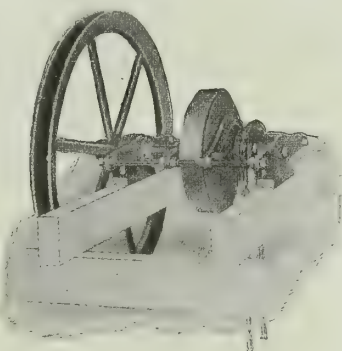
Information and details will be given on inquiry; every detail desired being furnished by either personal letter or illustrated catalogue, or by both.

**Size of Hatchways.**

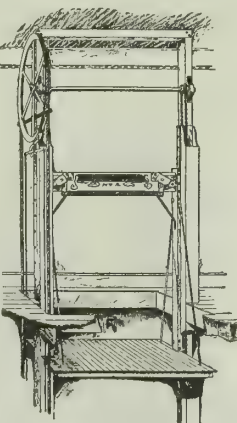
**DUMBWAITERS**—Hatch 8 ins. wider and 4 ins. longer from front to back than the cupboard.

**HAND ELEVATORS**—Hatch 18 ins. wider and 2 ins. longer than size of car in the clear.

**POWER ELEVATORS, PASSENGER OR FREIGHT**—Hatch 16 ins. wider and 2 ins. longer than car in the clear.

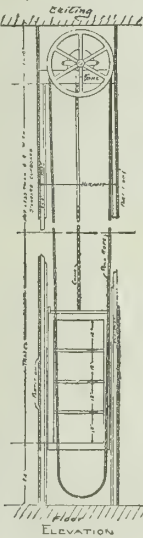


**SELF-LOCKING DUMBWAITER**  
Capacity 50 to 150 lbs.

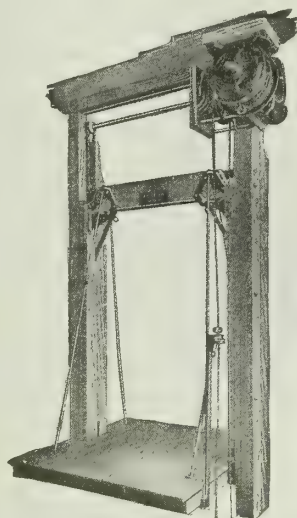


**NO. 2 FREIGHT HAND ELEVATOR WITH PATENT STEEL LEAF CHAIN**

Hatchway 18 ins. wider and 2 ins. longer than platform

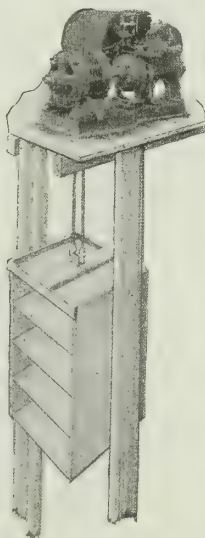


**CONSTRUCTION NOS. 22 AND 23**



**NO. 2 HAND ELEVATOR CHANGED TO DIRECT CONNECTED ELECTRIC**

Machine can be easily attached to hand elevator. Good for raising 1500 lbs.



**ELECTRIC DUMBWAITER OR SMALL ELEVATOR**

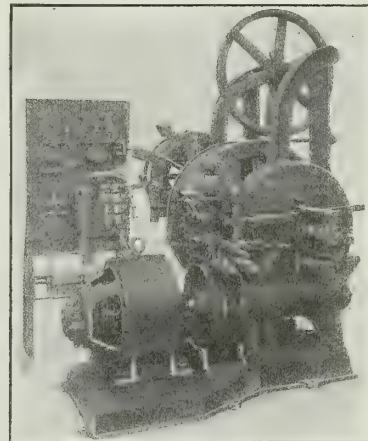
Either push button or cable control

**Electric Winding Machines.**

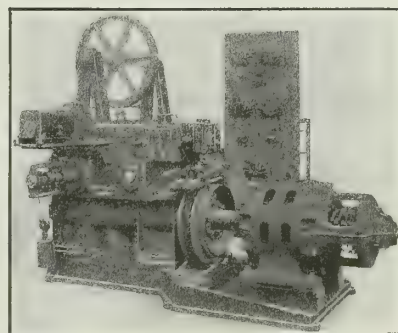
We build electric winding machines for full magnet, semimagnet and mechanical control, and carry a full line.

**Illustrations.**

A few of the accompanying illustrations clearly present the many excellent features of Kimball elevators.

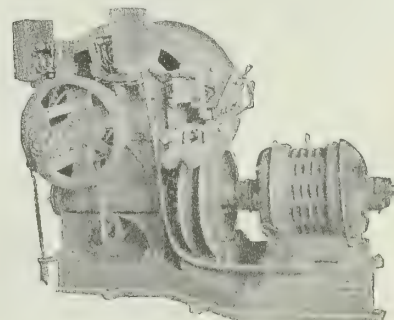


**AUTOMATIC PUSH BUTTON CONTROLLER AND WINDING MACHINE**  
To be operated by push buttons in car and at each floor



**HEAVY DIRECT CONNECTED WINDING MACHINE**

Has two worms and two worm wheels for extra heavy passenger and freight work. Full magnet or semimagnet controls



**DIRECT CONNECTED ALTERNATING CURRENT WINDING MACHINE**

Latest type for use over hatchway. Also furnished for setting on any floor

# KAESTNER & HECHT COMPANY

Electric Elevator Builders

OFFICES AND WORKS

Harrison, Throop and Congress Streets  
CHICAGO, ILL.

BRANCH OFFICES

DETROIT, MICH.

MILWAUKEE, WIS.

ST. LOUIS, MO.

## Products.

ELECTRIC ELEVATORS for all varieties of PASSENGER and FREIGHT SERVICE, including types with AUTOMATIC PUSH BUTTON CONTROL.

Electrically Controlled Hydraulic Lifts, Hand Power Elevators.



HOME OF KAESTNER & HECHT ELEVATORS

## Drum Type Elevators.

Provided with spirally grooved drums, upon which the winding and unwinding of the cables cause the suspended loads to be raised and lowered. Elevators of this type comprise the majority of machines and are built for all capacities up to 15 tons.



KIMBALL BUILDING, CHICAGO, ILL.  
GRAHAM, BURNHAM & Co., Architects

## Types Offered.

Stated briefly, KAESTNER & HECHT COMPANY build a complete line of elevators which embraces a large number of types for the many varieties of passenger and freight service. These types may be roughly divided into traction type elevators (described fully in Bulletin No. 500) and drum type elevators (described fully in Bulletin No. 501). This distinction arises owing to the method of roping employed for raising and lowering the platforms.

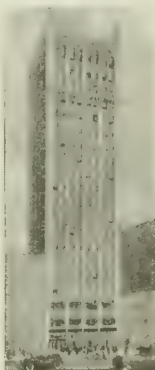
## Traction Type Elevators.

Utilize the friction generated between cables and driving drum to raise and lower the platform and counterweights and are almost exclusively used for speeds over 250 ft. per minute.

GEARLESS TRACTION TYPE—Used for speeds of 450 ft. per minute and over.

HELICAL GEARED TRACTION TYPE—Built for speeds of 400 to 500 ft. per minute.

WORM GEARED TRACTION TYPE—Successfully used for speeds up to 450 ft. per minute in a variety of single and double geared hoisting machines.



REAL ESTATE  
EXCHANGE  
BUILDING,  
DETROIT  
LOUIS KAMPER,  
Architect

## "K. & H." Traction Elevators.

All parts of this product are manufactured in the company's plant, and the production of each part of the equipment is carefully scrutinized, which secures a greater perfection in finished parts and economy in production. Quality considered, the company is in a position to offer competition that will interest owners and architects, as its reliability insures satisfaction to any purchaser.



"K. & H." ONE TO ONE GEARLESS TRACTION TYPE ELEVATOR



### Methods of Control.

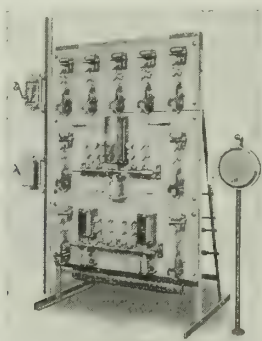
All Kaestner & Hecht elevators are supplied with standard controllers, which are manufactured complete in the shops of the company. Satisfactory results are assured with *less cost for repairs* than any competing controller.

Control systems governing the direction of movement of the elevator are supplied for:

Electric car switch control.

Automatic control push buttons, to call or dispatch car.

Hand rope or mechanical lever.



VARIABLE SPEED FULL MAGNETIC CONTROLLER PANEL, WITH OPERATING SWITCH AND HATCH LIMIT SWITCHES

### Manufacturing Facilities.

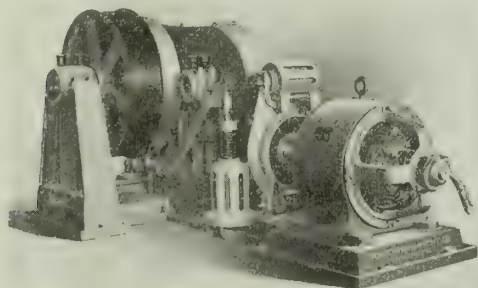
In offering competing values in the different types of elevators, the company recognizes the necessity of adequate manufacturing facilities. To those interested in comparing quality the invitation is extended to visit the plant and see in the actual process of construction the various elevators built. KAESTNER & HECHT COMPANY are manufacturers—not assemblers.

### Data and Information.

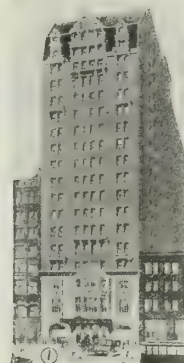
Architect or owner will be gladly supplied with proper information, fully describing the application of elevators for any type of service. This co-operation is recommended to insure proper allowance being made for engineering requirements.

### Independent Competition.

The KAESTNER & HECHT COMPANY is independent of any other elevator company and endeavors to conduct its sales and manufacturing policy along lines which will result to the satisfaction of the owner and increase the scope of its business as a result of satisfied customers. The active management of the business is in charge of the owner, insuring personal attention to all contracts.



"K. & H." TANDEM GEAR TRACTION TYPE ELEVATOR



KAISERHOF HOTEL, CHICAGO, ILL.

MARSHALL & FOX, Architects

Equipped with K. & H. helical geared and gearless traction elevators



WISCONSIN STATE CAPITOL, MADISON, WIS.

GEO. B. POST & SONS, Architects

Equipped with K. & H. tandem spur gear traction type elevators



BANK OF COMMERCE & TRUST BUILDING, MEMPHIS, TENN.

HANKER & CAIRNS and GRAHAM, BURNHAM & Co., Architects

Equipped with K. & H. tandem worm gear traction elevators



INTER-SOUTHERN LIFE INSURANCE BUILDING, LOUISVILLE, KY.

BRINTON B. DAVIS, Architect

Equipped with K. & H. tandem worm gear traction elevators

ESTABLISHED 1868

# GEORGE MASSA

## Manufacturer of Tube Guide Dumbwaiters

OFFICE AND FACTORY  
245 South 6th Street  
PHILADELPHIA, PA.

### Product.

Specialist in TUBE GUIDE DUMBWAITERS for all purposes.

### Description.

Tube guide dumbwaiters are operated by hand power, and are especially desirable wherever a first class dumbwaiter is required. They are used in restaurants, hotels, libraries, stores, banks, and fine residences.

Guides are made of steel or brass tubes, in one of which runs the counterweight which balances car. The other guide may be equipped as a speaking tube.

The sheave type dumbwaiter, Fig. 1, is widely used in restaurant work with car as in Fig. 3. With a small

brass wire mesh car as in Fig. 2, or a neatly finished hardwood car, it is very desirable as an office lift. Capacity to 25 lbs. This capacity may be increased to 40 lbs. by addition of a single hand rope at front of car.

For book lift, store, factory, institution and residence work, self-retaining types are used, in 100-lb. and 300-lb. capacities.

In addition to car types shown, hardwood and sheet steel box type cars are regularly furnished to order.

All types of tube guide dumbwaiters are easily operated, and are as nearly noiseless as any dumbwaiter can be made. Installation can be made by any good mechanic.

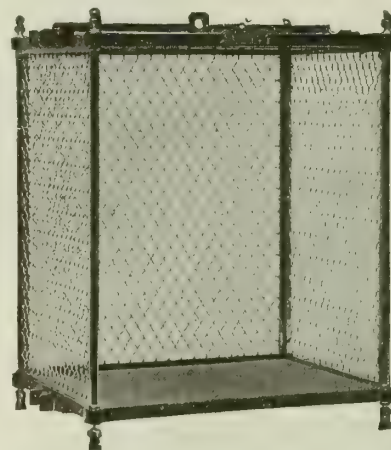


FIG. 2. CAR SUITABLE FOR BOOK LIFT OR STORE USE

### Further Information.

On receipt of data as to car size and capacity, number of stories to travel, height of same, and a statement of the purpose for which dumbwaiter is required, prices and blue prints will be promptly furnished.

Table below gives wellhole sizes for those sizes of cars in general use. Special size cars can be furnished. If special conditions are to be met, write for information.



FIG. 3. CAR SUITABLE FOR CAFE, RESIDENCE, ETC.

### CLEAR WELLHOLE SIZES REQUIRED

Car sizes, ins.	25 lbs.	40 and 100 lbs.		300 lbs.	
	Single or double face, ins.	Single face, ins.	Double face, ins.	Single face, ins.	Double face, ins.
12x10	17x12	.....	.....	.....	.....
15x12	20x14	.....	.....	.....	.....
18x12	23x14	.....	.....	.....	.....
18x15	23x17	.....	.....	.....	.....
20x16	26x18	.....	.....	.....	.....
20x18	26x20	.....	.....	.....	.....
24x18	30x20	30x21	30x22	.....	.....
24x20	30x22	30x23	30x24	30x23	30x24
24x24	.....	30x27	30x28	30x27	30x28
30x20	.....	37x23	37x24	37x23	37x24
30x24	.....	.....	.....	37x27	37x28
30x30	.....	.....	.....	37x33	37x34

FIG. 1. QUICK SERVICE DUMBWAITER FOR RESTAURANTS, CAFES, ETC.



# MONTGOMERY ELEVATOR COMPANY

MOLINE, ILL.

BRANCH OFFICES  
KANSAS CITY, MO.

CHICAGO, ILL.

SAN FRANCISCO, CAL.

**Products.****PASSENGER ELEVATORS.**

Medium Speed Passenger Elevators; Freight Elevators in all capacities; Hand Power Elevators; Hand and Electric Power Dumbwaiters, and a complete line of Automatic Electric Passenger Elevators and Dumbwaiters for hospitals, apartment houses and residences.

**Electric Passenger Elevator.**

Below is shown a typical traction type electric passenger elevator, full magnet control, alternating current drive. Quiet operation, smooth and accurate control, and high efficiency are characteristics of this line of equipment. Illustrations and descriptive matter of

machine or equipment for any service or duty, will be promptly and cheerfully furnished on request.

**Facilities.**

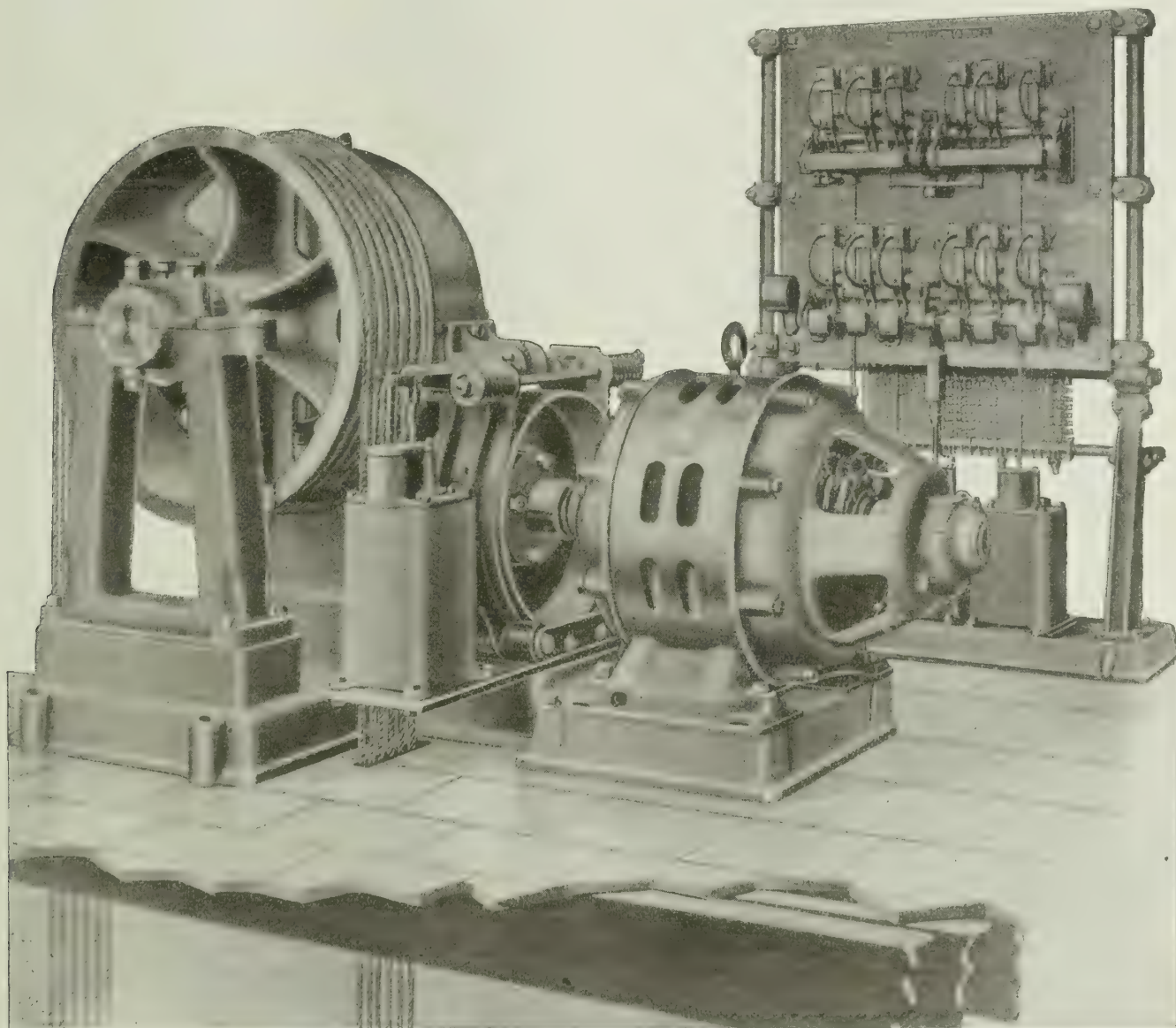
A completely equipped plant enables this company to execute orders without delay.

Prices are reasonable.

**Co-operative Services.**

Our engineering department is at the service of architects and engineers.

Any required information concerning construction data relative to elevators and dumbwaiters, preliminary layout showing loading stresses, etc., also estimates, will be sent on request.



TRACTION TYPE ELECTRIC PASSENGER ELEVATOR ENGINE, FULL MAGNET CONTROL, ALTERNATING CURRENT DRIVE

# OTIS ELEVATOR COMPANY

Eleventh Avenue and Twenty-sixth Street  
NEW YORK, N. Y.

OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD

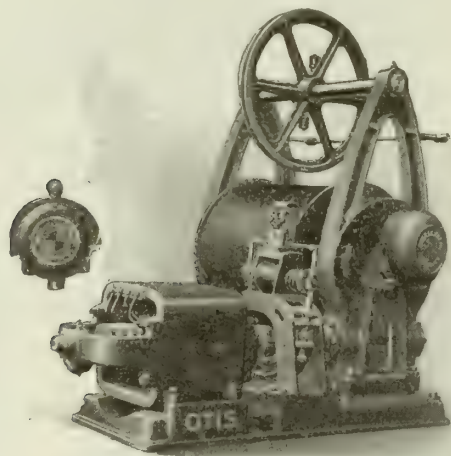
For Addresses or Telephone Numbers, See Local Directories

## Products.

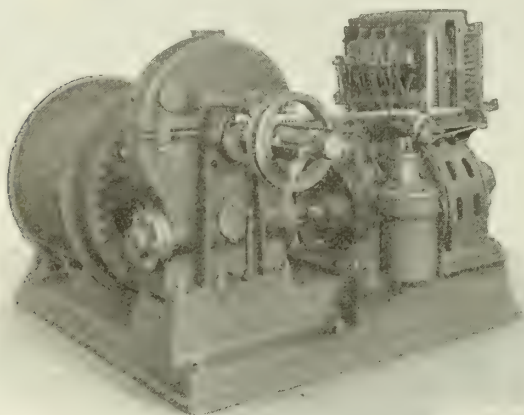
Manufacturer of PASSENGER, FREIGHT and SIDEWALK ELEVATORS, operated by Electric, Hydraulic, Steam, Belt or Hand Power; ELECTRIC DUMBWAITERS; ELECTRIC SKIP HOISTS; FURNACE HOISTS; AUTOMOBILE and CARRIAGE HOISTS; WHIP HOISTS; INCLINE RAILWAYS; GRAVITY SPIRAL CONVEYORS; ESCALATORS or MOVING STAIRWAYS; INCLINED ELEVATORS, etc.

## Electric Drum Type Elevators.

With the drum type elevator the car is raised and lowered by winding and unwinding the hoisting ropes on a cast iron drum. This type of elevator is used for both passenger and freight service. The machines are made for operation on alternating or direct current circuits, and can be provided for light or heavy capacities.



OTIS DIRECT CURRENT SINGLE SCREW ELEVATOR MACHINE—  
DRUM TYPE; SWITCH CONTROL



OTIS ALTERNATING CURRENT SINGLE SCREW INTERNAL  
GEARED ELEVATOR MACHINE—DRUM TYPE;  
HAND ROPE CONTROL



In this type of elevator, a worm and gear reduction is used between the motor and winding drum. The worm gears consist of bronze rims with hobbled teeth, and the worm thread is cut in solid steel forgings integral with the worm shaft. The gearing is enclosed in an oiltight housing which is provided with handhole plates and with means for draining the oil. Worm gear elevator machines are built in what are known as the single screw and double screw types, and the worm shaft of single screw machines is provided with ball bearing thrusts backed with self-aligning disks. These machines are provided with an electromagnetic brake, and the brake pulley constitutes flange of coupling between worm and armature shafts. In order to preserve alignment, the machine parts are mounted on a continuous heavy iron bed. When it is desired to lift heavy loads at comparatively low speeds, a spur gear reduction, usually of the internal gear and pinion type, is provided between the worm gear drive and winding drum.

**MOTORS**—For direct current circuits, moderate speed compound wound motors are used, combining high starting torque with reasonably low starting current. For alternating current circuits induction motors are used, which are wound for the proper voltage, phase and frequency of the supply circuit.

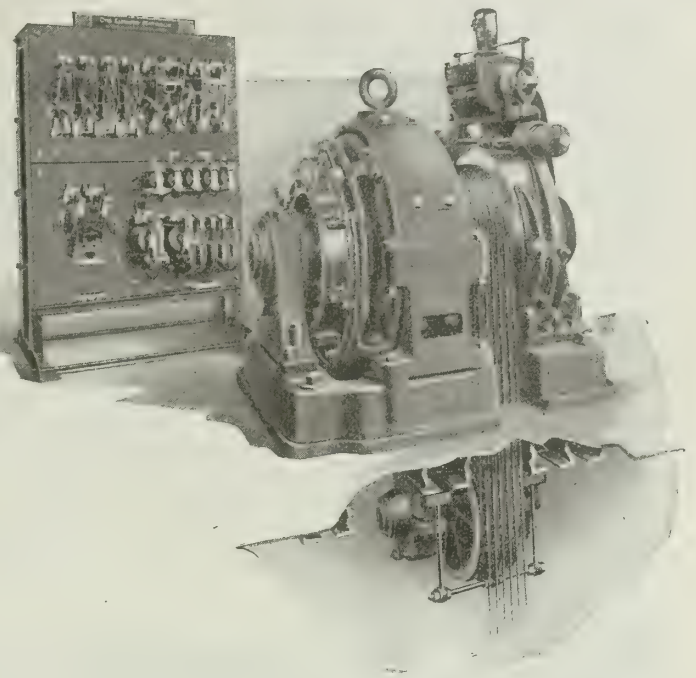
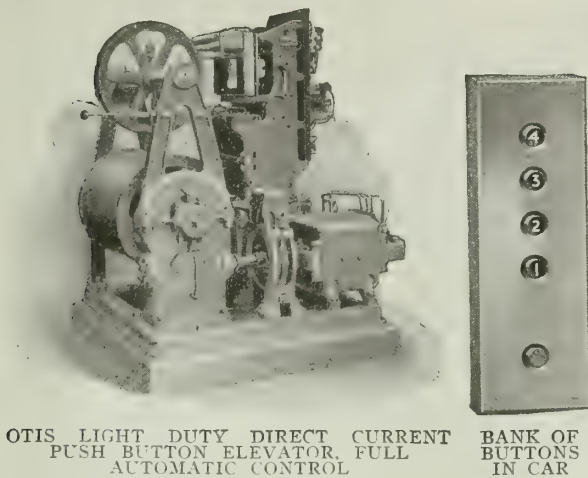
**CONTROL**—This type of elevator can be provided with car switch, push button or hand rope control, so arranged as to give the attendant complete control of the elevator. The controller boards are provided with the necessary direction, accelerating and speed switches, all of which are of the electromagnetic type except with hand rope type controllers, which are usually provided with mechanically operated reversing switches.

**SAFETY DEVICES**—This type of equipment is provided with all necessary complete and effective safety devices to suit the respective equipment. These devices include machine automatic terminal stopping device, hatchway limit switches, slack cable device, car safety device, overspeed governor, etc.

## Automatic Push Button Control Electric Elevators.

This type of elevator which has been used extensively in residences, hospitals, asylums, etc., is now being applied to freight service also, especially where very accurate floor stops are required, and also to passenger and freight installations where the expense of an operator is not desired. The control equipment consists of single call operating buttons at each landing and a full set of operating buttons in the car having one button for each landing. These buttons are electrically connected to the magnets on the control panel so that the momentary pressing of either a hall or car operating button will automatically bring the car to the design-





nated landing. The hatchway doors and car gate are so interlocked that the elevator operates with complete safety and non-interference features are provided to prevent conflict between car and hall operation.

### Traction Type Elevators.

With the traction type of elevators, power is transmitted from the motor to the hoisting ropes by traction (friction) existing between the hoisting ropes and the traction driving sheave. One of the particularly prominent and inherent advantages resulting from this arrangement of ropes and method of driving them is the decrease of traction obtained if either car or counterbalance is obstructed in its descent or bottoms on its respective oil buffer, and consequent minimizing of the lifting power of the machine, even though the driving member may continue to revolve. Another advantage of the traction type of elevator results from the fact that the width of face of the driving sheave is entirely independent of the height of the building.

### Gearless Traction Elevator, 1: 1 Roping.

This type of elevator is the logical result of the present tendency to the greatest simplicity, combined with maximum operating economy and the highest degree of safety for high rise, high speed elevators.

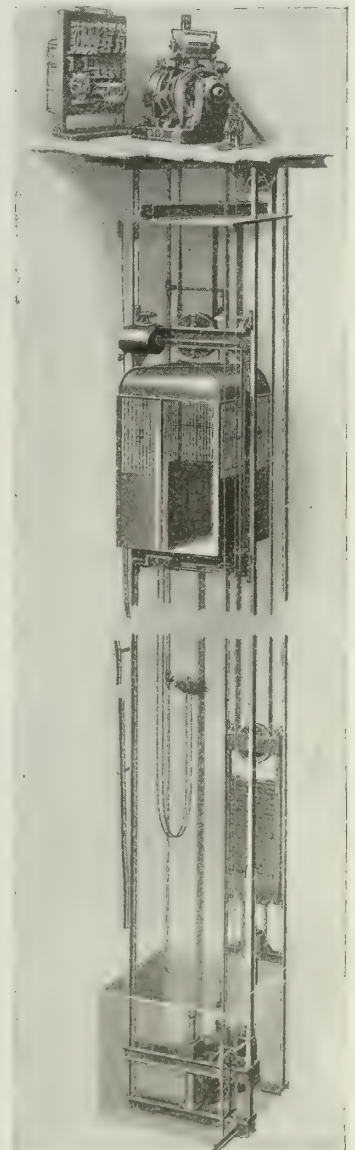
The machine consists of a motor, traction driving sheave and electromagnetic brake compactly grouped and mounted on a continuous heavy iron bed. The motors used are of the slow speed, shunt wound, multipolar type, especially designed for elevator service, and have a remarkably high efficiency. A direct drive is provided between the armature and traction driving sheave, thereby relieving the armature shaft of all torsional strains and eliminating the use of keys. The direct drive and consequent elimination of all reduction gearing between the motor and traction driving sheave also insures that the machine will have an exceptionally high over all efficiency.

The compact and extremely desirable arrangement of parts permits of the greatest simplicity of installation and economy of space. Machines of this type are preferably located at the top of the hatchway. To date it has been built for direct current only. This type of elevator is usually installed for lifting capacities ranging from 2000 to 3500 lbs. at car speeds ranging from 500 to 700 ft. per minute.

OTIS GEARLESS TRACTION ELEVATOR MACHINE, 1:1 ROPING

**CONTROLLER** — The controllers used with this type of elevator embody the very latest and most approved application of electromagnetic switches, which are operated by a master switch located in the elevator car. These machines have a wide speed variation which is placed completely within the control of the operator, resulting in smooth acceleration, retardation and accurate stops at the landings.

**SAFETY DEVICES** — The safety devices usually installed in connection with modern high grade elevator apparatus, including an automatic slow-down and terminal stopping device, hatchway limit switches, speed regulating device, over-speed governor, oil buffers, car safety device to clamp the guide rails and bring the car to a gradual stop in case of excessive speed, etc., are provided with this type of elevator. It is also provided with an emergency device within the car by means of which the attendant can operate the car safety device, if necessary.



OTIS GEARLESS TRACTION  
ELEVATOR, 2:1 ROPING

### Gearless Traction Elevator, 2:1 Roping.

This type of elevator represents an adaptation of the 1:1 gearless traction type in which lower car speeds are obtained by roping the car and counterbalance 2:1, and by means of which the high efficiency of the gearless traction machine is combined with the lower car speeds. These elevators retain all the safety and controlling features of the 1:1 gearless traction elevator, and are usually installed for car speeds ranging from 250 to 450 ft. per minute. They have been installed for a lifting capacity of 11,000 lbs. passenger load.

### Worm Gear Traction Elevators.

The machine used with this type of elevator is essentially the same as with the drum type elevator machines, the main difference being the substitution of a traction driving sheave for the winding drum. This type of elevator will give very satisfactory service in moderately high buildings requiring moderately high speed elevators.



OTIS DIRECT CURRENT SINGLE SCREW WORM GEAR TRACTION ELEVATOR MACHINE  
For overhead installation

**MOTORS**—For direct current circuits, moderate speed compound wound motors are used, combining high starting torque with reasonably low starting current. For alternating current circuits, induction motors are used, which are wound for the proper voltage, phase and frequency of the supply circuit.

**CONTROLLERS**—The controller boards are provided with the necessary direction, accelerating and speed switches, all of which are of the electromagnetic type. The switches are connected to a master operating switch in the car, giving the attendant complete control of the elevator.

**SAFETY DEVICES**—This type of equipment is also provided with all necessary complete and effective safety devices.

### Helical Gear Traction Elevator.

In addition to the application of the traction principle already described, we build machines of the traction type that employ helical cut herringbone gears in place of worm and gear.

These gears are cut with great accuracy, and run,

immersed in an oil bath, in an oiltight iron case or housing.

This type of equipment is likewise provided with complete safety devices.

### Other Types and Service.

**HYDRAULIC ELEVATORS**—Of the standard vertical and horizontal geared and direct plunger types, for high and low pressure service. The plunger type employs a plunger within a vertical cylinder sunk into the ground below the bottom of the hoistway, the car being attached directly to the top of the plunger. In the vertical and horizontal geared types the hydraulic cylinder is made considerably shorter, by introducing multiplying sheaves. A cylinder with piston is used, and the car, properly counterbalanced, is suspended by cables which pass over sheaves at the top of the hatchway.

Hydraulic elevators are built for all conditions of passenger and freight service, passenger elevators being usually controlled by a lever in the car actuating the main operating valve by means of a pilot valve.

**HYDRO-STEAM ELEVATORS**—Of the hydraulic type, driven from a closed hydraulic tank from which the water is forced by steam admitted direct from boilers.

**AERO-HYDRO ELEVATORS**—Operate in the same manner as the hydro-steam type, with compressed air substituted for steam.

**STEAM ELEVATORS**—Used for freight service; direct driven and belted.

**BELT POWER ELEVATORS**—Of slow speed, for freight service only; worm and gear transmission, controlled by hand cable.

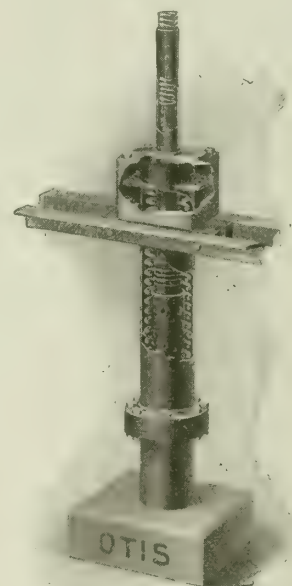
**HAND POWER ELEVATORS, CARRIAGE HOISTS AND SIDEWALK TYPES**—For use where the service does not warrant an expenditure for power driven apparatus.

### Otis Two-speed Alternating Current Motors.

The successful development of our two-speed alternating current induction motor has materially broadened elevator possibilities in alternating current circuit territory. These motors are used principally for higher car speeds and for conditions necessitating accurate floor stops. Our engineers are always glad to explain these new developments to architects.

### Otis Patented Oil Cushion Buffers.

Otis patented oil cushion buffers are furnished with all traction machine installations, and are a feature of security of the greatest interest and importance. They are placed in the hoistway, under the car and the counterweight, and are capable of bringing either the car or the counterweight to a gradual stop from full speed, through the displacement of oil in the buffer at a carefully calculated rate of retardation, which is regulated by the escape of the oil from one chamber of the buffer to another.

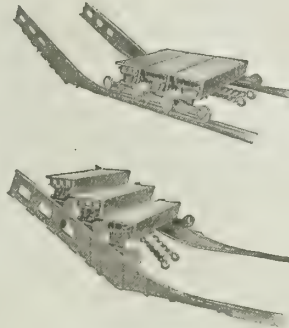


OTIS PATENTED OIL CUSHION BUFFER



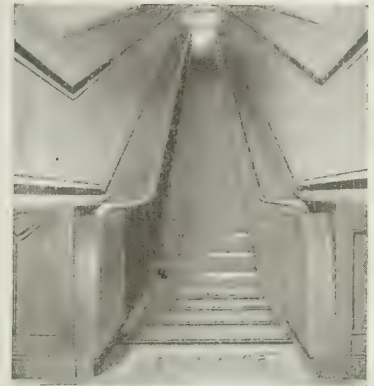
### Electric Dumbwaiters.

We are prepared to furnish and install electric dumbwaiters of all descriptions to meet all classes of service. Electric dumbwaiters are usually of the drum type, and the machines are provided with a worm and gear reduction between the motor and winding drum. With some of the less expensive types a chain and sprocket drive is used. The machines are provided with electromagnetic brakes, and limitation stops and slack cable devices are usually included. Push button control is the more desirable, although hand rope control can be used with the lower speeds; and numerous button control arrangements have been devised to apply to a wide range of service conditions.



STEP TYPE TREADS

On landing treads are flush, passenger stepping onto them from a stationary floor plate. Approaching incline, a step formation is produced. At upper end reverse action takes place and steps flatten out into a moving platform.



ESCALATOR, STEP TYPE

### Electric Skip Hoists.

Full automatic push button control. Built to operate on direct or alternating current. For the economic and efficient handling of coal, ashes and similar material in gas plants, central stations, mining plants, factories, etc.

### Furnace Hoists.

Electric or steam driven, with full automatic control. Built to operate on both direct and alternating current circuits, with the same accuracy of regulation.

### Incline Railways.

Electric and steam driven, for passenger, freight and vehicle traffic service. Built to operate on direct and alternating current circuits. Installed in mountainous and hilly districts and in cities where the topography compels an abrupt ascent.

Catalogue, showing operating installations, on request.

### Escalators.

The problem of interfloor travel, where it is necessary to keep large numbers of people moving constantly and rapidly, has been successfully solved by the escalator, due to its continuity of motion and its enormous capacity.

Built to have a standard capacity of 11,000 people an hour.

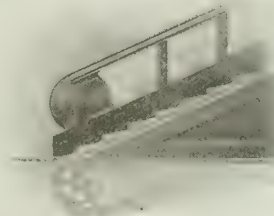
There are two types of escalators, known as the step and cleat types. The step type begins as a moving platform, rising slowly into a perfect staircase as it breaks into steps. The cleat type is an endless moving platform formed of hardwood cleats located in longitudinal ridges and grooves.

In both types, on each side, a hand rail of flexible material travels at the same speed as the treads. An electric motor drives the mechanism, which travels on rollers on an inclined plane, which supports the treads.

The escalator can be made to operate either up or down. The duplex escalator handles traffic in both up and down directions simultaneously.

Escalators are now being operated in large railway terminals, at elevated and subway stations in the big cities, in theaters, department stores, and in large mills and factories.

Architects should become familiar with this efficient and rapid method of handling large masses of people. No department store, theater, public building, large rail-



CLEAT TYPE TREADS

Treads are nearly horizontal, at an angle of  $12\frac{1}{2}^\circ$ . Platform revolving over sprocket glides through prongs of comb at lower level and journeys upward. At upper landing it disappears through comb and, revolving over sprocket, travels downward.



ESCALATOR, CLEAT TYPE

way terminal, or factory is complete without an escalator to supplement its elevator equipment.

Catalogue, with plan drawings which give necessary preliminary information to architects in estimating space requirements and floor openings, will be sent on request.

### Inclined Elevators.

The quick handling of large quantities of merchandise is a vital problem that confronts every transportation company, merchant and manufacturer; and the architect who has an intimate knowledge of labor saving, rapid handling mechanical apparatus can often aid his



OTIS SINGLE FILE INCLINED ELEVATOR AT LARGE FREIGHT TERMINAL

client by the suggestion of our various types of inclined elevators. The Otis inclined elevator meets the problem of rapid interfloor conveyance, as it is a continuous motion carrier and adapted to the quick movement of freight.

There is no time or power lost in starts and stops to load and unload; it can be made to operate in either direction; saves employees' energy, and enables one man to do the work of many.

The Otis inclined elevator consists, primarily, of an endless steel chain or platform revolving about sprockets at each end, which are driven by a conveniently located motor. In operating, the flange or lug of the elevator engages with axle of truck; and truck and load together, with the man if desired, are transported from level to level, quickly, safely and without physical effort.

The Otis inclined elevator is particularly adapted to the varied merchandise of department stores; parcels in express offices and railroad stations; freight to and from vessels and docks; bags, bales, boxes and packages in stores and warehouses; transfer of finished parts, or merchandise in process of manufacture, in mills and factories.

Catalogue, on request.



OTIS DUPLEX INCLINED ELEVATOR IN DEPARTMENT STORE

### Gravity Spiral Conveyors.

For moving speedily and safely, by gravity, packages, bundles, boxes, bales, heavy cases or barrels, from



OTIS OPEN TYPE GRAVITY SPIRAL CONVEYOR

an upper level or floor to a lower level. Installed in various sizes to convey material weighing from a few ounces up to boxes and cases weighing 1000 lbs. each. Built of high grade sheet steel in form of spiral, giving smooth riding surface for goods. One of the greatest modern labor and money saving devices. Used in factories, department stores, warehouses, jobbing houses, printing and publishing establishments, etc.

Catalogue, giving full description of types, sizes, list of installations, typical layouts, etc., on request.



OUTLET, OTIS CLOSED TYPE GRAVITY SPIRAL CONVEYOR

### Co-operation, Specifications and Estimates.

The company cordially invites all architects to call upon it when laying out elevator, escalator and conveyor requirements, and will gladly give the benefit of experience and facilities to work out with the architect plans for economical space arrangements, and to submit estimates of cost.

Because of the wide range of elevator apparatus which is manufactured and the diversified conditions of installation, it is impracticable to attempt to show here construction requirements.

### Organization.

The complete organization, with offices in 100 cities in the United States alone, makes full co-operation possible. No matter in what part of the country the architect is situated, he will find an Otis office near by. This element of personal attention, aside from the quality of Otis products makes the architect's dealing with this company a most desirable connection.

### Service After Installation.

The fact that this company has been 65 years in the elevator business is a guarantee of stability and successful engineering work.

By specifying Otis apparatus, the architect identifies his client with a stable, resourceful organization that, from the time of installation, will look carefully after the user's needs.

Service after installation is important. We have complete facilities for inspection and proper maintenance work. This fact is fully appreciated by the building owner and manager who is a user of Otis equipment.



# SEDGWICK MACHINE WORKS

Manufacturers of Hand Power Dumbwaiters and Elevators

TELEPHONE:  
RECTOR 2463

152 West 15th Street  
NEW YORK, N. Y.

FACTORY  
POUGHKEEPSIE, N. Y.

## Products.

HAND POWER DUMBWAITERS and ELEVATORS of all types and for every purpose:

Private House Dumbwaiters; Apartment House Dumbwaiters; Hospital Dumbwaiters and Elevators; Hotel and Restaurant Dumbwaiters; Library Book Lifts; Fuel Lifts; Brass Tube Dumbwaiters; High Speed, Automatic Brake, Band Brake, and Geared Dumbwaiters; Trunk Lifts, Invalid Elevators, Domestic Elevators, Freight Elevators, Sidewalk Elevators, Carriage Elevators, Automobile Elevators, Ash Hoists, Hatchway Hoists, etc.

## Special Features.

Long life, easy operation, freedom from trouble, low repair cost—all the result of superior design and principle, executed from the best of materials by skilled workmen in a factory devoted exclusively to the manufacture of hand power dumbwaiters and elevators, and equipped with special machinery for this purpose.

Quantity production on the interchangeable part system guarantees a uniformly high grade product.

## Installation.

Proper installation is essential to satisfactory operation. Blue prints and full directions for installing are furnished with each outfit, from which local labor may install. Or, experienced mechanics will be sent by the company, to install, on request. Customers will always secure better results by purchasing complete outfits from the company, rather than by securing part of the equipment from local sources.

## Guarantee.

"Sedgwick" dumbwaiter machines are guaranteed for 5 years from date of purchase and will be repaired free of charge at any time within that period if returned to the factory at Poughkeepsie, N. Y., charges prepaid.

## Prices, Drawings, etc.

On the following pages are listed some of the standard Sedgwick types and sizes, the prices given being net to the consumer. Whenever further data are desired, drawings, estimates, and more complete descriptive matter will be gladly submitted.

## Deliveries.

Catalogue sizes are carried in stock, and shipment is made the day order is received. Special sizes require 3 to 4 days—principally to allow for proper finishing.

## Sedgwick Service.

Complete satisfaction depends upon the selection of dumbwaiters or elevator outfits exactly suited to the conditions and requirements of each case. Sedgwick service places at the disposal of architects and others, without charge, the benefit of specialized experience of more than 20 years. The Service Department will work with architects in deciding upon the proper dumbwaiter or elevator equipment to give specific results under specific conditions.

## Special Outfits.

Thousands of special drawings and designs have been developed, during a long experience, for special purposes.

If these pages do not offer what is needed, consult Sedgwick service. Special constructions can be furnished on very short delivery, without sacrifice of quality and with the usual guarantee.

## Specifications.

Specify as follows: "The Dumbwaiter [or Elevator] to be manufactured and installed by the SEDGWICK MACHINE WORKS, 228 Liberty Street, New York."

Thus all contractors may figure on the same equipment, the owner gets maximum value, and the architect has the guarantee that the outfit will be satisfactory and the work properly done. If local mechanics are to install, simply omit the words "and installed."

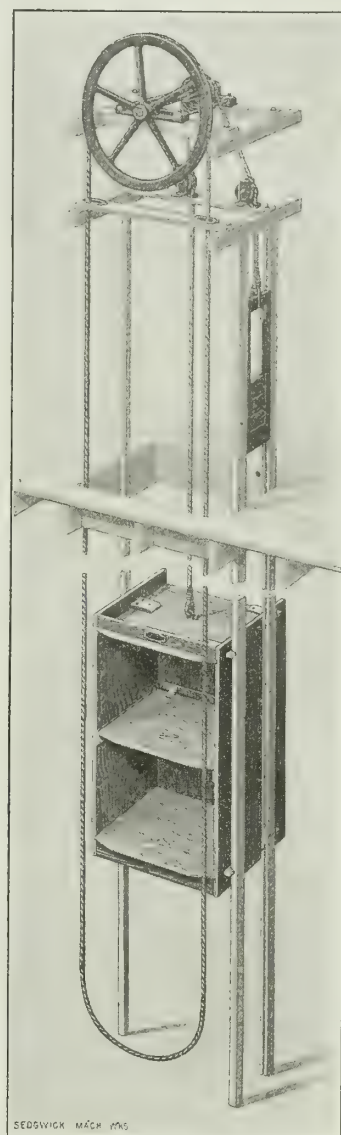


FIG. B. "SEDGWICK" AUTOMATIC BRAKE DUMBWAITER  
ERECTED  
Enclosure removed

### Plain Dumbwaiters (Figs. A and B).

The word "plain" is used in contradistinction to the "geared" type described later. The three plain dumbwaiter types here described are the ones most largely used for average service, where usual loads are less than 25 lbs. The automatic brake dumbwaiter is for general work in private houses. The load can not run down, but is automatically held by the machine itself without any check or brake line.

The band brake dumbwaiter is for high wells, as in factories, apartments, hospitals, etc., where a harder service is imposed.

The Simplex dumbwaiter is a good, low priced outfit for light work, with a spring check on the hand ropes.

Complete outfits include machine on platform, car, adjustable counterweight, guide runs for car and weight, and ropes for total height of 20 ft. over all, f. o. b. Poughkeepsie, N. Y.

DATA, "SEDGWICK" IMPROVED DUMBWAITER OUTFITS  
(FIGS. A AND B)

No.	Size of car (outside) ins.*	Size of ceiled well (inside) ins.*	Shipping weight, lbs.	Prices of single face outfits				Prices of double face outfits*	
				"Auto-matic"	"Sim-plex"	"Band Brake"	Add for extra height per ft.	Add for double face	Add for extra height per ft.
1	20x16	23x19	215	\$54.00	\$36.00	\$65.00	\$0.45	\$10.00	\$0.60
2	24x20	27x23	285	66.00	45.00	78.00	.50	10.00	.65
3	28x24	31x27	360	80.00	52.50	94.00	.55	11.00	.70
4	34x30	37x33	470	93.00	60.00	107.00	.60	11.00	.75

\*See note to table below.

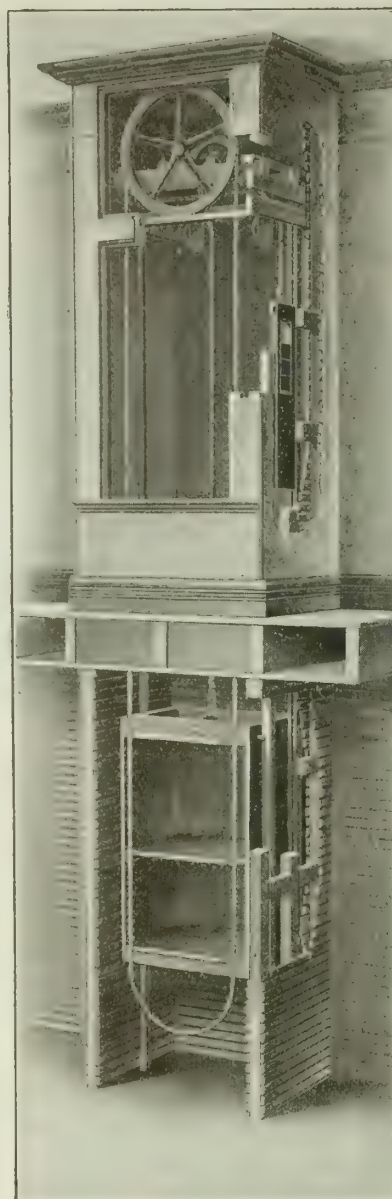


FIG. A. "SEDGWICK" AUTOMATIC BRAKE DUMBWAITER ERECTED IN PLASTERED SHAFT

### Geared Dumbwaiters.

These are intended particularly for locations where the service is heavier than the average private house, such as hospitals, hotels, restaurants, factories and commercial establishments where the usual load will exceed 25 lbs.

They are built in two types—the automatic and the band brake—as listed below.

Complete outfits include machine on platform, car, adjustable counterweight, guide runs for car and weight, and ropes for total height of 20 ft. over all, f. o. b. Poughkeepsie, N. Y.

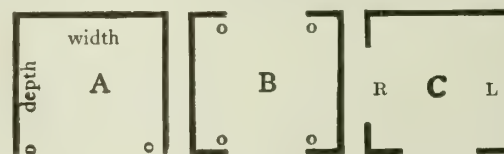
DATA, "SEDGWICK" GEARED DUMBWAITER OUTFITS

No.	Size of car (outside) ins.*	Size of ceiled well (inside) ins.*	Shipping weight, lbs.	Prices of single face outfits			Prices of double face outfits*	
				"Band-Brake"	"Auto-matic"	Add for extra height per ft.	Add for double face	Add for extra height per ft.
1	20x16	23x19	300	\$90.00	\$100.00	\$0.60	\$10.50	\$0.90
2	24x20	27x23	400	100.00	110.00	.70	12.00	1.00
3	28x24	31x27	500	110.00	120.00	.80	15.00	1.10
4	34x30	37x33	600	125.00	135.00	.90	17.00	1.30

\*No extra charge for outfits of different sizes and smaller dimensions. Price of special sizes is that of the regular size, out of which the special size could be made.

Inside dimensions of ceiled well is specified, as the guide runs may be screwed direct to the ceiling boards. If the shaft be fireproof or lath and plastered inside, grounds or cleats must be provided, to which the guide runs may be screwed.

If these grounds or cleats are not provided in the walls and must be put on the face of the plaster, add 2 ins. to the inside finished width of the well for this cleating.



FLOOR PLANS OF DUMBWAITERS

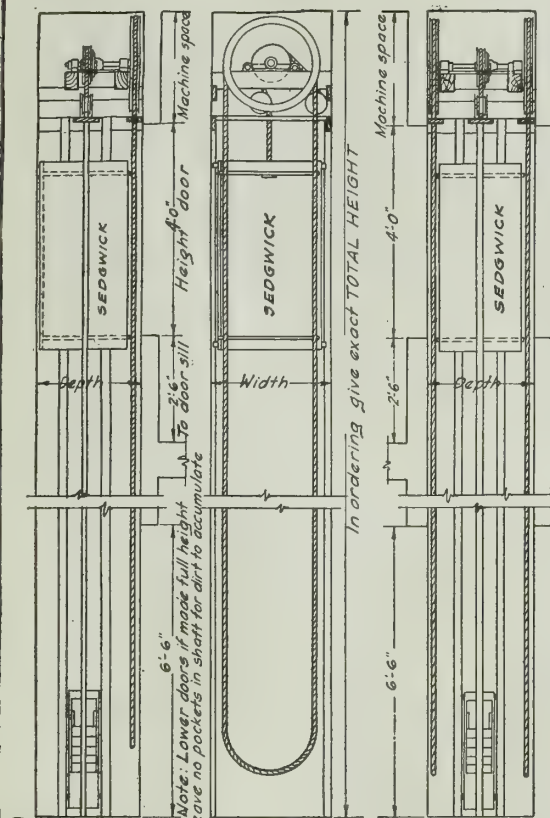
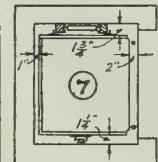
- A—Open at front on all floors; the best arrangement where it can be used  
 B—Requires a double face outfit to operate from both fronts  
 C—Open at front and right or left, say which. This arrangement is to be avoided, if possible

### Dumbwaiter Cars.

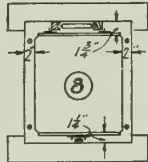
These are regularly built 3 ft. high inside, with one hinged shelf; or 3 ft. 6 ins. high inside, with two fixed shelves in addition to top and bottom; except that No. 1 cars are usually 6 ins. less in height.

In the tables, the first measurement given is the width from right to left; the second, the depth from front to rear. Thus, a No. 2 car is 24 ins. wide, right to left, and 20 ins. deep, front to rear

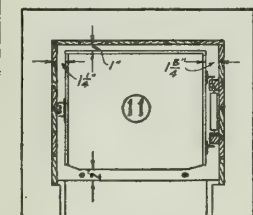


① SIDE ELEVATION.  
SINGLE FACE D.W.② FRONT  
ELEVATION③ SIDE ELEVATION.  
DOUBLE FACE D.W.SINGLE FACE  
PLAN.

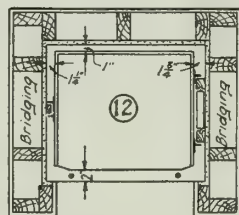
**DESIGN NOTE:**  
Wherever possible dumb waiter shafts should be designed either single face as No. 2, 3 & 8 to insure the utmost satisfaction. No. 2 above shows the front elevation of either single or double face shaft.

DOUBLE FACE  
PLAN.**DESIGN NOTE**

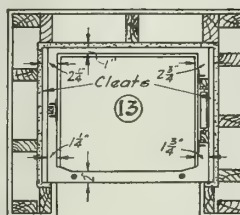
Where absolutely necessary to have door openings in adjacent sides of well, locate and identify each door and specify door chiefly used. Corner post dumb-waiter, with double face machine can be operated in both directions from all doors by reversing one hand rope as shown in No. 4, 5, 6, 8, 9. Corner post dumb waiter, single face machine shown No. 6 & 10 can be operated in both directions from front only. Specify right or left for side door. Dumb waiter may be conveniently lowered from the side door. It is much better to arrange the outfit either single face as 1 & 7 or double face as 3 & 8 if possible.

PLAN.  
CEILED WELL

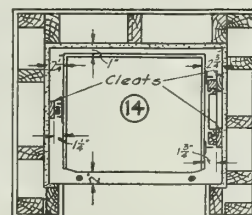
Where well is sheathed inside with boards the guide runs are fastened direct to this sheathing with wood screws. Clear inside dimensions of well are 3" larger than outside dimensions of car.

PLAN.  
PLASTERED WELL

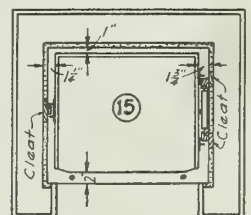
Where well is plastered inside, the vertical studs are almost never located exactly where required for the guide runs; therefore it is advisable to have horizontal bridging or cats in both sides of the enclosure 30" on centers, to which guide runs are secured by long screws passing through lath and plaster. Clear inside dimensions of shaft are 3" larger than outside dimensions of the car.

PLAN.  
PLASTERED WELL

Where horizontal bridging as shown on plan No. 12 has not been provided it is necessary to put horizontal cleats on the face of the plaster 30" on centers to which guide runs are fastened by means of wood screws. Allowing for 1" cleats on each side, the outside width of car will be 5" less than net inside width of the well. 3" being allowed for the guide runs, counter weight, clearance etc.

PLAN.  
PLASTERED WELL

Horizontal cleats as shown in plan No. 13 are frequently objectionable because they make little shelves on which dust collects. This objection is overcome where it is possible to secure vertical cleating back of the guide runs as shown in plan No. 14. Allowing for 1" cleats on each side, the outside width of car will be 5" less than net inside width of well. 3" being taken for the guide runs, weights, clearance etc.

PLAN.  
FIRE PROOF WELL

In fire proof wells cleating may be put in horizontally as shown in plan No. 13 or vertically as shown in plan No. 14. The latter is preferable where the construction permits the firm fastening of the vertical cleating. Where cleating is put in before well is plastered inside, the plaster may be brought flush with face of cleating as shown in plan No. 15 above.

The above show various Single Face Dumb Waiter enclosures, having all door openings in front. The car in a single face well is three inches less in depth than the depth of the well from the front to the rear. In Double Face wells, construction and arrangement are the same except that an extra inch is required between the fronts for the second hand rope. In Double Face wells therefore the car is four inches less in depth than the net inside measurement of the well from front to front.

Copyright 1916 by SEDGWICK MACHINE WORKS

**Invalid Elevators (Fig. E).**

The "Sedgwick" automatic brake hand power invalid elevator (Fig. E) is a practical outfit for the purpose intended.

The essential features of such an outfit are ease of operation, absolute safety, and simplicity of design, so that no interruption of service need be anticipated. These essentials are embodied in the Sedgwick outfits.

While the weakness which prevents the invalid climbing stairs would probably make it inadvisable for him to operate the elevator himself, the amount of power required is so small that even a child can safely operate the elevator either up or down with full load.

Complete outfits include machine, car 6 ft. 3 ins. high in clear, guide runs, ropes and cables for total height over all of 20 ft. or less, and counterweight, f.o.b. Poughkeepsie, N. Y. For extra height, see table below.

Special booklet on application.

DATA, "SEDGWICK" INVALID ELEVATORS, FIG. E

Size of car, ft.	Size of well		Price of outfit	Add for extra height per ft.	Shipping lbs.
	Width, ft. ins.	Depth, ft. ins.			
3 x 3	3 4 <sup>1</sup> / <sub>2</sub>	3 3	\$350.00	\$1.50	950
3 <sup>1</sup> / <sub>2</sub> x 3 <sup>1</sup> / <sub>2</sub>	3 11 <sup>1</sup> / <sub>2</sub>	3 9	450.00	2.00	1,200
4 x 4	4 6	4 3	500.00	2.50	1,300
4 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	5 0	4 9	550.00	2.75	1,700
5 x 5	5 6	5 4	600.00	3.00	1,800
6 x 6	6 8	6 4	750.00	4.00	2,000

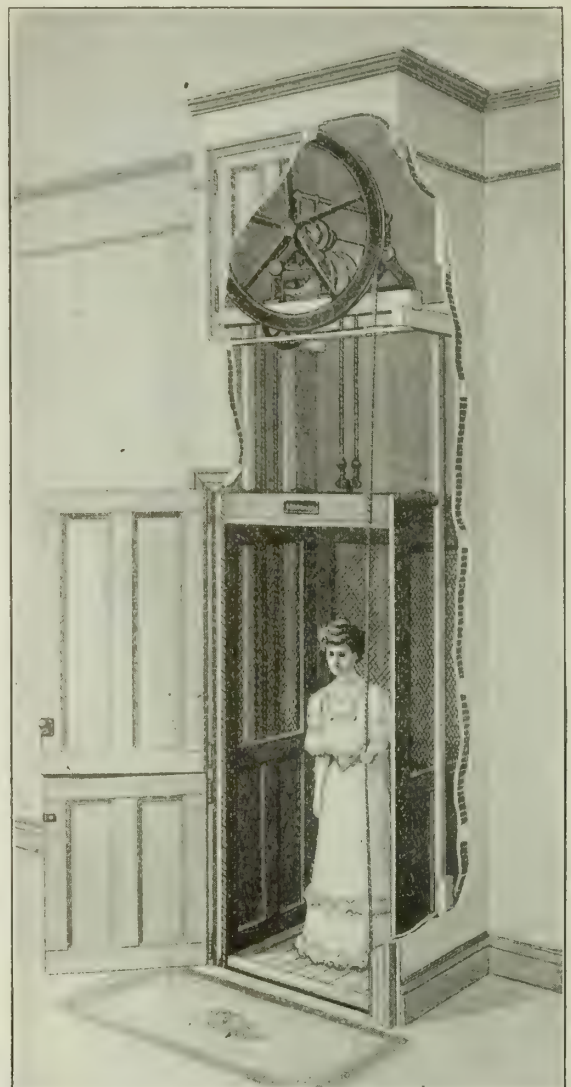


FIG. E. "SEDGWICK" AUTOMATIC BRAKE HAND POWER INVALID ELEVATOR

**Sidewalk Elevators (Fig. O).**

Many improvements make the "Sedgwick" the simplest, strongest, safest, most durable, most easily operated sidewalk elevator that an architect can specify.

It is designed for heavy duty and stands up under the work.

Blue prints and full directions for erecting with each outfit.

DATA, "SEDGWICK" SIDEWALK ELEVATOR, FIG. O

Capacity, lbs.	Size of platform, ft.	Price	Add for extra height per ft.
500	3 x 3	\$200.00	\$3.00
1,000	3 <sup>1</sup> / <sub>2</sub> x 3 <sup>1</sup> / <sub>2</sub>	225.00	3.25
1,500	4 x 4	290.00	3.75
2,000	5 x 5	300.00	4.00
2,500	5 x 5	315.00	4.50

Prices cover outfits complete f.o.b. Poughkeepsie, N. Y., for a total height of 10 ft. Extra for additional height as per table above.

Prices on heavier outfits on application.

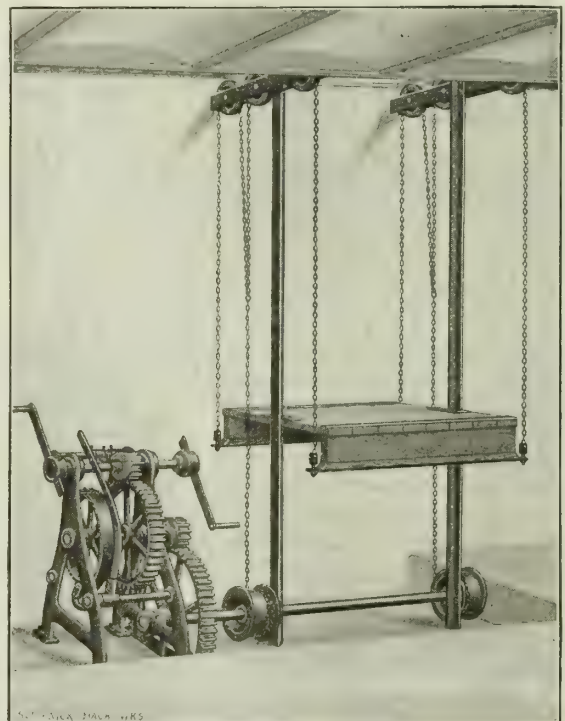


FIG. O. "SEDGWICK" SIDEWALK ELEVATOR



Carriage and Automobile Elevators (Fig. C).

“Sedgwick” quality is here represented in high grade equipment for stables, garages, livery stables, etc.

These elevators are simple, easy running, safe, and substantially built.

They can be furnished in any size and capacity.

Complete outfits include overhead gearing, platform, adjustable counterweight, guide runs for platform and weight, ropes and cables for total height over all of 20 ft., f.o.b. Poughkeepsie, N. Y.

DATA, “SEDGWICK” AUTOMOBILE ELEVATORS, FIG. C				
Capacity, lbs.	Platform, ft.	Shipping weight, lbs.	Complete outfit	Add for extra height per ft.
1,500	7½ x 12	2,000	\$315.00	\$2.60
2,000	7½ x 14	2,400	369.00	2.85
2,500	8 x 15	2,800	390.00	3.00
3,000	8 x 16	3,200	450.00	4.00
4,000	8 x 16	4,200	600.00	5.00
5,000	8 x 16	5,200	750.00	6.00
6,000	8 x 16	6,200	900.00	7.50

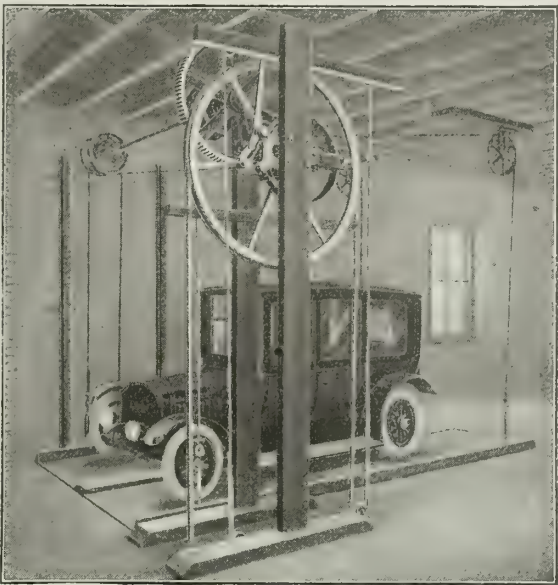


FIG. C. “SEDGWICK” AUTOMOBILE ELEVATOR

Freight Elevators (Fig. D.)

These equipments are built in the most substantial manner, designed for severe service and easy operation. In smaller sizes they are used in private homes as trunk lifts.

The larger sizes find application in factories, shops, stores, warehouses, schools and industrial buildings for all purposes.

They have steel antifriction roller bearings and rigidly braced iron frames, resulting in correct alignment and easy running. They are fitted with the improved “Sedgwick” self-locking indestructible band brake.

We recommend double cables independently attached to car and counterweight.

Complete outfits include overhead gearing, platform, adjustable counterweight, guide runs for platform and weight, ropes and cables for total height over all of 20 ft., f.o.b. Poughkeepsie, N. Y.

DATA, “SEDGWICK” IMPROVED HAND POWER FREIGHT ELEVATORS, FIG. D						
Capacity, lbs.	Size of car, ins.	Space required		Complete outfit	Add for extra height per ft.	Shipping weight, lbs.
		Width, ins.	Depth, ins.			
500	36 x 36	40½	40	\$150.00	\$1.25	800
750	42 x 42	47¼	46	210.00	1.50	1,200
1,000	48 x 48	53¼	52	240.00	1.75	1,300
1,200	54 x 54	59¼	58	270.00	2.00	1,600
1,500	60 x 60	65¼	64	300.00	2.25	1,900
2,000	72 x 72	79¼	76	330.00	2.50	2,400
2,500	72 x 72	79¼	76	360.00	2.75	2,700

Price on outfits of greater size or capacity quoted on request.

Blue prints and full directions for erecting sent with each outfit.

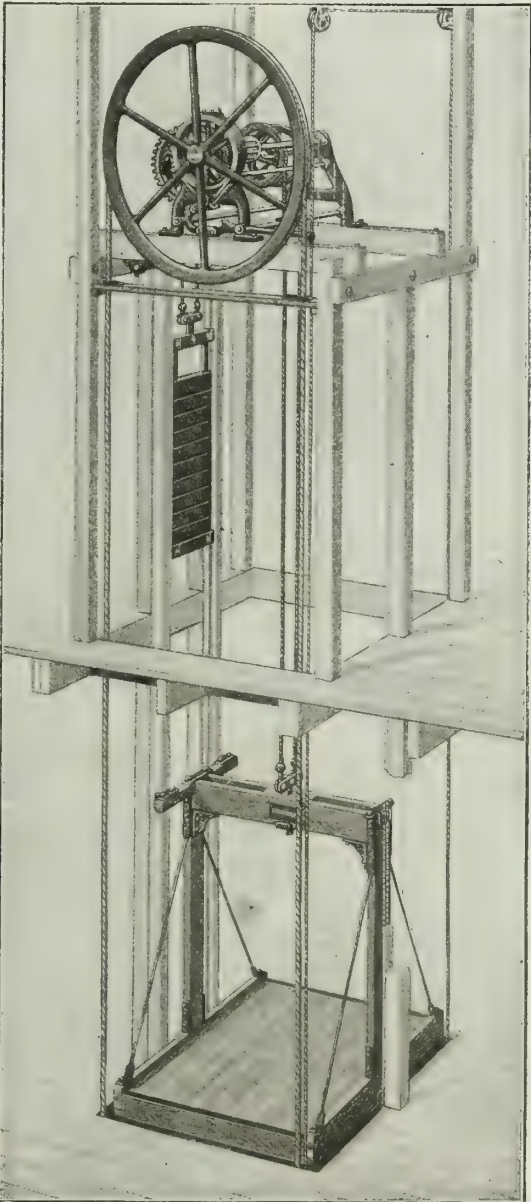


FIG. D. “SEDGWICK” FREIGHT ELEVATOR

# F. S. PAYNE CO.

## Elevator Manufacturers

GENERAL OFFICE AND WORKS

Richdale Avenue  
CAMBRIDGE, MASS.

### Products

ELECTRIC and HYDRAULIC PASSENGER and FREIGHT ELEVATORS.

PAYNE (Patented) HYDRAULIC ASH LIFTS.

ELEVATOR CONTROLLERS for operation by Hand Rope, Lever Car Switch, Push Button and Dual Control, adapted for any make of machine.

### Electric Elevator Machines.

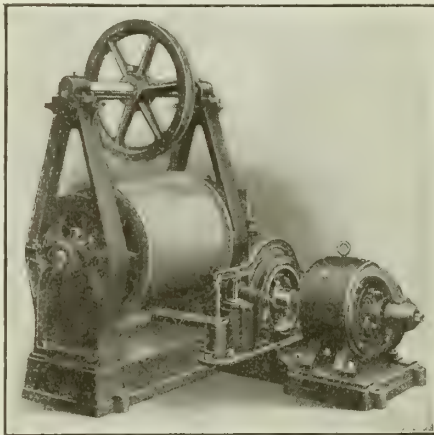
These machines are adaptable for use on any electric current and have a wide range of duty as regards capacity and speed.

All safety devices of the latest type are a part of the equipment and have met with the approval of representative architects, engineers and insurance companies.

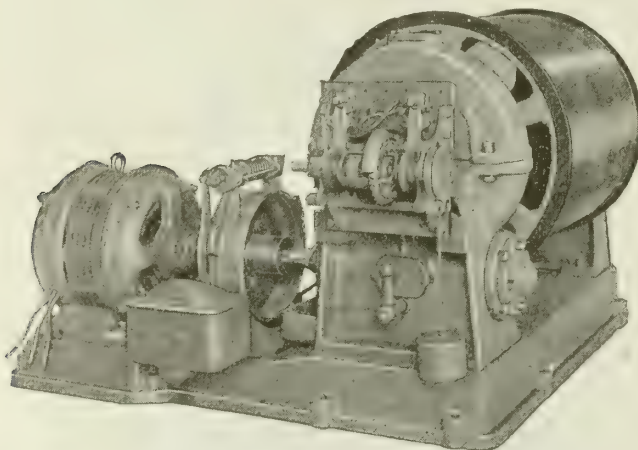
State and city requirements are complied with in all installations.

Conservative engineering principles have been adhered to in the design of all F. S. PAYNE Co. products which have resulted in most efficient and satisfactory installations.

Prompt deliveries and a refined product are assured by our policy of standardizing the design of all our machines.



PAYNE DIRECT CURRENT DIRECT CONNECTED ELECTRIC ELEVATOR MACHINE



PAYNE ALTERNATING CURRENT DIRECT CONNECTED ELECTRIC ELEVATOR MACHINE

### Hydraulic Elevator Machines.

Hydraulic plunger elevators which can be adapted to meet any requirements are manufactured by this company.

### Information Desired for Estimates on Elevator Machines.

The opportunity to co-operate with architects, engineers and owners will be appreciated either in furnishing preliminary plans and specifications or comparative costs of electric and hydraulic equipments.

To avoid delay and to insure intelligent response to inquiries the following information should be furnished:

Travel of car: Distance between bottom and top landings.  
Maximum load to be carried. If a freight elevator, materials to be carried.

Approximate speed desired.

Size of car required or size of hoistway provided.

Construction of hoistway: Brick, concrete, steel or wood.

Number and size of openings at each floor, and side or sides of hoistway where openings are located.

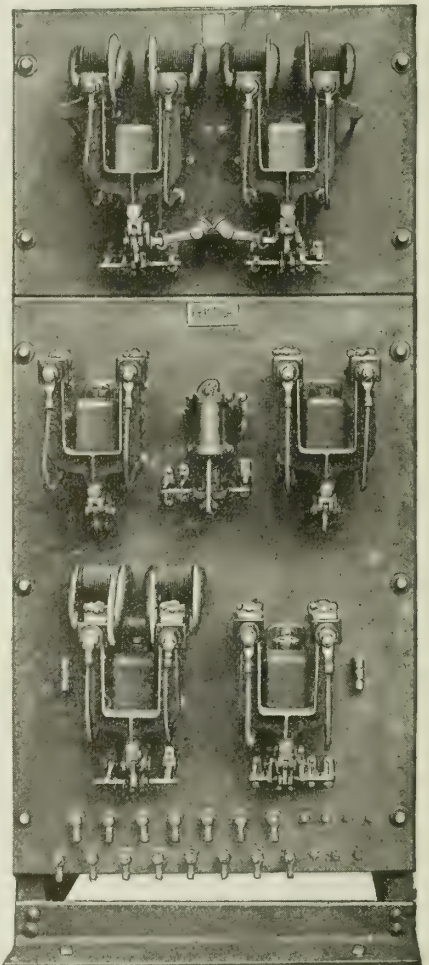
If electric elevator state location of space provided for machine: in pent house over hoistway or adjacent to hoistway at lowest landing.

If hydraulic plunger elevator advise nature of soil: gravel, sand, salt marsh or rock. Give water pressure.

For electric elevators give current available, whether D. C. or A. C. If D. C. state voltage. If A. C. state voltage, phase and cycles.

As there is considerable difference in cost between wood and steel guides a preference should be designated or a request made for price of each.

Where wooden freight elevator gates are required state number and type: full automatic or semi-automatic; also if gates are to be single or double bar or slatted.



PAYNE ELECTRIC ELEVATOR CONTROLLER



**Hydraulic Ash Hoists.**

These machines were originally designed for use in schoolhouses, and due to their success in this service are now being used wherever it is necessary to raise ashes or other materials from basement to sidewalk level.

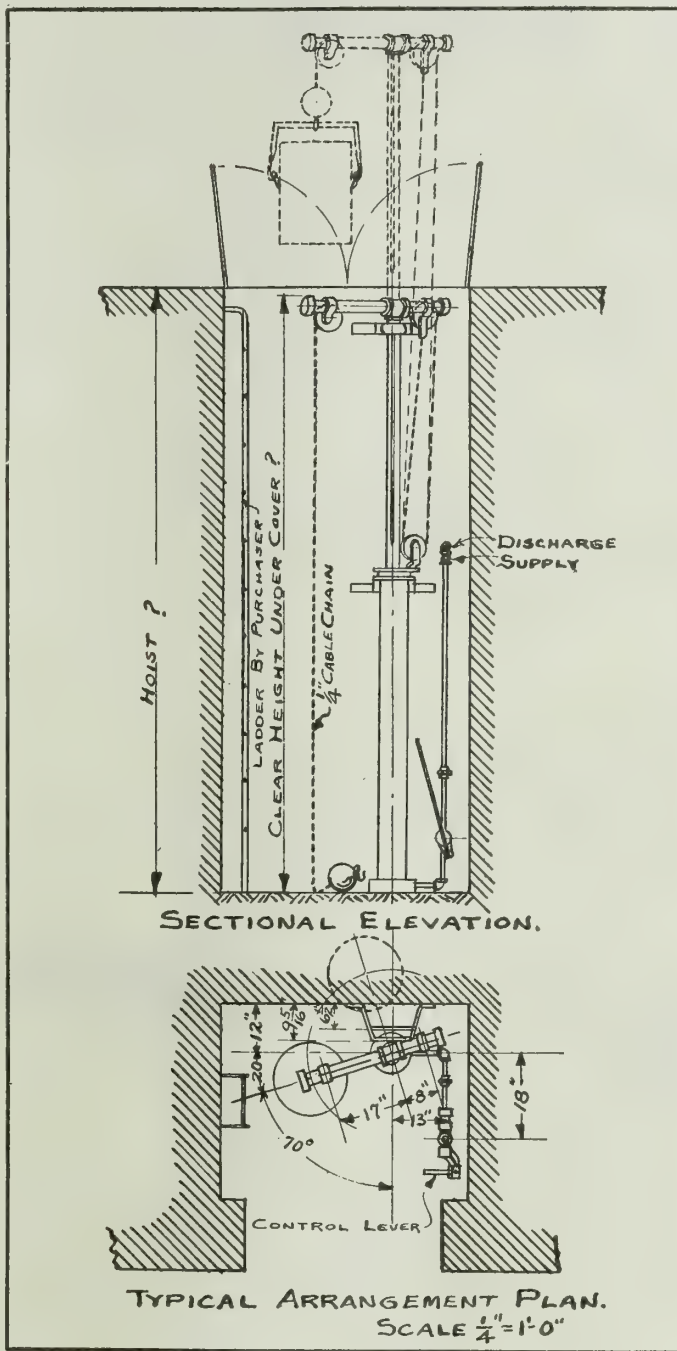
The machine is designed not to disturb conditions in existing buildings nor require special provision for it in new buildings.

Any mechanic can install this machine, as it is free from any mechanical complications and detailed instructions are furnished for the erection of the apparatus.

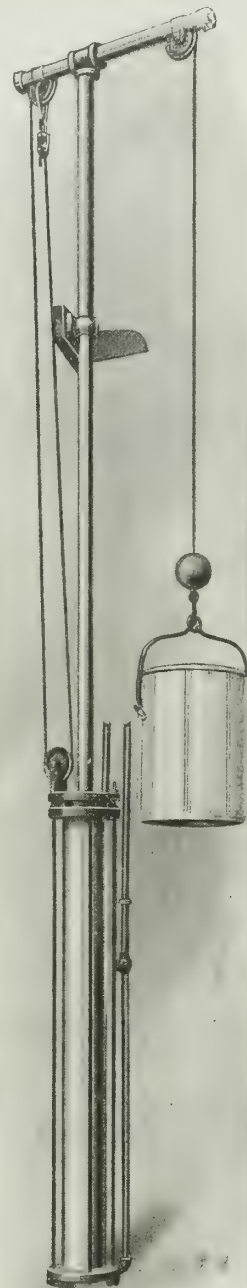
*When Ordering*—When ordering please furnish the following data: (1) Water pressure available; (2) Distance between loading and unloading levels.



Fixed Mast Type



Installation Details



Disappearing Mast Type

DETAILS OF PAYNE HYDRAULIC ASH HOISTS (PATENTED)

## ELEVATOR LOCKS CO.

PEORIA, ILL.

**Products.**

M-C-K AUTOMATIC, PURELY MECHANICAL ELEVATOR SAFETY LOCKS.

**Principle of M-C-K Safety Locks.**

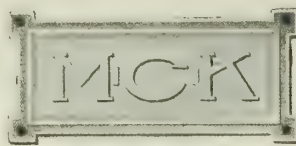
The principle of this safety lock is to compel the operator to come within a certain distance of the floor level before he can open the gate.

The three essentials to perfect safety are: (1) a control of the landing, (2) the locking of the enclosure gate, (3) the control of the car.

With these locks one can not start a car until the door is shut and locked, and can not open the door until the car has effected a landing within a given radius at each floor, and the controlling lever is in a neutral position.

**Construction.**

The material used in the construction of these locks is genuine manganese bronze and high grade malleable iron and steel.



TRADE-MARK

**DURABILITY**—Every engagement is a revolving steel wheel working on a straight smooth surface of a different metal, which insures durability and ease in operation.

Friction is eliminated to the greatest possible extent.

Repair records of users show the up-keep cost to be a minor detail.

**Operation.**

The operating lever controls the locking and unlocking of the enclosure gate, without the dangerous method of attaching directly to the operating lever.

The lever must be brought to a neutral point (where there is no power) before the gate can be opened.

The operation of the device is in alignment with the movement of the gate in the opening—no parts obstruct the hatchway in performing their functions.

Every operation of locking and unlocking the gate and locking and unlocking the controlling lever is visible to the operator, without the necessity of testing the safety locks to see if they are working.

It does not impair the efficiency of the elevator, and does not easily get out of order.

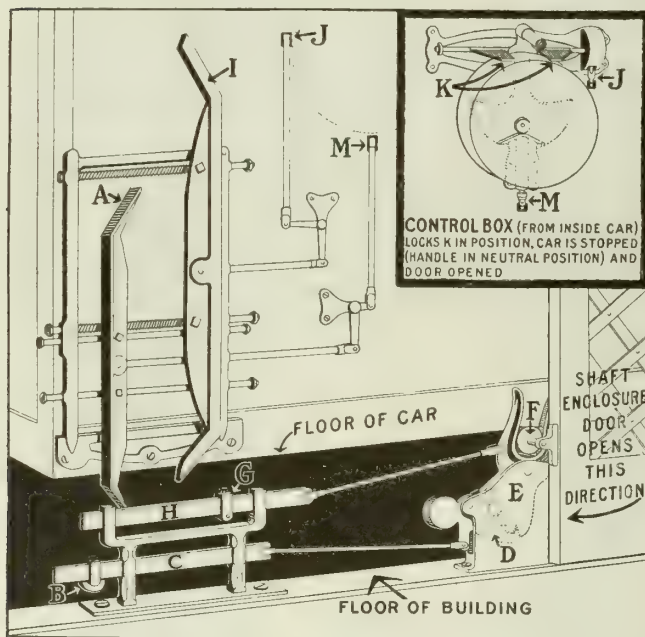
The device is exceedingly simple, being purely mechanical in its operation. This mechanism is applicable both with electric and hydraulic power. Elevators will not start with doors open, and the doors can not be opened unless the elevator is at a safe landing.

**Underwriters' Label.**

After thorough tests by experts of the Underwriters' Laboratories, Inc., this label has been awarded the ELEVATOR LOCKS CO. It is the only official statement and endorsement made as to a safety lock efficiency.



FACSIMILE OF UNDERWRITERS' LABEL



DETAILS OF M-C-K AUTOMATIC SAFETY ELEVATOR LOCKS

Showing elevator approaching a landing, with shaft enclosure door shut and locked

Roller "F" is attached to shaft enclosure door and fits into rocker arm "E," which in turn is held by lock "D," thus preventing door from being pulled back and opened. Lock "D" does not release rocker arm "E" until bar "C" pulls it out of engagement, when roller "B" comes into contact with cam "A." However, cam "A" does not make this contact until rod "M" moves, pushing it over the necessary distance. Rod "M" is controlled by the operation of the car, it being so adjusted to the operating lever that, when the car is stopped (the operating lever therefore in neutral position), it automatically makes a contact between cam "A" and roller "B," which in turn releases lock "D," allowing rocker arm "E" to swing back when door is opened, thus shaft enclosure door is not unlocked until car is within the radius of cam "A" (a safe landing) and the operating lever is in a neutral position, with power shut off by the operator. When the elevator is at a safe landing, and the operating lever is at the neutral position necessary, when shaft enclosure door is opened, rocker arm "E" is pushed back by roller "F" (which as before mentioned is attached to shaft enclosure door). This pushes bar "H" to the left, bringing roller "G," which is attached to bar "H," into contact with cam "I," thereby pushing it to the left. This moves rod "J" upward, bringing the two arms "K" (on inside of car) down on both sides of the operating lever so that it can not be moved from its neutral position.

**Guarantee.**

This company fully guarantees its M-C-K safety locks to perform the following functions:

(1)—To mechanically lock the power and door automatically.

(2)—To lock the power while the door is open to receive and discharge passengers.

(3)—To keep the power locked until the door is securely closed, by which the power is released.

(4)—To securely lock the door automatically before the power can be used to start the car.

(5)—To lock each door in the shaft independently of the others, so that they can not be opened until the car is stopped level or within the required distance above or below the floor level, then only the one at which the landing has been made.

(6)—To give the above safety without attaching to motive power, and furnish free of cost any defective material for one year from date of installation.



## THE STEELITE COMPANY

Manufacturers of Elevator Cars, Enclosures and Gates; Iron and Wire Work

1920 West 77th Street  
CLEVELAND, OHIO

### Products.

ELEVATOR CARS AND ENCLOSURES.  
ELEVATOR GATES.

### Steelite Elevator Cars and Enclosures.

Standardization of design and construction enables this company to offer a better product at a lower price—better in appearance and workmanship and with prompt delivery.

Cars and enclosures can be specified from the many standard designs shown in the company's catalogue, which will be sent on request, or the company will estimate on construction according to architects' designs and specifications.

Steelite elevator cars and enclosures are furnished in any color, in grain or flat finish.

### Steelite Elevator Gates.

Made of pressed steel in standard end pieces and filling sections. Completed gates are built up to any width by welding. Top and bottom longitudinal reinforcements are inserted according to the width of gate specified. The completed gate is one rigid piece of steel.

Steelite gates are finished with an attractive dark olive green enamel baked on.

Steelite gates will not warp or stick, come apart, shake loose, burn, break or wear out. They are strong, rigid, permanent and safe. They lift and lower easily.

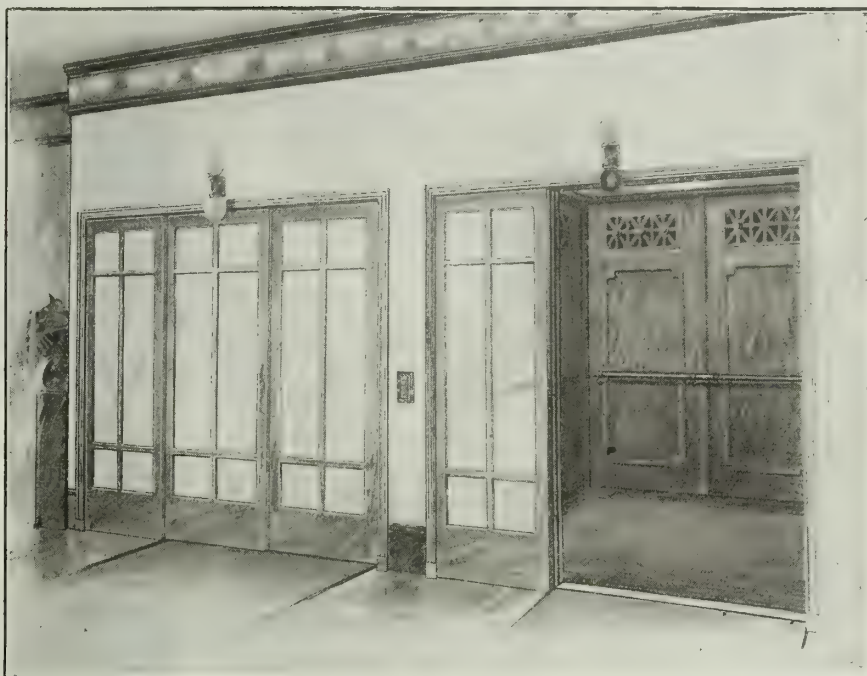
Steelite gates are standardized.

Special sizes of the same design and construction as standard can be produced to meet any requirement, but cost and deliveries must necessarily be uncertain.

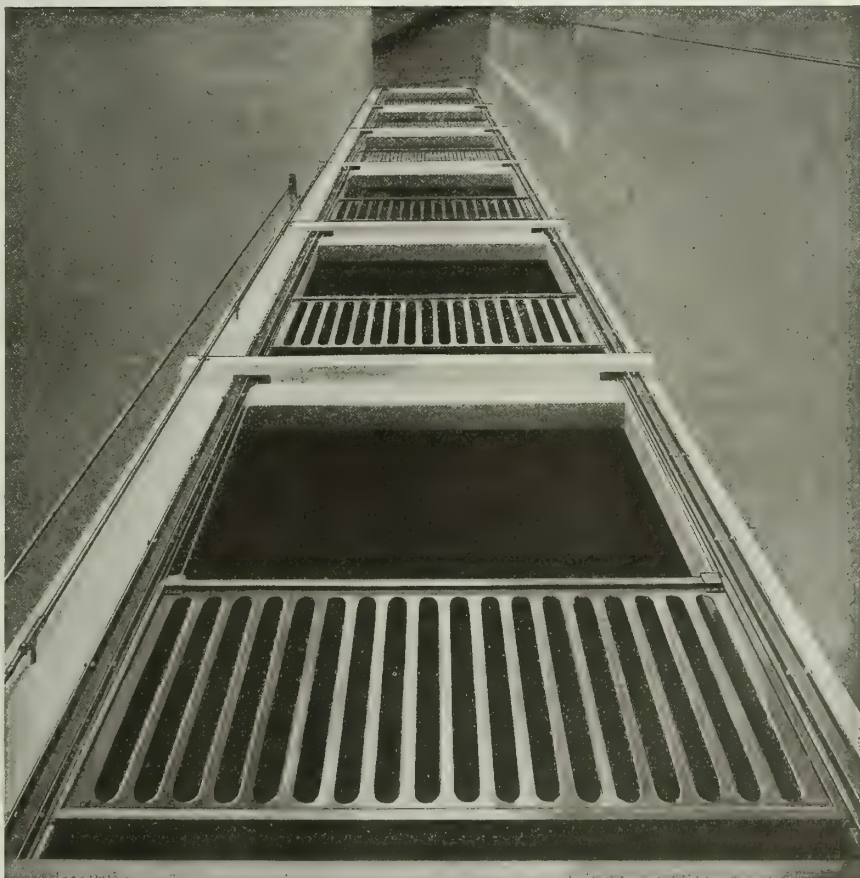
Steelite gates are designed to meet all code requirements and safety standards.

### Literature.

Detailed information on installation to meet any requirements and a comprehensive list of users of steelite products will be sent to interested persons on request.



TYPICAL INSTALLATION OF STEELITE ELEVATOR CARS AND ENCLOSURES



TYPICAL INSTALLATION OF STEELITE FREIGHT ELEVATOR GATES  
Looking upward in shaft

# C. K. ERNST SPECIALTY CO.

Manufacturers of Iron Specialties

998-1006 East Ferry Street  
BUFFALO, N. Y.

## Products.

SELF-RAISING PLATFORM LIFT.

TELESCOPIC ASH LIFTS, Sidewalk and Basement Operated.

AUTOMATIC SAFETY-GUARDED SIDEWALK DOORS.

PERFECTION ELEVATOR.

ASH CONVEYORS.

TYPE "A" LIGHT SIDEWALK ELEVATOR.

## Ernst Self-raising Platform Lift.

A platform lift of unusual merit that can be used through a cellar window or sidewalk door, for handling of material, ashes, etc., to and from the basement, requiring the least amount of labor to operate.

Lowers loads of 300 to 1,000 lbs. capacity by gravity, controlled by powerful band brake. Platform, when empty, automatically rises from cellar to sidewalk.

Where goods are chiefly lowered into basement and platform goes up empty, this lift is ideal, as no cranking is necessary. The only time cranking is necessary is when a load is taken up from the basement to sidewalk. Turning the hand wheel 10 times elevates the platform 1 ft.

**SPECIAL FEATURES**—An endless chain drive, fitted into special pocket wheels, and cranking mechanism, being directly attached to the uprights, eliminates expense due to rust, as no working part is in a pit.

The platform is counterbalanced. This and the endless chain drive make the lift always operate the same.

Lift is self-supported, making installation of the same an easy matter. Lowers platform directly into cellar, takes up practically no more room than a vertical lift, being inclined but 2 ft. 5 ins.

**WINDOW TYPE ASH LIFT**—This lift, installed alongside a cellar window, makes an excellent 4-can ash lift or basement elevator. Cellar windows 3 ft. or more in height permit the use of this lift, eliminating expense of building an outside areaway or cellar door. (See Fig. 4.)

Can be used with or without a pit; hinge window to swing out.

**WHEN SPECIFYING**—Provide an areaway 2 ft. wider than width of cellar door to be used, to provide space for operator to crank lift from the side. A 4 by 4-ft. square door will permit a platform 3 ft. 10 ins. wide by 3 ft. long.

Detail drawing sent upon request. Recommend using Ernst safety-guarded sidewalk doors.

**PRICES**—For heights up to 10 ft., with platforms up to 4 ft. square, \$175.00. For heights over 10 ft., \$3.00 per ft.

**MOTOR DRIVEN ASH ELEVATOR**—Handles 4 full ash



FIG. 1. Lift with Platform Level with Floor

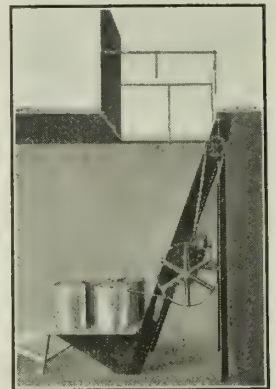


FIG. 2. Platform without Pit. Can be set up in any old or new building. Only 18 ins. from cellar floor

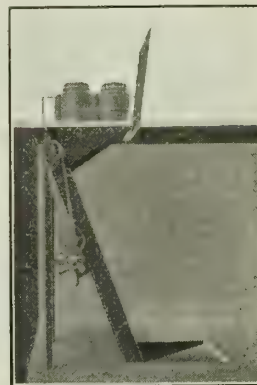


FIG. 3. Platform Level with Sidewalk Shown with sloping pit

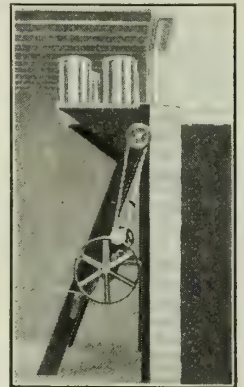


FIG. 4. Lift Used Through Cellar Window or Door Requires no areaway or cellar door

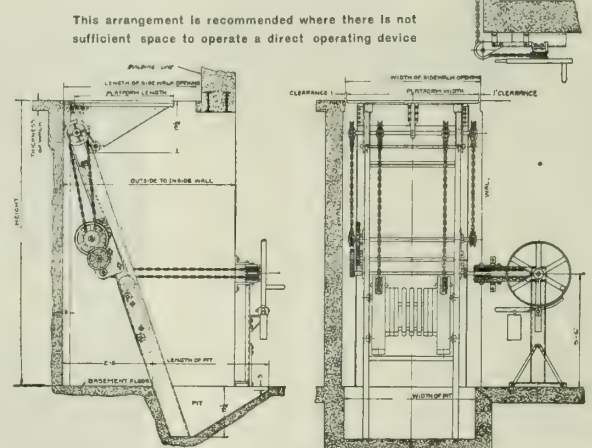


FIG. 5. Shows Platform Lift with Right Angle Cranking Mechanism, Arranged in a Crowded Areaway with Walls on Three Sides

ERNST SELF-RAISING PLATFORM LIFT

cans at a speed of 18 to 20 ft. per minute, controlled automatically at both floor levels by an automatic limit switch and brake. Motor and switch are mounted between uprights, taking up no extra space.

Prices on application.



### Ernst Combination Sidewalk Operated Telescopic Ash Hoist and Sidewalk Door.

A practical, compact, one-man operating lift, with which ash cans, barrels, etc., can be hoisted to or from the basement with perfect ease. When not in use, hoist telescopes into cellar and is invisible when door is closed. Position of operator on sidewalk safeguards the open hatchway while hoisting.

**CONSTRUCTION**—Upright made of heavy 5-in. channel bolted to floor and door frame, into which slides telescopic arm, made of two 1½ by 2-in. angles, strongly riveted, on which hoisting mechanism is mounted. Made of the very best and strongest materials throughout, and is subjected to thorough working tests before shipping. Capacity, 400 lbs., and operates at a speed of 30 ft. per minute. Has compound gears, powerful band brake, cable grooved drum, automatic safety lock for hoisting head, ratchet, pivoted hoisting head to swing ash cans on walk, which is detachable for storing in summer months when not in use, giving cable and gears extra long life.

**OPERATION**—Hoisting mechanism, attached to upright in cellar, raises telescopic arm in position, at same time automatically opens the sidewalk door, which is *completely safety-guarded*. The operator then climbs a ladder and from sidewalk level lowers hoisting cable, hooks can on hook, raises, swings and lowers the can on walk without lifting. Four ash cans can be hoisted to sidewalk before operator need leave sidewalk level. After empty cans are lowered into the cellar, operator goes down the ladder, releases the safety locking device and lowers the hoist, which at the same time lowers the sidewalk door, *automatically* locking same when closed as well as when open.

**USED AS A VENTILATOR**—This outfit can be used to advantage all year round as a ventilator, as the automatic opening and closing device locks the

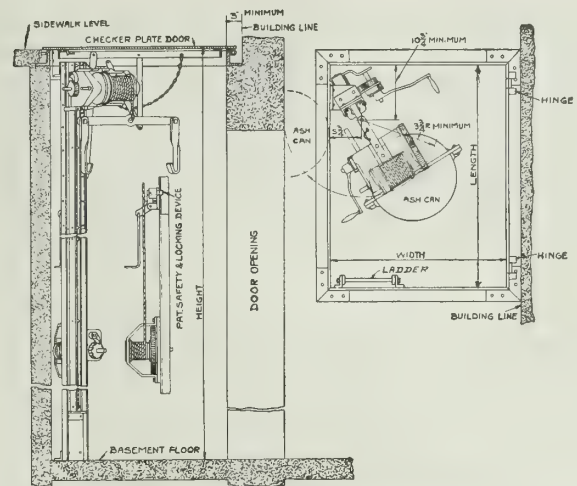


FIG. 10. ELEVATION AND PLAN OF ERNST SIDEWALK OPERATED TELESCOPIC ASH HOIST

door in any position desired, being controlled entirely from cellar floor, the safety-guarded door avoiding accidents from an open hatch.

Standard makes of ash cans need only be used with this hoist; Ernst improved grip holders are detachable on all ash cans having side handles. After cans have been hoisted to sidewalk level, the grip holders can be instantly removed and used on the next lot of ash cans to be hoisted. The hoist can be installed in any existing areaway within 2 hours' time. Note simplicity of outfit, as there is nothing to get out of order.

**PRICE**—Price of hoist alone, \$80.00 for heights up to 10 ft.; each additional ft., \$1.50 extra. Furnished complete with safety-guarded sidewalk door and opening device any size to 3 ft. sq., \$150.00; up to 4 ft. sq., \$160.00. Additional can holders, \$1.50 each. Iron ladder, \$1.00 per ft. Swing-ball ash cans, \$6.00 each. All f.o.b. Buffalo.

**GUARANTEE**—Order the above equipment and use for 30 days. If not satisfactory, return at Ernst expense.

### Ernst Basement Operated Telescopic Hoist.

This hoist is in principle and design similar to the sidewalk operated hoist, but is made to operate entirely from cellar floor from a 3-ft. high hoist stand. The entire operation of raising the telescopic arm in position, raising, swinging and lowering of ash cans on sidewalk,

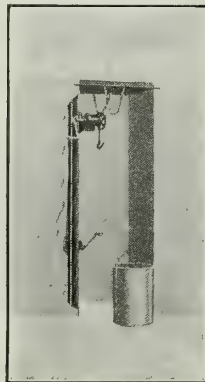


FIG. 6. Door Closed; Small Space Occupied by Ash Hoist

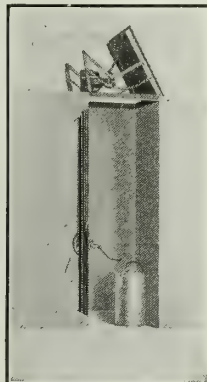


FIG. 7. Door Automatically Opened as Hoist is Raised

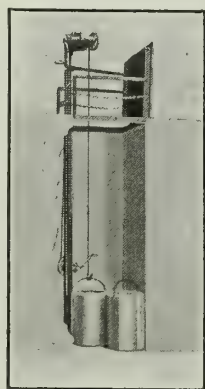


FIG. 8. Shows Door Opened Completely, Safety-guarded. Cans hooked on by operator at sidewalk level

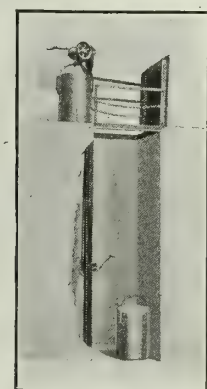


FIG. 9. Can Raised and Swung on Wall Without Lifting or Touching Ash Can

ERNST SIDEWALK OPERATED TELESCOPIC HOIST



FIG. 11. Cans Swung on Walk by Operator in Cellar

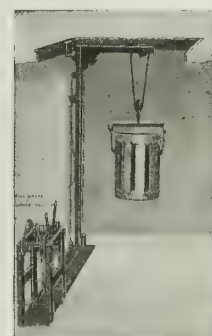


FIG. 12. Hoist Lowered. Invisible from Above



FIG. 13. Hoist Deposits Cans on Walk or to Wagon Height

ERNST BASEMENT OPERATED TELESCOPIC HOIST

and return of hoist to the cellar, is accomplished without operator leaving the hoist stand or putting himself in danger of being obliged to move under the load. When not in use, hoist is invisible. Operates at a speed of 30 ft. per minute and has a capacity of 400 lbs. Has compound gears, powerful brakes, cable grooved drums, safety locking device and ratchets. Bottom floor channel is 7 ins.; is 5 ft. long, and made to fit all sizes of areaways.

**WAGON HEIGHT EXTENSION ARM**—Cellars 9 ft. 6 ins. or more in height allow hoisting arm to extend 8 ft. or more above the walk, permitting unloading of ash cans directly into an ash wagon, saving rehandling at grade line. Extension arm made of reinforced heavier section angle iron for a capacity of 300 lbs.

**PRICE** — Price for hoist complete, \$85.00 for heights up to 10 ft.; additional ft., \$1.25 per ft. extra. Wagon height extension arm, \$95.00 complete. Motor driven hoists quoted on application.

### Ernst Perfection Elevator (Cellar Window Type).

This handy and compact elevator makes use of a cellar window to hoist and swing ash cans or produce directly onto the sidewalk, and can be used in any new or existing building to advantage. Any cellar window 28 ins. wide by 28 ins. high will allow all standard makes of ash cans to be passed through the window, size of window governing the size of can or package that can be handled on elevator platform.

Made entirely of metal, consisting of a 2½-in. pipe upright, securely fastened to the ceiling and cellar floor by flanges, on which rides a platform 21 ins. in diameter, operated by cranking mechanism directly attached to the

upright. Upright is 8 ins. from wall, just clear of window. Platform lowers to within 1½ ins. from floor, requiring no pit, and operates at speed of 15 to 25 ft. per minute; any load in capacity up to 300 lbs. Elevator is equipped with compound gears, powerful brake to lower the empty cans to cellar; has ⅜-in. flexible wire cable, automatic stop at sill height, lock to prevent platform from swinging when being cranked, ratchet, cable grooved drum, everything necessary to make it the safest, simplest, strongest and easiest to operate.

Easy to install to concrete ceiling, plastered ceiling, wood joists or cellar floor, by any mechanic in an hour's time. Necessary anchor bolts and setting directions are included. By using a stepladder, or ladder anchored to the wall, the operator can perform the entire operation of hoisting full cans to sidewalk and lowering the empties to cellar. Ideal for hoisting and lowering baskets of wash from laundry, ashes from furnace, produce and boxes in cellars, storeroom, etc. Has nothing to get out of order.

**PRICE**—Price for elevator complete, \$45.00 f.o.b. Buffalo. Each additional ft. in height, 75¢ extra. To order, give height from cellar floor to ceiling. A handy ash can truck for wheeling ash cans from furnace to elevator platform, price, \$2.50.

### Type "A" Platform Lifts.

A quick, dependable, firm elevator of 500-lb. capacity, designed for use in most any areaway; one that can be quickly and inexpensively installed. Fig. 16 shows elevator in an areaway, with the cranking mechanism secured to the cellar wall, a pit being provided to allow the platform to be lowered level with floor. Where no pit is desired, platform lowers to within 10 ins. of cellar floor. Raises flush with first story (Fig. 17). Constructed entirely of metal, including the platform. Elevator is worked with a single cable which does not bind. Uprights made of 3-in. pipes; has compound gears, 2 hoisting speeds for heavy and light loads, band brake and safety ratchet to hold platform at any desired height. Platform slides of non-binding type.

**PRICES**—Prices for platform in sizes up to 3 ft.



FIG. 14. Platform Loaded, Ready to Hoist to Grade Level. No changes to window necessary. No pit

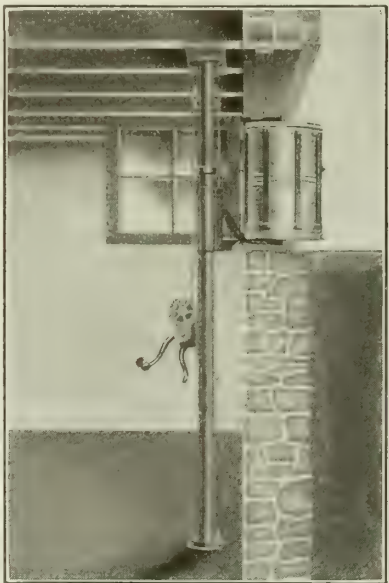


FIG. 15. Platform Hoisted and Swung out of Window. Ash cans hoisted and swung through window over sidewalk by operator in cellar. ERNST PERFECTION HOIST

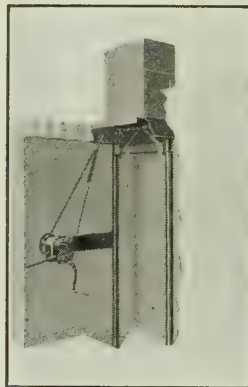


FIG. 16. Shows Elevator in Areaway Flush with Sidewalk

Cranking mechanism secured to wall. Takes up but a foot of space

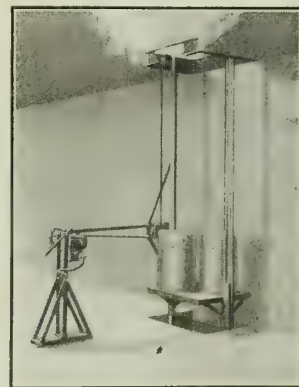


FIG. 17. Shows Elevator off Floor 10 ins., Where No Pit is Used

Cranking mechanism mounted on stand bolted to floor

ERNST TYPE "A" PLATFORM LIFT



square, \$115.00; platforms in sizes up to 3 by 4 ft., with larger gearing mechanism, capacity, 750 lbs., \$135.00 f.o.b. Buffalo. When ordering, state size of door; height of basement and whether desired with or without pit.

### Ernst One-piece Safety-guarded Sidewalk Door.

Practically no single article in the construction of a modern building causes more annoyance than the sidewalk doors now in use, due to their imperfections.

**DESCRIPTION**—The Ernst door is the only door made automatically counterbalanced and safety-guarded, to offer the best protection to pedestrians when door is open. The guards raise and close automatically when moved, and are invisible when closed.

Constructed of a one-piece 3 by 3 by  $\frac{1}{4}$ -in. thick angle, and one-piece checkered top (non-slippery)  $\frac{1}{4}$ -in. thick plate, strongly reinforced by stiffener angles and hinges to withstand a load of 300 lbs. per sq. ft.

Heavy counterbalancing weights allow opening and closing of the door easily, giving long life. Has no middle seams to bend down or leak. Has an iron stop on four sides around the frame that acts as a gutter and prevents concrete from breaking around the door frame.

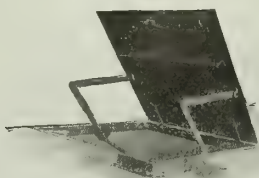


FIG. 18. Showing How Guards Close When Door is Moved

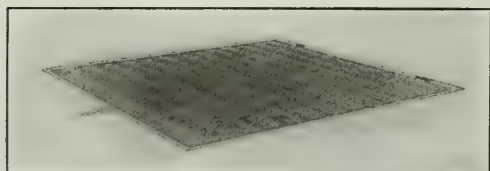


FIG. 19. Neat Appearance of Door Closed

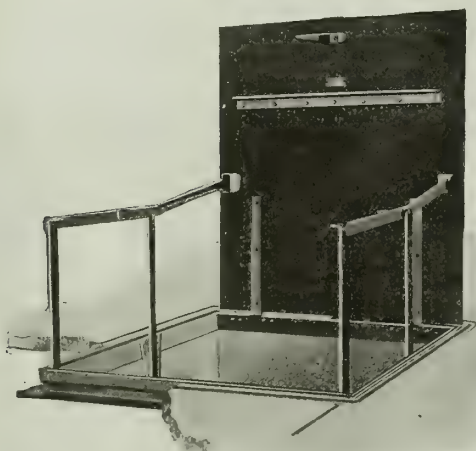


FIG. 20. Door Opened, Showing Complete Rail Guard, Concealed Frame and Hanger, and Iron Stop (Patented)

ERNST ONE-PIECE SAFETY-GUARDED SIDEWALK DOOR

**PRICE**—Made in all sizes. Stock sizes from 3 ft. by 3 ft. to 5 ft. sq., and ranging in prices from \$45.00 up.

When ordering, designate on which side the door is to be hinged. Double doors having same flush frame and construction, but lacking automatic guards and weights, also made. The use of Ernst door with Ernst various types of ash lifts and sidewalk lifts is recommended.

### Ernst Window Type Ash Conveyor.

This model cellar window elevator is strongly recommended.

It makes use of a cellar window to hoist and project ash cans through thick cellar walls to sidewalk for easy unloading. Constructed of two pipe uprights, on which travels a non-binding platform made entirely of metal. Uprights installed to ceiling and floor only 11 ins. from the wall.

Can be operated through any window 30 by 30 ins.; window to be hinged and swung outside.

Operates at a speed of 15 to 25 ft. per minute.

Price, \$90.00 up to heights of 10 ft.

**3-CAN CAPACITY LIFT**—This type lift is furnished in 3-can capacity, without projecting platform feature. Platform stops at window sill level.

Requires no pit, as platform lowers to within  $1\frac{1}{2}$  ins. of cellar floor.

A large cranking mechanism is furnished to handle heavy loads. Windows 3 ft. or more in height by 3 ft. or more in width are suitable for a 3-can capacity lift.

Price, \$140.00.

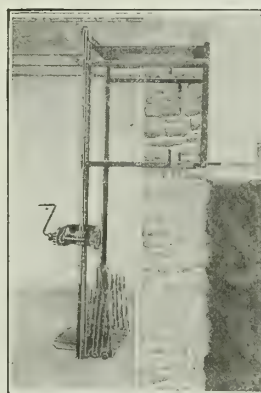


FIG. 21. Platform Empty, Lowered to Floor. Note compactness of lift

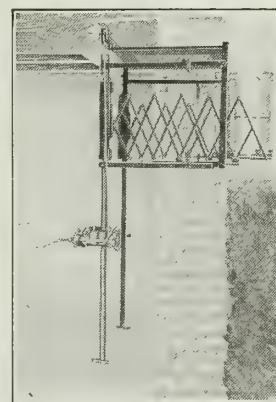


FIG. 22. Flexible Platform Extended Through Wall to Sidewalk. Handles all sizes of ash cans

ERNST WINDOW TYPE ASH CONVEYOR

### Ernst Labor-save Cellar Elevator.

This lift is similar to the Perfection elevator, but is made lighter specially for residences only. Capacity, 200 lbs. Platform removable, to take up the least amount of space possible. Upright installed 8 ins. from wall. Useful all year round for handling ashes, waste, produce, etc.

Price complete to 8 ft., \$35.00 f.o.b. Buffalo.

# GIFFORD-WOOD CO.

Manufacturers of Elevating and Conveying Machinery and Ice Tools

MAIN OFFICE AND WORKS  
HUDSON, N. Y.

BRANCH OFFICES

NEW YORK, 30 Church Street  
ROCHESTER, Cutler Building

BOSTON, 51-52 North Market Street  
SCRANTON, Union National Bank Building

CHICAGO, 565 W. Washington Street  
PHILADELPHIA, Widener Building

## Products.

ELEVATING and CONVEYING MACHINERY for Handling Coal, Ashes, Stone, Sand, Gravel and Ice (natural and manufactured), and Bulky Materials of any nature; WAREHOUSE CONVEYORS; WAGON LOADERS.

Coal and Coke Bagging Machinery.

## Services.

Our Engineering Department places at your disposal the services of experts in these lines. Before deciding on any particular type of machinery equipment ask our advice, as you will find our recommendations peculiarly fitted for your exact conditions.

## G.-W. Ice Elevators and Conveyors.

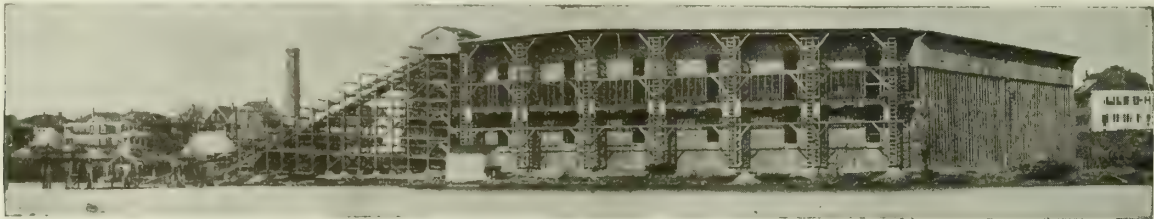
We design, build and install, ready to operate, ice elevators, conveyors and lowering machines for houses



G.-W. WAGON LOADER

## G.-W. Collapsible Wagon Loader.

The new Gifford-Wood collapsible wagon loader marks the crowning point in wagon loader efficiency and modern coal yard equipment, this new design embodying many of the valuable suggestions offered by



G.-W. ICE ELEVATORS AND CONVEYORS

of any capacity. Plans and specifications for construction of ice houses furnished without charge.

## G.-W. Ice Lowering Machinery and Tools.

In manufactured ice plants, cold storage plants and breweries, these machines are extensively used. Built entirely of steel and very durable, and automatic in operation. Also, complete equipments for car icing stations.

Our stock comprises every tool used for harvesting and handling ice. The large variety of styles and sizes provide for the most exacting user.

Illustrated catalogue on request.



G.-W. AUTOMATIC  
ICE LOWERING  
MACHINE

## Coal Handling Machinery.

In designing retail coal pockets, the question of the proper type of machinery equipment is of the greatest importance and depends largely upon individual conditions. Our co-operation in solving these problems is offered to those who may require this service.

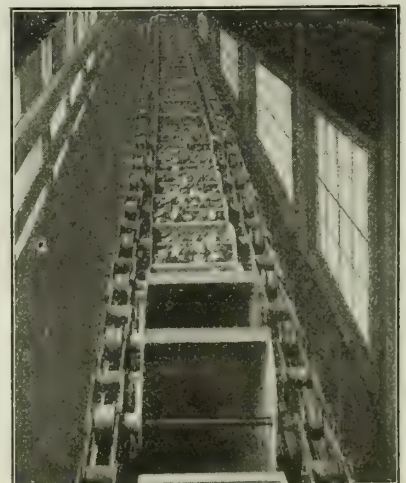


G.-W. COAL HANDLING MACHINERY

our customers. A radical departure in driving mechanism has been made by the substitution of cut gears for the detachable chain drive. Light in construction and easily moved about the yard. Write for booklet No. 22.

## G.-W. Pivoted Bucket Carrier.

Every modern powerhouse to-day requires a machine of this description. The carrier not only takes care of the coal from the cars to the bunkers, but removes the ashes from under the boilers to cars or to separate bins provided for storage. The chain is one of the most essential points of this type of carrier. The self-oiling chilled rollers require little or no attention; the short pitch chain eliminates the jerky motion incident to long pitch chains and does away with any device necessary to correct this difficulty; it also gives a more substantial method of driving, due to the increased number of teeth on the wheels and in action at one time.



G.-W. PIVOTED BUCKET CARRIER



# GILLIS & GEOGHEGAN

## Manufacturers of Telescopic Hoists

TELEPHONE:  
SPRING 6140

542 West Broadway  
NEW YORK, N. Y.

### PARTIAL LIST OF AGENCIES IN THE UNITED STATES

ATLANTA, GA., HILL R. HUFFMAN, INC., Candler Building  
BALTIMORE, MD., EASTERN SALES Co., 15 East Fayette Street  
BUFFALO, N. Y., FARRAR IRON & STEEL Co., Builders Exchange  
CHICAGO, ILL., KAUFMAN & THOMAS, 708 Peoples Gas Building  
CHARLOTTE, N. C., GENERAL MILL SUPPLY Co., Latta Arcade Building  
CLEVELAND, OHIO, THE R. L. QUEISSER Co., Schofield Building  
COLUMBUS, OHIO, R. L. WATSON, 51 Columbia Building  
DALLAS, TEX., BUILDERS METAL PRODUCTS Co., Busch Building  
DES MOINES, IOWA, DES MOINES BUILDING MATERIAL Co., 906 Walnut Street  
DETROIT, MICH., KENNEDY & DAWSON, 4 Buhl Block  
INDIANAPOLIS, IND., VONNEGUT HARDWARE Co.  
KANSAS CITY, MO., DAY K. SMITH, Reliance Building

MILWAUKEE, WIS., PHILIP GROSS HARDWARE Co., 218-22 3d Street  
MINNEAPOLIS, MINN., MORGAN-GERRISH Co., 501 South 6th Street  
NEW HAVEN, CONN., THE WARNER-MILLER Co., Railroad Avenue and St. John Street  
OMAHA, NEBR., F. H. TURNER & Co., 773 Brandeis Building  
PHILADELPHIA, PA., W. G. CULBERT, 1503 Sansom Street  
PITTSBURGH, PA., JAMES R. PITCAIRN, 345 Fourth Avenue  
RICHMOND, VA., J. S. ARCHER, 203 Real Estate Exchange Building  
SIOUX CITY, IOWA, HAAKINSON & BEATY Co., 1st and Nebraska Streets  
ST. LOUIS, MO., CONCRETE STEEL FIREPROOFING COMPANY, Syndicate Trust Building  
TOLEDO, OHIO, BUILDING PRODUCTS Co., 222 Sycamore Street

### Products and Services.

Manufacturers of the G & G TELESCOPIC HOIST (Patented) in the following Models:

MODEL A HAND POWER HOIST, with Automatic Gear Shifting Brake Device and Silencer.

MODEL B OVERHEAD CRANE HAND POWER HOIST, with Automatic Gear Shifting Brake Device and Silencer.

MODEL C HOIST operated by Electric Motor.



MODEL D OVERHEAD CRANE HOIST operated by Electric Motor.

MODEL E HOIST operated by Electric Motor mounted on pipe standard. Apparatus installed in New York, N. Y.

NOTE—For use with hoist, we manufacture the G & G AUTOMATIC SIDEWALK DOOR OPENING and CLOSING DEVICE with

SPRING GUARD GATE and SIDEWALK DOORS. (Works automatically in connection with the G & G telescopic hoist, all models.)

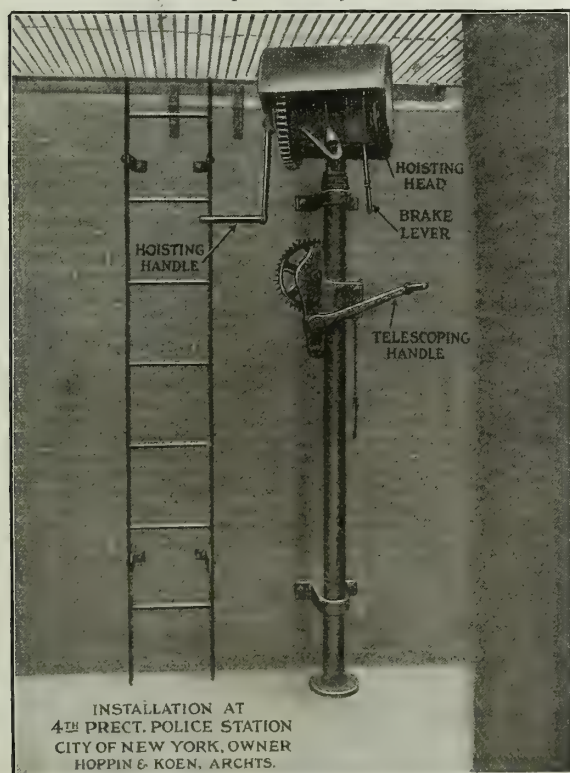


FIG. 1. Hoist Not in Use

When not in use hoist telescopes and no part shows above street level. Sidewalk doors may be closed down flush with pavement



FIG. 2. Hoist in Operation

After load is raised to proper point, hoisting head revolves on ball bearings and can is deposited on sidewalk without lifting. An automatic steady pin holds hoisting head in proper position over hatchway while can is being raised

MODEL A HOIST INSTALLATION AT FOURTH PRECINCT POLICE STATION, NEW YORK, N. Y.

**Model A Hoist.**

The G & G telescopic hoist is a simple, safe and substantial means for hoisting and lowering between cellar and sidewalk, ash cans, kegs, barrels, ice, etc. Fig. 1 shows hoist as it is when not in use—*no part shows above sidewalk*. To put apparatus in position for hoisting, the operator turns the telescoping handle as far as it will go. A safety ratchet device is provided with both telescoping handle and hoisting handle. For lowering, a powerful all-steel brake attachment is provided.

**ADVANTAGES** — Automatic gear shifting brake device shown in Figs. 4A and 4B.

One man, unaided, can operate hoist (Fig. 3).

Hoist is equipped with patented silencer, making it noiseless in operation.

Hoist raises the load at speed of 30 ft. per minute.

Compact—shipped complete, not "knocked down"; therefore very easy to erect.

All necessary clamps and bolts furnished; also blue print showing erection in detail.

No pit required.

When brake is used to lower load, the hoisting handle does not revolve.

Will handle a barrel of oil.

**CONSTRUCTION** — Only the strongest and most durable materials are used. The hoisting head is of cast steel. The cable drum is grooved and the steel cable is non-rotating. Brake is lined with asbestos wire woven brake lining. Important construction features are automatic steady pin, ball bearings under hoisting head, handles provided with sliding grips, gears keyed in position, and pinions cut from bar

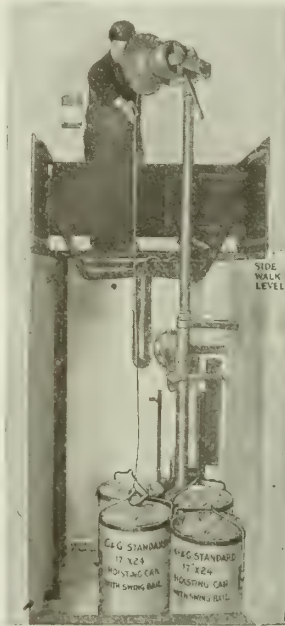


FIG. 3. SHOWS HOW ONE MAN, UNAIDED, CAN "HOOK" AND RAISE FILLED CANS WITHOUT LEAVING SIDEWALK

steel. Every hoist is subjected to thorough working test, and is painted before shipment.

**CAPACITY**—No part has a factor of safety of less than 8, based on the ultimate strength of the material when the maximum load of 500 lbs. is raised.

**WORKING TEST**—Every hoist is subjected to a thorough working test before shipment, all parts are assembled and hoist is set up in the same manner as it will be set up in building for which it is intended.

**HOW TO SPECIFY**—Furnish and install, where indicated on plans, one G & G Telescopic Hoist with Automatic Gear Shifting Brake Device and Silencer (Model A).

**PRICES**

Price, f.o.b. New York, N. Y., \$160.00.

Erected complete in New York, N. Y., only \$175.00

NOTE—A small additional charge is made if distance from area floor to sidewalk exceeds 15 ft.

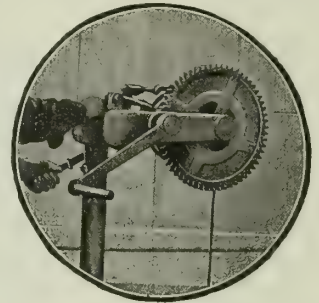


FIG. 4a. SHOWING AUTOMATIC GEAR SHIFTING BRAKE DEVICE

A single movement of brake lever shifts gears and applies brake. Hoisting handle does not revolve

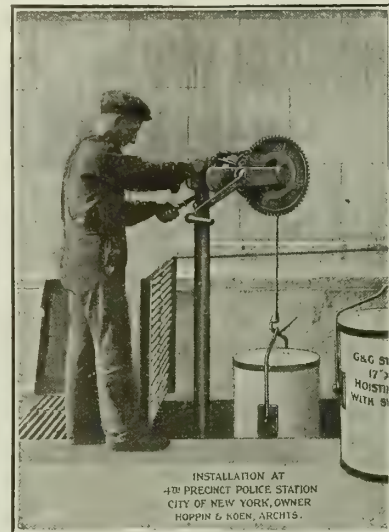


FIG. 4b. AUTOMATIC GEAR SHIFTING BRAKE DEVICE IN OPERATION

A single movement of brake lever automatically shifts gears and applies brake so that load is readily lowered. Hoisting handle does not revolve.

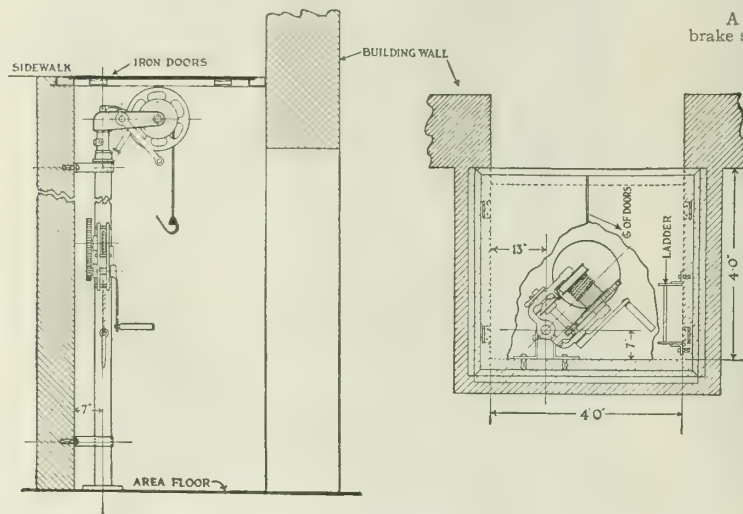
**SIZE OF AREA**—It is strongly recommended that area be made 4 by 4 ft. in size. This gives the operator room enough to do his work. If necessary, a smaller area may be provided, but it is not as practical.

**PATENTS ISSUED—****UNITED STATES:**

April 30, 1912  
May 19, 1914  
June 23, 1914  
June 30, 1914 (Reissued)  
October 19, 1915  
August 17, 1915  
August 17, 1915  
December 7, 1915  
December 7, 1915  
February 1, 1916  
March 7, 1916  
March 28, 1916  
March 13, 1917

**DOMINION OF CANADA:**

May 14, 1912  
December 9, 1913  
April 7, 1914 (Reissued)  
November 14, 1916  
April 27, 1915  
June 22, 1915  
August 3, 1915  
May 9, 1916  
July 25, 1916  
September 5, 1916  
October 10, 1916  
November 21, 1916  
Other Patents Pending



Scale  $\frac{1}{4}$  in. = 1 ft.

FIG. 5. ELEVATION AND PLAN SHOWING ARRANGEMENT OF G & G TELESCOPIC HOIST, MODEL A, IN AREA OF USUAL SIZE

NOTE—Area shown is large enough for Model A, B, C, D or E



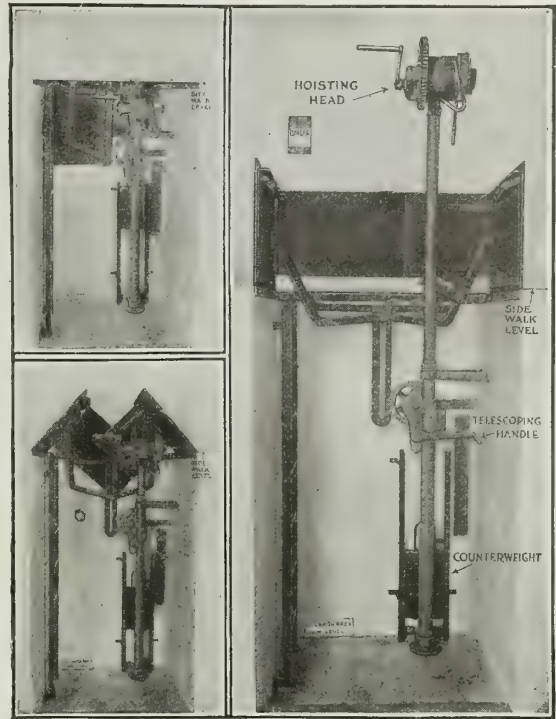
### The G & G Automatic Sidewalk Door Opening and Closing Device With Spring Guard Gate.

This device is illustrated in connection with Model A hoist, but may also be used in connection with Models B, C, D and E.

Device operates automatically when telescoping handle of hoist is revolved. Sidewalk doors open and close as hoisting head is raised or lowered. A counterweight is provided so that telescoping handle works smoothly and easily. An important feature is the *self-locking doors, whether open or shut*. The spring guard gate automatically closes up the opening, at the sidewalk level, between the wide opened sidewalk doors. The gate *can not be swung inward; swings outward only*, to permit passage of ash can, thus protecting the public and the operator.

We furnish and install the sidewalk doors and G & G automatic sidewalk door opening and closing device with spring guard gate and weatherproof electric alarm bell, in connection with the G & G telescopic hoist, in New York City and vicinity. An iron ladder furnished and installed and ash cans furnished if desired.

Wrought steel sidewalk doors close flush with surface of sidewalk—entire surface checkered. Equipped with brass hinges, and wrought steel frame with extra deep gutter.



FIGS. 6 and 7 FIG. 8  
THE G & G AUTOMATIC SIDEWALK DOOR OPENING AND CLOSING DEVICE WITH SPRING GUARD GATE AS ADAPTED TO MODEL A HOIST

Patented Feb. 1st, 1916, March 7th, 1916, and March 28th, 1916.  
Other patents pending



View of hatch, sidewalk doors closed and automatically locked



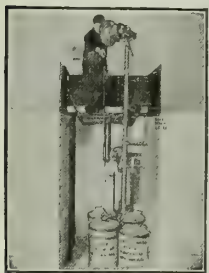
As hoisting head is raised, sidewalk doors automatically open; alarm bell rings



Doors opened and automatically locked, operator ascending iron ladder to sidewalk



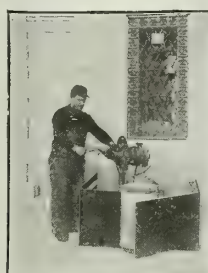
"Hooking" a G & G standard hoisting can with swing bail



Hooking a G & G standard hoisting can with swing bail



Raising filled can without leaving sidewalk



Swinging hoisting head to deposit can on sidewalk. Can pushes gate open



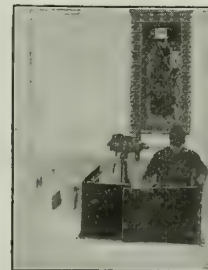
Can deposited on sidewalk without lifting. Gate automatically closes



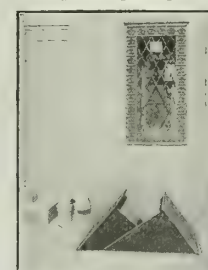
Four filled cans raised without leaving sidewalk



Lowering empty cans. Hoisting handle does not revolve



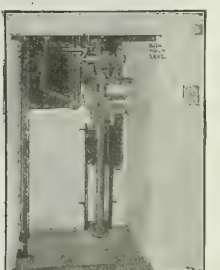
Operator descending iron ladder to cellar level



As hoisting head is lowered, doors automatically close; bell rings



Sidewalk doors closed and automatically locked



Hoist in area, compact, out of the way

FIG. 9. OPERATING THE G & G TELESCOPIC HOIST, IN CONNECTION WITH THE G & G AUTOMATIC SIDEWALK DOOR OPENING AND CLOSING DEVICE WITH SPRING GUARD GATE

Note that one man, unaided, performs entire operation. Sidewalk doors are self-locking, whether open or shut



Device and sidewalk doors shipped with hoist to any part of the United States. Blue print is furnished, showing how to erect. It is our custom to subject each hoist door opening and closing device with spring guard gate, and sidewalk doors to a thorough working test before shipment. For this reason, and also because it makes for ease of installation at the building, *this company prefers to furnish its own sidewalk doors with each hoist and opening and closing device.*

#### PRICES, MODEL A HOIST

Model A Hoist, G & G automatic sidewalk door opening and closing device with spring guard gate, and sidewalk doors to cover an opening 4 by 4 ft., f. o. b. cars, New York, N. Y. .... \$310.00

Model A Hoist, G & G automatic sidewalk door opening and closing device with spring guard gate and sidewalk doors to cover an opening 4 by 4 ft., with weatherproof electric alarm bell to warn pedestrians, with battery, wiring, etc., all complete as required by the Department of Public Works, erected complete in New York, N. Y. .... \$370.00

NOTE—A small additional charge is made if distance from area floor to sidewalk exceeds 15 ft.

The prices include sidewalk doors to cover an area or opening 4 by 4 ft., which is the size recommended. However, doors are furnished to fit any size of opening and prices are forwarded on request. Vault light doors also furnished. Iron ladders \$1.10 per lin. ft., f. o. b. cars New York. Iron ladders \$1.30 per lin. ft. erected complete, New York, N. Y., in connection with model A hoist

#### Model B Overhead Crane Hoist.

Illustrations (Figs. 10 and 11) show the G & G telescopic overhead crane hoist. This hoist is so arranged that the operator, standing at grade level, may raise ash can from cellar to position 6 or 7 ft. above grade, and empty can directly into cart, without re-handling at grade level. This hoist has the telescopic

feature, so that no part shows above pavement when not in use.

ADVANTAGES—Hoist is equipped with *automatic gear shifting brake device and silencer* (Figs. 14 and 15).

Hoist is so designed that it is practicable for one man to perform entire operation of raising ash cans, emptying direct into ash wagon and lowering empty cans to cellar. Operator "hooks" the swing bail cans in same manner as with Model A hoist (Fig. 3).

Raises maximum load of 300 lbs. at speed of 30 ft. per minute. On request, hoist with adjustable guy rods running from top of hoist to building walls will be constructed. When hoist is so arranged, its maximum working capacity is 500 lbs.

CAPACITY—No part has a factor of safety of less than 8, based on the ultimate strength of the material when maximum load is raised.

SIZE OF AREA—It is strongly recommended that area be 4 by 4 ft. in size (Fig. 5). This gives the operator room enough to do his work. If necessary, smaller area may be provided, but it is not as practicable.

ASH CANS—G & G standard 17 by 24 ins. hoisting cans with swing bail are especially recommended for use with Model B hoist. No other cans will work as well. For prices see third page following.

HOW TO SPECIFY—Furnish and install, where indicated on plans, one G & G Telescopic Overhead Crane Hoist with Automatic Gear Shifting Brake Device and Silencer. (Model B.)

#### PRICES, MODEL B HOIST

Model B hoist f.o.b. cars New York, N. Y. (without can) ..... \$225.00

Erected complete by GILLIS & GEOGHEGAN in New York, N. Y. (without can) ..... \$255.00

Model B hoist, G & G sidewalk door opening and closing device with spring guard gate, and sidewalk doors to cover an opening 4 by 4 ft. f.o.b. cars New York, N. Y. .... \$375.00

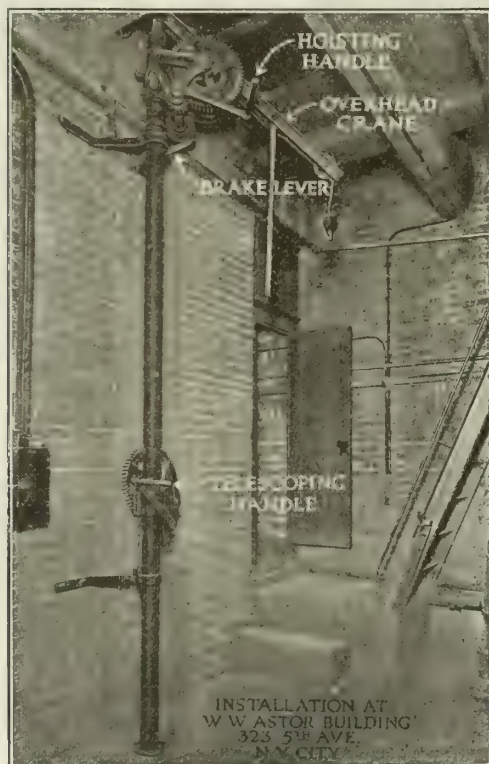


FIG. 10. WHEN NOT IN USE MODEL B HOIST TELESCOPES AND NO PART SHOWS ABOVE GRADE LEVEL. SIDEWALK DOORS MAY BE CLOSED DOWN FLUSH WITH PAVEMENT



FIG. 11. MODEL B HOIST IN OPERATION. POSITION OF OPERATOR WHEN CAN IS BEING RAISED



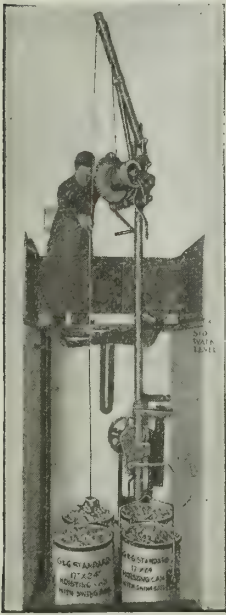


FIG. 12. MODEL B HOIST IN CONNECTION WITH DOOR OPENING AND CLOSING DEVICE WITH SPRING GUARD GATE

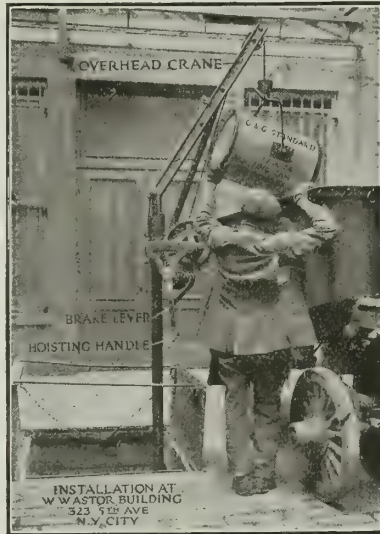


FIG. 13. MODEL B HOIST IN OPERATION

Hoisting head revolves on ball bearings and can be emptied into wagon without re-handling at grade level

PRICES, MODEL B HOIST (Continued)

Model B Hoist, G & G automatic sidewalk door opening and closing device with spring guard gate, and sidewalk doors, to cover an opening 4 by 4 ft., with weatherproof electric alarm bell to warn pedestrians, with battery, wiring, etc., all complete as required by the Department of Public Works, erected complete in New York, N. Y. .... \$450.00

NOTE—A small additional charge is made if distance from area floor to sidewalk exceeds 15 ft.

**Model E Telescopic Hoist, Electric.**

This hoist operates by electric power and provides for hoisting and lowering, between cellar and sidewalk, ash cans, kegs, barrels, ice, etc. When not in use no part shows above sidewalk. Hoist is compact, very easy to erect, no pit is required, and blue prints are furnished showing erection in detail. It is subjected to working test before shipment; and all parts are painted one coat except machined parts, which are coated with grease.

**A ONE-MAN HOIST**—One man, unaided, can perform entire operation of ash removal.

**MOTOR**—Hoist has a 1½ h.p. totally enclosed motor (series wound for direct current, squirrel cage for alternating current), with brake, automatic upper limit, and single speed controller; giving one hoisting and one lowering speed. Lubrication is effected throughout by means of grease forced through compression cups.

**SPEED**—Hoist raises maximum load of 500 lbs. at actual speed of 60 ft. per minute.

**SIZE OF AREA**—It is strongly recommended that area be 4 by 4 ft. in size (Fig. 5). If necessary, a smaller area may be provided, but it is not as practicable.

**DOOR OPENING AND CLOSING DEVICE**—The G & G automatic door opening and closing device with spring guard gate, described on a preceding page, is recommended for use with Model E hoist.

**PRICES**—Furnished on request.

**HOW TO SPECIFY**—Furnish and install, where indicated on plans, one G & G Telescopic Hoist with Electric Motor Model E.

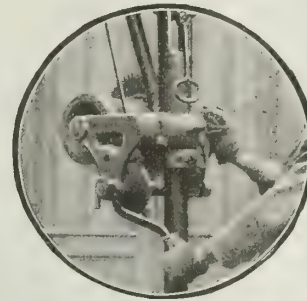


FIG. 14. AUTOMATIC GEAR SHIFTING BRAKE DEVICE IN OPERATION



FIG. 15. SHOWING THE AUTOMATIC GEAR SHIFTING BRAKE DEVICE

A single movement of break lever automatically shifts gears and applies brake so that load is lowered with no movement of hoisting handle



FIG. 16. WHEN NOT IN USE MODEL E HOIST TELESCOPES AND NO PART SHOWS ABOVE STREET LEVEL. SIDEWALK DOORS MAY BE CLOSED DOWN FLUSH WITH PAVEMENT



**Model D Hoist with Electric Motor.**

This hoist (Fig. 17) is intended for use in large buildings where the grade level approach permits ash wagons to drive up alongside of hatch leading to boiler room.

**ADVANTAGES**—Hoist has 1½ h.p., series wound, totally enclosed motor and automatic upper and lower limit.

Raises maximum load of 300 lbs. at speed of 60 ft. per minute. The can, shown in Fig. 17, weighs 200 lbs. when filled with ashes.

This hoist is so arranged that the operator may raise ash can from cellar to position 6 or 7 ft. above grade and empty can directly into cart without re-handling at grade level.

When not in use, hoist telescopes and *no part shows above pavement.*



FIG. 17. MODEL D HOIST IN OPERATION

When can is being raised, automatic upper limit shuts off power and overhead crane revolves to swing can over wagon



FIG. 18. MODEL D HOIST IN OPERATION

Hoisting head revolves on ball bearings and can is emptied into wagon without re-handling at grade level

**ASH CANS**—G & G standard 17 by 24-in. hoisting cans with swing bail are specially recommended for use with Model D hoist.

No other cans will work as well.

**SIZE OF OPENING**—It is strongly recommended that opening at grade level be 4 by 4 ft. in size (Fig. 5). If necessary, a smaller area may be provided, but it is not as practicable.

**DOOR OPENING AND CLOSING DEVICE**—The G & G automatic door opening and closing device with spring guard gate, described on a preceding page, is recommended for use with Model D hoist.

**PRICES**—Furnished on request.

**HOW TO SPECIFY**—Furnish and install, where indicated in plans, one G & G Telescopic Overhead Crane Hoist with Electric Motor, Model D.

**Model C Hoist with Electric Motor.**

This hoist (Fig. 19) is used in larger hotels, office buildings and institutions, where daily ash removal involves a large number of cans, also where boilers are placed at a considerable distance below grade level.

**ADVANTAGES**—Hoist has 1½ h.p., series wound, totally enclosed motor and automatic upper and lower limit.

Raises maximum load of 500 lbs. at speed of 60 ft. per minute.

General features of construction same as Model A hoist.

**SIZE OF OPENING**—It is strongly recommended that opening in sidewalk be 4 by 4 ft. in size (Fig. 5). If necessary, a smaller area may be provided, but it is not as practicable.

**DOOR OPENING AND CLOSING DEVICE**—The G & G automatic door opening and closing device with spring guard gate, described on a previous page, is recommended for use in connection with G & G telescopic hoist Model C.

**PRICES**—Furnished on request.

**HOW TO SPECIFY**—Furnish and install, where indicated in plans, one G & G Telescopic Hoist, with Electric Motor, Model C.

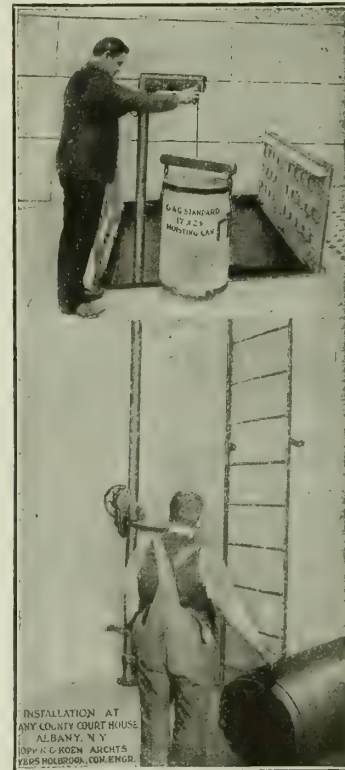


FIG. 19. MODEL C HOIST IN OPERATION

When can is being raised, automatic upper limit shuts off power and hoisting head revolves on ball bearings to deposit can on sidewalk without lifting



### G & G Improved Hoisting Cans.

These ash cans are manufactured in GILLIS & GEOGHEGAN'S factory, especially for use with their hoists, and are constructed throughout of No. 16-gage galvanized iron, reinforced at top and bottom with  $\frac{1}{4}$  by  $1\frac{1}{4}$ -in. steel bands. The thickness and weight of the No. 16-gauge iron (very much heavier than the material ordinarily used in making ash cans) makes for great strength and durability.

This company recommends the use of the G & G standard 17 by 24-in. hoisting can *with swing bail* in all cases with Model B hoist and Model D hoist, also with Model A hoist, in buildings where *only one man* is employed to remove ashes. The swing bail can is "balanced," that is, the can may be easily emptied and will not spill the ashes when being raised. The swing bail is so arranged that it will not drag on the floor when can is being handled in the cellar, and will "stay put" when raised above can.

The use of the G & G standard 17 by 24-in. hoisting can is recommended with Model C hoist. This type of can may also be used with Model A hoist, in buildings *where more than one man* is employed to remove the ashes.

#### PRICES

G & G standard 17 by 24-in. hoisting can \$6.25 each; \$67.50 per dozen, f.o.b. cars New York, N. Y.

G & G standard 17 by 24-in. hoisting can with swing bail, \$7.00 each; \$75.60 per dozen, f.o.b. cars New York, N. Y.



FIG. 20. STANDARD HOISTING CAN



FIG. 21. G & G HOISTING CAN WITH SWING BAIL  
Patented March 13, 1917

### Samples.

Demonstrations can be seen at the Architects Samples Co.'s rooms, 101 Park Avenue, New York, N. Y.

### References.

The following architects have repeatedly specified the G & G telescopic hoist:

Clyde S. Adams, Philadelphia, Pa.  
 Ballinger & Perot, Philadelphia, Pa.  
 Donn Barber, New York, N. Y.  
 W. W. Bosworth, New York, N. Y.  
 F. J. Berlenbach, Brooklyn, N. Y.  
 D. A. Bohlen & Son, Indianapolis, Ind.  
 Brown & Von Beren, New Haven, Conn.  
 Claude Bragdon, Rochester, N. Y.  
 Edgar Blair, Seattle, Wash.  
 Brainerd & Leeds, Boston, Mass.  
 Cross & Cross, New York, N. Y.  
 Cram & Ferguson, Boston, Mass.  
 Carrere & Hastings, New York, N. Y.  
 C. Howard Crane, Detroit, Mich.  
 Paul A. Davis, 3rd, Philadelphia, Pa.  
 Delano & Aldrich, New York, N. Y.  
 Elmer E. Dunlap, Indianapolis, Ind.  
 J. H. Felt & Co., Kansas City, Mo.  
 C. S. Frost, Chicago & Northwestern R. R., Chicago, Ill.  
 Cass Gilbert, New York, N. Y.  
 C. P. H. Gilbert, New York, N. Y.  
 Bertram G. Goodhue, New York, N. Y.  
 Edward M. Gee, Toledo, Ohio  
 R. V. L. Haxby, Minneapolis, Minn.  
 Hunt & Hunt, New York, N. Y.  
 F. A. Henninger, Omaha, Nebr.  
 Halstead & Sullivan, Duluth, Minn.  
 F. Burrall Hoffman, New York, N. Y.  
 Hewitt & Emerson, Peoria, Ill.  
 Wm. B. Ittner, St. Louis, Mo.  
 C. H. Johnston, St. Paul, Minn.  
 Joseph & Joseph, Louisville, Ky.  
 Thomas M. James, Boston, Mass.  
 Louis E. Jallade, New York, N. Y.  
 W. W. Knowles, New York, N. Y.  
 Albert Kahn & Ernest Wilby, Detroit, Mich.  
 H. E. Kennedy & Co., Pittsburgh, Pa.  
 Thomas W. Lamb, New York, N. Y.  
 C. Howard Lloyd, Harrisburg, Pa.  
 McKim, Mead & White, New York, N. Y.  
 McKenzie, Voorhees & Gmelin, New York, N. Y.  
 W. R. McCornack, Cleveland, Ohio  
 Maginnis & Walsh, Boston, Mass.  
 H. Van Buren Magonigle, New York, N. Y.  
 Milburn, Heister & Co., Washington, D. C.  
 Malcolmson & Higginbotham, Detroit, Mich.  
 Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio  
 P. Thornton Marye, Atlanta, Ga.  
 Lewis F. Pilcher, Albany, N. Y.  
 Frank L. Packard, Columbus, Ohio  
 Parish & Schroeder, New York, N. Y.  
 Peabody, Wilson & Brown, New York, N. Y.  
 Chas. A. Platt, New York, N. Y.  
 John Russell Pope, New York, N. Y.  
 John T. Rowland, Jr., Jersey City, N. J.  
 C. W. & G. L. Rapp, Chicago, Ill.  
 Reimer & Herlin, Marshalltown, Iowa  
 Richards, McCarty & Bulford, Columbus, Ohio  
 Rutan & Russell, Pittsburgh, Pa.  
 Sanguinet & Staats, Houston, Texas  
 J. B. Snook Sons, New York, N. Y.  
 Starrett & Van Vleck, New York, N. Y.  
 C. B. J. Snyder, New York, N. Y.  
 Leon E. Stanhope, Chicago, Ill.  
 Trunk & Gordon, St. Joseph, Mo.  
 Tracy & Swartwout, New York, N. Y.  
 Trowbridge & Livingston, New York, N. Y.  
 Horace Trumbauer, Philadelphia, Pa.  
 Van Ryn & De Gelleke, Milwaukee, Wis.  
 Warren & Wetmore, New York, N. Y.  
 James A. Wetmore, Washington, D. C.  
 Wyatt & Nolting, Baltimore, Md.

#### OTHER REFERENCES

United States Government  
 Ford Motor Company  
 Pennsylvania Railroad  
 United Cigar Stores Co. of America  
 American Telephone & Telegraph Co.  
 Willys-Overland Co.

# THE HASLETT SPIRAL CHUTE CO.

FACTORY AND ENGINEERING DEPARTMENT  
Southeast Corner Westmoreland and 23d Streets  
PHILADELPHIA, PA.

SAN FRANCISCO OFFICE, 310 California Street

BALTIMORE OFFICE, 523 Calvert Building

## Products.

SPIRAL CHUTES, GRAVITY ROLLER CONVEYORS, BELT and CHAIN CONVEYORS, INCLINED ELEVATORS.

Automatic Hoists, Fire Doors, etc.

## Spiral Chutes.

The Haslett spiral chute has a patented concave bottom which causes a counterbalance between gravity, centrifugal force and friction. It offers the only solution of speed control of packages on gravity slides.

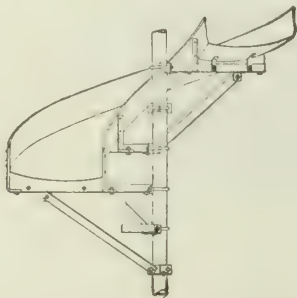


FIG. 1. STANDARD CONSTRUCTION HASLETT SPIRAL CHUTE

## Gravity Roller Conveyors.

Haslett ball bearing roller conveyor has shafts hung in patented adjustable shaft holders. These are easily adjustable on side rails for spacing rollers, and permit of training for straight travel. Side rails are not weakened by punching.

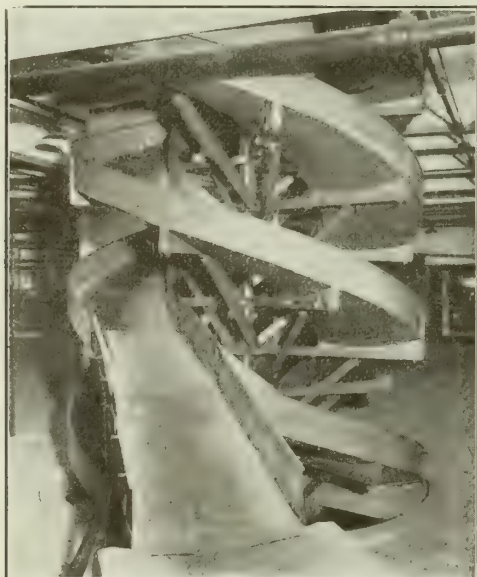


FIG. 2. TRIPLE CHUTE, AUSTIN, NICHOLS & CO., BROOKLYN, N. Y.

Showing tangent delivery switch from triple spiral

## Vertical Lifts.

THE HASLETT SPIRAL CHUTE CO. have several standard designs of vertical lifts suitable for heavy warehouse work, jobbing house requirements, factory service, department store work, and for handling trays of dishes between basement and upper restaurant floors. These are made to operate both up and down, and from one or both sides. Special vertical conveyors are also designed for any requirements for which standard machines are not suited.

## Bakery Conveyors.

Special conveyors are designed for handling hot bread from the ovens, tins of delicate crackers, etc.; and complete equipment for bread and cracker bakeries are laid out and designed by the engineering department.

## Power Driven Conveyors.

For mail order houses, department stores, factories, etc. A specialty is made by this company of devising and laying out complete systems, including belt and chain conveyors, inclined elevators, etc., with noiseless transmission.

The Haslett treatise on speed control in spiral chutes will be mailed on request, and information will be furnished on special conveyors for any kind of work. Correspondence is solicited with architects, engineers and builders.

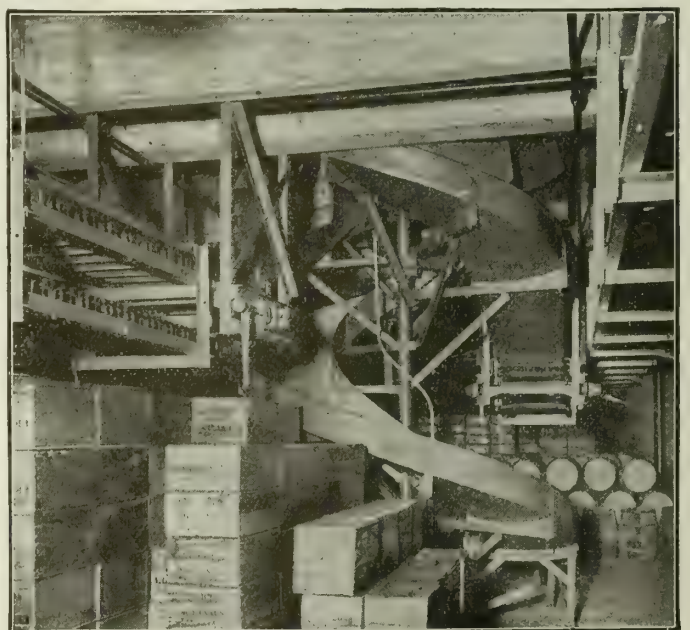


FIG. 3. TRIPLE HASLETT SPIRAL CHUTE, AUSTIN, NICHOLS & CO., BROOKLYN, N. Y.

Two troughs delivering to power driven, ball bearing, pallet conveyors; and one trough to first floor



# THE LAMSON COMPANY

Builders of Pneumatic, Electrical and Conveyor Apparatus

100 Boylston Street  
BOSTON, MASS.

WORKS  
LOWELL, MASS.  
TORONTO, CANADA

## REPRESENTATIVES

NEW YORK, N. Y., 15 West 44th Street  
PHILADELPHIA, PA., 1200 Walnut Street  
BALTIMORE, MD., 10 East Fayette Street  
CHICAGO, ILL., 6 North Michigan Avenue  
DETROIT, MICH., 97 Woodward Avenue  
MINNEAPOLIS, MINN., 221 Tribune Annex  
CINCINNATI, OHIO, 119 East Fifth Street  
INDIANAPOLIS, IND., cor. Washington and  
Illinois Streets  
CLEVELAND, OHIO, 2063 East Fourth Street

SAN FRANCISCO, CAL., 617 Mission Street  
ST. LOUIS, MO., 709 Pine Street  
ROCHESTER, N. Y., 174 South Clinton Avenue  
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SEATTLE, WASH., 215 Stewart Street  
PITTSBURGH, PA., 319 Third Avenue  
DENVER, COLO., 1622 Arapahoe Street  
OMAHA, NEB., Room 675, Brandeis Building  
LOS ANGELES, CAL., 627 Broadway  
TORONTO, ONT., 136 Simcoe Street

For Texas, Oklahoma, New Mexico and Western Louisiana Business, refer to  
THE LAMSON COMPANY OF TEXAS, DALLAS, TEX.

## Products.

PNEUMATIC TUBES; SELECTIVE PICK-UP and SWEEP-OFF CARRIERS; AUTOMATIC TRAY CONVEYORS; BELT CONVEYORS; GRAVITY ROLLER CONVEYORS; LIGHT HAND and ELECTRIC POWER ELEVATORS and LIFTS for carrying papers and materials in industrial plants.

Wire Line Cash and Parcel Carriers, Sheet Writers' and Drivers' Bins for carrying cash, sales slips and parcels.

## Scope of Use.

Used in stores, offices, factories, libraries, banks,

hotels, post offices, etc., for carrying money, papers and materials between departments or buildings.

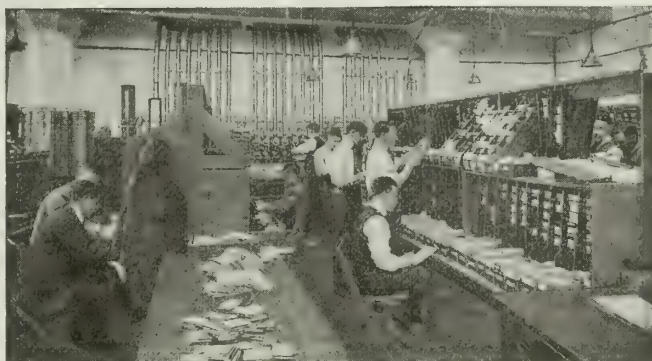
## Co-operative Service.

Architects, engineers and contractors are invited to avail themselves of Lamson experience and service. Specialists employed by this company are constantly solving complicated conveying and carrying problems. Full information covering any problem to which Lamson conveyors may be adapted will be gladly furnished.



LAMSON GRAVITY ROLLER CONVEYOR

Carries boxes, barrels and any kind of container with one flat surface. Conveyors consume no power and save time, money and labor. Systems designed to fit problem on hand



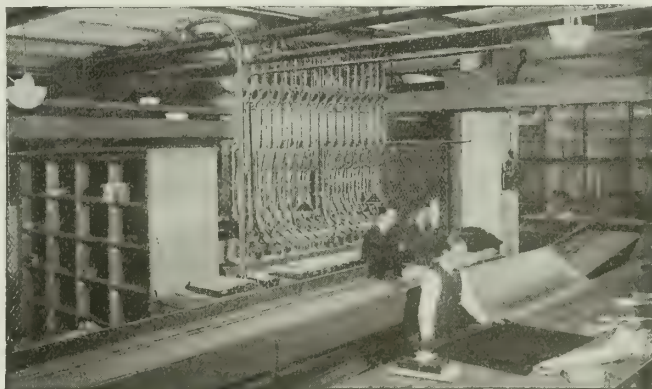
CENTRAL PLANNING DEPARTMENT OF LARGE MANUFACTURING COMPANY

Main office constantly in touch with the work of each department. No chance for misunderstanding oral messages



INSTALLATION OF LAMSON GRAVITY CONVEYORS AND CHUTES IN SEARS, ROEBUCK & COMPANY'S SEATTLE WAREHOUSE

Shipments for points south take the right-hand chute. The problem of how to separate the thousands of packages for ready shipment to various states was solved by these conveyors and chutes.



LAMSON TUBES AND CONVEYORS IN DEPARTMENT STORE

Pneumatic tubes handle money and sales slips in a speedy and economical manner. Conveyors are used to save time and money in collection and delivery of parcels. Both systems designed to meet need of each store



# LOWERATOR COMPANY INC.

244-46 West 23d Street  
NEW YORK, N. Y.

## Products.

THE LOWERATOR; TRAY ELEVATORS; SPIRAL CHUTES and GRAVITY ROLLERS; SPECIAL CONVEYING MACHINERY; ROLLER SPIRALS and INCLINES.

## The Lowerator.

A patented machine to lower merchandise, without power—discharges automatically. Built for erection anywhere, either by local or our own skilled mechanics, if required. Working drawings and diagrams for this purpose will be supplied.

**ADVANTAGES**—The Lowerator combines efficiency, reliability, and simplicity of operation. Economy, as it operates without "power," eliminating the services of an attendant. Time saving, as it is automatic and positive in action. Workmanship and materials used to the best possible advantage in its manufacture and erection. The first cost is practically the only one, enabling it to pay for itself soon after it is installed. Permits quick movement of merchandise from the upper floors to the shipping room. Can be built any height and arranged to discharge on packing tables or conveyors. Enables trucks and wagons to make more deliveries on account of the rapidity with which they can be loaded. Eliminates the use of flat trucks on the shipping floor. No time is lost in loading. The operative risks are reduced to a minimum. A modern and systematic freight handling method.

**DESIGN AND CONSTRUCTION**—The Lowerator consists of a series of cars, equally spaced, attached to endless cables, which engage sheave wheels at upper and lower terminals. An iron partition divides the cars lowering merchandise from the empty ones returning on the opposite side.

**OPERATED BY GRAVITY**—No power required—weight of merchandise upon the cars starts the machine.

**SPEED**—The speed is controlled by an automatic governor brake (patented) and can be regulated to any speed, always maintaining same, irrespective of varying weights placed upon the cars. A brake lever, conveniently placed on the shipping floor, controls the entire machine. This can be locked at any time.

**CARS**—Cars are built of finger type and arranged to discharge by passing through a chute of similar construction. They travel between guides, which assures stability.

**STOPPING AND LOCKING**—The equipment includes a hand brake rope connected with the stopping and locking device at each floor, so that the machine may be stopped and locked at any point, allowing the lowering of merchandise from one floor to another and facilitating the loading of heavy packages.

**DISCHARGING CHUTE**—Substantially built of iron and arranged to receive goods deposited by cars. Length is made to meet requirements. Cut-out chutes installed to facilitate automatic discharge at intermediate floors.

**MATERIAL**—The entire construction is of steel and iron throughout.

**TYPES**—Lowerators are built in standard sizes. For capacity, dimensions and other particulars, see table. Lowerators also built to meet special requirements.

## Vertical Tray Elevators.

For elevating and lowering merchandise of any description. Automatic receiving and discharging chutes. Electric and mechanical control. Direct motor connections or belt drive.

## Spiral Chutes.

Open type chutes built in sizes to meet particular requirements.

## Gravity Rollers and Conveyors.

Designed to handle goods packed in cases, cartons, etc. Built in required widths, portable lengths, and adjustable stands.

## Roller Spirals and Inclines.

Roller spirals and incline conveyors designed and built for all purposes.

## References.

### LOWERATORS

F. H. Leggett & Co., New York  
J. E. Linde Paper Co., New York  
Seaman Bros., New York  
The F. Widlar Co., Cleveland, Ohio  
Kinney & Levan Co., Cleveland, Ohio  
Pepperell Mfg. Co., Biddeford, Me.  
Eastern Drug Co., Boston, Mass.  
Shapleigh Hardware Co., St. Louis, Mo.  
W. H. Maule, Inc., Philadelphia, Pa.  
Letts-Parker Grocer Co., St. Joseph, Mo.  
Park & Tilford, New York  
Foley Bros. & Quinlan, St. Paul, Minn.  
Nathan-Dohrmann Co., San Francisco, Cal.  
Fischer Bros., Seattle, Wash.  
Wm. H. Walker & Co., Buffalo, N. Y.  
Philadelphia Wholesale Drug Co., Philadelphia, Pa.  
T. G. Bush Grocery Co., Mobile, Ala.  
Feilbach & Co., Toledo, Ohio  
Bering-Cortes Hardware Co., Houston, Tex.

### VERTICAL TRAY ELEVATORS

Victor Talking Machine Co., Camden, N. J.  
Pennsylvania Warehouse & Safe Deposit Co., Philadelphia, Pa.  
Howard Lamp Co., Newark, N. J.  
W. K. Prudden & Co., Lansing, Mich.  
Morley Bros., Saginaw, Mich.  
Baltimore Bargain House, Baltimore, Md.  
Endicott, Johnson & Co., New York  
Hulman & Co., Terre Haute, Ind.  
Klaxon Co., Newark, N. J.

### DETAILS OF STANDARD LOWERATORS

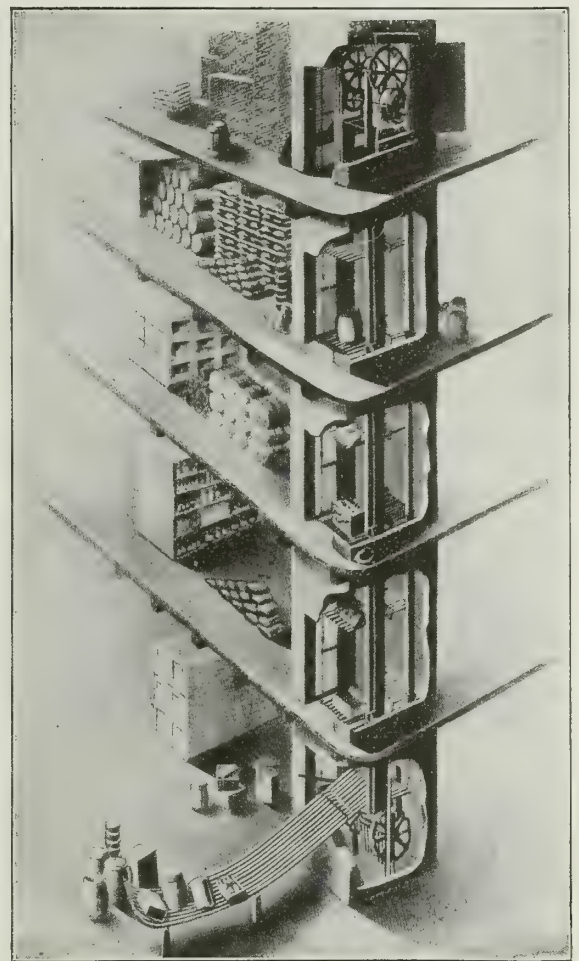
INFORMATION REQUIRED FOR ESTIMATES, DISTANCE FROM LEVEL OF TOP FLOOR TO FLOOR OF SHIPPING DEPARTMENT

Number of Machine	AA		A		B		C		D	
	Depth	Width	Depth	Width	Depth	Width	Depth	Width	Depth	Width
Size of shaft required if enclosed.....	84"	76"	76"	56"	60"	46"	54"	42"	38"	28"
Size of shaft required if not enclosed.....	84"	62"	76"	48"	60"	38"	54"	32"	38"	24"
Size of cars.....	36"	48"	26"	36"	24"	28"	20"	24"	14"	16"
Maximum size of package carried.....	42"	52"	32"	38"	28"	30"	24"	26"	16"	18"
Maximum height of package carried.....	60"		54"		54"		48"		36"	
Carrying capacity per car, lbs.....	800		500		400		200		50	
Machine can be loaded to extent of lbs.....	4,000		3,000		2,000		1,500		600	
Distance between cars.....	6'-8" — 8'-0"		6'-8" — 8'-0"		6'-0"		5'-6" — 6'-0"		4'-0" — 5'-0"	
Speed per minute, in ft.....	60 to 80		60 to 80		60 to 100		60 to 120		60 to 120	
Discharging chute, length in ft.....	16'-0"		16'-0"		14'-0"		12'-0"		10'-0"	
Especially adapted for the requirements of	Warehouses, dock companies, dry goods and paper jobbers		Loft buildings, hardware jobbers and dept. stores		Grocery, drug, confectionery, hardware and shoe jobbers		Drug and shoe jobbers, candy and cracker factories		Handles small packages of every description	

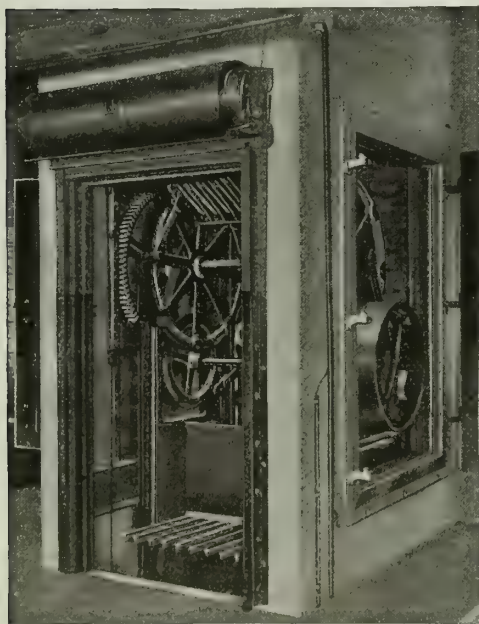




DISCHARGE CHUTE OF LOWERATOR INSTALLED IN WAREHOUSE  
View of shipping floor



LOWERATOR WITH ENCLOSURE, AS INSTALLED IN MERCANTILE HOUSES  
Installations also made without enclosure



MANNER OF ENCLOSING UPPER TERMINALS IN FIREPROOF SHAFTS

Door openings shown on sides of enclosures give access to working parts and accommodate gears and governor.

No roof openings necessary where ceiling is 8 ft. high.



Receiving Merchandise from Gravity Roller Conveyor, Carrying Same to Upper Floors



Automatically Discharging Merchandise to Floor Where it is to be Stored

#### VERTICAL TRAY ELEVATORS

Operated independently, or in connection with gravity roller systems; furnish a safe, speedy and economical method of handling merchandise. For use in warehouses, stores, manufacturing plants, wholesale establishments, etc.; equipped to elevate or lower barrels, baskets, containers, bags, cased goods and general line of light, heavy or bulky merchandise



# LINK-BELT COMPANY

Manufacturers of Elevating, Conveying and Power Transmission Machinery

PHILADELPHIA

CHICAGO

INDIANAPOLIS

## BRANCH OFFICES AND AGENCIES

NEW YORK, N. Y., 299 Broadway  
PITTSBURGH, PA., 1501 Park Building  
BOSTON, MASS., 49 Federal Street  
DETROIT, MICH., 732 Dime Bank Building  
ST. LOUIS, MO., Central National Bank Building

SEATTLE, WASH., 576 First Avenue, South  
SAN FRANCISCO, CAL., 461 Market Street  
LOS ANGELES, CAL., 161 North Los Angeles Street  
DENVER, COLO., LINDROOTH, SHUBART & Co., Boston Building  
NEW ORLEANS, LA., C. O. HINZ, Hibernia Bank Building

## Products.

ELEVATING and CONVEYING MACHINERY for handling all kinds of materials, including COAL and ASH HANDLING CONVEYORS; WATER INTAKE SCREENS for cleaning condenser water.

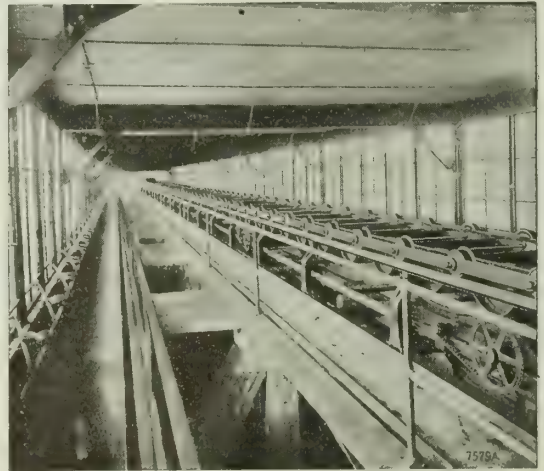
Coal Storage Systems; Link-Belt and Sprockets; Belt Conveyors; Silent Chain Drives for generators, power plant auxiliaries, etc.; Locomotive Cranes for storing coal; Coal Crushers; Coal Bunkers, Stoker Spouts and Gates; Wagon and Truck Loaders; Power Transmission Machinery.

## The Peck Pivoted Overlapping Bucket Carrier.

The superiority of the pivoted bucket carrier over the ordinary bucket or flight elevators and conveyors, for handling coal, ashes, stone and similar materials, is recognized by architects and engineers everywhere. The material is *carried*, eliminating injury or degradation, and reducing friction to a minimum, as well as the power required.

Sifting of material between the buckets is prevented by overlapping lips on the buckets. The Peck carrier is so constructed that the buckets are suspended from extensions of the inner links beyond the chain joints, so that, in passing around the corner wheels, they travel on a larger circle than the chain, as shown by the lower illustration. They are thus automatically separated at the turns; and as no overlap exists at these points, the overlap on the upper run is not affected by that on the lower run. There is no spillage at the turns or on the horizontal or vertical runs.

The Peck carrier is the only overlapping carrier in which, through its entire path, the buckets can always maintain their carrying position by gravity. It is the only one in

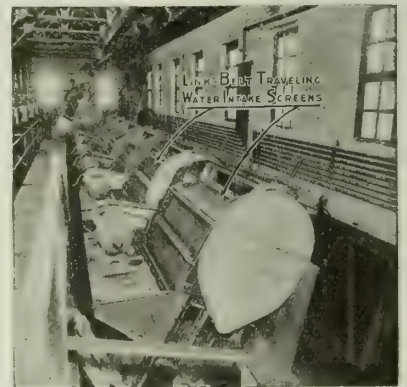


THE PECK CARRIER FOR COAL, ASHES, ETC.

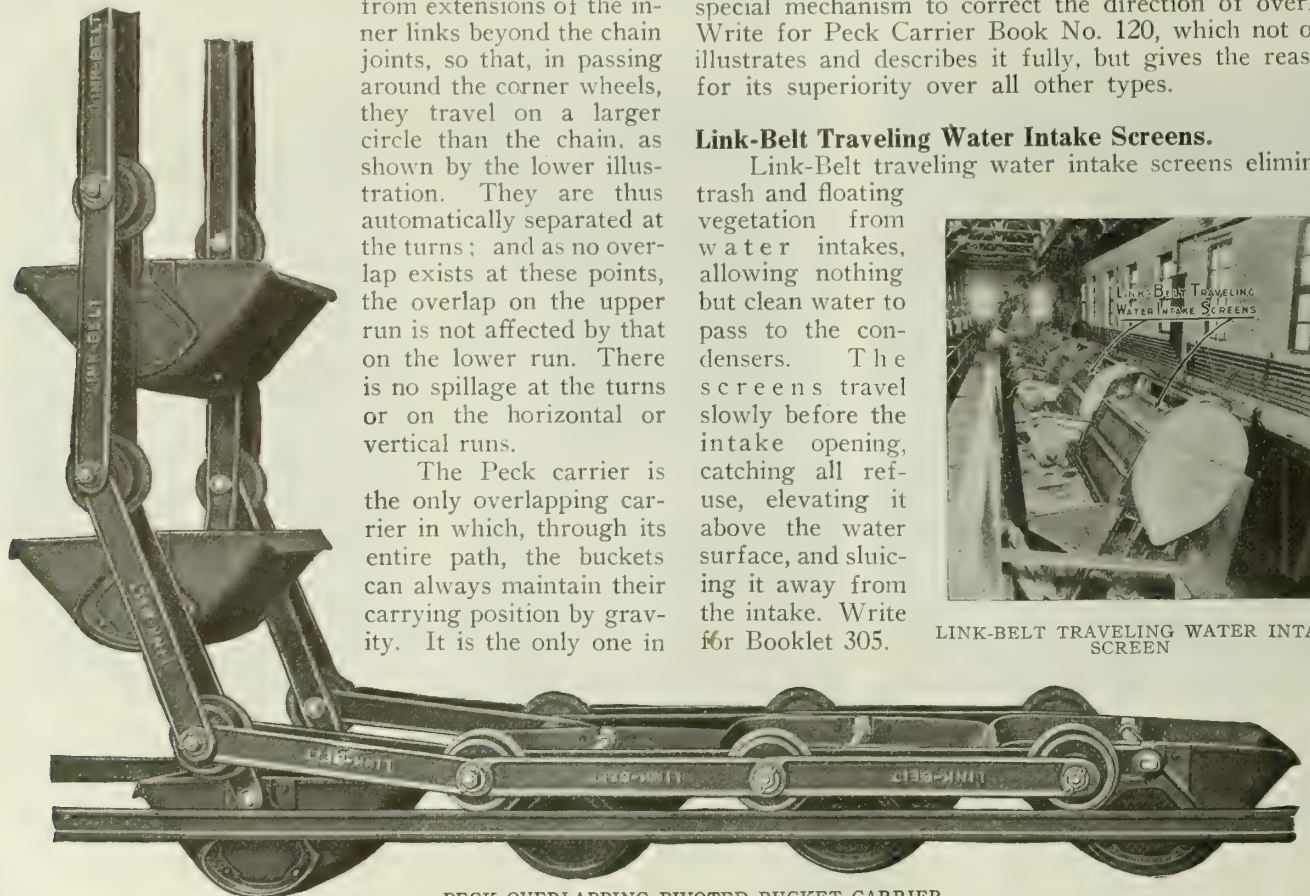
which a fully loaded bucket can make a complete circuit without discharging. In all other carriers, the buckets after discharging have to be manipulated by special mechanism to correct the direction of overlap. Write for Peck Carrier Book No. 120, which not only illustrates and describes it fully, but gives the reasons for its superiority over all other types.

## Link-Belt Traveling Water Intake Screens.

Link-Belt traveling water intake screens eliminate trash and floating vegetation from water intakes, allowing nothing but clean water to pass to the condensers. The screens travel slowly before the intake opening, catching all refuse, elevating it above the water surface, and sluicing it away from the intake. Write for Booklet 305.



LINK-BELT TRAVELING WATER INTAKE SCREEN



PECK OVERLAPPING PIVOTED BUCKET CARRIER



# MINNESOTA MANUFACTURERS' ASSOCIATION

Manufacturers of Labor Saving Conveying Machinery

OFFICE AND FACTORY  
NORTH ST. PAUL, MINN.

BRANCH OFFICES

CHICAGO

NEW YORK

BUFFALO

CLEVELAND

CINCINNATI

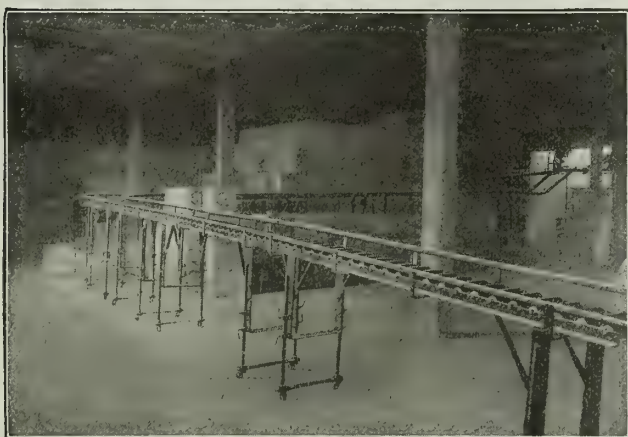
REPRESENTATIVES IN ALL PRINCIPAL CITIES

## Products.

GRAVITY ROLLER CONVEYORS; SPIRAL CHUTES;  
AUTOMATIC ELEVATORS; SPIRAL FIRE ESCAPES.

## Gravity.

Gravity is bridled, harnessed and hitched, ready for 24 hours' service in plant, yard or warehouse. Manufacturers and owners of stores and warehouses should make use of this mighty force, placed at their disposal by the MINNESOTA MANUFACTURERS' ASSOCIATION in their patented scientifically constructed spiral chutes, and gravity roller conveyors for conveying general merchandise, and save one-half the cost of handling boxed or cased merchandise, instead of continuing with old, laborious and expensive methods to handle materials. A large illustrated catalogue showing what gravity is doing for others will help them to make a decision. Write for it today.

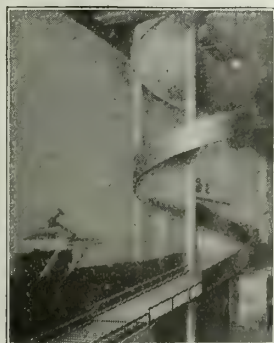


GRAVITY STEEL ROLLER BALL BEARING CONVEYORS

## Spiral Chutes.

This type of chute will save time and money, and enable shipments to go forward in double quick time.

Spiral chutes can be used with efficiency in gravity roller or belt conveyor systems. Merchandise can by this means be moved from topmost floor to ground level with only one handling—placing in the inlet chute or in the conveyor leading to the chute.



SPIRAL MERCHANDISE CHUTE AT BUTLER BROS., MINNEAPOLIS, MINN.

## Belt Conveyors.

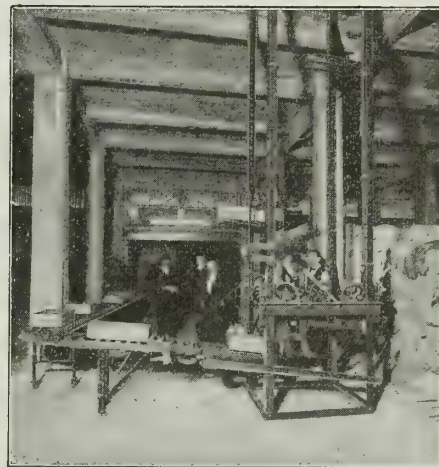
Now in general use in all large department stores for the economical handling of package merchandise. In ordinary practice merchandise is lowered on a gravity spiral chute to belt conveyor located in basement. Complete plans showing typical layout for department stores furnished on request.



BELT CONVEYOR

## Automatic Straight Lift Elevators.

Receive boxed and cased goods from gravity roller conveyors and elevate to higher floors, then release to receiving line of gravity roller conveyors. A box travels directly from car to place of piling.



GRAVITY ROLLER CONVEYORS AND AUTOMATIC ELEVATORS IN WHOLESALE GROCERY PLANT

## Spiral Fire Escape.

This is the modern, safe method of escaping from fire. The spirals are especially suitable for schools, asylums, hotels, etc. The capacity of the spiral escape is unlimited. A whole building can be emptied of its occupants in a few minutes, without congestion or injury.



SPIRAL FIRE ESCAPE



# SAMUEL OLSON & CO.

## Conveying and Elevating Machinery

2418-2422 Bloomingdale Avenue  
CHICAGO, ILL.

TELEPHONE:  
ARMITAGE 780, 781

### Products.

CONVEYING and ELEVATING MACHINERY for handling materials of every description:

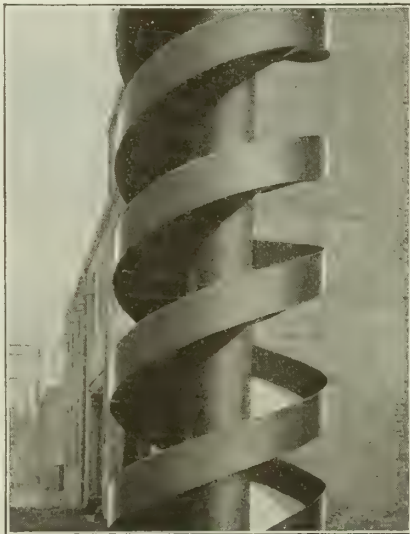
Coal and Ash Handling Elevators and Conveyors, Subveyors, Packing House Conveyors, Ice Handling Machinery, Spiral Chutes, Spiral Fire Escapes, Gravity and Belt Conveyors, Store and Office Service Conveyors, Patented Automatic and Pivoted Tray Elevators, Steel and Wood Apron Conveyors.

Power Transmission Machinery, Flour Blenders and Patented Automatic Proofers for Bakeries.

### Spiral Chutes.

Make possible direct delivery from any floor, regardless of height, to floor of final distribution.

Flights which enter into their completion are pressed from steel, being flanged on four sides. They are bolted together from the under-side, making an absolutely smooth sliding surface, which averts the remotest possibility of damaging merchandise in transit. Write for circular G.S.-1.



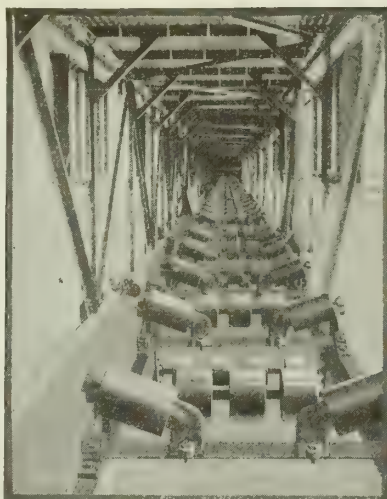
SPIRAL CHUTE

### Belt Conveyors.

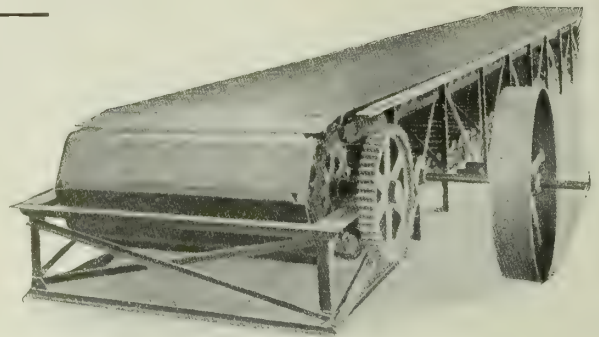
Can be utilized for carrying all classes of material. This company specializes in designing systems for varied requirements. The store and office service systems make possible substantial cuts in overhead expense.

The view at extreme right portrays an illustration of a comprehensive system of belt conveyors recently installed in the American Can Company's new Maywood, Ill., plant. Note the intermediate sections of gravity conveyors.

Belt conveyors, appropriately designed, are a positive medium with which to reduce handling cost to a minimum. The uses to which belt conveyors can be ad-



BELT CONVEYOR



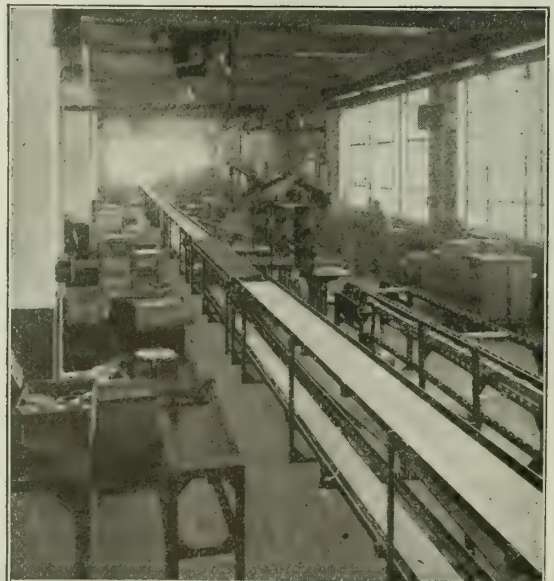
APRON CONVEYOR

Appropriate equipment for institutions having bulky and heavy merchandise to convey. Several different types manufactured for varied uses



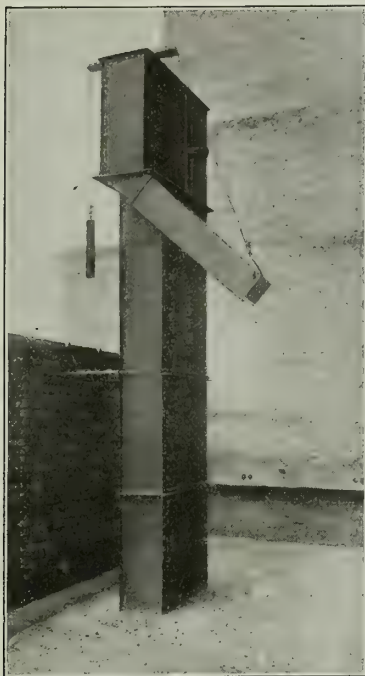
TERMINUS OF DOUBLE SPIRAL CHUTE, 7 STORIES IN HEIGHT, INSTALLED IN WEIBOLDT'S DEPARTMENT STORE, CHICAGO, ILL.

Delivers to 2 belt conveyors running in different directions carrying merchandise to points of final distribution



PORTION OF A COMPREHENSIVE CONVEYING AND ELEVATING SYSTEM RECENTLY INSTALLED IN AMERICAN CAN COMPANY'S PLANT AT MAYWOOD, ILL.



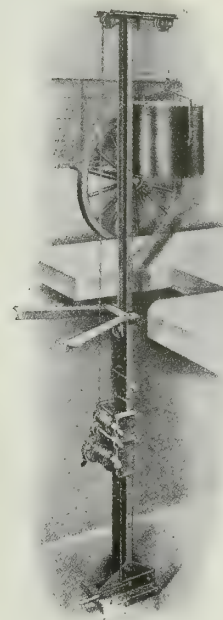


INSTALLATION OF OLSON ASH ELEVATORS IN WESTERN NEWS-PAPER UNION BUILDING, CHICAGO, ILL.



SECTIONAL VIEW OF OLSON'S POWER ELEVATOR

A complete line of elevators of this type, in either steel or wood, for handling commodities such as sand, gravel, cement, coal, ashes, grits, seed, grain, flour, ice, dry chemicals, lime, etc.



DISAPPEARING ASH LIFT

Designed especially for buildings such as apartments, stores and offices where fuel consumption necessitates a mechanical medium of handling which would not warrant equipment other than hand power

vantageously put are too numerous to mention; "a system for every requirement," being our slogan.

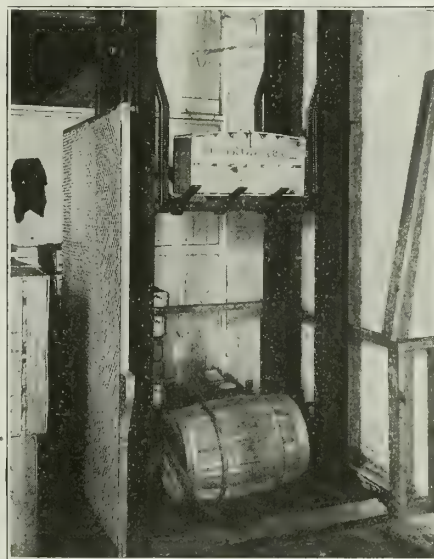
Making a specialty of designing, manufacturing and completely installing individual conveying and elevating systems, you can readily appreciate the advisability of consulting us when propositions of this type come up from time to time.

#### Automatic Elevators.

Olson automatic elevator will prove thoroughly efficient in the handling of packages, boxes, bags, etc., from the basement or lower floors, to any desired upper floors; also for the lowering of packages, etc., from any floor above to any floor below. In other words, goods may be elevated on the upward moving trays unloading automatically on any desired floor, and other goods



AUTOMATIC ELEVATOR



PIVOTED TRAY ELEVATOR

The logical equipment where exceptionally heavy or bulky merchandise is to be elevated

simultaneously, being lowered on the downward moving tray automatically unloading at any desired floor below.

#### Co-operative Service.

Architects should use the vast experience of SAMUEL OLSON & Co. in the solving of intricate handling-problems. The engineering department is ever ready to place at the architect's service experts in this line.

Previous to making final decision as to any type of conveying machinery, consult this company. Recommendations particularly adapted for exact conditions will be supplied.



# STANDARD STORE SERVICE, INC.

## Conveying Systems for Merchandise and Messages

GENERAL OFFICES AND FACTORY  
PLANTSVILLE, CONN.

BRANCH OFFICES

NEW YORK, N. Y., 304 Madison Avenue

CLEVELAND, OHIO, 2218 East 9th Street

### Products.

Manufacturers of CONVEYING SYSTEMS for money, papers, books and merchandise, including:

Wire Line Cash and Package Carriers.

Cable Carriers.

Pneumatic Despatch Tube Systems.

Belt and Gravity Roll Conveyors.

Tray Conveyors.

Sweep-off and Pick-up Carriers.

Hand Power and Push Button Light Lifts.

### Standard Cable Cash Carriers.

One important feature found only in Standard cable carriers is the unique design of the drop station.

In using this drop station, boxes going from one station to another do not go through intermediate stations, but remain on the main line until they reach the station for which they are intended.

This important feature means greatly increased speed in transit, obviates all danger from collision with the operators' hands, and reduces the strain on the cable; eliminates considerable noise; and, in short, is the most efficient drop station designed up to this time.

### Uses.

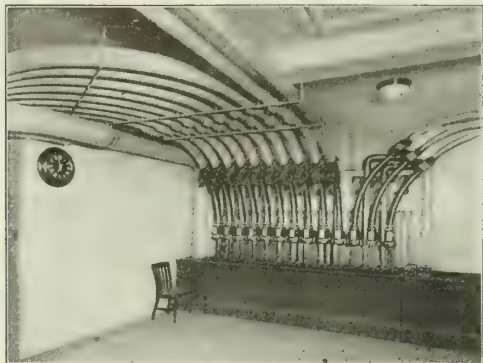
Our systems are extensively used in offices, stores, factories, banks, libraries, post offices, etc., for the conveyance of papers, money and merchandise between floors, departments and buildings.

### Repairs and Supplies.

This company manufactures and sells repair parts and supplies for all makes of systems at reasonable prices, and every inquiry or order will receive prompt attention.



A NOISELESS BOOK CONVEYOR



A 3-IN. BY 6-IN. PNEUMATIC TUBE CENTRAL STATION

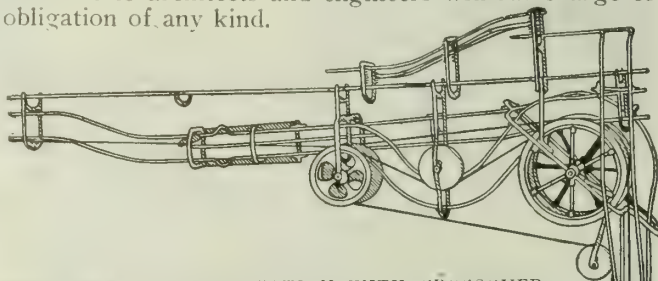
### Guarantee.

Every endeavor has been made to fully meet the most exacting conditions to which any and all parts of our systems are subjected; and are backed by liberal guarantees, made by a responsible and financially strong company.

### Services.

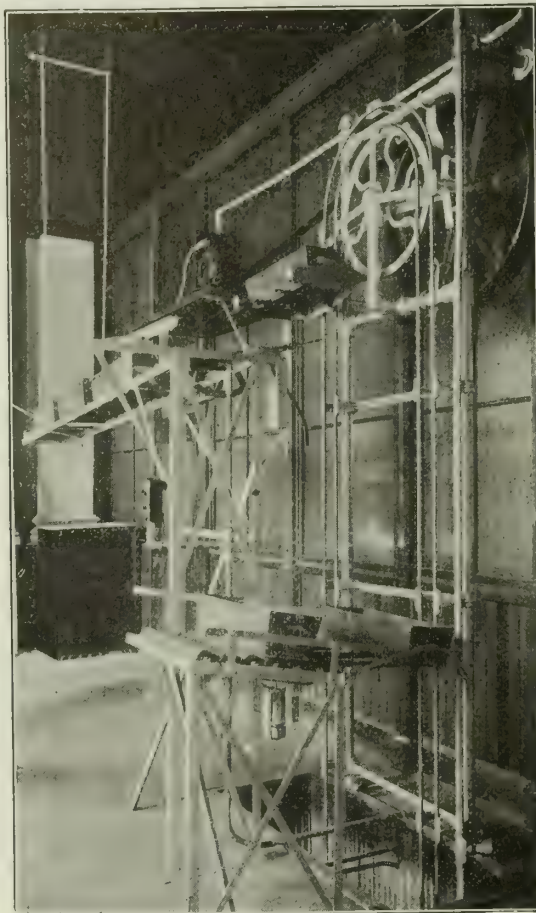
Separate booklets, covering these systems, and any other information, may be had on request.

The services of our engineering department are available to architects and engineers without charge or obligation of any kind.



ONE FORM OF DROP STATION WITH CROSSOVER

This station requires but 4 by 5 ins. of fixture or aisle space. Various forms and sizes of cars may be used on this track.



SELECTIVE DELIVERY TRAY CONVEYOR



# CARTER WHITE LEAD CO.

CHICAGO, ILL.

## DISTRIBUTING POINTS

NEW YORK, N. Y.  
PHILADELPHIA, PA.  
BUFFALO, N. Y.  
CLEVELAND, OHIO  
DETROIT, MICH.  
DALLAS, TEX.

PITTSBURGH, PA.  
ST. PAUL, MINN.  
ST. LOUIS, MO.  
NEW ORLEANS, LA.  
KANSAS CITY, MO.  
BOSTON, MASS.

JACKSONVILLE, FLA.  
CINCINNATI, OHIO  
MEMPHIS, TENN.  
SAVANNAH, GA.  
NEWARK, N. J.  
SAN FRANCISCO, CAL.

NASHVILLE, TENN.  
DULUTH, MINN.  
MINNEAPOLIS, MINN.  
ALBANY, N. Y.  
MILWAUKEE, WIS.  
OKLAHOMA CITY, OKLA.

## Products.

Manufacturers of STRICTLY PURE WHITE LEAD and RED LEAD.  
Litharge.

## Carter White Lead.

Carter White Lead is a high grade and standard product, noted for its extreme whiteness, fineness, superior body, uniformity and great durability, because perfectly corroded by the only modern and scientific process in the white lead industry.

Architects should not fail to specify "Carter" when white paint or soft, clear tints are desired.

## Carter Coach and Car Lead.

Carter Coach and Car Lead is a particularly high grade product, especially ground in bleached oil with reference to interior work. It is extremely white and fine. It flats well. Equally good for exterior work.

## Red Lead.

Carter Dry Red Lead is guaranteed to run 94% or over true red lead and to conform to government specifications.

## Distribution.

Carter White Lead is widely distributed through jobbers, and can be purchased of dealers in every locality.

Carter Lead is the only brand obtainable in every state and territory. Architects in New York, Chicago, Philadelphia, etc., may specify "Carter" to be used on a building in California or anywhere else, and the contractor can secure it.

## Prices.

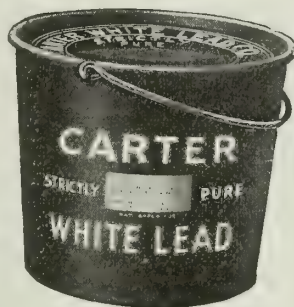
Prices are governed by the fluctuations of the metal market. Carter Lead is sold for about the same price as other standard brands.

## Specifications.

**WHITE LEAD FOR EXTERIOR**—Before any paint is applied, woodwork to be thoroughly dry. Apply no paint when raining or snowing. All knots and sappy places to be varnished with best grain-alcohol shellac.

**Priming Coat**—To be a thin coat of Carter Strictly Pure White Lead, linseed oil and turpentine, properly brushed into the pores.

All nailholes and other defects in surface to be puttied thoroughly after priming coat is dry.



TRADE-MARK

**Second and Third Coats**—To be Carter Pure White Lead, pure, well-settled linseed oil, pure turpentine and drier, mixed to proper consistency and colored to suit.

All new lumber requires 3 coats to produce a durable job.

**WHITE LEAD FOR INTERIOR WOOD WORK**—Surface to be put in proper condition for paint; all dust, dirt, loose paint, etc., removed; all knots and sappy places to be varnished with pure grain-alcohol shellac varnish.

**Priming Coat**—To be a thin coat of Carter White Lead (Coach and Car preferred), pure turpentine and white turpentine japan drier, thoroughly mixed and properly applied.

Putty all nailholes, cracks and other defects with linseed oil putty, composed of equal parts of Carter Lead and whitening, after priming coat is thoroughly dry.

**Second and Third Coats**—(Gloss finish, flat, eggshell gloss—architect to specify finish desired). Paint to be Carter Lead (Coach and Car preferred), pure, well-settled linseed oil, pure turpentine and pure turpentine white drier, colored to suit; paint to be carefully strained and brushed.

**WHITE LEAD FOR INTERIOR WALLS**—The idea that white lead and oil colors are possible only for the finest decorating on canvas covered or other walls is not fully justified. While the first cost of such decorating may exceed other forms a little, the ultimate cost is less. White lead tinted with oil colors produces superior clear and delicate tints which are truly washable. Decorating of this character is good for long service, until a change in color is wanted, in fact. Properly painted and starched, these walls may be washed as often as need be to keep them fresh and clean. "The Carter Paint Calculator" gives specifications in detail for plaster walls.

## Important to Architects.

We recommend letting the painting contract separate from the general contract, and that estimates be asked only from competent and reliable contracting painters.

In order to insure the carrying out of your specifications we have stamped the name "Carter" on the side of every keg. When the head is removed, your superintendent can still identify the package.

## Guarantee.

Carter White Lead is sold under the following guarantee, which is printed on every package:

This package contains 8% linseed oil, 92% carbonate of lead. The CARTER WHITE LEAD CO. will pay \$100 if adulterant is found in this package.

## Useful Information.

Every architect should have "The Carter Paint Calculator." Sent on request, no charge. It contains the answers to most paint questions, a complete list of the manufacturers of pure linseed oil and much other paint information.

# THE ARCO COMPANY-

ESTABLISHED 1880!

## Paints, Varnishes and Enamels

GENERAL OFFICES

Euclid Avenue and East 65th Street  
CLEVELAND, OHIO

FACTORIES AND LABORATORIES: Bessemer Avenue and East 79th Street

BRANCH OFFICES IN PRINCIPAL CITIES

### Products.

DUM DUM, a material for bonding plaster to concrete; ARCO RAYS, a super-white coating; ARCO VITROGRAIN, a liquid treatment for hardening concrete floors; ARCO N. B. WALL PRIMER, ARCO INCRETE COATING, ARCO FOUNDATION COAT, ARCO INHIBITIVE COATING.

### Dum Dum.

A material that insures the permanent adhesion of plaster to concrete surfaces. Has great elasticity and is exceptionally tenacious.

Dum Dum consists of a mixture of solid and liquid materials, the solid being a compound of asbestos fibre and suitable inert pigment.

The pigment is added with the asbestos fibre to obtain satisfactory working properties in the product as well as to properly regulate penetration of the oils and to develop suitable characteristics of elasticity in the dry film.

It is applied with a trowel, and can be used effectively in place of the brown or scratch coat if so desired.

Working demonstration and full detail on request.

#### USERS OF DUM DUM—

American Museum of Natural History, New York, N. Y.  
Metropolitan Museum of Art, New York, N. Y.  
Central Railroad of New Jersey, Jersey City, N. J.  
City of Chicago, Chicago, Ill.  
Firestone Tire & Rubber Co., Akron, Ohio  
Akron Pure Milk Co., Akron, Ohio  
Swetland Building, Cleveland, Ohio  
The May Company, Cleveland, Ohio  
Winton Hotel, Cleveland, Ohio  
Second Church of Christ, Scientist, Cleveland, Ohio

### Arco Rays.

The super-white coating for interior surfaces: brick, concrete, plaster and wood.

A high gloss paint which gives an enamel-like finish and has a light-diffusing value not equalled in any other paint. Retains its whiteness longer than anything else on the market. Oils used in Arco Rays are treated and prepared by a special process such as will insure the maximum whiteness for the longest period.

Walls painted with Arco Rays can be washed as often as desired without destroying the enamel finish.



TRADE-MARK

### SPECIFICATIONS FOR CONCRETE, BRICK AND PLASTER

For best results:

*First Coat*—Arco N. B. Wall Primer.

*Second Coat*—Arco Rays Flat.

*Third Coat*—Arco Rays Semi-Gloss.

If two coat work is desired:

*First coat*—To be a combination of Arco N. B. Wall Primer and Arco Rays Flat, in the proportion of 1 quart Arco Rays Flat to 1 gallon of Arco N. B.

Wall Primer.

*Second coat*—Arco Rays Semi-Gloss.

COVERING CAPACITIES—Arco N. B. Wall Primer, 250 to 300 sq. ft. to the gal.; Arco Rays Flat, 300 to 400 sq. ft. to the gal.; Arco Rays Semi-Gloss, 400 sq. ft. to the gal.

#### SPECIFICATIONS FOR WOOD SURFACES.

*First coat*—Arco Rays Flat.

*Second coat*—Arco Rays Gloss.

COVERING CAPACITY—Arco Rays Flat, 300 sq. ft. to the gal.; Arco Rays Gloss, 400 sq. ft. to the gal.

#### USERS OF ARCO RAYS:

General Electric Co., Fort Wayne, Ind.  
U. S. Post Office (Equipment Division), Washington, D. C.  
Republic Metal Ware Co., Buffalo, N. Y.  
The Delph Spinning Co., Philadelphia, Pa.  
Muncie Electric Light Co., Muncie, Ind.  
Arlington Mills, Lawrence, Mass.  
Liggett & Meyers Tobacco Co., New York, N. Y.  
Continental Can Co., Syracuse, N. Y.  
Washington Gaslight & Heat Co., Washington, D. C.

### Arco Vitrograin.

A chemical compound which, when applied to concrete, immediately enters into a chemical action with the cement and lime, and so combines the cement, lime and sand that the friction of trucking and walking can not tear these grains out of their bedding.

This method is wholly scientific in its operation, with the result that the porosity of the concrete is greatly reduced. As a consequence, the dusting is checked and the wearing properties of the floor are materially increased.

**SPECIFICATIONS—General**—All cement floors shall be given 3 liberal applications of Arco Vitrograin as manufactured and recommended by THE ARCO COMPANY, Cleveland, Ohio; the material to be delivered on the job in original and sealed packages and used in accordance with the manufacturer's instructions.

**Conditions of the Surface**—All rubbish, dirt, oil and grease shall be removed so as to permit of the Arco Vitrograin coming in direct contact with the cement. All grease or oil shall be removed from the floor by a careful washing with a solution of 3 lbs. of sal soda to 1 gal. water.



*Method to be Used in Applying Material*—Material shall be applied in such a manner as to secure a thorough saturation of the floor and the floor shall be soaking wet after each application.

The contractor may apply Arco Vitrograin with a brush or it may be applied with a sprinkling can, after which it shall be brushed over so as to secure a uniform distribution of the Arco Vitrograin treatment.

(a) The first application shall be 1 part Arco Vitrograin mixed with 2 parts of water.

(b) The second application shall be 1 part of Arco Vitrograin and 1 part water.

(c) The third application shall be 2 parts Arco Vitrograin and 1 part water.

#### USERS OF ARCO VITROGRAIN—

Eastman Kodak Co., Rochester, N. Y.

Indianapolis Light & Heat Co., Indianapolis, Ind.

B. Loewenbach & Sons, Milwaukee, Wis.

Nashua Manufacturing Co., Nashua, N. H.

Bausch & Lomb Optical Co., Rochester, N. Y.

Pittsburgh Electric Mfg. Co., Pittsburgh, Pa.

### Arco N. B. Wall Primer.

Provides a perfect base for the finishing coat, insuring an even, uniform flat surface; and in addition to this, it provides an alkali resisting film that prevents the free lime from burning through and spotting the outer surface.

### Arco Inhibitive Coating.

A positive non-corrosive or antirust steel and iron coating to be used as a primer and also as the finishing coats on all iron and steel structures exposed to the elements or where resistance to the action of acids or alkali is necessary.

The pigments and liquids used in the formation of Arco Inhibitive Coating were selected after the most exhaustive practical tests in Arco laboratories and also in the field.

*SPECIFICATIONS—General*—All exposed iron and steel surfaces shall be coated with Arco Inhibitive Coating as manufactured and recommended by THE ARCO COMPANY, Cleveland, Ohio; the material to be taken from original and sealed packages and used in accordance with the manufacturer's directions.

*Preparation of the Surface*—All metal shall be thoroughly clean and free from mill scale, rust, grease or any foreign substance.

*CAUTION*—No painting shall be done in wet weather and no paint shall be applied to a wet or damp surface.

Arco Inhibitive Coating shall be used as it comes in the original package; no thinners shall be added without the written consent of the engineer or architect.

*Shop Coat*—(a) The first coat shall be Arco Inhibitive Coating brushed out well to cover the surface properly.

(b) All surfaces to be riveted in the shop shall receive 2 coats of Arco Inhibitive Coating No. 20 (red) before being assembled.

(c) All surfaces to be riveted in the field shall receive 1 coat of Arco Inhibitive Coating No. 30 (green) in addition to the first coat of Arco Inhibitive Coating No. 20 (red) before leaving the shop.

(d) The necessary time shall be allowed for the paint to dry thoroughly before shipping.

*Field Coat*—(e) After erection, the work shall be touched up, covering all parts or spots where the previous coats have been marked or knocked off.

(f) The entire structure shall then receive a well-brushed coat of Arco Inhibitive Coating No. 40 (black).

### Arco Increte Coating.

Iron and steel that are embedded in concrete must possess the rust inhibitive quality and in addition thereto must resist the action of alkali that is present in all forms of concrete construction.

A very close study of this condition has been made by THE ARCO COMPANY and Arco Increte Coating is recommended as being unusually well fitted for this type of work.

*SPECIFICATION—General*—All steel to be embedded in concrete shall be coated with Arco Increte Coating as manufactured and recommended by THE ARCO COMPANY, Cleveland, Ohio; the material to be taken from original and sealed packages and used in accordance with the manufacturer's directions.

*Preparation of the Surface*—All metal shall be thoroughly clean and free from mill scale, rust, grease or any foreign substance.

*CAUTION*—No painting shall be done in wet weather and no paint shall be applied to a wet or damp surface.

Arco Increte Coating shall be used as it comes in the original package; no thinners shall be added without the written consent of the engineer or architect.

*Shop Coat*—(a) The first coat shall be Arco Increte Coating brushed out well to cover the surface properly.

(b) All surfaces to be riveted in the shop shall receive 2 coats of Arco Increte Coating No. 20 (red) before being assembled.

(c) All surfaces to be riveted in the field shall receive 1 coat of Arco Increte Coating No. 40 (black) in addition to the first coat of Arco Increte Coating No. 20 (red) before leaving the shop.

(d) The necessary time shall be allowed for the paint to dry thoroughly before shipping.

*Field Coat*—(e) After erection, the work shall be touched up, covering all parts or spots where the previous coats have been marred or knocked off.

(f) The entire structure shall then receive a well-brushed coat of Arco Increte Coating No. 40 (black).

### Arco Foundation Coat.

A bituminous coating manufactured for use as a dampproofing for foundation and other types of underground masonry where hydrostatic pressures are so slight as to make a more elaborate and complicated system of waterproofing unnecessary.

*SPECIFICATION—General*—Arco Foundation Coat, as manufactured and recommended by THE ARCO COMPANY, Cleveland, Ohio, is to be used on the exterior of all foundation walls and general substructural work under earth filling, where only slight seepage pressure is to be resisted; the material to be delivered on the job in original and sealed packages and used in accordance with the manufacturer's instructions.

*Preparation of the Surface*—The wall shall be thoroughly dry and free from any foreign substances which might prevent the Arco Foundation Coat from coming in direct contact with the surface.

*Application*—(a) The Arco Foundation Coat shall be applied with a flat wall brush and must be brushed out well, particular care being taken to insure the spreading of a heavy, uniform and continuous application. The application shall then be allowed to dry for at least 24 hours.

(b) A second coat shall then be applied and allowed to dry for at least 24 hours before the fill is thrown against it.

ESTABLISHED 1883

# THE BILLINGS-CHAPIN CO.

## House Paints, Cement Coatings, Varnishes, Stains and Enamels

438 Pearl Street  
NEW YORK  
TELEPHONE, WORTH 1354

1163 East 40th Street  
CLEVELAND, OHIO  
TELEPHONE, PROSPECT 1608

146 High Street  
BOSTON, MASS.  
TELEPHONE, MAIN 4137

### Products.

Manufacturers of COATINGS, Transparent and Opaque, covering all departments of EXTERIOR and INTERIOR treatment of surfaces—Wood, Metal, Cement, Stucco, Brick, Plaster.

CEMENT COATINGS, "DRIWAL" (Waterproofing); "BILCHACO" CEMENT FLOOR COATING; "ROSTNIGHT" (Antirust and Insulator for Structural Steel); "ARTONE" (for Wall Decoration and Plaster, Wood or Metal Ceilings).

House Paints, Shingle Stains, Roof Paint, "Flexo-Flint Finish," "Rubeffect" (a Flat Finish Varnish), "Flo-rite" (The Perfect White Enamel).

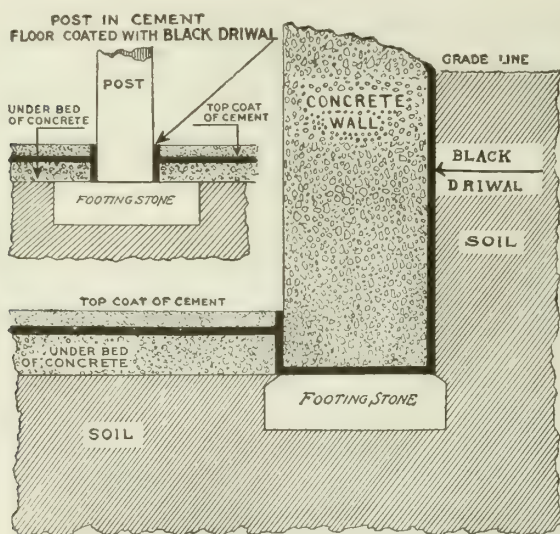
### "Driwal" Decoration for Concrete and Brick.

A waterproofing and decorative coating for cement, stucco, brick and similar surfaces. "Driwal" prevents dampness, efflorescence and staining. Made in 14 colors, including greens, browns, reds, yellows and stone colors; white and black; also, transparent. *"Driwal" will not blister or peel if properly applied. It penetrates, stains and preserves the texture of the surface. Has no disagreeable odor.*

**Driwal**  
TRADE-MARK

### Waterproofing for Heavy Pressure.

Black "Driwal," unlike tar, will not become brittle, and may be applied without heating. Made in three consistencies: No. 1, Standard Body; No. 2, Extra Heavy, especially desirable on rough work; and No. 3, Paste for filling cracks and crevices.



APPLICATION OF "DRIWAL"

Showing where Black "Driwal" should be used in waterproofing cement floors and foundation walls in damp locations, and also proper treatment of posts setting in cement floor

### Interior Painting—Walls, Ceilings, etc.

"Artone" produces the beautiful velvetlike flat finish so much desired for interior decoration of hos-



TRADE-MARK

pitals, schools, hotels, theaters, public buildings, apartment houses and residences. It is designed for use on smooth or rough plaster, cement, brick, wall board, and on metal or wood. It is sanitary, durable, and can be cleaned with soap and water or dis-

infectants.

It will not rub off as kalsomine and cold-water paints do, and is more sanitary than wall paper. Tiffany blends or French glaze effects are obtained with "Artone French Glaze."

**ARTONE**

TRADE-MARK

### "Rostnicht."

"Rostnicht" is a protective coating for steel, iron and other metals against rust. This coating is made along the lines indicated as best by the results of the investigation of the Cushman Laboratories as to the best protective coatings for structural iron, bridges, etc. It contains ingredients best calculated to act as insulators. It contains no asphaltum nor tar. It will successfully resist sulphuric acid fumes, brine and lubricating oil.

**ROSTNIGHT**

TRADE-MARK

"Rostnicht" is also especially suitable for metal roofs and other metal surfaces exposed to severe weather conditions, as it is an antirust coating of greatest durability. Seven colors and black.

### Specification and Estimate Book.

A very practical specification book for architects and engineers has been compiled by this company. The book is complete in every detail, giving full data on the different surfaces and woods and how best to treat them. A reliable cost guide is also included. Many architects insert this book in SWEET's opposite this page for ready reference. Send for a copy.

### References.

The following is a list of a few of the many prominent buildings where "Bilchaco" paints, varnishes, and kindred products have been used.

BUILDING	LOCATION
Yale University	New Haven, Conn.
West Baden Springs Hotel	West Baden, Ind.
War Department	Fortress Monroe, Va.
Mt. Washington Hotel	Bretton Woods, N. H.
Lincoln Memorial Hall	Hodgenville, Ky.
Cuyahoga County Court House	Cleveland, Ohio
The Alling & Corv Co.	Pittsburgh, Pa.
The New Greenbrier Hotel	White Sulphur Springs, W. Va.
Hotel Chamberlin	Old Point Comfort, Va.
Hotel Olmstead	Cleveland, Ohio
Carolina Hotel	Pinehurst, N. C.
University of Michigan	Ann Arbor, Mich.
Hotel Wentworth	Portsmouth, N. H.
Eastman Kodak Co.	Rochester, N. Y.
Hotel Champlain	Bluff Point, N. Y.
Michigan Soldiers' Home	Grand Rapids, Mich.



ESTABLISHED 1900

## DE SOTO PAINT MFG. CO.

MEMPHIS, TENN.

BRANCH OFFICES

DALLAS, TEX., 409-417 North Lamar Street

MOBILE, ALA., Dauphin and Water Streets

**Products.**

MEMPHI FRESCO PAINT; MEMPHI OIL STAINS; MEMPHI VARNISHES; LILLY WHITE ENAMELS; MEMPHI CONCRETE WATERPROOF COATING, for Brick, Cement, etc.

Memphi Shingle Stains, several varieties of Structural Varnishes and Stains, Wall and Floor Coatings and Finishes, Washable Paints, Enamel Paints, Stucco Mixtures, Fillers, Sizine, Preservatives for Wood, Brick, etc.

**Memphi Fresco Paint.**

A pure linseed oil, flat wall finish, absolutely free from acids, alkalis or varnish gums. Finishes with soft velvet luster of a water color fresco; is washable, durable, unfading and sanitary.

**DIRECTIONS FOR PLASTERED WALLS**—Patch all cracks and holes, if not too large, with strictly pure putty. If too large, use Keene's cement.

In applying the paint, first, apply 1 coat of Memphi Fresco Paint, thinned with pure boiled linseed oil to any desired consistency.

Second, apply 1 coat Memphi Sizine.

Third, apply 1 coat Memphi Fresco Paint, thinned with about from a quarter to a half pint of turpentine to each gallon of paint.

Although the above directions are recommended, very good results may be had by applying, first, a coat of mixture composed of Memphi Fresco mixed with equal parts of either Memphi Sizine or boiled linseed oil.

Second, apply 1 coat of Memphi Fresco Paint, thinned with a little turpentine.

**DIRECTIONS FOR PAINTING OLD WALLS**—Wash the walls clean with benzine, gasoline, or soap and water, being careful to rinse thoroughly with clean water if soap be used. Patch all cracks and holes, and apply 1 coat of Memphi Fresco Paint, thinned with a little turpentine. Where 2 coats are necessary, thin the first coat with boiled linseed oil and the last coat with turpentine.

**Memphi Oil Stains.**

A durable, penetrating stain for new work where a finishing coat of varnish is to be used.

**ADVANTAGE**—This company has adopted and uses the only one-color standard generally recognized in the finishing of furniture and mantels, viz.: the standard of the Grand Rapids Furniture Manufacturers' Association, which, when applied to window and door frames and other inside trim, affords a perfect match for all kinds of interior decoration. All natural wood color effects are obtained by the specification and use of Memphi Oil Stains.

**SPECIFICATIONS—For Structural Woodwork**—For open grain woods such as oak, ash, walnut and mahogany, fill with a suitable paste filler. Apply 1 coat Memphi Oil Stain of desired shade, and wipe lightly to bring out beauty of grain.

After 24 hours, apply thin coat of Orange Shellac.

After 24 hours, when dry, apply first coat of Memphi Brilliant Interior, reduced 10% with turpentine.

After 24 hours, apply second coat of Memphi Brilliant Interior.



BUCKET OF MEMPHI  
FRESCO PAINT

After 48 hours, rub with curled hair, and apply third coat of Memphi Brilliant Interior.

After 72 hours, for eggshell gloss, rub with burlap, pumicestone and oil. For polished finish, rub with felt, pumicestone and water; and polish with rottenstone and water.

**For Finest Work, Exterior**—Specify Memphi Outside Spar. For close grain woods omit the paste filler; otherwise proceed as above.

**For Floors**—For open grain woods fill with a suitable paste filler. Apply 1 coat Memphi Oil Stain of desired shade, and wipe lightly to bring out beauty of grain.

After 24 hours, apply first coat of Memphi Floor Varnish, reduced 10% with turpentine.

After 12 to 24 hours, apply second coat of Memphi Floor Varnish, full body.

After 12 to 24 hours, apply third coat of Memphi Floor Varnish, full body.

After 48 hours for eggshell gloss, rub with burlap, pumicestone and oil.

**For Waxed Floors**—Fill with a suitable paste filler, and apply a mixture composed of equal parts Memphi Floor Varnish and turpentine. Sand lightly with fine sandpaper, then wax and polish.

**Lilly White Enamel.**

The company has perfected a new system for white enameling on wood, which has reduced the cost of white enamel for interior woodwork, so that it is now possible to obtain results with 4 coats on bare wood (even yellow pine), where, heretofore, from 6 to 8 coats were necessary.

**SPECIFICATIONS**—First coat, apply Memphi Fillac (an oil shellac); second coat, Lilly White Flat; third coat, Lilly White Flat; sand lightly with 00 sandpaper; fourth coat, Lilly White Enamel.

If a rubbed effect is desired, use a coat of Lilly White Flat in place of Lilly White Enamel.

**Memphi Concrete Waterproof Coating.**

A strictly monolithic combination paint and waterproof coating for concrete or cement work. It is made to dry either flat or with a gloss. It can be used on stone or stucco with equally good results. On concrete floors the gloss finish gives a beautiful tilelike effect. It is especially fine for stucco and concrete block houses, because of its durability and water resisting features.

**USES**—It can be used on floor either gloss or flat. It is sanitary; it keeps cement dust from rising; prevents water, oil, grease and other stains from penetrating and staining the concrete. It makes rooms lighter and brighter. It reduces vibration, noise and underfoot resistance. It prevents wear, and, when disintegration of cement has set in, it gives reinforcement. Where used for outside work when a flat finish is desired, it produces beautiful ornamental effects, and waterproofs and preserves the work.

**References.**

Notable buildings on which Memphi Fresco Paint has been specified:

Municipal Building, Eagle Building, Adams Express Company, and Hotel Astor, New York; Third National Bank Building, Candler Coca-Cola Building, Atlanta; American Savings Bank & Trust Co., L. & N. Depot, Empire Building, Birmingham; New Union Depot, Southern Express Building, New Country Club, Falls Building, Bank of Commerce & Trust Co., Memphis; Patton Hotel, Chattanooga; Belmont College and Maxwell Hotel, Nashville; Grunewald and St. Charles Hotels, New Orleans.

# HAMPDEN PAINT & CHEMICAL CO.

MAIN OFFICE AND WORKS  
SPRINGFIELD, MASS.

DISTRIBUTING AGENCIES  
BOSTON, MASS. NEW YORK, N. Y.  
Address all correspondence to main office

## Products.

"HAMPDEN" MILL WHITE for mill and factory walls and ceilings.

"HAMPDEN" INTERIOR FLAT FINISH for hospitals, offices and public buildings.

"HAMPDEN" CEMENT FLOOR COATING.

"HAMPDEN" MILL ENAMEL for interior mill trim.

"REGAL" WALL COATING, a Cold Water Paint.

"HAMPDEN" STRUCTURAL PAINT for the protection of structural iron and steel.

"HAMPDEN" CONCRETE FLOOR HARDENER for concrete floors.

"RUBERCOAT" ELASTIC CARBON PAINT for waterproofing roofs, and all walls below grade.

"HAMPDEN" PIPE ENAMEL for hot and cold interior piping systems.

"HAMPDEN" VARNISHES for all classes of work—exterior and interior.

"HAMPDEN" READY MIXED PAINT for exterior use.

"HAMPDEN" PERMANENT GREEN for all exterior work.

"HAMPDEN" ALMANDINE REDS for exterior use.

"HAMPDEN" PRIMERS.

## "Hampden" Mill White.

This paint is particularly adapted for brightening interiors of mills, factories and industrial plants, and may be applied to walls, ceilings and columns of wood, brick and concrete. Possesses great light reflecting qualities. It will not chip, scale or turn yellow; is permanent and washable, and is supplied in 3 finishes.

**MILL WHITE GLOSS**—For use in rooms free from moisture. Insures permanent high gloss. Exceptional ease of spread and covering capacity.

**MILL WHITE EGGSHELL**—Has a semigloss finish, great covering capacity, and opaqueness combined with ease of spread.

**MILL WHITE FLAT**—For use as an undercoat for gloss and eggshell finishes, and interiors where moisture and steamy conditions exist. A permanent, velvety finish, pleasing to the eye.

### SPECIFICATION DATA

**For New Surfaces**—Surfaces must be dry and free of all loose particles. All knots and sappy places in woodwork should be coated with shellac of good body.

**For Old Surfaces**—Surfaces must be dry, and cleaned of loose particles by wire brushing.

Previous applications of whitewash or similar coatings removed and the surface left clean.

Grease and oil stains removed and the surface coated with shellac.

**First Coat**—Concrete, brickwork, and plastered surfaces given 1 coat "Hampden" Concrete Primer brushed well into pores. Allow at least 24 hours drying time.

Unpainted galvanized surfaces given 1 coat "Hampden" Galvanized Iron Primer. Woodwork given 1 coat "Hampden" Mill White Primer. Allow at least 48 hours drying time.

**Second Coat**—1 coat "Hampden" Mill White Flat. Allow at least 48 hours drying time.

**Third Coat**—1 coat "Hampden" Mill White—Flat, Eggshell or Gloss, as desired.



TRADE-MARK

Flat or eggshell finish when necessary to be made workable by addition of "Hampden" Mill White Thinners in proportion of not greater than 10%. Gloss used as it comes in the package.

**NOTE**—The second coat of "Hampden" Mill White Flat may be omitted for 2-coat work; it is not advised, unless surface has been previously painted, and old paint is in good condition. "Hampden" paints may be obtained from HAMPDEN PAINT & CHEMICAL Co., Springfield, Mass.

### COVERING CAPACITIES OF HAMPDEN MILL WHITE AND PRIMERS

Hampden Concrete Primer on concrete and brick.....200 sq. ft. per gal.  
Hampden Mill White Primer on wood.....350 sq. ft. per gal.

### ON BRICK AND CONCRETE OVER HAMPDEN CONCRETE PRIMER

Hampden Mill White Flat.....350 sq. ft. per gal.  
Hampden Mill White Gloss.....350 sq. ft. per gal.  
Hampden Mill White Flat over Flat.....400 sq. ft. per gal.  
Hampden Mill White Gloss over Flat.....400 sq. ft. per gal.

### ON WOOD OVER HAMPDEN MILL WHITE PRIMER

Hampden Mill White Flat.....400 sq. ft. per gal.  
Hampden Mill White Gloss.....450 sq. ft. per gal.  
Hampden Mill White Flat over Flat.....450 sq. ft. per gal.  
Hampden Mill White Gloss over Flat.....450 sq. ft. per gal.

## "Hampden" Interior Flat Finish.

This is an unexcelled sanitary, washable, oil base flat finish for old and new plastered surfaces, metal ceilings, composition board and woodwork. Excellent as an undercoat for enamel finishes. Particularly adapted for interiors of hospitals, offices, public buildings and residences. Made in 10 standard tints, also black and white, and special shades when quantity warrants. A slow setting paint, which permits ease of application, and prevents the appearance of brush marks or laps on finished surface. Covering capacity, approximately 1 gal. for 500 to 700 sq. ft. 1 coat, according to surface to be painted.

### SPECIFICATION DATA

**Preparation and First Coat**—New woodwork must be dry and clean. Priming coat "Hampden" Interior Flat Finish thinned with pure linseed oil in proportion not greater than 20%. Allow at least 48 hours drying time. Putty all nailholes; after this, coat with "Hampden" White Lead Putty and sandpaper smooth.

New brick and concrete surfaces must be dry. Apply 1 coat "Hampden" Concrete Primer. Allow at least 24 hours drying time.

New plaster surfaces must be dry. Holes and cracks filled neatly with plaster of Paris, which is to be allowed to set hard. Apply 1 coat "Hampden" Interior Flat Finish mixed with equal parts "Hampden" Sealing Compound. Allow at least 24 hours drying time.

Metal surfaces must be dry and cleaned of all loose particles, grease, etc. Galvanized surfaces treated with 1 coat "Hampden" Galvanized Iron Primer.

**Second Coat**—1 coat "Hampden" Interior Flat Finish (color selected).

**Third Coat**—1 coat "Hampden" Interior Flat Finish (same shade as second coat); flowed on with as little brushing out as possible. Paint to be thinned to easy working consistency with pure turpentine, in proportion not greater than 10%.

"Hampden" paints may be obtained from HAMPDEN PAINT & CHEMICAL Co., Springfield, Mass.



**"Hampden" Cement Floor Coating.**

This is a sanitary, washable, decorative paint for cement floors in hospitals, schools, office buildings, halls, etc. It hardens the surface and prevents cement dust, thus lengthening the life of even the best concrete floors. Easily kept clean. It is oilproof, therefore very valuable for use in garages, factories and engine rooms. Not intended for wet basement floors.

**SPECIFICATION DATA**

*Preparation*—Surfaces coated must be dry and broom clean. All oil and grease removed. Floors on ground, or exposed to moist conditions, to be given 1 thorough coat "Hampden" Concrete Primer. Allow at least 24 hours drying time.

*First Coat*—1 coat "Hampden" Cement Floor Coating (color selected), brushed well into pores with a good solid brush. Allow at least 48 hours drying time.

*Second Coat*—1 coat "Hampden" Cement Floor Coating. Allow at least 48 hours drying time.

*Third Coat*—1 coat "Hampden" Cement Floor Coating. Allow 48 hours before surface is used, and 1 week before exposure to severe usage.

"Hampden" paints may be obtained from HAMPDEN PAINT & CHEMICAL Co., Springfield, Mass.

**"Hampden" Mill Enamel.**

This enamel is used for mill trim where neatness is desired, and where white walls and posts are liable to become soiled by contact. Furnished in various shades of highest quality for the painting of dados, etc.

**SPECIFICATION DATA**

*Preparation*—After overhead painting has been completed as far as possible, walls, posts, partitions and stair runs are to have a dado 6 ft. high, true to a line at the top. Surfaces to be thoroughly dry, and all loose particles removed. Grease and oil stains to be removed as well as possible.

*Priming*—1 coat "Hampden" Concrete Primer to all brick and concrete work, brushed well into pores. Allow at least 48 hours drying time.

*First Coat*—1 coat "Hampden" Mill Enamel Flat (color selected). Allow at least 48 hours drying time.

*Second Coat*—Finishing coat "Hampden" Mill Enamel Gloss. Allow at least 24 hours drying time.

Consistency of all paints to be made workable by the addition of "Hampden" Mill White Thinners in proportion not greater than 10%.

"Hampden" paints may be obtained from HAMPDEN PAINT & CHEMICAL Co., Springfield, Mass.

**"Regal" Wall Coating.**

This is a white, free flowing, fire retarding, cold water paint which forms a velvety appearing surface that is pleasing to the eye. It contains no deteriorating glue, therefore does not scale, rub or peel off. Materials used are not softened by heat or affected by cold.

Approximate covering capacity of 10 lbs.: brick, 300 sq. ft.; wood, 400 sq. ft.; metal, 500 sq. ft.

**"Hampden" Structural Paint.**

This paint forms a permanent coating to protect structural iron and steel, and is a most efficient rust inhibitor. Made in 5 colors, and in special shades when quantity warrants.

**SPECIFICATION DATA**

*Shop Work*—All metal surfaces must be thoroughly scraped and cleaned of all rust, mill scales, dirt and dust. All grease removed and surfaces dusted. Apply 1 heavy coat "Hampden" Structural Gray No. 502; thinned, if necessary, by addition of pure turpentine in proportion not greater than 10%. All surfaces inaccessible when assembled to receive 2 coats before assembling.

*Erection*—After erection, all rust spots and places where paint is off to be thoroughly cleaned. All edges, rivets, nuts and bolt heads to receive an extra coating of above paint. Dip all bolts before placing.

*Finishing*—2 coats "Hampden" Structural Paint (of shade selected). Allow from 3 to 5 days' drying time for previous coat. Nothing but strictly pure settled linseed oil shall be used in reducing, and in proportion not greater than 15%.

"Hampden" paints may be obtained from HAMPDEN PAINT & CHEMICAL Co., Springfield, Mass.

**"Hampden" Liquid Concrete Floor Hardener.**

For hardening, wearproofing and dustproofing concrete floors. Chemically transforms the concrete—colorless.

If used according to directions, 1¼ gals. will cover 100 sq. ft. of surface, 3-coat work.

**"Rubercoat" Elastic Carbon Paint.**

This is a black protective coating with a heavy elastic body that will not blister. It does not dry quickly, but becomes firm and well set when exposed to the wind and sun for 1 or 2 days. Cold, salt air or water does not affect it. Longer wearing and better protecting than mineral paints. Will not crack, blister nor peel off, and has a high luster. Particularly adapted for roofs of steel and iron structures, pipe, waterproofing below grade, etc.

Guaranteed to effectively stop all leaks from pin point size to 2 ft.

Directions for applying to any type of roof, and for patching leaks, sent on request.

**"Hampden" Pipe Enamel.**

This enamel is adapted for hot or cold interior piping, and forms a permanent coating for the preservation of metal pipe. Made in shades adopted by the American Society of Mechanical Engineers.

**"Hampden" Varnishes.**

Each of these varnishes is made for its particular class of work, exterior and interior. They fulfill every service required.

**"Hampden" Ready Mixed Paints.**

A pure linseed oil paint, durable, beautiful and economical. Made especially to withstand exterior exposure. Furnished in 32 shades. Special shades when quantity warrants.

**"Hampden" Permanent Greens.**

"Hampden" Permanent Greens are made expressly for blinds, shutters and all exposed surfaces. They are bright, non-fading colors, possessing a covering and hiding power that is economical and time saving. Made in chrome and bronze shades.

**"Hampden" Alamandine Reds.**

These reds are brilliant permanent colors of great covering capacity and exceptional quality. They are not affected in any way by the chemical action of acid or alkali. Particularly desirable for railways, store fronts, signs, etc., and in all cases where hard service is required. Put up in any desired quantity in dry, oil, japan, or ready made form.

**Packages.**

Paints in quantities are shipped in barrels equipped with mechanical agitators.

**Publications.**

Bulletins and pamphlets covering the different paints will be sent on request.

A book of specifications for painting is offered with the idea that it may prove of assistance to the busy architect and engineer, and may be had on application.

# HARRISON WORKS

OWNED AND OPERATED BY E. I. DU PONT DE NEMOURS & CO.

Manufacturers of Paints, Colors, Varnishes and Pigments

35th Street and Grays Ferry Road  
PHILADELPHIA, PA.

## BRANCH OFFICES

NEW YORK, N. Y., 6 East 39th Street  
CHICAGO, ILL., 2001 Mendel Street  
MINNEAPOLIS, MINN., 918 South 4th Street

KANSAS CITY, MO., 1221 West 9th Street  
BOSTON, MASS., 8 Portland Street  
NEWARK, N. J., 272 Passaic Street

## Products.

HARRISONS PAINTS: Town & Country; Sanitary Flat, Sanitary Gloss; Du-Lite; Wire Screen; Inside Floor; Floor and Deck; Aluminum, Antoxide Rust Inhibitive; Ferro-Keep Rust Inhibitive; Flat Black; Smokestack; Exterior Mill; Graphite.

HARRISONS PURE WHITE LEAD.

HARRISONS PURE RED LEAD.

HARRISONS WHITE ENAMEL UNDERCOATING.

HARRISONS FLOWKOTE ENAMEL.

HARRISONS VARNISHES: Damar; French Wax Finish; Vitrolac Interior, Vitrolac Exterior; Vitrolac Floor; Vitrolac Flat; Seat Finish; Cabinet Finishing and Rubbing; Ideal Interior; Ideal Hard Oil; Ideal Floor; Transparent Hard Oil; Spar; Extra Coach; No. 1 Coach; Light Coach; Hard Oil Finish.

HARRISONS STAINS: Oil Stains; Decorative Stains; Creosote Shingle Stains.

HARRISONS WALL SIZING.

HARRISONS SHELLAC; KWI-K-LAC, a substitute for shellac.

HARRISONS DISTEMPER COLORS; OIL COLORS.

HARRISONS ELASTIC WALL PRIMER.

HARRISONS SANITARY PASTE REDUCER.

HARRISONS FLOOR CRACK FILLER.

HARRISONS CONCRETE FLOOR COATING.

HARRISONS BRONZING LIQUID.

## Quality.

Harrison products are the results of more than a century of experience.

This organization makes only the highest possible quality of product for each intended use, and sincerely publishes both the advantages and limitations, if any, of each product.

## Co-operative Services.

Architects and engineers may specify with entire confidence in the statements made in this listing. We will be pleased to correspond and co-operate with architects and engineers to give their clients the utmost service and value possible per dollar spent.

Color card and folder on any Harrison product on request.

## Harrisons Town & Country Paint.

Our opinion, backed by a century of paint making experience, is that this offers the highest quality, yet cheapest paint, expressed in terms of yard-year service and permanence of color.

The composition of each color is balanced so as to be chemically harmonious, hence free from internal disintegration, and resultant porosity and changes in color or texture. Its constituents are also selected for physical homogeneity, including large, small and medium particles, thus insuring an impermeable metallic coating protected and reinforced by inert pigments.

Our formulæ, as printed on every can, are the most perfectly balanced our laboratories are able to produce. That they represent the very best paint practice is proved by the astonishingly long life of the paint in actual service.

COATS—On new unpainted work, 3 coats.

On old surfaces, previously painted in no darker color, and in good smooth condition, 1 coat.

On old surfaces, previously painted in a darker color, or in rough condition, 2 coats.

COVERING CAPACITY—First coat, thinned with one-half linseed oil, 750 sq. ft. average per gal.

Second or third coat thinned slightly, 850 sq. ft. average per gal., 1 coat.

*Note*—On account of the purity and fineness of our colors, Town & Country Paint will stand much more thinning than ordinary paint.

COLORS—An exceptionally fine assortment that will meet every requirement. Color cards on application.

## Sanitary Interior Finishes.

We manufacture an exceptionally adequate line of these finishes in both gloss and flat effects, for use on plaster walls, to replace wall paper or on wood, composition board, or rough cast interior walls and ceilings.

## Harrisons Sanitary Flat.

A ready-to-use interior finish, built up of permanent, non-poisonous pigments, ground in an oil and varnish vehicle.

When applied to new walls where the plaster is still fresh, it should be preceded by 1 (or better, 2) coats of Harrisons Elastic Wall Primer, which will seal the pores of the plaster and prevent the lime from attacking the tinting colors or disintegrating the vehicle, causing "dusting off."

If properly applied, Harrisons Sanitary Flat *will not dust off* and is readily cleaned by washing, *not scrubbing*, which destroys the "flat effect." These characteristics make it the ruling favorite in modern homes where re-papering is a dreaded ordeal.

Manufactured in 14 colors, and in white.



**Harrisons Sanitary Gloss.**

A companion product to the Sanitary Flat, and may be used in bathrooms, kitchens, closets, playrooms, and as a contrasting trim where Sanitary Flat has been used for side walls of living rooms, dining rooms or bedrooms.

Its smooth, tile-like surface offers no resting place for dust or germs, and, being a glossy surface, is very readily and quickly cleaned.

It is manufactured in 17 colors, and in white.

NOTE—On both the above products, color cards are offered showing desirable combinations, which the architect may show to his client. Special color combinations will be made up on request.

**Sanitary Paste White.**

This interior white may be broken up and thinned by the painter to suit his requirements.

It is especially recommended for its superior covering quality and extreme whiteness.

The main pigment is a lithopone manufactured by us under the trade name "Beckton White," supported by the necessary and suitable reinforcing pigments, all ground in the palest refined oil, drier and varnish.

This combination adapts itself to the widest possible range of interior finishes—flat or gloss. It may be tinted the same as white lead. It is best to reduce it with Harrisons Sanitary Paste Reducer, turpentine, or a good turpentine substitute, and linseed oil.

To produce an enamel gloss, Harrisons Damar Varnish is recommended.

**White Enamel Undercoat.**

A ground coat for enamels.

It flows smoothly, dries quickly, and requires little sanding. It dries flat enough to secure the proper adhesion of, but with sufficient gloss to prevent the absorption of, enamel, thus insuring full gloss in the succeeding coats of enamel.

**Liquid Light.**

The tile-white sanitary wall finish so much in demand in the design of hospitals, schools, restaurants and public buildings where tiling itself is too expensive.

Its use is particularly desirable in mills and factories where the utmost conservation and dissemination of daylight is required.

The great virtue of this product lies in its applicability to any surface wood, steel, iron, brick, cement, plaster, beaver board, or any of the modern "composition" wall materials. Suitable for interior use only. Can be kept clean with the greatest ease, and stays glossy and white indefinitely.

It remains unaffected by soot, cinders, dust, dirt or cooking vapors and is, therefore, especially adapted for application in hospital kitchens or restaurants.

Best results are obtained when applied over an undercoat of Harrisons Sanitary Flat well brushed out, or white enamel undercoat.

On new work, 1 coat of Du-Lite over the undercoat mentioned will sometimes serve, but 2 coats

over the undercoat give a more durable and permanent finish.

**Flowkote Enamel.**

A white enamel that may be used equally well for interiors or exteriors.

It does not check or crack. It will outwear quick drying enamels. As it is slow drying, it does not show brush marks.

It is used over a priming coat of Town & Country Outside White and 2 or 3 coats of White Enamel Undercoat.

Flowkote Enamel should be applied in 2 or more coats. The last may be rubbed or left full gloss, as preferred.

**Oil Stain.**

A stain for new wood that can be used to imitate the color of expensive woods. Made in the following colors:

Light oak, dark oak, mission oak, mahogany, cherry and walnut.

**Decorative Stains.**

Permanent, penetrating stains for finishing wainscoting, panels, furniture, or other woodwork.

They make common woods decorative and greatly heighten the beauty of those with handsome grain. They dry flat, and may be finished with French Wax Finish, or, if a gloss finish is desired, Vitrolac Interior Varnish should be used.

Made in golden oak, antique oak, bog oak, brown oak, fumed oak, mission oak, cherry and mahogany.

**Shingle Stain (With Creosote Oil).**

A creosote shingle stain that may be used for dipping or brush coating.

Its preservative action greatly lengthens the life of shingles, and a variety of colors permits the selection of a stain that will harmonize with any color combination.

**Vitrolac Exterior Varnish.**

Recommended for any grade of exterior work where an elastic and durable varnish finish is desired.

Dries free from tack in from 6 to 8 hours, dry in 24 hours, and hard in from 2 to 3 days.

**Vitrolac Interior Varnish.**

A pale, hard, brilliant, easy working and durable inside varnish. Dries dust free in 3 hours and hard in 24 hours. It rubs perfectly.

**Vitrolac Floor Varnish.**

A brilliant transparent floor varnish of great toughness and durability.

Does not mar or spot from contact with water or mud, nor does it show heel marks. It works and hardens perfectly. Dries dust free in 2 hours and hardens in 12 hours.

**Vitrolac Flat Varnish.**

A fine finishing varnish which dries with a subdued

gloss, and imitates the appearance of a finely rubbed high-grade varnish.

It is a permanent flat finish, which sets in 4 hours and dries hard in 12 hours.

#### **Seat Finish.**

A hard drying, durable varnish for seats, church pews, and stools.

It does not soften or become tacky in the warmest weather. It is of sufficient body that only 1 coat is necessary over a properly filled surface. It rubs perfectly, however, for the application of another coat when desired. It dries dust free in 4 hours and hard in 12 hours.

#### **Cabinet Finishing and Rubbing Varnish.**

A quick drying, durable varnish for interior work.

It dries with a fine gloss, dust free in 4 hours and hard in 18 hours. It may be rubbed in 2 or 3 days, according to the conditions under which it is applied, and then polished if desired.

#### **Ideal Varnish.**

**IDEAL HARD OIL VARNISH**—A limpid body varnish for interior work and master painter's use.

**IDEAL FLOOR VARNISH**—An elastic varnish for floors, linoleums, bathrooms, window casings, and similar interior work.

Especially recommended for any purpose where subjected to hard usage or moisture in any form.

**IDEAL INSIDE FINISH**—For finishing interior work of houses and public buildings.

It is very pale and free working, and therefore labor saving. It does not spot white with moisture, and can be used on window sash, sills and for bathroom and kitchen finishing. Especially adapted to contractors' requirements.

#### **Transparent Hard Oil Finish.**

A medium priced varnish of sterling quality.

It produces an elastic coating of high gloss and excellent wearing qualities.

Used for finishing all classes of interior woodwork, trim and fixtures.

#### **Spar Varnish.**

A pale, brilliant and durable varnish for all classes of woodwork exposed to the weather.

Especially resistant to salt air. Works and flows well. Dries dust free in 3 hours and hard in 24 hours.

#### **Extra Coach Varnish.**

A good, durable, elastic varnish for inside work.

Flows well and dries dust free in 3 hours, and hard in 24 hours. Especially recommended for use over graining.

#### **No. 1 Coach Varnish.**

A good, quick varnish for inside work.

Full bodied, and dries hard with excellent gloss in 24 hours. Desirable for graining purposes. Used for varnishing inside woodwork and furniture.

#### **Light Coach Varnish.**

A pale, quick drying varnish for interior use.

Works freely and gives an excellent gloss. Dries without tack in 3 hours and hard in 24 hours.

Used for varnishing cheaper grades of inside woodwork and furniture.

#### **Hard Oil Finish.**

A good, quick drying finish for interior woodwork, that may be used as a gloss finish or rubbed down.

Sets in about 4 hours and hard in 24 hours.

#### **Light Hard Oil Finish.**

A pale, quick drying, durable finish for interiors.

Works freely and may be rubbed. Dries dust free in 3 hours and hard in 18 hours.

#### **Shellac Varnish.**

A strictly first class shellac containing nothing but high grade shellac gum and denatured alcohol.

It is cut at the rate of 4 lbs. of gum to the gallon of alcohol, which gives a varnish of good heavy body. For most purposes this may be still further reduced with denatured alcohol by the user.

#### **Wall Sizing.**

A pale, quick drying varnish for priming ceilings and walls. Prevents absorption of after coats.

#### **Kwik-Lac.**

A superior substitute for shellac.

#### **Wire Screen Paint.**

A specially prepared paint for protecting and decorating wire screen.

It completely covers the wire strands without clogging the meshes, and is at the same time suitable for use on the framework as well as on the wire.

Made in 2 colors—black and green.

#### **Harrisons Inside Floor Paint.**

For old and new wood floors.

Dries with a hard gloss that is extremely resistant to wear. On fairly good surfaces, it will cover about 275 sq. ft. (2 coats) per gal.

Made in 10 suitable colors.

#### **Harrisons Floor and Deck Paint.**

Pigments and vehicle carefully selected to produce a floor paint that will give maximum service under trying conditions, either inside or outside. Resists moisture well and is permanent in color.

Made in 10 colors.

#### **Harrisons Pure White Lead.**

This is a strictly pure article, finely ground in best refined linseed oil.

Being a mixture of stack and cylinder process leads, it combines the advantages of each, having better whiteness and spread than the old style leads, better hiding power than the straight quick process, and greater durability than either, due to a minimum of voids in the film. It is also furnished dry.



**Concrete Floor Coating.**

A coating for concrete floors that preserves the texture and individuality of concrete, and prevents moisture from penetrating the surface.

It contains nothing that will be affected by the lime and alkali of the cement. Dries overnight with a gloss finish. Works freely and easily and does not show laps.

For new work, 2 coats are used over Harrisons Concrete Floor First Coater, and can be finished with 1 or 2 coats of Vitrolac Floor Varnish if desired.

Made in 4 colors.

Color card on request.

**Floor Crack Filler.**

A non-shrinking filler for floor cracks, to be used on old or new floors preparatory to painting or varnishing.

Very bulky and economical. It works easily and makes a permanent job.

**Harrisons Oil Colors.**

These colors are the standards for purity, tone, uniformity, strength and fineness of grinding. Their quality is so high that they have been selected for decorating such buildings as the United States Capitol, the Congressional Library, the Washington Public Library, the United States Custom House at New York, and other prominent buildings. In strength tests they stand supreme.

Offered in all standard colors.

**Bronzing Liquid.**

A specially prepared floating liquid, suited for those who prefer to mix their own bronze paints.

It will be found to give uniformly excellent results on all surfaces, hot or cold, exterior or interior.

It is free from disagreeable odors.

**Aluminum Paint.**

A ready-to-use, quick drying aluminum paint in a varnish vehicle, which insures maximum durability of the paint and gives a bright, silvery non-tarnishing surface.

It is suitable for use on inside and outside work.

**Distemper Colors.**

Used by mural decorators and fresco painters.

They do not contain any size or binding material when they leave the factory, because these materials are subject to fermentation which spoils distemper colors for use. Made in the form of a paste with pure water, and packed in glass jars with tight strip covers, which may be removed and replaced as desired.

On account of these advantages, the last drop of color can be used out of the jar, thus avoiding waste.

The base is Paris White or Extra Gilder's Whiting, and the binding material used is generally a fine grade of pure white powdered glue, dissolved in pure water.

Most of these colors should not be applied to fresh plaster, as they are very sensitive to the action of lime, particularly the chrome green and yellow.

The cobalt blue shade, however, is an exception,

and may be used over fresh plaster, as it is unaffected by any caustic.

Architects interested in mural decoration will make no mistake by specifying Harrisons Distemper Colors.

They are offered in 15 shades.

Further particulars on request.

**Pure Red Lead.**

Very brilliant, and of the utmost purity and fineness. It is highly oxidized.

Special red leads are also manufactured for makers of rubber, glass, storage batteries, varnishes, driers and pottery.

**Antoxide (Rust Inhibitive).**

A rust inhibitive paint with a varnishlike vehicle, that completely covers surface and prevents moisture from attacking the metal and causing rust. It prevents the formation of rust beneath the coating, as well as progressive oxidation where it has begun.

This paint withstands acid fumes and conditions in a most unusual degree, and, therefore, is peculiarly adapted for use around smelters, acid plants, paper and other mills. It is also much used on water towers and standpipes, both inside and out, as it does not foul the water.

Made in red, bronze green, maroon and black.

Color card on request.

**Ferro-Keep (Rust Inhibitive).**

An excellent metal protective paint prepared with special rust inhibitive pigments.

It is recommended for work where the cost of Antoxide is prohibitive. It has great spreading capacity, brushes out easily, and dries with full oil gloss. If properly brushed, it will spread 400 sq. ft. per gal., 2 coats after thinning.

Manufactured in 4 colors—gray, black, red and green.

Color card on request.

**Flat Black Finish.**

Produces the appearance of old black wrought iron. Easily applied, flows smoothly, and dries rapidly.

**Smokestack Paint.**

A paint that withstands the high temperature met with on hot stacks.

It bakes to an enamel-like surface, which resists corrosion and which is impervious to moisture and gases. Can be applied while the stacks are hot.

**Elevator Paint (Exterior Mill Paint).**

A high grade linseed oil paint, producing a tough coating which will stand severe exposure on wood and metal surfaces.

Made in 4 shades—red, moss green, light slate and brown.

**Graphite Paint.**

Ready for use. The pigment is finely ground in linseed oil. It brushes out easily and smoothly, and covers about 500 to 600 sq. ft. per gal., 2 coats, dependent upon the condition of the surface.

Also furnished in paste form.

ESTABLISHED 1833

# OLIVER JOHNSON & CO., INC.

## Manufacturers of Paint

### PROVIDENCE, R. I.

#### Products.

OJACO FLAT MILL WHITE; OJACO GLOSS MILL WHITE; OJACO EGGSHELL MILL WHITE; OJACO INTERIOR KON-KRETE-KOTE, OJACO EXTERIOR KON-KRETE-KOTE, for protection of concrete, etc.; OJACO MOISTURE and ACID RESISTING WHITE; OJACO CHROM-OXID, a Metal Protective Paint; OJACO DEC-O-KOTE, SANITARY FLAT WALL FINISH; OJACO DADO ENAMELS; OJACO GRAPHITE PAINT; OJACO PURE LINSEED OIL OUTSIDE MIXED PAINT; OJACO No. 1071 STEEL SASH PUTTY; OJACO 33 $\frac{1}{3}$ % WHITE LEAD PUTTY.

Ojaco Pipe Enamels; Ojaco Gloss Opaque; Ojaco Structural Paint.

#### Ojaco Flat Mill White.

This is a heavy bodied paint of intense whiteness intended principally for use as an undercoat for Ojaco Gloss Mill White, but it can be used with excellent success for finishing coat, if a gloss finish is not desired.

Ojaco Flat Mill White can be used on wood, brick, concrete, and metal. We advise, however, a priming coat of Ojaco Kon-Krete-Kote for brick and concrete, and a priming coat of Ojaco Light Gray Chrom-Oxid on metal.

Covering capacity approximately 50 sq. yds. to gal., 1 coat on wood; 30 sq. yds. on brick; 25 sq. yds. on concrete.

#### Ojaco Gloss Mill White.

After years of experimenting at great expense, we have eliminated the defects of ordinary mill whites, and have confirmed our reputation as manufacturers of only the highest grade paints by producing Ojaco Gloss Mill White.

We have, therefore, in Ojaco Gloss Mill White, an enamel paint for interior millwork which excels in original whiteness, in permanency of that whiteness, in the ease with which it spreads, and in general wearing qualities. These are statements the correctness of which has been demonstrated over and over again by competitive tests on a large scale.

Covering capacity approximately 50 sq. yds. to gal., 1 coat on primed wood surface; 30 sq. yds. on brick; 25 sq. yds. on concrete.

#### Ojaco Eggshell Mill White.

Original experiments with Mill White convinced us that eggshell finish was ideal for mill work, and the most elaborate scientific experiments have recently shown this contention to be correct.

For this reason the use of eggshell finish is recommended more strongly than ever, as its light reflecting value is fully equal to that of the glaring high gloss paint.

Covering capacity approximately 50 sq. yds. to gal., 1 coat on primed wood surface; 30 sq. yds. on brick; 25 sq. yds. on concrete.



#### Ojaco Kon-Krete-Kote (Interior).

Ojaco Kon-Krete-Kote is a scientifically developed paint for the protection and decoration of brick, concrete, plaster, etc. It is made from an essentially non-saponifiable vehicle; is practically immune from the attacks of alkalis, and is recommended as a waterproofing and priming paint for undercoats on brick and concrete, wherever moisture is prevalent, as a first coater and surfacer on concrete floors.

Covering capacity on brick, approximately 25 to 30 sq. yds. to gal.; on concrete, 20 to 25 sq. yds.

#### Ojaco Moisture and Acid Resisting White.

In paper mills, chemical factories, dye houses, and similar places where there is excess moisture in the atmosphere as well as acid and alkali fumes, ordinary paints will not stand up.

Ojaco Moisture and Acid Resisting White is made of the most stable pigments and vehicles treated by our private process to make them nearly immune from acid, alkali and sulphurous fumes, also extremely resistant to moisture. In all structures, where these trying conditions exist, the use of Ojaco Moisture and Acid Resisting White is strongly urged. This paint dries flat and is washable.

Covering capacity approximately 50 sq. yds., 1 coat on wood; 30 sq. yds. on brick, and 25 sq. yds. on concrete.

#### Ojaco Chrom-Oxid.

Selecting a paint for structural iron and steel is an exceedingly important matter and protective results should be the sole factor in selecting such a paint.

Ojaco Chrom-Oxid is a paint high in oxide and reinforced with a chromate, a pigment which is one of the best known rust inhibitors. A thoroughly practical paint for structural iron and steel. The most perfect protection which it is possible to give metal work is assured to the user of Ojaco Chrom-Oxid Paint.

Shop coat, as well as field coat, should be Ojaco Chrom-Oxid.

It is made regularly in 6 standard shades: natural red, orange red, lead color, gray, bronze green, black.

Average covering capacity, approximately 3 tons to gal. on 16-in. I-beam.

#### Ojaco Pure Linseed Oil Paint.

In the manufacture of this paint, the best pigments have been selected to insure durability, covering capacity and permanency of color. Only pure linseed oil and high grade liquid dryers and turpentine are used in grinding and thinning this paint, thus producing a most economical paint, because of its great spreading and wearing qualities.

During the many years that we have manufactured Ojaco Mixed Paint, we have had many opportunities to observe the results from its use in cities, by the seashore



and in the mountains, and have never found an instance where it failed to give the utmost satisfaction.

Made regularly in 40 attractive shades, or furnished in special colors on quantity orders.

Ojaco Pure Linseed Oil Paint will cover on wood from 50 to 60 sq. yds. 1 coat, or from 30 to 40 sq. yds. 2 coats.

### Ojaco Dado Enamels.

Ojaco Dado Enamels are made for use on walls and posts for dado work. They are tough, durable, and elastic, and withstand the hard usage common in mills today. Regular colors as follows: F. A. red, bright green, bronze green, moss green, machinery gray and seal brown.

Average covering capacity over brickwork primed with Kon-Krete-Kote, 30 sq. yds. to gal.

### Ojaco Graphite Paint.

This is an exceptionally finely ground paint mixed with pure linseed oil for painting all kinds of structural metal after the priming coat. It is so fine and works so freely that it covers a large area per gallon, and is an exceptional water shedding paint.

Natural color is black, but can be furnished in various shades if desired.

A gallon will cover from 50 to 60 sq. yds. 1 coat.

### Ojaco Dec-O-Kote, Sanitary Flat Wall Finish.

Dec-O-Kote is a flat paint in liquid form ready for use, not a calcimine or water finish. It meets the demand of the modern physician, surgeon and scientist for the interior decoration of office and public buildings like theaters, churches and stores, and particularly for the interior decoration of homes. Dec-O-Kote makes a hard, elastic, durable flat wall finish that may be washed or cleaned with soap and water, producing a surface non-porous, non-absorbent, and germproof, cleanly and sanitary.

It is made in 12 attractive colors, also white and black, producing decorative effects that are rich, deep and clear in tone, extremely pleasing to the eye and restful to the mind.

Dec-O-Kote works easily under the brush, flows on and levels up well, is very opaque, and dries absolutely flat.

One gallon covers approximately 50 sq. yds. 1 coat, or 30 sq. yds. 2 coats.

### Ojaco 33 1/3 % White Lead Putty.

For heavy sash, sawtooth roofs, and general mill construction, Ojaco 33 1/3% White Lead Putty is recommended. For purposes of identification, this grade is tinted a peculiar blue color, which minimizes deception and assures closer obedience to specifications.

One lb. of 33 1/3% Putty will glaze 200 ins. of ordinary mill sash, the putty extending 1/4 in. on to glass and wood, or 3 1/2 lbs. will glaze 12 lights, 12 by 18 ins.

### Ojaco No. 1071 Steel Sash Putty.

In glazing steel sash it is essential that the putty set up quickly and very hard, otherwise proper adhesion will not result.

Ojaco No. 1071 Steel Sash Putty contains sufficient hardening materials to produce the proper setting and drying for best results. It is absolutely sure in all temperatures.

## Specification for Painting a Brick, Steel and Wood Manufacturing Building (Slow Burning Mill Construction).

**EXTERIOR**—All exterior woodwork including sash, window frames, doors, etc., and all exposed metal work usually painted, shall receive 2 coats of Ojaco Pure Linseed Oil Paint, color to be selected, in addition to priming coat.

**INTERIOR**—*Woodwork*—All interior wooden ceilings and beams and all window sash and frames, exclusive of office portion, shall be painted as follows: first coat Ojaco Flat Mill White; second coat Ojaco Flat Mill White; third coat Ojaco Gloss Mill White.

All wooden posts, stair rails, partitions, and all other standing woodwork usually painted and not otherwise specified, shall also be painted as above to a line 6 ft. from the floor. From this line to the floor, they shall receive 2 coats of Ojaco Dado Enamel, color to be selected, over a priming coat of lead and oil.

*Brick and Concrete*—All brick and concrete side walls to a line 6 ft. from the floor shall be painted as follows: first coat Ojaco Kon-Krete-Kote; second coat Ojaco Kon-Krete-Kote; third coat Ojaco Gloss Mill White or Eggshell Mill White.

The 6-ft. dado shall receive 2 coats of Kon-Krete-Kote tinted, and 1 coat of Ojaco Dado Enamel, color to be selected.

*Structural Steel*—All exposed steel beams, posts, etc., in addition to priming coat, shall be painted as follows: first coat Ojaco Gray Chrom-Oxid; second coat Ojaco Flat Mill White; third coat Ojaco Gloss Mill White.

*Stock Bins, Racks, etc.*—All bins for stock or racks for tools, etc., shall receive 3 coats of Ojaco Pure Orange Shellac.

*Toilet Enclosures*—All North Carolina pine toilet enclosures shall be finished on both sides as follows: 1 coat of Ojaco Liquid Wood Filler and 2 coats of Ojaco Interior Spar Varnish left in the full gloss.

*Sprinkler Pipes*—All sprinkler pipes shall receive 2 coats of Ojaco Pipe Enamel.

## Specification for Application of Dec-O-Kote Flat Wall Finish.

**WOODWORK**—Sand smooth and shellac all knots and sappy places.

Dec-O-Kote must be stirred to uniform consistency before applying and painter should flow on as he would apply varnish. If necessary to thin except as specified below use turpentine sparingly.

*First Coat*—Ojaco Pure Linseed Oil Mixed Paint of shade similar to finishing coat. Putty all nailholes.

*Second Coat*—Ojaco Dec-O-Kote as received.

*Third Coat*—Ojaco Dec-O-Kote as received.

**PLASTER WALLS**—Do not paint until plaster is dry.

*First Coat*—Ojaco Dec-O-Kote thinned one-quarter with pure linseed oil.

*Second Coat*—Ojaco Dec-O-Kote as received.

*Third Coat*—Ojaco Dec-O-Kote as received.

## Specification Forms.

We will gladly furnish on application, form of specification for any Ojaco product applicable to any specific building project.

## Where Sold.

Ojaco paints can be bought direct from the manufacturers, OLIVER JOHNSON & CO., INC., Providence, R. I., or authorized agents.

## Trade-mark.

No paint should be accepted as an "Ojaco" product unless the package bears the trade-mark shown.

## References.

A list of satisfied users will be furnished to architects, engineers and other interested persons, and requests for detailed information about any or all Ojaco paints will be given prompt and careful attention.

ESTABLISHED 1862

# THE LOWE BROTHERS COMPANY

Paints, Varnishes, Enamels, Stains, Japans

450-452 East Third Street

DAYTON, OHIO

LOWE BROTHERS, LIMITED, TORONTO, CAN.

## BRANCHES

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KANSAS CITY, MO., 1217-1219 West 9th Street  
MINNEAPOLIS, MINN., 330-334 North 1st Street

FACTORIES AND STOREHOUSES  
DAYTON, OHIO, 450-452 East Third Street  
40-52 Wayne Avenue  
2-22 Crane Street  
500-520 East Third Street, R. R. Front  
TORONTO, CAN., 267 Sorauren Avenue

SERVICE OFFICE: DAYTON, OHIO, 452 East Third Street

## Products.

PAINTS, VARNISHES, ENAMELS, CONCRETE and CEMENT COATINGS, STAINS, and METAL PRESERVATIVES for every requirement of architect, builder and engineer. They include: "High Standard" Liquid Paint, "Rich-Tone" Shingle Stain, Marine Paint, "Mellotone" Flat Wall Paint, "Mello-Gloss" for walls, "Mill White" Interior Paint, "Red Lead Lute," "Metalcote," Aluminum Paint, Graphite Paint and other Metallic and Technical Paints, Elastic Cement Floor Finish, Concrete and Cement Coating, etc.

"Linduro" Exterior and Interior Enamel, "Vernicol" Enamel White, Decorative Interior Enamels in colors; "Little Blue Flag" Varnishes, "Vernicol" Floor and Varnish Stain, Non-fading Oil Stain, Fillers, "Sealcote" Wall Size, etc.

## General Information.

Catalogues cover details fully, explaining uses and giving colors in a way that can not be reproduced here.

Lowe Brothers "High Standard" paint and varnish products have been known for nearly half a century for their uniform excellence. They may be found on sale in all parts of the United States. Name of local dealer given on request.

Lowe Brothers metal coatings are used by leading railroad and construction companies as standards for the protection and preservation of bridges, steel structures, cars, etc. They have been tried under most difficult conditions with uniformly complete success.

Because of the care in the selection of materials and the thorough methods of manufacture, Lowe Brothers products have unusual spreading and covering power, as well as durability and excellence of wear. These qualities make them the most economical paint and varnish products.

They are put up only in sealed packages of convenient sizes.

## Special Qualities.

Lowe Brothers "High Standard" paint and varnish products are known among architects and builders



TRADE-MARK

for their uniform high quality, meeting all requirements. They are the result of many years of scientific research into the qualities and characteristics of woods and other surfaces to which paint, stain, enamel, or varnish is applied, as well as a study of materials for best meeting conditions.

The "Little Blue Flag" trade-mark on a paint or varnish can is customer's protection, the assurance of quality.



"HIGH STANDARD" PAINT

For exterior and interior

## Service.

LOWE BROTHERS COMPANY is prepared, through the samples of finished panels displayed in the rooms of the Architects Samples Company, 101 Park Ave., New York, and by the personal attention of its experts, to render a service of unique value to architects and their clients. Write for information or suggestions for handling any specific decorative problem.

## Suggestions for Specifications.

### FOR EXTERIORS OF BUILDINGS—

"High Standard" Liquid Paint—42 colors and white and black, highest quality, for all coats. Special colors when desired.

Porch Floor Paint—8 colors, durable, practical.

Flat Brick Colors—3 colors: Reds and Milwaukee brick.

"Linduro" Exterior Enamel—Of highest efficiency, durable, economical. Nothing better. Suitable for all surfaces, including metal, wood, concrete and brick. White, cream and ivory.

Standard Metallic Paint—4 colors. Good grade for roofs, barns and outbuildings.

"Rich-Tone" Shingle Stain—A penetrating, preservative stain of proved efficiency. 14 standard colors.

### VARNISH FOR PORCHES, DOORS AND EXPOSED SURFACES—

"Little Blue Flag" Spar—The very best for salt air, spray, and severe usage.

"Little Blue Flag" House Spar—Very durable for outside and inside uses.

### FOR INTERIOR WOODWORK—ENAMELS AND PAINTS—

"Linduro," an Enduring Enamel for Exterior or Interior—The highest quality for finest work. May be rubbed and polished.

"Vernicol" Enamel White—Very high grade enamel for gloss or rubbed finish. White and durable.

Extra White Enamel—A good quality of enamel for gloss or rubbed finish. Dries very hard; is glossy, blue white.



*Interior Enamel Colors*—16 colors. Medium price, durable. Especially for bedrooms, hospitals, kitchens, public buildings, etc.

"Mellotone"—See "For Walls."

**FOR INTERIOR WOODWORK—STAINS AND FILLERS—**

*Non-fading Oil Stain*—12 colors, non-fading pigments, reproducing various wood finishes. Will not raise the grain.

*Mahogany Glaze*—For use over mahogany or walnut oil stain, saving one coat of varnish. Permanent and non-fading; produces a depth of luster and beauty of color closely approximating old mahogany. The most beautiful finish for finest work.

*Prepared Wood Filler*—Paste form. For open grained woods. Light, dark and golden oak. Other colors as desired.



"LITTLE BLUE FLAG" VARNISH

**FOR INTERIOR WOODWORK—VARNISHES—**

*Transparent Varnish Primer*—A liquid filler for close grained woods. Remarkably good.

*Mission Finishing*—Mission Finishing is designed to produce a dull or mission effect with one coat. It is not a flat varnish, and will not spot or turn white.

*Rubtone*—A light colored varnish which dries with a slight gloss, giving, without rubbing, the effect of an oil rubbed varnish.

"Little Blue Flag" Varnishes—All high quality.

*House Spar*—Pale, quick drying and elastic. Unusually durable.

*Quick Action House No. 64*—Hard drying. Pale color and good luster.

*Inside Rubbing Varnish*—Quick, hard drying. Takes beautiful finish.

**FOR FLOORS—**

*Prepared Wood Filler*—Paste form. For hardwoods. Light, dark and golden oak.

"Little Blue Flag" *Durable Floor Varnish*—Pale, hard drying, very tough. Does not spot white. May be used on hard or soft wood.

*Hard Drying Floor Paint*—14 colors. A varnish paint giving fine, hard, glossy finish.

*Vernicol*—A high grade varnish stain. May be used in graining old floors.

**FOR WALLS AND CEILINGS, CEMENT OR PLASTERED, WALL BOARD, BATHROOMS, HOSPITALS, ETC.—**

"Linduro"—The highest grade of durable enamel for waterproofing, preserving and decorating concrete, plaster, wood, metal, etc.

"Mellotone"—Interior flat colors. 7 tints, 9 positive colors, black and white. A durable, practical, economical flat liquid paint for plaster or concrete walls, steel ceilings, woodwork, burlap, wall board, etc. Easily used; washable, sanitary.

"Sealcote"—A special wall size for first coat on plaster, burlap, etc., under "Mellotone" and similar products.

"Mello-Gloss"—A liquid paint ready for use, drying with the gloss surface that experience proves to be especially satisfactory in offices, schools and public buildings where dust and hard usage prevail.

Its working qualities make it attractive to building superintendents and managers as well as painters who use it. 8 standard colors; special colors made on order.

*Interior Enamel Colors*—For wood, metal, concrete or plaster surfaces, particularly for hospitals, public buildings, kitchens, etc.

*Distemper Colors*—For fresco work. Colors as desired.

*Mill White*—Gloss or flat. A high class paint for factory interiors, made to give a solid, durable covering with the least number of coats.



"MELLOTONE" FLAT WALL COLOR

**FOR CONCRETE AND CEMENT SURFACES—**

*Concrete and Cement Coating*—14 colors. A practical, durable coating for all concrete buildings, exterior or interior. Waterproof and alkali-proof. Prevents discoloration; easily cleaned; economical.

*Elastic Cement Floor Finish*—10 attractive colors. A high class varnish finish for floors of public buildings, hotels and factories. Easily cleaned; prevents dust. To be used over priming coat of Concrete and Cement Coating.

**FOR IRON AND METAL SURFACES—**

*Aluminum Paint*—For steam and gas fixtures, radiators, galvanized iron, etc.

*Automobile Varnish Colors*—9 colors and a clear varnish. For heated surfaces, fences, etc., where high gloss is desired. Will stand high degree of heat.

"High Standard" *Flat Black*—For ornamental iron. (See also "Metal Surfaces.")

**FOR METAL SURFACES, IRON AND STEEL CONSTRUCTION, BOATS, ETC.—**

*Red Lead Lute*—A special red lead preservative paint of highest character. Ready for use. Does not settle in the can. 2 colors. For first coating on exposed surfaces or both coatings on steel structures. A remarkably good product, the standard for large structures.

"Metalcote"—The best protective coating for steel that LOWE BROTHERS COMPANY knows how to produce. 1 color, black, to be used over Red Lead Lute.

*Galvanized Iron Primer*—Gray color. A special color which will not only adhere to galvanized iron, but presents a suitable surface for re-coating. Durable and easy working.

*Graphite Paint*—Liquid form. Made of best quality graphite. Highest grade. For bridges, tin and steel roofs, etc.

*Standard Metallic Paint*—4 colors. For roofs, bridges, etc. Medium price.

**Number of Coats and Method of Using.**

In view of the extreme thinness of a film of paint or varnish, the manufacturers recommend that not less than 3 coats be specified for all new work.

For wood surfaces the first or priming coat of paint should be of white or a light tint of "High Standard," thinned with  $\frac{1}{2}$  gal. of raw linseed oil to 1 gal. of paint. In no case should a primer be allowed to be made from ochre or mineral, or with slow drying oils. The second coat should be of same color as finishing coat, reduced with  $\frac{1}{2}$  pt. spirits of turpentine to 1 gal. of paint. For third coat the paint should be used as it comes from the container.

For interior enamels the undercoats, of whatever number, should be built up of "High Standard" Flat White or similar product, the last 2 coats being of the enamel.

For metal surfaces use Red Lead Lute, or similar metal coating, for first coats; the selected kind for the last. (See "Hints to Architects.")

For concrete surfaces specify coatings as above "used according to maker's directions." In view of the extended lines manufactured, complete forms for specifications for all kinds of work will be found in "High Standard Paint Specifications," sent on application.

**Publications and Co-operation.**

"High Standard Paint Specifications" (a book of forms), "Paint and Painting," "Hints to Architects," "Metal Preservative and Protective Coatings," General Catalogue, "Common Sense About Interiors," "The House—Outside and Inside," and other valuable pamphlets, together with handsome color cards, giving details of the best methods of usage, are especially prepared for architects, mechanical engineers and builders. Sent on application.

Finish panels showing effects to be secured by any of the processes suggested are supplied by the Service Department. It is also prepared to give special assistance to architects who desire it.

Correspondence on these matters should be addressed to Dayton, Ohio.

# THE MARIETTA PAINT & COLOR CO.

Manufacturers of Stains, Paints, Enamels and Wood Finishing Specialties

GENERAL OFFICE AND FACTORY

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NEW YORK, N. Y., 203 Broadway

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## Products.

MARIETTA SPARTAN ART WOOD STAINS; MARIETTA ENDURANCE ENAMELS; SPARTANITE ENAMEL; SPARTAN ART WALL FINISH, a Flat Oil Paint; AURORA MIXED PAINT; PASTE WOOD FILLERS.

Marietta Oil and Water Stains; "French (Oil) Lacquer"; Kopalac, a Spirit Varnish; Marietta Interior Floor Paint; Marietta Porch and Deck Paint; Marietta Mill White Paint.



oil white varnish, the yellowing tendencies of the oils having been overcome. On the market for years, its quality has stood every test. It is sold in both gloss and eggshell finishes, in white, old ivory and assorted colors.

## Spartan Art Wall Finish.

A sanitary, washable, flat oil paint, of artistic beauty, with working and wearing qualities that have stood every practical test. Is the culmination of the best efforts; the highest grade wall finish so far offered, regardless of price.

Made in a score of distinct tints.

## Specialization.

Prior to the commencement of their manufacturing experience, THE MARIETTA PAINT & COLOR CO. were large users of wood finishes. From a business of practical wood finishing, the production of the company developed into the manufacture of finishes required and used by others. An important asset in the new venture was and is the *real knowledge* of the finishes in demand in connection with the trade, acquired during long practical training and experiment—information obtainable in no other way. As in the former business, the company have been constantly engaged in working out new problems of finishing; and, in the manufacture of materials for others, the main specialization encouraged by the management is the creation of *new* products to meet the demands of an ever-widening field. This policy has resulted in the accumulation of thousands of formulæ that are invaluable, because they represent the wisdom of years of practical experience as well as extensive and recent experiments in the laboratory.

## Aurora Mixed Paint.

A high grade lead and linseed oil mixed paint, reinforced with proper inert pigments to give it good covering and long wearing qualities. It has been on the market for twenty years.

## Paste Wood Fillers.

The demand for these fillers has kept pace with the demand for Marietta Spartan Art Wood Stains, due to the fact that the company long ago recognized the importance of good filler in the finishing of all open grained wood.

Marietta Fillers are made from the finest siliceous, ground in pure linseed oil and linseed oil japan; they fill perfectly and wipe off flush with the surface of the wood; they dry overnight and form a hard, firm and permanent foundation for subsequent coats of finish.

Marietta Fillers are made in all the standard shades, including mahogany; are thoroughly practical and can be recommended unreservedly for the highest grade work.

## Spartan Art Wood Stains.

Under this trade-name is manufactured a full line of stains designed to produce a high-class finish at a marked saving of labor over former methods. The stains do not raise the grain of the wood and, therefore, require no sanding; they do not blister veneers or bring out wind checks. Because of these facts, in addition to the saving of labor in sanding, they produce a first class finish with fewer coats. Made in a wide variety of colors to meet every need of the trade.

## Marietta Endurance Enamels.

Marietta enamels are made in a variety of colors to meet the modern demand of the architectural trade. Among these are mauve, cream, buff, green, brown, red, blue and other popular decorative colors in both gloss and eggshell finish.

## Spartanite Enamel.

The highest grade enamel; made from French process zinc, ground impalpably fine with a strictly long

## Co-operative Service.

In solving wood finishing problems for the architectural profession, THE MARIETTA PAINT & COLOR CO. are better equipped to-day than ever before; their strong position as manufacturers of finishes for the furniture, piano and talking machine trades should appeal to every architect, because there is no more exacting field, and it makes it an easy matter for the company to match every standard furniture finish.

## Specifications, Literature, Etc.

Full information for specifications and directions for getting the best results from the company's products will be furnished cheerfully to architects, contractors and interior finishers.



# THE NATIONAL PAINT & VARNISH CO.

CLEVELAND, OHIO

## Products.

NATIONAL TINNERS RED, a Metal Coating; "COAT-O-LITE," an Enamel Paint; NATIONAL FLAT WALL ENAMEL.

National Graphite Structural Paint for exposed metal surfaces.

## Efficiency of Metal Paint.

The purpose of a metal paint is to seal a metallic surface from contact with moisture and other corrosive agents. Everything depends upon the elasticity and durability of the paint, which in turn depends largely upon the quality and adaptability of the oils and pigments used, and their combination under varying degrees of production for the specific use of the paint. No greater mistake can be made than the unwarranted use of driers which destroy the life of the paint, causing it to become brittle and to either crack or chalk off, leaving the surface unprotected.

## National Tinnners Red.

A strictly scientific metal coating manufactured under laboratory supervision. This company originated National Tinnners Red in 1905, since which time it has become the standard of efficiency among metal workers generally, and is used by at least 70% of the metal shops. Consequently, specifying it will entail no hardship upon the metal workers.

## "Coat-o-lite."

"Coat-o-lite" is the most modern method of making walls and ceilings light, sanitary and wholesome. It reflects light without harshness and glare.

SCOPE OF USE—"Coat-o-lite" should be used in factories, warehouses, storerooms, offices, entrances, abattoirs, dairies, candy factories, pickling and preserving works, breweries, bottling works, bakeries and all public and private buildings requiring light and sanitary walls and ceilings.

EFFICIENCY — The efficiency of a "Coat-o-lite" painted interior over those coated with whitewash, kalsomine or so-called cold water or ordinary factory white paints is as clearly defined as the difference between a carbon filament lamp and a mazda. "Coat-o-lite" looks and wears like porcelain, can be wiped or washed as clean and sanitary as the surface of tile, and becomes whiter with age. It will never crack, chalk nor flake, as it maintains its elasticity under vibration, steam moisture, heat, cold, acids, alkalis, gases, fumes, etc. It covers the greatest surface area on old or new

surfaces of wood, metal, brick, stone, cement, concrete or plaster. It sprays or brushes freely, spreads evenly, dries quickly and can be furnished in gloss, eggshell or flat finish.

ECONOMY—A "Coat-o-lite" painted interior absorbs, holds and radiates daylight, and offers a very substantial saving in excess artificial light. Experiments made by several large lighting companies and scientifically measured by delicate light-recording instruments have shown a percentage of increased light averaging from 40% to 75%, according to window area, position and interior conditions of walls and ceilings before painting.

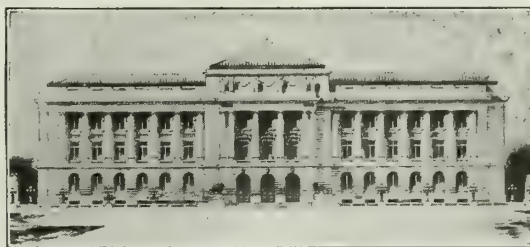
METHOD OF APPLICATION—Surfaces on which "Coat-o-lite" is to be applied should be cleaned free of dirt, grease, finger marks, etc., before application. Cover surfaces thoroughly with "Coat-o-lite," especially when painting or spraying rough surfaces. As "Coat-o-lite" is opaque, it will cover up ordinary surface deficiencies. Best results are obtained by careful preparation of surfaces before application.

## National Flat Wall Enamel.

National Flat Wall Enamel is the high test finish for walls; and where highest class decoration is desired, it satisfies the most exacting requirements.

COLORS—The colors are rich and permanent. The white is remarkable for its intense whiteness.

APPLICATION—It flows easily under the brush, has remarkable covering qualities, dries with a stonelike hardness and gives a rubbed enamel surface finish. Guaranteed not to flake or peel, and, as it is a flat enamel, it has a wonderfully smooth surface that can be washed repeatedly.



Cleveland City Hall



Equitable Building, New York



Schulze Bakery Building, Chicago

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# PATTON PAINT COMPANY

MILWAUKEE, WIS.

BRANCH WORKS AND OFFICE, NEWARK, N. J.

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## Products.

Manufacturers of PAINTS for all purposes, including:

PATTON'S SUN-PROOF LIQUID PAINT;

PATTON'S VELUMINA INTERIOR FLAT WALL PAINT;

PATTON'S IRONHIDE STEEL PROTECTIVE PAINT;

PATTON'S ALBA-LUX INDUSTRIAL PAINT;

PATTON'S DUR-A-TOR CEMENT HARDENER.

Patton's Porchite Porch Paint, Tor-on Shingle Stain, Princess Floor Paint, Florhide Cement Floor Paint; Graphite, Paste Wood Filler; and 17th Century Wax.

### Patton's Sun-Proof

Patton's Sun-Proof Liquid Paint is made from white lead, oxide of zinc, silica and coloring matter, ground in strictly pure linseed oil, and specially prepared drier.

Sun-Proof Paint contains the maximum quantity of linseed oil consistent with good paint, and the quantity of linseed oil is in the proper relative proportion to the pigment to produce a tough, durable, wear resisting paint film—a paint that can be spread uniformly and a paint that is suitable for all general purposes.

### Patton's Velumina.

Patton's Velumina is, first of all, a practical flat paint.

It is an oil paint, covering the walls with a tough, oil paint film, at once durable, washable and therefore sanitary.



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PATTON'S SUN-PROOF PAINT CAN

An interior decorated with Velumina adds refinement and distinction to the surroundings.

Velumina is made from pigments which are smooth in texture, possess extreme opacity or hid-

ing properties, and the liquids used are free from varnish and all resinous substances.

Being an oil base paint, it works easily and can be spread and brushed without danger of showing brush marks or laps.

Velumina dries with a smooth, tough, washable, elastic coat which will not readily collect dust or dirt.

### Patton's Ironhide.

Patton's Ironhide (Inhibitive Red and Finishing Black) is a liquid paint, ready for use, for the painting and preservation of iron and steel work, inside and outside.

Suitable for use on structural steel, bridges, gas holders, smokestacks, railway cranes, oil tanks, iron or steel wire or light poles, coal loaders, steel cars, tank cars, air drafts, metal silos, fire hydrants, cranes, ventilating fans, etc.



PATTON'S VELUMINA CAN



PATTON'S IRONHIDE CAN



### Patton's Alba-Lux (White Light).

It has been demonstrated to manufacturers that well lighted interiors are big economic factors in the conduct of every business, consequently well lighted plants are fast becoming the rule.

It will be found that Patton's Alba-Lux (White Light) is the ideal paint for the purpose. It is made in gloss and flat. It is an oil paint.

The "Gloss" dries with a glasslike finish and the "Flat" with a good eggshell finish.

Alba-Lux is suitable for use on wood, plaster or cement; for either new or previously painted surfaces. Alba-Lux is easily washed and remains white.

This material brushes out easily, does not remain tacky, dries in 24 to 36 hours, has good covering capacity and will wear indefinitely.



PATTON'S ALBA-LUX CAN

### Patton's Dur-a-tor Cement Floor Hardener.

Patton's Dur-a-tor is a clear, liquid chemical preparation containing neither pigment or color, and will not change the appearance of the floor. Dur-a-tor is not a paint. Where a cement floor paint is desired, Patton's Florhide should be used.

Dur-a-tor penetrates into the cement floor and a chemical reaction takes place that makes the soft or worn floor as hard as adamant. Dur-a-tor will stop disintegration and dust; make the floor last much longer; save machinery parts and bearings, stock, and repair bills. Dur-a-tor is simple, easy, convenient and economical to apply, and the results are almost immediate.



PATTON'S DUR-A-TOR CONTAINER

### Specifications.

**WOOD SURFACES (EXTERIORS)**—Surface must be clean and dry. Shellac knots and pitchy places before painting. Putty nailholes after first coat. Allow ample time for each coat to dry. Paint must be brushed in well.

**First Coat**—To each gallon of Sun-Proof, as it comes in the can, add 1 qt. strictly pure linseed oil and 1 pt. of turpentine.

**Second Coat**—Add 1 qt. strictly pure linseed oil and 1 pt. of turpentine.

**Third Coat**—Sun-Proof Paint as it comes in the can.

Note: On porch floors and steps substitute Patton's Porchite.

**ROOFS**—Dip all shingles two-thirds their length and, after laying, apply a brush coat of Patton's Tor-on Shingle Stain. Stir frequently while using, to keep mixture uniform.

**STRUCTURAL IRON WORK**—The surface to be painted must be free from oil, grease and rust. Rust must be removed by

wire brushing, scraping or sand blast. Grease must be removed with gasoline or benzine. All paint must be well brushed out, and nothing larger than a 3-in. oval brush used in applying paint. No paint is to be applied at a temperature below 50° Fahr., in damp or rainy weather, or to a damp or wet surface.

**First Coat**—Apply 1 coat of Patton's Inhibitive Red Ironhide as it comes in the container. Allow at least 3 days for drying.

**Second Coat**—Apply 1 coat consisting of a mixture of half red and half black Ironhide as it comes in container.

**Third Coat**—Apply 1 coat of Patton's Finishing Black Ironhide as it comes in the container.

Note: If 2 coats only are desired, specify as directed for first and third coats.

**INTERIOR PLASTER WALLS**—Wash or scrape off all calcimine, loose paint, dirt, etc. Smooth or glossy paint should be roughened with steel wool or sandpaper. Fill cracks with a stiff paste made from Velumina and plaster of paris and allow at least 24 hours for drying.

**Two-coat Finish**—First Coat: Thin 1 gal. of Velumina with ¼ gal. of pure boiled linseed oil, except for new and exceedingly porous walls, where ½ gal. of oil is required. Under no circumstances use any leptyne, turpentine, or benzine on first coat. Allow at least 24 hours for drying, more time being required in cold or damp weather.

Suction, or so-called "hot spots," which may show through first coat, should be touched up with first coat mixture, allowing at least 24 hours for drying, otherwise these suction spots may appear in the following coat, due to imperfect priming, and then will require treatment as above before another coat of Velumina is applied. To insure perfect results, never apply finishing coat until first coat presents a uniform subdued gloss surface. Extremely bad walls may require an additional application of the first coat mixture to accomplish this; or if preferred, a coat of glue size may be applied over the first coat. Never apply glue or varnish size direct on the plaster, as it will prevent the proper penetration of the paint.

**Finishing Coat**: Use Velumina as it comes in the can. Do not use any of the material left over from first coat in the finishing coat, as it will impair the perfect flatness of Velumina. If too heavy, add leptyne or turpentine, not to exceed ½ gal. to 1 gal. of Velumina. Best results will be obtained by applying Velumina of good heavy body with a wide wall brush. After finishing coat has set for about 30 minutes it may be stippled, if this finish is desired.

**TO HARDEN CEMENT FLOORS**—In order to be in proper condition to receive Dur-a-tor, the floor must be swept clean, and be free from grease spots.

Dur-a-tor should be diluted with water in a wooden or granite container, as follows:

1st treatment: 1 part Dur-a-tor, 4 parts water.

2nd treatment: 1 part Dur-a-tor, 2 parts water.

3rd treatment: 2 parts Dur-a-tor, 3 parts water.

The applications must be liberal, so that Dur-a-tor may penetrate the cement and harden it below the surface. A broom is best adapted for applying. Although Dur-a-tor acts instantly on the cement, the floor must be allowed to dry thoroughly between applications.

In extreme cases, such as when a floor is very porous or badly worn, additional applications of undiluted Dur-a-tor shall be given until the cement is sufficiently hardened.

**To Decorate**—Wash all oil and grease spots thoroughly with benzine. Do not use water for washing either old or new cement surfaces before painting, but remove all dust and dirt from the surface by sweeping carefully. The room must be well dried out and ventilated and the floor show no indication of sweating. Apply Patton's Florhide as it comes in the can, brushing in thoroughly. Allow at least 24 hours for drying or longer when possible. For finishing coat apply Florhide as it comes in the can.

**WHITE INTERIORS OF COMMERCIAL BUILDINGS**—**Two-coat Gloss Finish**—First Coat: Patton's Gloss Alba-Lux as it comes in the can; or if Patton's Flat Alba-Lux is used add to each gallon from ⅛ to ¼ gal. of pure boiled linseed oil.

**Finishing Coat**: Apply Patton's Gloss Alba-Lux as it comes in the can. If too heavy, add leptyne or turpentine, not to exceed ½ gal. to each gallon of paint.

**Two-coat Flat Finish**—First coat: Apply Patton's Flat Alba-Lux thinned with from ⅛ to ¼ gal. of pure boiled linseed oil. Allow at least 24 hours for drying.

**Finishing Coat**: Apply Patton's Flat Alba-Lux as it comes in the can. If too heavy, add leptyne or turpentine, not to exceed ½ gal. to each gallon of paint.

# THE NATROCO PAINT & VARNISH WORKS

OWNED AND OPERATED BY THE NATIONAL ROOFING COMPANY

Manufacturers of Preservative Paints, Waterproofings and Roof Coatings  
TONAWANDA, N. Y.

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PROVIDENCE, R. I., NARRAGANSETT SUPPLY CO., 830 Eddy  
Street

SYRACUSE, N. Y., ONONDAGA BUILDERS SUPPLY CO., 569 South  
Clinton Street

TONAWANDA, N. Y., CORDES, AYRAULT & CO., Fillmore Avenue

## Products.

"NATROCO," "CORPORATION" and  
"EGYPTIAN" READY MIXED PAINTS; "NAT-  
ROCO (WASHABLE) FLAT WALL FINISH";  
"N. R. C. PROTECTIVE PAINT," for iron and  
steel; "FACTROLITE," an Interior Factory  
Paint; "NATROCO VARNISHES"; "HYDRO-  
LOX" and "RETAW PROOFING," Liquid Wa-  
terproofings; "PHLORKOTE," an Enamel for  
concrete floors; "STUCKOTE," for waterproofing exterior  
surfaces of brick and concrete; "ASPHALTUS ROOF  
COATING"; "NATIONAL BONDKOTE."

"National XX Graphite Paint," "National Creosote Shingle Stains," "Natroco Interior Hard Drying Floor Paint," "National Asphalt Varnish," "Protec-Stac," "Minrubite Proofing," "Kalsolite," "Black Knight Paint."

### "Natroco Ready Mixed Paint."

A high grade paint for use upon exterior or interior of residences, buildings, etc. Prepared from white lead, zinc oxide, pure linseed oil and turpentine japan dryer. Made in 35 attractive and durable colors. Color card on request.

### "Natroco (Washable) Flat Wall Finish."

A durable and artistic mode of wall covering to be used for interior decoration. The soft tones of "Natroco Flat Wall Finish" are restful to the eye, and harmonize with any scheme of decoration. An oil paint prepared from specially treated linseed oil and non-poisonous pigments free from lead. Made in 18 colors. Color card on request.

### "N. R. C. Protective Paint."

Highest grade protective paint for the preservation of iron and steel against rust and corrosion. Pigment is composed of magnetic oxide of iron, zinc chromate and prepared linseed oil vehicle. A scientific paint actually inhibitive or rust preventing. Produced in black, maroon and bronze-green. Color card on request.

### "Factrolite."

An intense white, high gloss linseed oil paint of brilliant reflecting properties, giving a maximum of lighting efficiency. Made expressly for factory interiors, free from lead pigments and absolutely non-poisonous.



TRADE-MARK

### "Hydrolox."

A concentrated liquid waterproofing. When mixed in the proportion of 1 gal. "Hydrolox" to 14 parts of water it produces a liquid solvent, which when used in mixing concrete dissolves the mineral glues, filling the voids, waterproofing the aggregate, and increasing its crushing and tensile strength.

### "Retaw Proofing."

This is a stainless, liquid waterproofing of dependable efficiency for stucco, concrete, brick and porous building stone. It is easily applied with a brush, penetrating deeply. It is proof against atmospheric action and is not affected by natural extremes of heat and cold.

### "Phlorkote."

A floor enamel for the waterproofing or dustproofing of a concrete or cement floor. Will adhere firmly to the surface, and is very durable. "Phlorkote" permits the decoration of concrete floors in many desirable shades.

### "Stuckote."

Waterproofs and decorates exterior surfaces of concrete and brick structures. Successfully resists action of the elements. Made in 14 durable and attractive colors. Color card on request.

### "Asphaltus Roof Coating."

For renewing, preserving and beautifying felt, rubber and other composition roofing. Made from pure natural mineral asphalt, which reinforces and protects the weather surface. "Asphaltus" is in a class by itself. Made in colors: black, red, green, brown, and terra cotta. Color card on request.

### "National Bondkote."

A dampproof coating and plaster bond. Produced from mineral asphalts, refined and manipulated by our own special process. For use upon the exterior or interior of concrete, brick, or other buildings above or below ground level to prevent seepage of moisture through the structure; also, as a backing to prevent discoloration of high grade marble or stone, etc. As a plaster bond it does away with the necessity of furring and lath.



# THE TROPICAL PAINT & OIL CO.

Manufacturers of Structural, Decorative and Technical Paints of  
Scientific Reliability

GENERAL OFFICES AND FACTORIES  
CLEVELAND, OHIO

## Products.

EXTERIOR and INTERIOR PAINTS,  
ENAMELS and VARNISHES.

## Elastikote.

A high standard protective and preservative paint, made in strong positive colors, designed for general use on all exterior surfaces exposed to severe weather where solid, substantial, durable paint protection is required. In the manufacture of Elastikote certain defects in ordinary keg lead and linseed oil paints, as well as in ordinary prepared paints, have been overcome, and a resulting product far superior in actual durability and elasticity has been produced. Elastikote contains a certain percentage of a specially prepared natural, hardened gum. This gum is scientifically fused and blended with the usual paint pigments, and the resulting combination, thoroughly ground and mixed in pure linseed oil, forms the basis of Elastikote, to which are added only the purest and most durable tinting colors.

Elastikote, applied to wood, metal, brick and stone, is probably the only paint made that possesses the necessary elasticity, toughness, adhesiveness, waterproofing and weather resisting qualities necessary to conform to the various conditions met with in treating the several surfaces mentioned, and from which dependable results can be obtained.

## Tropical Finest Outside Gloss White.

This product, originally made for private use only, is the essence of perfection in exterior paint. Made in white only. Is unaffected by sulphur fumes, gases, etc., and produces a solid, durable and beautiful finish. Is a pure white; spreads and covers economically, and will last longer than other exterior white paints.

## English Structural Iron Paint.

The protection of metal against rust, corrosion and electrolysis is a waterproofing problem, and its solution can be accomplished only by the use of a continuous impervious insulation that will protect it from contact with moisture. English structural iron paint is a product composed of materials that experience has shown will meet the conditions of metal painting and waterproofing most successfully; and is far superior to ordinary oxide, red lead, or graphite and other mixtures frequently used for the purpose.



## Cementkote.

A preservative and decorative paint for exterior dampproofing of cement, brick or stone walls above ground. Dries with a dull finish, and is proof against alkaline conditions always met with in treating surfaces of this kind.

## Tropical Waterproofing Paint.

A dense black which works remarkably easy under the brush. Applied in 2 coats to foundation walls, etc., on that surface against which the water first comes in contact. Its easy working properties and low cost make Tropical waterproofing paint an attractive proposition for the contractor. Its elasticity and durability insure the owner against future dampness.

## Tocotone.

A durable, non-absorbent, washable and highly decorative interior flat wall paint. Tocotone can be used upon all interior plaster surfaces—rough, smooth, pebbled; also upon composition wall board, wood trim, metal ceilings, and upon burlap and other fabric wall coverings. From a decorative standpoint, a dull, smooth, clean tinted finish on plaster walls and ceilings is far more preferable to fading wall paper or glaring gloss paints. Tocotone is designed for the finest work, but its moderate cost and unusual durability permit of its being used on all interior work.

## Alpine White Enamel.

The finest domestic enamel that can possibly be secured. Equal in whiteness, spreading qualities and durability to the best imported brands.

## Toco Mill White.

A solid body, white paint in dull or gloss finish, designed expressly for mill work and other large surfaces. Stays white.

## Toconamel.

A hard service enamel, in white and colors, intended for all interior use. Withstands washing. Taintless, odorless, and non-poisonous.

## Varnish.

Architectural finishes of the highest quality—exterior, interior, floor, coach, light hard oil, and rubbing and polishing varnishes. White Damar, liquid wood filler and dryers.

# U. S. GUTTA PERCHA PAINT CO.

PROVIDENCE, R. I.

NEW YORK OFFICE: 101 Park Avenue, Room 208

## Products.

Manufacturers of RICE'S PAINT SPECIALTIES: "BARRELED SUNLIGHT" RICE'S MILL WHITE—Gloss, Eggshell or Flat—for mill and factory ceilings and walls of wood, brick and concrete; FLAT MILL WHITE for office use; CHEMIC-ENAMEL; FLAT WALL COATING; GRANOLITH CONCRETE COATING; RICE'S REINFORCED PAINT for outside use; GLOSS-O-LITE for interior use; FLOW-ON, CHINA-LINE, and other Paints and Enamels for interior and exterior finish; structural and metal protection; ERIC STRUCTURAL PAINT, CEMENT FLOOR PAINTS.

Damp resisting and Waterproofing Paints and Compounds; Technical Paints; Gutta Percha Paint; "Special Paints for Special Uses."

### "Barreled Sunlight" Rice's Mill White.

Has been tested and approved by the National Board of Fire Underwriters, Inc. (Their report Retardant No. 926.)

GLOSS—The *original* light reflecting permanent paint for mill and factory ceilings and walls. It will not craze nor crack, because the gloss does not depend upon varnish, but on an exclusive process of treating the oil. This insures a durable result and a free flowing paint. All other gloss paints are of necessity made from varnish.

The glossy surface can be washed and kept clean. "Barreled Sunlight" Rice's Mill White has the whiteness of French zinc; more body or opacity than white lead; produces an enamel gloss; flows as freely as ordinary oil paint. Stays white longer than any other gloss paint possibly can. A fair estimate for covering is about 400 sq. ft. to the gal., each coat, on woodwork. See specifications on this page.

Price, March 6, 1918: \$2.40 per gal. in barrels.

EGGSHELL—This is like "Barreled Sunlight" Rice's Gloss Mill White in all respects except gloss. Gives a finish which has just enough "shimmer" or "surface film" to shed dust and dirt and withstand occasional washing. See specifications on this page.

Price, March 6, 1918: \$2.40 per gal. in barrels.

FLAT—Office Use—Produces a velvetlike, dull, or flat finish. Even though flat, it withstands occasional washings, flows freely, leaving no brush marks or streaks. Has intense opacity. See specifications on this page.

Price, March 6, 1918: \$2.40 per gal. in barrels.

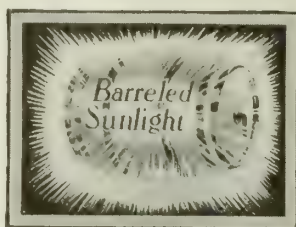
### Rice's Undercoat.

Used for priming under "Barreled Sunlight" Rice's Mill White. Made to improve the adverse conditions which the paint is called upon to meet when lumber is sappy and unseasoned. See specifications on this page.

Price, March 6, 1918: \$2.15 per gal. in barrels.

### Rice's Chemic-Enamel.

For laboratories, bakeries, dye and bleach houses and other places where chemical fumes, excessive heat, steam or other discoloring agents may be prevalent.



TRADE-MARK  
Reg. U. S. Pat. Off.

It has all the physical qualities of "Barreled Sunlight" Rice's Mill White in its intense whiteness and brilliant luster, and, in addition, resists the action of discoloring agents better than does any other white paint or enamel.

Price, March 6, 1918: \$2.75 per gal. in barrels.

### Rice's Granolith for Walls and Ceilings.

A concrete, cement and brick coating. Retards dampness. Sometimes a single coat only is applied. Its largest use is as an undercoat on concrete, cement and brick for finishing coat or coats of "Barreled Sunlight" Rice's Mill White. See specifications on this page.

Price, March 6, 1918: \$2.15 per gal. in barrels.

### Rice's Granolith for Cement Floors.

Stops the forming of dust which is constantly wearing from cement floors. It penetrates sufficiently to bind well and become a part of the cement surface. It gives a more uniform and slightly appearance to cement floors and allows of keeping them clean. Especially suited for hospitals, schools and other public institutions and for modern factories and stores.

Price, March 6, 1918: \$2.15 per gal. in barrels.

### Specifications for Factory and Mill Use.

#### THREE-COAT WORK

*First Coat*—Rice's Undercoat. Let this stand as long as practicable before applying the second coat.

*Second Coat*—If knots or sappy spots show through priming coat, shellac these spots well and then apply a second coat of Rice's Undercoat.

*Third Coat*—"Barreled Sunlight" Rice's Mill White (Gloss, Eggshell or Flat).

#### CONCRETE AND BRICK

*First Coat*—Rice's Granolith. This coat should be reduced with a mixture of 3 parts linseed oil and 1 part turpentine, according to porosity of surface, and allowed to dry hard before applying next coat.

*Second Coat*—Rice's Granolith.

*Third Coat*—"Barreled Sunlight" Rice's Mill White (Gloss, Eggshell or Flat).

#### TWO-COAT WORK

Where the surface is well seasoned or dried out and economy desired, it will be found possible to get a solid white finish with 2-coat work. On new woodwork use Rice's Undercoat for the first coat. On new brick and concrete use Rice's Granolith for the first coat. Finishing coat "Barreled Sunlight" Rice's Mill White (Gloss, Eggshell or Flat).

### Specifications for Office Use and Other Interior Work Requiring a Flat Finish.

#### PLASTER WALLS

*First Coat*—Rice's Granolith. This coat should be reduced with a mixture of 3 parts linseed oil and 1 part turpentine, according to porosity of surface, and allow to dry hard before applying next coat.

*Second Coat*—"Barreled Sunlight" Rice's Flat Mill White—Office Use.

*Third Coat*—"Barreled Sunlight" Rice's Flat Mill White—Office Use.

#### WOODWORK

*First Coat*—"Barreled Sunlight" Rice's Flat Mill White—Office Use. This coat to be thinned slightly with about ¼ pt. each linseed oil and turpentine.

*Second Coat*—"Barreled Sunlight" Rice's Flat Mill White—Office Use.

*Third Coat*—"Barreled Sunlight" Rice's Flat Mill White—Office Use.



**Rice's Reinforced Paint, Exterior.**

A scientifically machine made paint designed in the interest of consumers. Durability is the chief feature. The formula is the result of years of practical tests and experiments conducted by the makers, which have been confirmed by the elaborate scientific tests of the American Society for Testing Materials and the Paint Manufacturers' Association, at Atlantic City, N. J.; Pittsburgh, Pa.; Nashville, Tenn., and Fargo, N. D.

Rice's Reinforced Paint contains the proper percentage of lead, enough zinc to prevent chalking, enough additional reinforcing pigments to insure the most resistant coating, and pure linseed oil treated by a process that removes all objectionable constituents. These components are thoroughly and intimately blended by special machinery, insuring absolute uniformity.

Price fluctuates, according to linseed oil market.

Send for color card giving complete details.

**Rice's Gloss-O-Lite, Interior.**

Rice's Gloss-O-Lite, "The Paint that floods rooms with Light," produces a hard enamel gloss finish with fewer coats than is possible with any other enamel. It flows very freely, and in this respect, and because of its intense body or opacity, it is more like a paint than an enamel. It is pure white and will withstand frequent washing, such as is customary in hospitals, breweries, dairies, laundries, stores, hotels and cold storage plants.

Rice's Gloss-O-Lite is similar to "Barreled Sunlight" Rice's Mill White (see preceding page) as to whiteness, gloss and covering properties, but it is made to dry harder so as to better withstand the constant cleaning and "hard knocks" associated with such places as are named above. Also furnished in Eggshell and Flat. See specifications on this page.

Price, March 6, 1918: \$2.65 per gal. in barrels.

**Rice's Chinaline, Interior and Exterior.**

The finest enamel possible to make. It is superior to all domestic and imported enamels because it holds its pure white color better. The finish is like porcelain, for there are no brush marks or laps.

Rice's Chinaline contains no lead and is sanitary, non-poisonous and germproof, making it especially adaptable for hospitals and other institutions. The finish is a beautiful luster. It can be rubbed and polished; but to save this labor Rice's Chinaline is made also in flat or eggshell finish. See specifications on this page.

Price, January, 1918; \$5.00 per gal. in barrels.

**Rice's Flow-On.**

An interior oil paint in semipaste form, capable of producing a flat, washable finish when thinned. It contains no varnish nor China wood oil. It flows freely and eliminates all brush marks and streaks even on large wall surfaces. Being in semipaste form, it can be reduced with reference to the number of coats to be used and the kind of surface on which it is to be applied. Used largely in tints for offices.

To be applied according to manufacturer's directions.

Price, in semipaste form, March 6, 1918: \$2.35 per gal. in barrels.

**Rice's Eric Structural Paint.**

For iron and steel construction work. Made from a combination of pigments which are practically indestructible, and combined with a vehicle which is spe-

cially treated to be durable and to dry properly. Made in black, olive green and maroon.

Price quoted on application.

**Specifications for Interior Painting of Hospitals and Other Institutions.****PLASTER SURFACES**

*First Coat*—Size all surfaces with a priming coat made of 25 lbs. of pure white lead, well mixed with 3 gals. of best quality of pure linseed oil, containing sufficient turpentine dryer to set the coat thoroughly hard.

*Second Coat*—When first coat is thoroughly dry, apply a coat of Rice's White Enamel Primer, thinned with pure turpentine to the proper working consistency. To the last priming coat add a pint of finishing enamel to each gallon of primer. This will better seal the surface, and insure a uniform gloss of finishing coat.

*Third and Fourth Coats*—Rice's Chinaline\* (Gloss, Eggshell or Flat).

**WOODWORK**

*First*—Shellac all knots and sap spots.

*First Coat*—Rice's White Enamel Primer. Thin with about 1 pt. of linseed oil to gal.

*Second Coat*—Same as for second coat on plaster surfaces given above.

*Third Coat*—Rice's Chinaline\* (Gloss, Eggshell or Flat).

**BRICK AND CONCRETE**

*First Coat*—Rice's Granolith Concrete Coating. This coat should be reduced with a mixture of 3 parts linseed oil and 1 part turpentine, according to porosity of surface, and allowed to dry hard before applying next coat.

*Second Coat*—Same as for second coat on plaster surfaces given above.

*Third Coat*—Rice's Chinaline\* (Gloss, Eggshell or Flat).

\*For a less expensive finish which may be used for certain work, substitute Rice's Gloss-O-Lite for Rice's Chinaline. Descriptions, showing the difference in grade of these two finishing enamels, are given on this page.

**In General.**

For best results with any paint, time should be allowed for plaster, concrete, cement and unseasoned lumber to become dry.

At least 48 hours must be allowed between all coats.

All paint to be delivered on the job in the original packages bearing the name of the manufacturers, U. S. GUTTA PERCHA PAINT CO., Providence, R. I.

All paints to be used as received from the manufacturers, except that if any thinning is required a very little pure turpentine may be used (unless as otherwise specified).

**Testimonials and Samples.**

Partial lists of users, samples and circulars describing all the above in detail can be had for the asking.

**Specification Forms.**

Architects and engineers will be furnished with specification forms on application if they will mention the finish in which they are interested. The specifications will name the proper primers and give recommendations for the proper "building up" of a surface preparatory to receiving paints or enamels.

**Packages.**

All paints and enamels are shipped in automix barrels. By simply turning the crank the contents are kept thoroughly agitated and uniform results are assured.

**Prices.**

Prices subject to change due to fluctuation in cost of raw materials. Prices quoted are f.o.b. Providence, R. I.

**Deliveries.**

Made from factory at Providence, and stocks in principal cities of the United States (including the Pacific Coast).

# WADSWORTH, HOWLAND & CO., INC.

Manufacturers of Coatings, Paints, Varnishes, Enamels and Lead Corroders

## BOSTON BRANCHES

84 Washington Street  
222 Clarendon Street

## SALES OFFICE AND WAREHOUSE

139-141 Federal Street  
BOSTON, MASS.

BRANCH OFFICE  
BROOKLINE, MASS.  
297 Harvard Street

FACTORIES: MALDEN, MASS.

## BRANCH STORES AND OFFICES

NEW YORK, N. Y., 101 Park Avenue  
SPRINGFIELD, MASS., 30 Harrison Avenue

WORCESTER, MASS., 24 Southbridge Street  
NEW HAVEN, CONN., 382 State Street  
HARTFORD, CONN., 153 Asylum Street

Distributing Agents in all large cities in the United States and Canada

## Products.

PAINTS, COATINGS and ENAMELS, including "BAY STATE" BRICK and CEMENT COATING, a Sanitary, Damp and Fire Resisting Finish Coating for cement, concrete, brick, plaster and wood; "BAY STATE" CEMENT CRACK FILLER; "BAY STATE" AGATEX, a Cement Floor Filler, which hardens and makes concrete floors proof against wear, dust, water and oil; "BAY STATE" ENAMELS for applications where Gloss or Eggshell Finish is desired; WAHCOLITE ENAMEL for millwork; "BAY STATE" STEEL PROTECTIVE COATING.



THE BAY STATER  
TRADE-MARK  
(Reg. U. S. Pat. Off.)

FOR MILLWORK, ETC.—Its sanitary and fire resisting qualities find effective application in mill and factory interiors and in boiler and engine rooms. "Bay State" Coating for millwork protects the surface against disintegration and scaling, a feature valuable in the preservation of intricate machinery. Its flat, velvety water-color finish reflects light very effectively. Can be washed with soap and water.

FOR DAMPROOFING ABOVE GRADE—In this use, on exterior surfaces, "Bay State" Coating is characteristically effective. A sure bar against exterior moisture and will prevent hair cracking on exterior cement surfaces.

FOR INTERIOR WOODWORK—Can be used on interior woodwork by itself as a dull finish, and over such surfaces it serves as an approved fire retardant coating. Can also be used as an undercoat for "Bay State" No. 2 or Wahcolite Enamels.

COMPARATIVE COST—"Bay State" Brick and Cement Coating costs less per gallon than lead and oil paint. While it covers slightly less surface in area, one coat covers better than two and frequently better than three coats of lead and oil or other paints, showing a reduction in cost of material, with a great saving of labor and time. It being a permanent finish, it is not in the class with water paints which show rapid disintegration.

## "Bay State" Brick and Cement Coating.

Composed of carefully selected pigments, carried in a volatile liquid which evaporates upon application, and when applied to concrete, cement, brick, plaster or wood, incorporates itself as a part of the material, resisting dampness, and thus affording protection to the surface upon which it is applied. It contains no lead, glue, casein or water, and resists the attacks of alkalis, acid fumes, gases, steam, and extremes of temperature. It dries with a dull, uniform finish, and is made in white and in several soft, rich color tones.

The superiority of this, the original of all cement coatings, is also indicated in the facts that it is applicable to nearly all surfaces, even when somewhat moist, and that it will not turn yellow from exposure.

"Bay State" Brick and Cement Coating is supplied in several modifications to particularly suit it for the services indicated below:

FOR EXTERIOR AND INTERIOR CEMENT, CONCRETE, POROUS BRICK AND PLASTER SURFACES—In these applications "Bay State" Coating serves both as decoration and protection. It prevents exposed surfaces from absorbing and showing dampness after storms. Has been effectively applied in cases of factories, hospitals, laboratories, laundries, mills, dwellings, lightshafts, cold storage, grain elevators and packing houses, office buildings, hotels, etc.

FOR CEMENT FLOORS—"Bay State" Coating overcomes the annoyance and damage occasioned by the dusting of cement floors. It provides a surface of exceptional wearing and sanitary qualities. Prevents staining and absorption and reduces traction noise. Can be readily washed with soap and hot water. Made in several special colors, and in first and second coats.

## "Bay State" Cement Crack Filler.

A heavy paste suitable to be knifed into cracks before applying "Bay State" Brick and Cement Coating, thereby filling voids which paint could not be expected to do. It is of a slightly porous nature and produces an elastic surface which is not likely to become brittle. Thoroughly tested out under adverse conditions, and has produced excellent results.

## "Bay State" Agatex.

An exceptionally effective cement hardener. When applied to a concrete floor, a slight excess remains on top, forming a thin film which coats the surface. This film is not intended to resist abrasion; it is of such a nature that when subjected to wear it does not peel off, but is forced by the pressure of the wear into all pits and crevices of the surface, thereby producing a smooth, hard, wear-resisting finish within the top part of the floor itself. "Bay State" Agatex changes a soft,



porous, dusting or pitting cement floor into a smooth, hard, wear-resisting, and non-porous surface that will not dust or pit.

### Enamel Finish.

A first coat for enamel finish. Many surfaces of brick, cement, iron and wood, on interiors, are desired in a glossy enamel finish and "Bay State" Brick and Cement Coating or Wahcolite Flat forms an ideal first coat for such work, drying hard and perfectly flat.

### "Bay State" Enamels No. 2 and No. 3.

For finishing coats. "Bay State" Enamel No. 2 is made for enamel interior finish over "Bay State" Brick and Cement Coating, and is adapted for use in office buildings, hospitals, engine rooms, bathrooms, kitchens, laboratories, etc. It can be washed without injury, and is a most durable enamel. It may be left full gloss, or rubbed with pumice and water to a porcelain finish. Made in colors if desired. Samples on application.

"Bay State" Enamel No. 3, a high grade enamel for interior use, dries with an eggshell gloss, dispensing with the labor of rubbing.

### Wahcolite Enamel.

Wahcolite, a special enamel of less price than "Bay State" Enamel No. 2, which is specially adapted to factories and millwork. Samples on application. Made in first (flat), second (semi-gloss) and third (gloss) coats.

The amount of light reflected from the walls and ceilings prepared with these twin whites will more than pay for the labor and material used.

### "Bay State" Steel Protective Coating, a Metal Protective Paint.

This metal preservative is the result of years of research and of many practical and laboratory tests. It is made from the purest pigments, and has proved, under actual severe exposure, a most effective rust inhibitive. It is adhesive, moistureproof and a resistant of acid fumes, such as are encountered in the atmosphere of railroad and manufacturing districts.

TEST—All pigments used in this product have been thoroughly tested out on the Atlantic City and Washington Test Fences, where they were exposed for several years, and withstood the severest conditions.

APPLICATION—"Bay State" Steel Protective Coating is recommended for use on structural metal in buildings, bridges, subways, elevated railway structures, smokestacks, tanks, etc.

Its use should be preceded by a thorough cleaning of the surfaces to be protected, sand blasting being the most desirable method, in lieu of which method wire brushes and scrapers should be used. All scale, grease and rust spots should be thoroughly removed.

COVERING CAPACITY—About 400 sq. ft. per gal., 1 coat.

COLORS, PACKAGES AND PRICES—"Bay State" Steel Protective Coating is prepared in 4 standard colors: rich brick red, dark green, dove gray and coal black.

Note—For permanence where acid fumes are encountered, the coal black and dove gray are to be preferred.

Packed in barrels, half barrels, 5-gal. and 1-gal. cans. Samples sent on application.

### Orders, Shipments and Payment.

Order from nearest office, store or agent. Immediate shipment can be made. Terms, 60 days; less 2%, 10 days.

Satisfactory rating or references required.

### Application Data.

Brick, cement, concrete, stucco and wood, unless excessively rough, porous and weather beaten, will ordinarily require but one coat of "Bay State" Brick and Cement Coating. Interior plaster will require two or three coats of "Bay State" Brick and Cement Coating.

The following table shows requirements for first coat, under different conditions:

"BAY STATE" BRICK AND CEMENT COATING—On brick or concrete hard finish, 1 gal. to cover not over 18 sq. yds.

On brick, concrete, rough or porous or exterior rough plaster, stucco, 1 gal. to cover not over 15 sq. yds.

On plaster, interior, hard finish (over first coat), 1 gal. to cover not over 30 sq. yds.

"BAY STATE" ENAMEL No. 2—Over undercoat of "Bay State" Brick and Cement Coating, 1 gal. to cover not over 30 sq. yds.

### Specifications.

Clean off all loose particles from all surfaces before priming.

#### NEW INTERIOR PLASTER WALLS

Coat No. 1—Apply one coat of "Bay State" Brick and Cement Coating for plaster, thinned with pure spirits of turpentine, not over 1 pt. to 1 gal. of coating.

Coat No. 2—Apply one good, flowing coat of Special Plaster Cement Coating for plaster, as taken from the original package.

Coat No. 3—If third coat is necessary, apply same as Coat No. 2.

#### EXTERIOR BRICK, CONCRETE, CEMENT AND STUCCO

Coat No. 1—Apply one flowing coat of Cement Coating with a wide wall brush, as taken from the original package.

NOTE—This one coat should cover sufficiently well to give a good finish. If a more dense surface is desired an extra coat may be applied, allowing 24 to 48 hours between coats.

#### INTERIOR BRICK, CONCRETE OR CEMENT

Same as foregoing.

#### CEMENT FLOORS

Two coats of "Bay State" Cement Floor Coating must be applied; the first coat as a priming coat, which insures a proper foundation for the finish coat. "First coat" (a liquid of neutral color) to be tinted with a small quantity of the finish coat (about ¼ gal. to 1 gal.).

On cement floors of ordinary texture and condition, one coat of "Bay State" Agatex applied as it comes from the package is sufficient to produce satisfactory results.

On very porous and soft floors, two coats should be applied, the first coat thinned slightly with about ½ pt. of turpentine to the gal.

On very hard, close texture floors, only one coat is necessary, and should be thinned with about ½ pt. of turpentine to the gal.

#### GENERAL INTERIOR FINISH

Priming Note—"Bay State" Brick and Cement Coating or Wahcolite Flat will make an excellent ground coat for "Bay State" Enamel No. 2 or No. 3 or Wahcolite Gloss Enamel, as either dry perfectly flat and hard. Allow 24 hours for drying.

Enamel Finish—Sandpaper the primed surface thoroughly (see Priming Note above) and apply a good flowing coat of "Bay State" Enamel No. 2 [or No. 3 or Wahco Enamel]. Do not apply on surfaces which contain any dampness, as moisture will cause blisters and peeling.

Woodwork—Sandpaper the priming surface thoroughly (see Priming Note above) and apply one or two heavy coats of "Bay State" Enamel No. 2 [or No. 3 or Wahco Enamel]. (If two coats of enamel are used, sandpaper lightly the first coat.)

Note—Do not use "Bay State" Brick and Cement Coating on vitrified, granolithic or any other non-absorbent surface, nor over a surface that has been smoothed up with neat cement.

# BOSTON VARNISH COMPANY

## Manufacturers of Varnishes, Enamels and Finishes

Everett Station  
BOSTON, MASS.

BRANCH OFFICES AND WAREHOUSES

CHICAGO, 519 West 12th Street

SAN FRANCISCO, 311 California Street

### Products.

Highest grade VARNISHES and ENAMELS: KYANIZE FLOOR FINISH, KYANIZE WHITE ENAMEL, KYANIZE SPAR FINISH, KYANIZE INTERIOR VARNISH, KYANIZE CRYSTAL FINISH; KYANIZE CABINET RUBBING VARNISH, KYANIZE SEMIGLOSS FINISH, KYANIZE SANITARY FLOOR ENAMEL.

### Kyanize Floor Finish.

The correct varnish for floors. Waterproof, durable and elastic to an exceptional degree. Kyanize Floor Finish will not crack, check or peel and is especially made to stand the scuff and tread of heavy shoes. It dries over night with a beautiful luster and can be washed with hot or cold water without injury. Made in natural and eight permanent colors and sold only in sealed cans with our gold dome label. Owing to its free flowing qualities Kyanize Floor Finish is preferred by leading master painters, as the labor involved in its application is reduced to a minimum. This quality combined with its extreme durability makes it the most economical as well as the most satisfactory of all hardwood floor varnishes.



KYANIZE FLOOR FINISH CAN

### Kyanize Spar Finish.

Tough, hard drying gums treated by the Kyanize process give this all-weather varnish the ability to stand the worst kind of weather on outside, exposed surfaces. It is not affected by salt or fresh water, heat, cold, sun, wind or rain. It dries quickly and is exceedingly tough and elastic. Subjected to the most severe weather or submerged in water for weeks, Kyanize Spar Finish will not soften, peel, turn white or blue. The ideal varnish for outside doors, store fronts, piazza floors, window casings, porch furniture and all marine work. Packed in the handy three-cornered can for customers' protection.



KYANIZE SPAR FINISH CAN

### Kyanize Interior Finish.

Intended strictly for highest grade interior work, Kyanize Interior Finish is an extremely pale, free flowing varnish of excellent body. This high grade product can be left in the natural gloss or rubbed to a dull finish with equally perfect results.

Kyanize Interior Finish is absolutely waterproof and will not mar nor scratch white.

**Kyanize**  
KYAN-IZE  
TRADE-MARK

### Kyanize Crystal Finish.

For interior work over light colored woods, where paleness is particularly desirable in a varnish Kyanize Crystal Finish is recommended.

This is a light color free flowing varnish which will not turn white from water or moisture. It dries dust free in 6 to 8 hours, hard in 12 to 14, is very durable and suited to all gloss interior finish.

For woodwork, the color of which is not so light that it demands a varnish of extreme paleness, our Kyanize Interior Finish is suggested as the most suitable varnish for all around interior work where the very highest grade gloss or rubbed finish is required.

### Kyanize Cabinet Rubbing Varnish.

Where the surface is to be rubbed and polished to a high degree Kyanize Cabinet Rubbing Varnish is unsurpassed. This superior varnish is made for the very highest type of rubbed interior work. It is especially recommended for finishing the interior of churches and for use on pews, seats and all furniture. Can be coated every 48 hours and rubbed in 4 days.

Sample panels of oak, mahogany or any desired wood finished with Kyanize Cabinet Rubbing Varnish will be sent to architects requesting them.



KYANIZE CABINET RUBBING VARNISH CAN

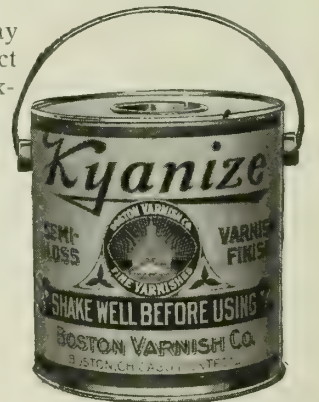
### Kyanize Semigloss Finish.

The most satisfactory way to obtain the rubbed effect without the labor and expense of rubbing is to use Kyanize Semigloss for all interior work where this effect is desired at a minimum expense.

It dries quickly with a velvety surface which can be brought to any desired degree of gloss by the addition of Kyanize Interior.

If tints are wanted, any shade can be obtained by mixing with pure colors.

Kyanize Semigloss Finish contains no wax and can, therefore, be used in any climate. It dries hard and will not stick. Equally effective on new work or over old varnish if the surface is clean and smooth. One coat makes a splendid finish over any filled or varnished surface.



KYANIZE SEMIGLOSS VARNISH FINISH CAN



**Kyanize White Enamel.**

For the highest grade work on wood, metal or plaster, the most durable enamel obtainable is Kyanize White Enamel. This fine product flows very freely, covers double the surface of ordinary enamels and dries with a waterproof film that will stand outside exposure without checking, cracking or peeling.

Providing the proper care is exercised in the application of the undercoats, the most beautiful and most durable pure white finish possible is produced with Kyanize White Enamel. Kyanize White Enamel is the finishing coat that will stand exposure without being affected by weather or climate changes.

Kyanize White Enamel will flow out perfectly smooth without showing a brush mark or lap, but it *can not eliminate* specks or brush marks left on the undercoats.

If desired, Kyanize White Enamel will be furnished tinted to match any desired light color, and it is made



GROUP OF KYANIZE WHITE ENAMEL CANS

in either gloss or eggshell finish. Any modification in the degree of luster can be obtained by mixing gloss and eggshell.

**CAUTION**—Do not permit Kyanize White Enamel to be thinned with varnish, oil or any thinner except strictly pure turpentine and then use turpentine only as directed— $\frac{1}{2}$  pt. to gal. on first coat only. At all other times Kyanize White Enamel is to be used just as it comes from the can.

**IMPORTANT**—It is necessary in order to have the best possible results, that Kyanize White Enamel should be applied at a temperature not less than 70° Fahr., and that each undercoat should be thoroughly rubbed with fine sandpaper and steel wool in order to remove all brush marks and other imperfections. This will leave a perfectly smooth surface for the application of Kyanize White Enamel.

**Specifications, Kyanize White Enamel.**

**FOR CLOSE GRAINED WOODS—First Coat**—Should be pure white lead ground in oil, thinned with one-half raw linseed oil and one-half pure turpentine, with small quantity of good japan dryer.

After applying this coat, putty all nailholes with white lead putty; sandpaper surface with fine sandpaper, and then give whole surface a coat of strictly pure white shellac, and sandpaper again before applying second coat.

**Second Coat**—One-half pure white lead in oil and one-half pure French zinc ground in oil; same to be thinned with  $\frac{1}{2}$  pt. of raw linseed oil to 1 gal. of turpentine.

**Third Coat**—One-half pure white lead ground in oil, one-half pure French zinc ground in oil, thinned with strictly pure turpentine only.

**Fourth Coat**—Kyanize Enamel thinned with  $\frac{1}{2}$  pt. of turpentine to the gallon.

**Fifth Coat**—Kyanize Enamel as taken from the can well flowed on.

**NOTE**—For exterior work, above specifications are correct, except that all pure white lead is recommended for the undercoats in place of part lead and part zinc.

**FOR OPEN GRAINED WOODS**—Open grained woods should first be filled with good paste filler well rubbed in. After this is dry and hard, sandpaper lightly and give the whole surface a coat of strictly pure white shellac. Then lightly sandpaper again and finish as above.

**PLASTERED WALLS**—A thin sizing coat should first be applied to prevent suction, seal up the surface and prevent cracking. For this coat we recommend Kyanize Pigment Wall Sizing. Then apply strictly pure white lead ground in oil.

**First Coat**—To be thinned with one-quarter boiled linseed oil and three-quarters turpentine.

**Second Coat**—To be thinned with pure turpentine, adding about  $\frac{1}{2}$  pt. linseed oil to the gallon of turpentine.

**Third Coat**—To be strictly pure white lead thinned with pure turpentine only.

**Fourth Coat**—To be Kyanize Enamel thinned with  $\frac{1}{2}$  pt. pure turpentine to the gallon.

**Finishing Coat**—To be Kyanize Enamel as taken from the can.

**SPECIFICATION BOOKLET**—The company has compiled a booklet of specifications for busy architects giving, in a brief manner, full information regarding the use of Kyanize White Enamel on metal, concrete, Portland cement, brick and all kinds of wood surfaces. It will be sent promptly to architects requesting it.

**Kyanize Sanitary Floor Enamel.**

After exhaustive research the Kyanize process has developed a product which far surpasses all previous coatings for old or soft wood floors and overcomes all the objectionable features common to floor paint. This product is Kyanize Sanitary Floor Enamel. It is a quick drying, elastic, durable enamel made of the highest grade gums and oils obtainable, blended in such a way that the enamel dries from the bottom through to the upper surface, thus insuring a film that is dry underneath as well as on top.

Kyanize Sanitary Floor Enamel flows freely from the brush so that brush marks or laps will not show. It is waterproof and can be washed with warm or cold water without injuring its luster. Made in 8 permanent colors, it is the ideal coating for all soft wood floors. Sold only in sealed cans bearing the Kyanize gold dome label.



KYANIZE SANITARY FLOOR ENAMEL

**Specification and Samples.**

At all times, through our Architect's Service Department, specifications will be furnished, samples of varnishes and enamels will be submitted or various kinds of wood panels finished with these products will be sent to any responsible architect who will write to the company. Architects should not hesitate to take up with us any finishing problem they may have. The Architect's Service Department offers its facilities and advice *gratis*.

ESTABLISHED 1865

## CHICAGO VARNISH COMPANY

Manufacturers of Varnish, Enamels and Stains

TELEPHONE:  
HAYMARKET 9002100 Elston Avenue  
CHICAGO, ILL.

NEW YORK, N. Y., HUDSON TERMINAL BUILDING, 50 CHURCH STREET

**Products.**

Manufacturers of WOOD FINISHES in great variety, including "SHIPOLEUM" "SUPREMIS FLOOR FINISH," "CHI-VO," "FLORSATIN," "No. 6 RUBBING," "ARCHITECTURAL COACH," "HYPERION FINISH," "DEAD-LAC," "WOOD-TINTS," "EXTERIOR OAK," "NAVALITE," "WHITE ENAMELITE," "FLO-WHITE," "EGGSHEL-WHITE," "FLAT-LEAD," "SUPREME YACHT WHITE," "SILEX PASTE FILLER," and "FLAT WALL-PAYNT."



on mantels and fine furniture and, as it dries thoroughly hard, it should be specified for use on church seats, etc.

"DEAD-LAC"—A special varnish for standing woodwork, drying with a soft, dead finish and saving the labor and cost of rubbing the varnish to a dull finish. This gives the dead effect which is so much desired on interior standing woodwork. It contains no wax, and work finished with "Dead-Lac" may be varnished over later. Being made of the best materials, it is far ahead of any of its many imitators and will be found to be very economical.

**Description.**

The products mentioned above are brands many of which we have manufactured continuously for nearly 35 years. They embody the knowledge and experience gained in more than 50 years in the varnish business and are specified by architects throughout the country who appreciate their high quality and durable finish.

Below is given the purpose for which each product is intended and, on the opposite page, proper specifications for their use.

"SHIPOLEUM"—The ideal varnish for interior finish on standing woodwork, enduring the hard wear and rough usage remarkably well. For this reason it is especially adapted not only for the finest residences, but for hospitals, public buildings, bathrooms, etc.

"SUPREMIS FLOOR FINISH"—The first varnish put on the market especially for floors, and, by reason of its great durability, freedom from scratching and marring, it has continuously held the lead of all floor varnishes.

"CHI-VO"—This is a varnish made by a new process and contains no wax. It dries with a rubbed effect of remarkable beauty and gives a tough, durable finish which is not affected by water. Where a rubbed effect is desired, "Chi-Vo" will give this result and save all the labor and expense of rubbing. It is intended for use on standing woodwork, or for other interior purposes.

"FLORSATIN"—A floor varnish drying with a soft, eggshell effect resembling a waxed finish, but being far more durable.

"No. 6 RUBBING" AND "ARCHITECTURAL COACH"—They are also for interior standing woodwork and have fine wearing properties.

"HYPERION FINISH"—Especially adapted for use

"WOOD-TINTS"—These are oil stains bringing out the beauty of the grain of the wood and producing the most exquisite effects. They do not raise the grain, have great covering capacity and are very easily applied. The different shades are shown in the specifications on the next page. Finished wood panels will be sent to any architect upon request.

"EXTERIOR OAK" AND "NAVALITE"—These are made especially for outside use on front doors, verandas and other exposed situations. Being made of such materials that they have remarkable durability for this purpose.

"WHITE-ENAMELITE"—A gloss enamel for high quality work on interiors.

"EGGSHEL-WHITE"—An enamel for interiors which dries with a soft, eggshell luster, requiring no rubbing.

"FLO-WHITE" AND "SUPREME YACHT WHITE"—Gloss white enamels especially prepared for outside use, and may also be used for interiors.

"FLAT-LEAD"—Especially prepared for undercoats for white enamel work and insures a durable foundation.

"FLAT WALL-PAYNT"—A flat drying paint for plaster walls or woodwork. May be washed with soap and water. Made in white and 21 beautiful tints.

**Booklet.**

Our booklet, "Architectural Finishes," giving a complete description of these materials, together with specifications for their use, will be sent on application.



**Prices.**

The prices of our products are as follows:

"Shipoleum" .....	\$4.00 per gal.
"Supremis" .....	4.00 per gal.
"Chi-Vo" .....	4.00 per gal.
"Florsatin" .....	4.25 per gal.
"Dead-Lac" .....	4.75 per gal.
"Hyperion" .....	4.00 per gal.
"No. 6 Rubbing" .....	3.75 per gal.
"Architectural Coach" .....	3.50 per gal.
"Wood-Tints" (see specification)	
	3.25 to 5.25 per gal.
"Exterior Oak" .....	5.00 per gal.
"Navalite" .....	5.25 per gal.
"No. 10 White Enamel" .....	5.50 per gal.
"White Enamelite" .....	7.00 per gal.
"Flo-White" .....	7.00 per gal.
"Eggshel-White" .....	7.00 per gal.
"Flat-Lead" .....	4.00 per gal.
"Supreme Yacht White" .....	6.25 per gal.
"Supreme Mahogany Glaze" .....	4.75 per gal.

*Prices subject to change without notice.*

**Specifications—Interior Standing Woodwork.**

FOR NATURAL FINISH—Specify 2 or 3 coats of Chicago Varnish Company's "Shipoleum" Varnish. If the wood is open grain (such as oak, ash, etc.), specify 1 coat "Silex Paste Filler" to be put on before the varnish is applied. The last coat may be rubbed if desired.

For an imitation rubbed effect where it is desired to save the labor of rubbing, substitute Chicago Varnish Company's "Chi-Vo" for the last coat of "Shipoleum."

For "No. 6 Rubbing," "Architectural Coach" and "Hyperion Finish," specify same as for "Shipoleum."

FOR STAINED FINISH: RUBBED EFFECT—For "Wood-Tints" Nos. 250, 251, 252, 253, 254, 325, 350, 220, 320, 330, 335, 336, 360, 553 and 554, specify 1 coat of any of these numbers of "Wood-Tints," 1 coat White Shellac, 1 coat of "Shipoleum" and 1 coat of "Chi-Vo." See Note No. 2.

For "Wood-Tints" Nos. 310, 312, 581, 620 and 621, specify same as above, substituting Orange Shellac for the White Shellac.

FOR A PERMANENT MAHOGANY EFFECT—Specify Chicago Varnish Company's system of Mahogany Finish, which consists of 1 coat each of No. 300 Dark Mahogany Wood-Tint, Orange Shellac, "Supreme Mahogany Glaze," "Shipoleum" Varnish (rubbed).

*Note No. 1*—On account of present inability to obtain certain dry color, the No. 300 Dark Mahogany Wood-Tint is discontinued temporarily, but a mahogany effect practically identical, may be obtained by substituting our No. 301 Special Dark Mahogany Wood-Tint and our Supreme Mahogany Glaze as above specified.

FOR A LIGHT MAHOGANY EFFECT—Specify the same as above, substituting No. 305 Light Mahogany Wood-Tint for the No. 300 Dark Mahogany Wood-Tint.

FOR STAINED FINISH: DEAD EFFECT—Specify same as for Stained Finish: Rubbed Effect, substituting "Dead-Lac" for the coat of "Chi-Vo."

*Note No. 2*—On open grain woods (such as oak, ash, etc.) if a filled surface is desired, specify 1 coat of stain and a "wash coat" of shellac, one coat of "Silex Paste Filler" (see next paragraph), 1 coat of "Shipoleum" and 1 coat of "Chi-Vo" [or "Dead-Lac," if desired].

Use "Silex Paste Filler" No. 51 for Wood-Tints Nos. 220, 250, 251, 320, 330 and 335; "Silex Paste Filler" No. 52 for Wood-Tints Nos. 252, 325, 336 and 360; "Silex Paste Filler" No. 53 for Wood-Tints Nos. 253, 254, 310 312 and 350; "Silex Paste Filler" No. 55 for Wood-Tints Nos. 300 and 301 and "Silex Paste Filler" No. 56 for Wood-Tint No. 305.

GLOSS OR RUBBED VARNISH FINISH—Specify same as above, substituting for the "Chi-Vo" or the "Dead-Lac" a second coat of "Shipoleum" Varnish, rubbing the last coat if a rubbed finish is desired.

**Specifications—Exterior Standing Woodwork.**

Specify for open grain woods (such as oak, ash, etc.), fill the pores with Chicago Varnish Company's "Silex Paste Filler" and apply 3 coats of Chicago Varnish Company's "Exterior Oak" or "Navalite." Close grain woods (such as maple, pine, birch, etc.) require no filler.

**Specifications—Enamel.**

INTERIOR—Specify 3 coats Chicago Varnish Company's "Flat-Lead" (adding 1 pt. raw linseed oil to each gallon of "Flat-Lead" for first coat only) and finish with 2 coats of Chicago Varnish Company's "Eggshel-White" ["White Enamelite" or "Flo-White," as desired], applied according to directions on can label.

EXTERIOR—Specify 3 to 4 coats of keg lead and oil for a suitable undercoating, and finish with 2 coats of Chicago Varnish Company's "Flo-White" [or "Supreme Yacht White" Enamel, as desired], applied according to directions on can label.

**Specifications—Floors.**

FOR "SUPREMIS"—Specify for open grain woods (such as oak, ash, etc.), fill the pores with "Silex Paste Filler" and apply 2 or 3 coats of "Supremis Floor Finish."

For close grain woods (such as maple, pine, etc.) use no filler.

FOR "FLORSATIN"—Specify, same as above, substituting "Florsatin" for the last coat of "Supremis."

*NOTE*—Never use shellac or liquid fillers as an undercoat on floors.

**Specifications—Walls.**

"FLAT WALL-PAYNT"—Specify for new plaster walls, for first coat, 4 parts "Flat Wall-Paynt Size" and 1 part "Flat Wall-Paynt," and then 2 coats "Flat Wall-Paynt."

For new woodwork specify, for first coat, 4 parts "Flat Wall-Paynt" and 1 part linseed oil, and then 2 coats "Flat Wall-Paynt."

# THE GLIDDEN COMPANY

Manufacturers of Varnishes, Stains, Enamels and Paint Specialties

CLEVELAND, OHIO

## BRANCH OFFICES

NEW YORK, N. Y., 634-636 West 34th Street  
CHICAGO, ILL., 843-845 West Washington Boulevard  
ST. LOUIS, MO., 1600 Clark Avenue

TORONTO, CAN., THE GLIDDEN CO., LTD., 370-382 Wallace Avenue  
LONDON, E. C., 86 Clerkenwell Road

## SALES OFFICES

SYRACUSE, N. Y., 321 Baker Avenue  
ERIE, PA., 509 West 9th Street

BALTIMORE, MD., 2700 Elsinore Avenue  
WAKEFIELD, MASS., 194 Main Street

## WESTERN DISTRIBUTERS

SAN FRANCISCO, CAL., WHITTIER COBURN CO.  
LOS ANGELES, CAL., CALIFORNIA GLASS AND PAINT CO.

PORTLAND, ORE., DULUTH, MINN., and SPOKANE, WASH., MARSHALL WELLS HARDWARE CO.

## Products.

A complete line of ARCHITECTURAL FINISHES: JAPSPAR VARNISH; M. P. DURABLE INTERIOR VARNISH; M. P. DURABLE FLOOR VARNISH; VELVET WHITE ENAMEL; SUPERIOR WHITE ENAMEL GLOSS; WOOD STAINS; FLAT WALL FINISH; DAYLITE MILL and BASEMENT WHITE PAINT; STUCOLOR LIQUID CEMENT COATING; FRENCH CAEN STONE FINISH.

Concrete Floor Dressing.

### Glidden JapSpar Varnish.

An extremely durable varnish for exterior and interior use. Will not turn white. It will stand all varnish tests: hot water test, rain test, salt water test, steam, gas and fume test, alcohol test, exposure test and heel test. JapSpar is an absolutely safe varnish for all architectural work. Send for test panel.

SPECIFICATION DATA—2 coats, following a good paste filler on open grained woods, is sufficient for general use. On close grained woods, omit filler. JapSpar sets dust free in 4 to 5 hours, dries in 24 to 48 hours and "rubbing to a dull finish" can be specified in 4 or 5 days.

### Glidden M. P. Durable Interior Varnish.

A high grade varnish for general interior use. It is light in color, extremely elastic and durable. For finest interior trim in gloss or rubbed effect, there is nothing better. Whether for natural or stained wood finishing, it enhances the grain and gives the wood a protective coating that will stand the most severe wear.

SPECIFICATION DATA—If shellac or liquid filler is used over stain, and a gloss finish is desired, specify 2 coats, allowing sufficient time for drying; sand between coats. If a rubbed dull finish is desired, specify 3 coats as above, rubbing the last coat with pumicestone and oil or water. This varnish sets dust free in from 3 to 4 hours and dries for sanding or rubbing in 24 to 48 hours according to temperature conditions.

### Glidden M. P. Durable Floor Varnish.

A wonderfully high grade varnish especially made for floor finishing, where it stands the supreme test; general hard rough usage in homes, institutions and large buildings of all kinds. This varnish combines hard and quick drying properties without sacrificing the elasticity so essential to a floor varnish. It does not turn white, can be washed and scrubbed repeatedly and does not easily scratch or mar. Send for test panel.

SPECIFICATION DATA—Specify 3 coats; thin the first coat with 10% of pure spirits of turpentine and apply the second and third coats full body. This varnish sets dust free in 2 to 3 hours and dries hard in 15 to 24 hours. Use best paste filler on open grained woods. To insure best results on floors do not use shellac.

### Glidden Velvet White Enamel.

A better enamel and a less expensive method of application. This finish meets all economy requirements clients may demand and still produces the beautiful soft velvety effect liked so well. It does not require expensive rubbing and yet it has all the durability and lasting power that could be desired. 4 coats will do the work of 7. Glidden Velvet White Enamel is especially adapted for finest interior woodwork, plaster, Keene's cement and metal work. The largest hotels, hospitals, sanitariums, large buildings, cold storage plants, etc., the country over, are using this sanitary, washable and extremely durable finish. Send for "Prove it" panel.

SPECIFICATION DATA—Specify first 2 coats of Glidden Perfect Enamel Undercoat. Then a third coat consisting of equal parts of Glidden Perfect Enamel Undercoat and Glidden Velvet Enamel. For the last coat, specify Glidden Velvet White Enamel full body. A light sanding with fine sandpaper between coats should be included in these specifications. This enamel dries dust free in 3 or 4 hours and hard in 48 to 60 hours.

### Glidden Superior White Enamel.

This is the highest quality gloss white enamel. Durable, elastic, versatile, it is everything to be desired in a pure white enamel coating. The fact that it is particularly well suited to hospital and sanitarium enameling is evidence of its extreme durability and general fitness. It is an enamel that positively retains its natural beauty through exposure and wear and does not turn yellow with age. Superior White Enamel can be rubbed to a rich satin finish. Send for finished panel.

SPECIFICATION DATA—3 coats of Glidden Perfect Enamel Undercoat should be specified for building up a suitable surface



THE NEW STYLE PACKAGE FOR GLIDDEN VELVET WHITE ENAMEL



for the succeeding coats of enamel. Follow with 2 coats of Superior White Enamel. This finish sets dust free in 3 to 4 hours and dries in 3 to 4 days according to conditions.

### Glidden Endurance Wood Stains.

They enhance the natural beauty of all woods. They give a rich clear color by penetrating the wood without clouding the grain. They are non-fading and owing to a special process of manufacture they do not raise the grain. Color cards with complete line of colors sent on request.

**SPECIFICATION DATA**—These stains should be specified for any stained effects, whether mission, wax or varnish, or for new or old wood from which all previous finish has been carefully removed. When colors are reduced, specify pure spirits of turpentine for varnish finish. All open grained woods should be filled with a good paste filler after stain has thoroughly dried. This requires 24 hours at least. For the following coats of varnish, specify Glidden JapSpar for exterior doors or other exterior surfaces and Glidden M. P. Durable Interior for all interior work. For the dull varnish finish, specify Glidden Dull Art Finish.

### Glidden Flat Wall Finish.

A most durable and artistic flat finish for walls, ceilings and woodwork. This sanitary and washable finish is suitable for use on rough or smooth plaster, beaver board, metal ceilings and walls, burlap canvas, wood trim or any wall or ceiling surface. It is prepared in 14 colors. The colors can be easily intermixed, thus giving an unlimited number of possible color effects. Should be specified for interior surfaces in finest residences, large buildings, apartment houses, schools, churches, hospitals, etc.

**SPECIFICATION DATA**—For a first coat or primer, specify a mixture consisting of 1 part Glidden Flat Wall Finish and 3 parts Glidden Wall Primer. This coat seals the surface and prepares it for successive coats. Specify 2 following coats of Glidden Flat Wall Finish for best results. For rush work with "hot lime" dangers, specify a thorough application of ordinary vinegar before priming. This neutralizes the alkali. On metal ceilings omit the priming coat.

### Glidden Daylite Mill and Basement White Paint.

Modern industrial efficiency demands the maximum of daylight reflection. Glidden Daylite White Paint meets this demand. It is a sanitary and waterproof pure white paint that will not chip, flake or turn yellow under ordinary conditions. It is made in both flat and gloss effects. It is a most economical finish for industrial plants, hospitals, institutions, apartment houses, etc., and it may be applied with a spraying machine. This finish should also be specified for basement walls of all kinds where greatest reflective power is required.

**SPECIFICATION DATA**—On new surfaces or on surfaces that are extremely dirty or previously whitewashed, specify a first coat of Glidden Daylite Mill White Paint, Flat. Then follow with 1 coat of flat or gloss as desired. The gloss finish produces a medium gloss effect and is recommended for use where surfaces are subjected to smoke, soot and other fumes. When applied over surfaces that have been previously whitewashed, specify a thorough brushing down before painting.

### Glidden Stucolor Liquid Cement Coating.

This Glidden product is made for dampproofing and uniformly coloring exterior surfaces of concrete, cement, stucco, unglazed tile, brick or stone without changing the surface texture. It produces a durable flat finish which closely resembles cement or stone. It is composed of a modified inert pigment incorporated with a vehicle which is extremely durable and water resisting. Color card sent on request.

**SPECIFICATION DATA**—On new surfaces of concrete, cement, stucco, brick, stone and unglazed tile, specify first coat as follows: To each gallon of Glidden Stucolor Liquid Cement Coating, in shade selected, add  $\frac{1}{2}$  pt. of pure spirits of turpentine. Apply liberally in order to thoroughly penetrate the surface. Allow 24 to 36 hours for thorough drying and apply a second coat of Glidden Stucolor Liquid Cement Coating as it comes from the package. For metal surfaces, specify a first coat consisting of equal parts of Glidden Stucolor Mixing Liquid and Glidden Stucolor Liquid Cement Coating. Old surfaces should be treated same as new, after all loose particles, dirt, old paint, etc., have been carefully removed by wire brushing.

### Glidden French Caen Stone Finish.

An extremely artistic finish very closely resembling the genuine French caen stone and caen stone cement. It is exceptionally well adapted to the decorating of lobbies and corridors of hotels, theaters and public buildings. Dining rooms and reception rooms of many beautiful homes have been tastefully decorated with this finish. It is adaptable to any wall or ceiling surface, whether rough or smooth plaster, unglazed tile, brick or stone.

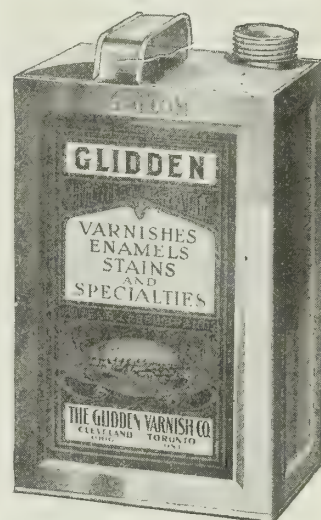
**SPECIFICATION DATA**—New plaster should be thoroughly dry and well seasoned. First specify a priming coat consisting of equal parts of Glidden Wall Primer and Glidden French Caen Stone Finish. Follow with 2 coats of Glidden French Caen Stone Finish, full body. At least 24 hours for thorough drying should be allowed between coats. Only turpentine should be used for thinning.

### Trade-marks.

The distinguishing marks of a Glidden product are the familiar "Green Label" and the name "Glidden." Nearly 50 years of varnish making have built an enviable reputation for "Green Label Products."

### Brands.

The dependable quality and integrity of Glidden products are their chief claims to consideration. They have been standard for years in the world's largest piano, furniture and automobile factories, in the country's leading hospitals and institutions; everywhere that real quality and economy mean most. Glidden Architectural Finishes are sold by dealers everywhere. If architects or contractors should experience difficulty in obtaining any Glidden product, notify this company at once and an immediate supply from the nearest possible source will be assured.



THE FAMILIAR GREEN LABEL PACKAGE FOR GLIDDEN ARCHITECTURAL FINISHES

### Specifications.

Specification data will be found with the above descriptions of Glidden products. Glidden Service Department will gladly prepare special specifications and furnish completely finished sample panels on request. This service will provide specifications for all new architectural effects which are constantly being developed. Specification cards to fit files will be gladly furnished.



ESTABLISHED 1858

**BERRY BROTHERS**

INCORPORATED

**Varnishes, Architectural Finishes and Shingle Stains**FACTORY AND MAIN OFFICE  
DETROIT, MICH.

CANADIAN FACTORY: WALKERVILLE, ONT.

PACIFIC COAST FACTORY: SAN FRANCISCO, CAL.

BRANCH OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD

**Products.**

Manufacturers of WOOD FINISHES: FLOOR FINISH, LIQUID GRANITE, LUXEBERRY WOOD FINISH, ELASTIC INTERIOR FINISH, LUXEBERRY SPAR VARNISH, LACKLUSTRE, DULGLOSS, LUXEBERRY WHITE ENAMEL, SHINGLETINT.

Luxeberry Wall Finish.

**Liquid Granite.**

The most durable floor varnish made, combining the three principal requisites—elasticity, durability and appearance. It has stood actual test of severe service for over 30 years and is recognized by master painters as the best article of its kind. It has never been equalled, and there is more Liquid Granite in use today than any other floor varnish.

SPECIFY—2 coats Liquid Granite applied over 1 coat Berry Brothers' Paste Filler on open grained woods; on close grained woods omit filler. Eliminate use of shellac and liquid wood fillers on all floor work.

**Luxeberry Wood Finish, Light.**

Luxeberry Wood Finish possesses exceptional qualities as a rubbing varnish, and is extensively used for trim work, such as doors, casings, etc., in hotel buildings, office buildings and residential work. Luxeberry Wood Finish is the registered trade-mark name now used to designate the finish long and favorably known as "Berry Brothers' Hard Oil Finish."

SPECIFY—1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Filler, 1 coat Berry Brothers' S. D. C. Shellac and 3 coats Luxeberry Wood Finish. On close grained woods omit filler.

**Elastic Interior Finish.**

For interior trim subjected to severe usage. It possesses great elasticity and durability, and will resist the action of hot water, soap, etc., to a greater degree than any other varnish.

SPECIFY—On open grained woods, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac, and 2 coats Elastic Interior. On close grained woods omit filler.

**Luxeberry Spar Varnish.**

For front doors, store fronts and exterior work subjected to severe exposure and changing weather conditions. The standard of quality with a reputation of 55 years. Made especially for use on all types of marine architecture, wherever a durable and lasting finish is desired. It can be used as both an exterior and interior varnish, as it is made to withstand severe wind, weather and water exposure and does not turn white.

SPECIFY—2 coats Luxeberry Spar Varnish, over 1 coat Berry Brothers' Paste Wood Filler on open grained woods. Omit filler on close grained woods.

**Lacklustre.**

For general interior work where economy in labor is a consideration. This ideal one-coat finish accomplishes with one coat what heretofore necessitated a coat of stain and a coat of wax. The method of application is easy—apply with a rag and wipe off with a

clean piece of cheesecloth, producing a soft and almost lustreless finish, as it contains no wax and has none of the disadvantages of a waxed finish. It will not collect dust, neither will it spot white, and varnish can be applied over it without the necessity of preparing the surface as in the case of wax.

Manufactured in the following colors:

Green Flemish	Mission	Golden
Brown Flemish	Light Weathered	Antwerp
Black Flemish	Dark Weathered	Forest Green
Silver Gray	Filipino	Bog
Special shades furnished on request.		

**Dulgloss.**

For interior trim work where a flat varnish is desirable. Produces in one coat an imitation rubbed effect over a shellacked or varnished surface. It is light in color, flows freely under the brush, dries dust-free in about an hour, and hardens in 12 hours with a soft velvety finish so much in demand.

SPECIFY—For Imitation Waxed Effect, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac and 1 coat Dulgloss.

For Imitation Rubbed Effect, 1 coat Berry Brothers' Stain, 1 coat Berry Brothers' Paste Wood Filler, 1 coat Berry Brothers' S. D. C. Shellac, 2 coats Luxeberry Wood Finish and 1 coat Dulgloss. On close grained woods omit filler.

**Luxeberry White Enamel.**

For bathrooms and bedrooms. Especially designed for the practical finisher and decorator. It possesses full body, flows very freely, and dries without showing brush marks. It will rub perfectly in 3 to 4 days, and can be polished on the fifth day to a piano finish. It can be used on the finest interior or furniture work. It is pure white in color and stays white.

NOTE—We can also furnish ivory white and pearl white tints, when desired. If an eggshell gloss or imitation rubbed effect is desired, we will furnish it at the same price as the high gloss goods.

SPECIFY—1 coat lead and oil (pure white lead mixed with equal parts turpentine and linseed oil to brushing consistency), 2 coats Luxeberry White Primer, 2 coats Luxeberry White Enamel. Sand each coat lightly with 00 sandpaper before applying succeeding coats.

**Shingletint.**

For half-timbered work or shingle stain specify Shingletint, which represents the highest results attained in the manufacture of shingle stains. It possesses great penetrative and preservative qualities, being a scientific combination of colors finely ground in pure linseed oil, creosote oil and the necessary drying agents. It prolongs the life of the shingles by retarding decay, at the same time imparting to them a very artistic finish.

**Literature and Information.**

If you desire a copy of Berry Brothers' specification book, special finished wood samples, or technical information on the subject of wood finishing, write Berry Brothers' Architectural Department.



# KEYSTONE VARNISH COMPANY

71 Otsego Street  
BROOKLYN, N.Y.

BRANCH OFFICE, LEEDS, ENGLAND

## Products.

"DEGRAH," for floors, interior trim, furniture and for every purpose where shellac, lacquer or varnish has been used in the past.

"EDELVICE," a Porcelain White Enamel, for interior and exterior use.

"KEYSTONA" CAEN STONE FINISH, a Flat Finish Oil Paint for rough or smooth caen stone effects.

"KEYSTONA," a Flat Finish Oil Paint for interior plaster work, woodwork, wall board, etc.

"ZINOLIN," the "Arnold-ized" Zinc, an All-zinc Paint made for outside use.

## "Degrah."

This elastic, waterproof, durable product is entirely unique and different from a varnish, in that it does the work of shellac and lacquer as well as all kinds of inside varnish, and is an improvement upon them while it is also lower in cost.

Used in place of shellac, "Degrah" resembles shellac in all of its good points, viz.: in being pore-filling, non-penetrating and by not raising the grain of the wood, but is superior in being waterproof, exceedingly durable and in holding its freshness and gloss indefinitely. "Degrah" dries almost as quickly as shellac, dependent upon the lightness of application, the atmosphere and temperature. "Degrah" also costs less per gallon and one application equals two of shellac, even when "Degrah" is thinned half with turpentine, as it should be for first coat work when a second coat is to be applied.

Used in place of varnish, "Degrah" does the work of floor, cabinet rubbing, finishing, hard oil finish or any other high grade varnish for interior use. It is proof against alcohol, water and everything else which naturally comes into contact with a varnish. Even strongest ammonia has no effect upon it. Exceptionally desirable as seat varnish, for "Degrah" dries exceedingly hard and quickly. While "Degrah" has all of these advantages and many uses, it is also less expensive to use than any regular varnish.

Can also be used as a lacquer, as it contains no acid to tarnish any metal and is unusually full bodied, tough and glossy. Smooths out, feels like glass and is just as transparent.

## "Edelvice" Enamel.

This enamel produces a beautiful, clear, white, high gloss porcelain finish that will not turn yellow, bloom, or become dull. For hard service, as on exterior surfaces, "Edelvice" will wear for years. It "works like butter," and allows of perfect freedom in applying, so that, no matter how large the surface, one man can do the work alone, without danger of laps or brush marks. Can be washed with warm soap-water.

Covering capacity, 300 sq. ft. per gal.

## "Keystona" Caen Stone Finish.

This paint is the result of years of experimenting, and will produce a beautiful caen stone finish on plaster or brick surfaces. Can be washed with warm soap-water.

Full directions for application, samples, etc., sent on request.

Covering capacity, 3 coats on primer, brick, or rough plaster surfaces, 50 sq. ft. per gal.; smooth plaster surface, 70 sq. ft. per gal.

## "Keystona."

A flat finish linseed oil interior paint, prepared by a secret process and according to exclusive patents. Has a reputation of 14 years, and is used most extensively throughout both hemispheres. Soft in effect as water paints, yet permanent in color, sanitary, germproof, verminproof and washable like marble. "Keystona" is easy to apply. It does not produce glossy spots, shows no lap or brush marks, and will not sag. Touching-up on finishing coat does not show. Marks of striking matches, and pencil marks, can be easily removed by washing.

Primarily a plaster wall, woodwork and wall board finish, "Keystona" can also be applied with assuredly satisfactory results as an undercoating for enamel, as a groundwork for staining, glazing and graining, and on metal ceiling, wall paper, burlap, canvas and galvanized iron. "Keystona" adheres to all non-absorbent surfaces upon which oil paint shells, such as patent cement, marble and slate.

"Keystona" colors, as shown on color card herewith, are rich and subdued in tone. Special tints to match any color scheme can be supplied at short notice, at slight increase in cost. Our preparatory liquid should be used to prepare walls before applying "Keystona."

Covering capacity of "Keystona," 2 coats: on plaster, 300 sq. ft. per gal.; on woodwork, 250 sq. ft. per gal.; on metal, 275 sq. ft. per gal.



EXACT COLOR REPRODUCTION OF "KEYSTONA" CAN  
Shown to help architects guard against substitution  
Color card on next page

## "Zinolin," the "Arnold-ized" Zinc.

The only all-zinc outside paint. Comes in paste form, similar to white lead. Contains 15% coarser inert pigment to allow for expansion, contraction and greater oil absorption. Recommended for its superior whiteness, durability and covering properties. Holds colors and

gloss indefinitely. Especially recommended where white paint is to be used and for the seaside. Covering capacity, 2 coats over primer, 250 sq. ft. per gal. Can also be used in combination with white lead in any proportion, eliminating straight zinc entirely. The more "Zinolin" is used, the more oil is required and the lower in cost per gallon and more durable the paint will be.

#### Specifications.

"DEGRAH"—All interior floors to be filled with paste filler followed by a first coat of "Degrah" thinned half with turpentine. Sandpaper lightly and wax or apply second coat of "Degrah" thinned one-third with turpentine.

All interior trim to be properly filled, and stained (or left in natural wood color), followed by 2 applications: first coat thinned half, second coat thinned one

pint to the gallon, with turpentine. Second coat to be rubbed down to a dead finish with pumice and water or oil.

"KEYSTONA"—All the walls in halls and rooms to be prepared with "Keystona" preparatory liquid and finished with 3 coats of "Keystona," according to directions furnished by the manufacturer.

"EDELVICE" ENAMEL—All the woodwork in rooms, excepting the doors, to be finished with 3 coats of "Keystona" and 2 coats of "Edelvice" Enamel, according to directions furnished by the manufacturers. Doors to be stained and filled mahogany color and finished with 3 coats of "Degrah" rubbed.

"ZINOLIN"—All the outside woodwork to be primed with imported French ocher and "Zinolin," and then given 2 coats of "Zinolin," according to the directions furnished by the manufacturers.

White	61	12	204	74	220	42
11	215	4	72	30	219	36
26	213	16	216	6	218	87
14	214	22	217	56	81	28
23	154*	18	114	3	55	62*
60*	127*	10	13	53	51	27
19	211	9	15	111	118	91
88	335	31	66	67	136	63
17	110	5	64	35	116	54

COLOR CARD OF "KEYSTONA" COLORS ON HAND AT ALL "KEYSTONA" AGENCIES, OR READY FOR IMMEDIATE SHIPMENT DIRECT. "EDELVICE" ENAMEL IS MADE IN ANY OF THESE TINTS, IF REQUIRED

No. 1, Flat Black; colors marked with star are both lime-resisting and self-color

Specify "Keystona" numbers from the above color chart



## LOUISVILLE VARNISH COMPANY, INCORPORATED

LOUISVILLE, KY.

CHICAGO, ILL.

BRANCH OFFICES  
SAN FRANCISCO, CAL.

NEW YORK, N. Y.

**Products.**

PREMIER VARNISHES; LOUVARCO STAINS; ELVEECO ENAMELS; PREMIER WOOD FILLERS.

**"Louvarco"**  
TRADE-MARK

**Elveeco Enamel.**

Durable for interior finish. Has free working and leveling properties; will not show laps or brush marks, and is a perfect snow white. Can be rubbed to a smooth eggshell finish.

Bathrooms, pantries and other surfaces exposed to water should be finished with Elveeco Exterior Enamel, which has our New Process Long Oil Varnish as a base, combining great elasticity with exceptional gloss and wearing properties.

**Louvarco Finishes.**

Architects, painters and builders will find in Louvarco Finishes a line of varnishes, stains, enamels and fillers, meeting every requirement and perfectly adapted to the specific uses for which they are designed.

**Premier New Process Varnishes.**

Oriental oils from Japan, China and Manchuria have been used for centuries in making lacquers and finishes and have become famous for this purpose. Not until recent years was it found that these oils were more of the character of gums, having great durability and containing the substance that gives body and gloss.

In making Premier New Process Varnishes these imported oils are used as a basis, cooked in a kettle by themselves, and afterwards only sufficient fossil gums are added to give hardness for rubbing and polishing.

**Varnall Waterproof Varnish.**

A superior varnish intended primarily for exterior finishing such as doors, vestibules, porch floors and ceilings, but on account of its waterproof character and quick drying properties, is equally adapted for inside finishing. Varnall, drying rapidly, can be water rubbed in 3 days, and after 6 days polished with rottenstone and oil. Will not turn white from effects of salt or fresh water.

**Premier Satine Floor Finish.**

Will withstand every test, requires less attention and labor than a wax or oil finished floor; is waterproof, and its elasticity insures against chipping or flaking. A floor that is given 3 coats of Premier Satine Floor Finish will last indefinitely, requiring an additional coat only after a period of 2 or 3 years, except on office floors or where used for dancing or constant walking, when a light coat every 6 months or so will preserve the natural color or grain of the wood, and prevent dirt or dust from being ground into the pores.

**Velvo Flat Finish.**

A gum varnish containing absolutely no wax. Impervious to moisture. When used as a finishing coat over gloss varnishes, it gives the appearance of being a rubbed finish. Years of research were expended in developing a proper blend of special gums and oils to produce a satisfactory flat finish with varnish, one that is waterproof as well.

**Pale Preservative Varnish.**

For either natural or stained finishing, Pale Preservative has no superior. Dries hard in 48 hours; can be either water or oil rubbed to an eggshell finish after 4 or 5 days, and retains the semigloss effect without sweating or showing streaks or shine.

**Louvarco Permanent Wood Stains.**

Intended primarily for architectural finishing. Have none of the objectionable features of spirit or water stains, and do not raise the grain of the wood, but leave a perfectly smooth surface for finishing. Louvarco Stains have a surpassing depth of tone and richness of color; dry quickly; do not show streaks or laps; and will not rub up when filled, shellacked, varnished or waxed. Soft woods absorb more stain than hard woods, giving much darker effects.

**Premier Paste Wood Fillers.**

Made from the very best rock crystal quartz silex, ground in pure linseed oil and high grade japan dryers. The two shades, light and dark, cover every possible requirement.

## STANDARD PRICE LIST

## PREMIER VARNISHES AND ELVEECO ENAMELS

	Gallon	Half gallon	Quart	Pint	Half pint
Varnall.....	\$4.75	\$2.50	\$1.35	\$0.75	\$0.40
Satine Floor Finish.....	3.75	2.00	1.10	.60	.35
Velvo Flat Finish.....	4.00	2.10	1.10	.60	.35
Pale Preservative.....	3.75	2.00	1.10	.60	.35
Elveeco Interior Enamel.....	6.00	3.10	1.60	.85	.45
Elveeco Exterior Enamel.....	6.00	3.10	1.60	.85	.45
Elveeco Enamel Primer.....	4.00	2.10	1.10	.60	.35

## LOUVARCO PERMANENT WOOD STAINS

Light Oak, Golden Oak, Brown Oak, Early English, Weathered Oak, Flemish Oak, Fumed (Acid) Oak

Gallon	Half gallon	Quart	Pint	Half pint
\$4.00	\$2.10	\$1.10	\$0.60	\$0.35

## Light and Dark Mahogany, Bog Oak, Moss Green

Gallon	Half gallon	Quart	Pint	Half Pint
\$5.00	\$2.60	\$1.35	\$0.70	\$0.40

## PREMIER PASTE WOOD FILLERS

	1- to 5-lb. can	12½ to 25-lb. can
Light or dark.....	\$0.25 per lb.	\$0.23 per lb.

**Co-operative Service.**

This company has made a study of wood finishing in all its branches and will be glad to give the benefit of experience and methods to interested persons.

# MURPHY VARNISH COMPANY

Chestnut and McWhorter Streets  
NEWARK, N. J.

50 West 22nd Street  
CHICAGO, ILL.

THE DOUGALL VARNISH COMPANY, LIMITED, MONTREAL, CANADIAN ASSOCIATE

## Products.

MURPHY TRANSPARENT INTERIOR VARNISH.  
MURPHY NOGLOSS INTERIOR VARNISH.  
MURPHY SEMI-GLOSS INTERIOR VARNISH.  
MURPHY TRANSPARENT FLOOR VARNISH.  
MURPHY VELVET FLOOR VARNISH.  
MURPHY TRANSPARENT SPAR VARNISH.  
MURPHY UNIVERNISH.  
MURPHY WHITE ENAMEL.  
MURPHY SEMI-GLOSS ENAMEL.  
MURPHY ENAMEL UNDERCOATING.  
MURPHY KONKRETO.



TRADE SYMBOL

whenever required, without removing the original coat. Stands the wear of passing feet; is not affected by heavy furniture rolled over it and is, besides, the most enduring of floor varnishes. Used in thousands of fine homes, hotels, office buildings, etc. \$4.00 a gallon.

**MURPHY VELVET FLOOR FINISH—**For final coats only over Transparent Floor Varnish when a semi-gloss finish is desired. Has the effect of wax without the slipperiness, and requires no rubbing. \$4.00 a gallon.

**MURPHY TRANSPARENT SPAR VARNISH—**A fine durable outdoor varnish for all outside work except floors. It is moistureproof, endures heat and cold, and resists grit and smut as long as any varnish possibly can. It lasts a long time and remains attractive as long as it lasts. \$5.00 a gallon.

**MURPHY UNIVERNISH—**A varnish for many uses—for inside and outside work and for floors. Proof against hot or cold water, steam, hot dishes, alkali, alcohol, ammonia, etc. Nothing turns it white. For these reasons, it is a particularly good varnish for bar tops, kitchen sinks, bath rooms and all places which are unduly exposed to rough use.

While the name suggests its all-round use where these qualities are desired, it is not, and no one varnish can be, the best varnish for every technical purpose. Univernish does, however, approximate the good qualities of many fine varnishes and may be relied upon for elegant finish and durability.

Murphy Univernish stands the extremes of weather wonderfully, does not thicken in the can, nor clog the painter's brush; it works easily and flows out smooth. Do not apply Univernish over shellac or liquid fillers. \$4.50 a gallon.

**MURPHY WHITE ENAMEL—**A pure white enamel of the finest grade and long life. It can be used either indoors or outdoors—dries hard for indoors and wears wonderfully well for outdoors. Can be tinted, of course. \$6.50 a gallon.

**MURPHY SEMI-GLOSS ENAMEL—**As a final coat over Murphy White Enamel it produces a beautiful semi-gloss effect without the expense of rubbing. \$6.50 a gallon.

**MURPHY ENAMEL UNDERCOATING—**Dense covering, flat drying. Is used for foundation coats for Murphy White Enamel. Much more suitable for this work than lead-and-oil. If colored enamel surface is wanted, the second and succeeding coats should be colored to match the enamel. \$4.00 a gallon.

**MURPHY KONKRETO—**For the sanitary treatment of concrete or cement floors, walls, or ceiling. Gives smooth surface. Prevents them from wearing, dusting and getting mouldy. Makes them as easy to clean and keep clean as tiling. \$4.50 a gallon.

## Scope.

The MURPHY VARNISH COMPANY has been in existence over half a century.

Most of the railways, the manufacturers of fine furniture, pianos, automobiles, and the other large consumers who are experts in the use of varnish are supplied by this company, which makes over 200 kinds of varnish—it being true to-day, as it always has been, that no one varnish can be used for all purposes.

## Architectural Varnishes.

The varnishes and enamels described below are those which time and experience have proved best for fine architectural work.

**MURPHY TRANSPARENT INTERIOR VARNISH—**A fine transparent, lustrous varnish which brings out the grain of the wood, flows freely, covers a great deal of surface, rubs easily, and keeps its full beauty for many years. Used extensively in fine residences, hotels, public buildings, office buildings and wherever fine woodwork needs to be beautified, protected and made sanitary. \$4.00 a gallon.

**MURPHY NOGLOSS INTERIOR VARNISH—**This varnish, used for the final coat over Murphy Transparent Interior, gives a rubbed effect without the labor of rubbing. Beautifully shows the grain of the wood. Can be used alone by applying the proper number of coats. \$4.00 a gallon.

**MURPHY SEMI-GLOSS INTERIOR VARNISH—**As the name implies, it is half way between the Nogloss rubbed effect and the Transparent Interior (unrubbed) and gives a slightly rubbed appearance. \$4.00 a gallon.

**MURPHY TRANSPARENT FLOOR VARNISH—**A fine free flowing varnish that rubs easily, producing a very smooth, beautiful surface. Does not flake off; is not affected by reasonable exposure to moisture, air, or water. It can be covered year after year with a new coat,



**Book on Varnish and Enamel.**

Any architect will be furnished, on request, with our book on Architectural Varnishes and Enamel, and placed on our lists to receive bulletins and such other literature as may be prepared from time to time.

**Free Educational Murphy Books.**

Rare Woods. Eight and one-half by eleven inches in size. An artistic and useful repository of rare wood finishes.

Architectural Varnishes and Enamels. Pocket edition, alike helpful to architects, painters and owners.

Beautiful Floors and How to Care for Them.

The House That Found Itself. An illustrated story of how a house was made into a home.

Beautiful Boats and How to Care for Them. A handsome book illustrated in color indicating the uses of Murphy Transparent Spar Varnish—the brineproof varnish.

Murphy Linoleum Varnish.

Murphy Finishing System for Carriages and Motor Cars.

Pure Colors Ground in Oil.

**Specification Guide for Varnish and Enamel.**

Below is a convenient reference guide to specifications for varnish and enamel. A copy will be sent to any architect who desires it.

It is urged that not only the maker be named, but the particular kind of varnish desired. It is not sufficient, for example, to say "Murphy Varnish." Many grades are made, each one the best for its special purpose, but no one the best for every purpose.

Do not use the phrase "or equal" in any specification. It results in the use of inferior varnish. The client's interest, the architect's interest, and each bidder's interest will be better served by specifying directly what is wanted, whether it is Murphy Varnish or some other make.

The slight difference in cost between good varnish and poor varnish is more than offset by the longer life of good varnish, by its saving of labor in application and the greater area covered, and a skillful painter, estimating on a definite basis, will always want the quality varnish.

**Specifications for Wood Finishing.**

**MATERIALS**—All materials shall be of the manufacture of the MURPHY VARNISH COMPANY and delivered at the mill or building in the original containers for inspection by the architect.

**PREPARATION**—All woodwork shall be thoroughly dry and all stains, finger marks or other blemishes carefully removed before any finish is applied.

**BACK PRIMING**—All back surfaces of woodwork shall be primed at the mill with 1 coat of paint, consisting of 15 lbs. of pure red lead to 1 gal. of pure boiled linseed oil, well brushed out.

**INTERIOR NATURAL FINISH**—All *oak* (or other open grain woods) finishing woodwork shall be prepared for varnishing with a coat of Murphy Filler No. ...., well wiped off the surface.

**NOTE**—All open grain woods should have the pores filled, in order to present a smooth surface for varnishing, unless an open pore effect is especially desired.

All *birch* (or other close grain woods) finishing woodwork shall be prepared for varnishing with a coat of Murphy Shellacquer, white or orange as the case may require.

**NOTE**—All close grain woods are thinly shellacked to prevent undue absorption or sinking. Fillers should not be used on close grain woods.

(A) *Rubbed Finish*—All *oak* finishing woodwork shall be given 3 coats and *birch* 2 coats of Murphy Transparent Interior Varnish, allowing ample time for drying between coats. Undercoats shall be lightly sandpapered and final coat, except in service portions of house, shall be rubbed down with pumice and water, and then with oil.

**NOTE**—Woods in italics are variable. The *birch* or other close grain wood is given only 2 coats of varnish, because the Shellacquer is the equivalent of a third. A flowed-on gloss finish is the more practicable for the service portions of the house, and naturally more economical.

(B) *Rubbed Effect, Dull*—All *oak* finishing woodwork shall be given 3 coats and *birch* 2 coats of Murphy Nogloss Interior Varnish, allowing ample time for drying between coats. Undercoats shall be lightly sandpapered and final coat flowed on.

(C) *Rubbed Effect, Semi-gloss*—All *oak* finishing woodwork shall be given 3 coats and *birch* 2 coats of Murphy Semi-gloss Interior Varnish, allowing ample time for drying between coats. Undercoats shall be lightly sandpapered and final coat flowed on.

**NOTE**—A, B and C are alternatives. B and C give a rubbed effect without any rubbing.

**EXTERIOR NATURAL FINISH**—The *oak* entrance doors and frame shall be given a coat of Murphy Filler No. ...., well wiped off the surface, and 3 coats of Murphy Transparent Spar Varnish.

Ample time shall be allowed for drying between coats; undercoats shall be lightly sandpapered and final coat left in the gloss.

**NOTE**—Parts in italics are variable. Exterior varnish is generally left in the gloss, but may be rubbed, if desired, after hardening for a week.

**WOOD FLOORS**—All *oak* (or other open grain woods) floors shall be prepared for varnishing with a coat of Murphy Filler No. ...., well wiped off the surface.

(A) *Gloss Finish*—All wood floors shall be given 3 coats of Murphy Transparent Floor Varnish, allowing ample time for drying between coats. Undercoats shall be lightly sandpapered and final coat shall be left in the gloss.

**NOTE**—If a rubbed finish is desired, substitute for the words in italics the following:

(B) *Rubbed Finish*—Rubbed down with pumice and water and then with oil.

(C) *Rubbed Effect*—All wood floors shall be given 2 coats of Murphy Transparent Floor Varnish and 1 coat of Murphy Velvet Floor Finish, allowing ample time for drying between coats. Undercoats shall be lightly sandpapered and final coat flowed on.

**NOTE**—A, B and C are alternatives. C gives a rubbed effect without any rubbing.

A flowed-on gloss finish is the more practicable for the service portions of the house and naturally more economical. To a great extent, a gloss finish is used in the main portions also, as the gloss is soon toned down, due to the periodic wiping with damp cloths to remove the dust.

**ENAMEL WORK**—The finishing woodwork in (*state room* or *rooms*) shall be given 1 coat of pure white lead and linseed oil paint and 3 coats of Murphy Enamel Undercoating, each coat lightly sandpapered.

(A) *Gloss Finish*—Follow the above with 2 coats of Murphy White Enamel, flowed on evenly.

(B) *Rubbed Finish*—Follow the above with 2 coats of Murphy White Enamel, flowed on evenly, the latter coat rubbed down with pumice and water to a semi-gloss or dull finish as directed.

(C) *Rubbed Effect*—Follow the above with 1 coat of Murphy White Enamel and 1 coat of Murphy Semi-gloss Enamel, each coat flowed on evenly.

**NOTE**—A, B and C are alternatives. C gives a rubbed effect without rubbing.

# PITCAIRN VARNISH CO.

Manufacturers of Varnishes, Enamels, Stains, Fillers and Surfacer  
MILWAUKEE, WIS.

BRANCH WORKS AND OFFICE, NEWARK, N. J.

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OKLAHOMA CITY, OKLA.  
OMAHA, NEBR.  
PHILADELPHIA, PA.  
PITTSBURGH, PA.  
SAN ANTONIO, TEX.  
ST. LOUIS, MO.  
ST. PAUL, MINN.  
TOLEDO, OHIO

OGDEN PAINT, OIL & GLASS CO.  
OGDEN, UTAH

PATTON PAINT CO.  
LOS ANGELES, CAL.  
SAN FRANCISCO, CAL.  
SEATTLE, WASH.

TIMMS, CRESS & CO.  
PORTLAND, ORE.

## Products.

Manufacturers of VARNISHES, ENAMELS, STAINS, FILLERS and SURFACERS for all purposes.

Our leaders are:

PITCAIRN AGED MAST SPAR, for exposed work.

PITCAIRN AGED FINISHING SPAR, for fine interiors.

PITCAIRN AGED FLOOR SPAR, for fine floors.

PITCAIRN AGED FLAT FINISH.

PITCAIRN AGED CHURCH PEW and SEAT FINISH, for church and school seats, desks, chairs, etc.

PITCAIRN TECTOR, an undercoat for all purposes.

PITCAIRN WOOD STAINS, for all wood tinting.

PITCAIRN BANZAI ENAMEL, for all white work.

## Distinctive Finishes.

These sealed packages bear the Pitcairn label and trade-mark for customer's protection. They guarantee *quality as represented* and insure the economical securing of results that will be most satisfactory and creditable to all concerned.

## Description.

No painstaking care or expense has been spared in bringing these wood finishes to their present state of perfection. Their excellence is vouched for. They are freely used by a large part of the most critical architects and contractors in America on some of the finest structures. Following is a brief description of each; and on the opposite page, specifications will be found.

### Pitcairn Aged Mast Spar.

Possesses the maximum of durability obtainable in



exterior finishing varnish. Use on all surfaces subjected to severest exposure, whether marine finishing, outside doors, window casings, signs, etc. New or old work. Has great elasticity and wear resisting qualities. Will not scratch or mar white, dries dust free in 10 to 12 hours and hardens in 48 hours.

Covers 550 to 600 sq. ft. to gal.

### Pitcairn Aged Finishing Spar.

For finest interiors. Rich and lasting. Use on new or old work, whether full gloss, rubbed dull or polished. Unexcelled in brilliance, body, working qualities and durability. Insures style and individuality to the work. Dries dust free in 8 to 10 hours, hardens in 2 days and may be rubbed the third day.

Covers 550 to 600 sq. ft. to gal.

### Pitcairn Aged Floor Spar.

For finest floor finishing. Withstands severest wear. Use on new or old work. Has wonderfully free, easy working qualities, extraordinary permanence, toughness, brilliance and elasticity. Dries dust free in 6 to 8 hours and hardens in 24 hours.

Covers 550 to 600 sq. ft. to gal.

### Pitcairn Aged Flat Finish.

For artistic interior work, producing rich, silky-dull rubbed effect. Use for mission finish and in place of hand rubbing. This varnish dries with an even flat finish that has the appearance of being rubbed. Has the body of gloss varnish, protects perfectly the surface to which it is applied, and may be used on either new or old work. One coat is sufficient to produce a dull rubbed effect on old work or over an undercoat of gloss varnish for new work. Two coats applied to new wood over filler will produce a silky, soft, mission effect. Works nicely under the brush; flows out well. Dries dust free in 2 hours and hardens in 24 hours. Contains no paraffin or beeswax, and therefore may be



THE PITCAIRN PACKAGE



coated with a gloss varnish, or as many coats may be applied as are necessary.

Covers 650 to 700 sq. ft. to gal.

### Pitcairn Tector (The Right Foundation).

Pitcairn Tector practically provides one undercoater for all purposes, interior and exterior.

Tector has a greater range of usefulness than any other undercoater. It may be used as an undercoater on any surface—interior or exterior; wood, metal, cement, plaster, burlap, canvas (under oil paints), enamels, varnishes, flat wall paint, calcimine, floor wax and varnish.

Pitcairn Tector is a discovery of far reaching importance, imparting durability under conditions where finishing materials have never been durable before, and greatly multiplying durability of paints, enamels, stains and varnishes under all circumstances.

NOTE—A book of Tector specifications, demonstration panels, and test tins will be furnished on request.

### Pitcairn Wood Stains.

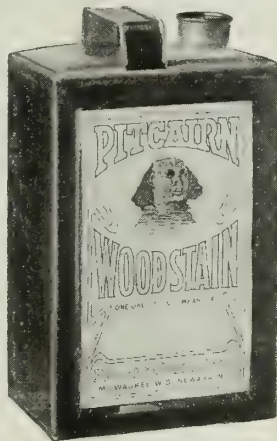
Excel in penetrating qualities, clearness and richness. Use on all kinds of wood, whether soft, spongy or the hardest close grain. They produce beautiful, deep, rich, soft, visual effects. They bring out the high lights and beauty of wood without obscuring the grain or causing cloudiness. They lend tone and impart an air of refinement to the surroundings. They do not raise the grain of wood nor affect thin veneers, being free from water, acid or alcohol. They may be mixed with the filler for tinting, or be reduced with turpentine or benzene. They set slowly, thus admitting of the surplus being removed from the surface with a cloth or sponge without showing cloudiness or laps. The work may be finished with wax or varnish as desired. There are 14 beautiful colors in imitation of all popular woods and shades.

Covers from 800 to 1,000 sq. ft. to gal.

NOTE—Stain set, consisting of 20 wood panels, mounted on cloth, showing the color of Pitcairn wood stains on various kinds of wood, will be sent to all architects and their clients or to painters on request.

### Pitcairn Banzai Enamel.

Rich and permanent. Use for all white work whether natural gloss, rubbed dull, polished, or flat enamel finish. It is marvelously tough and elastic, approximately 50% more durable than ordinary enamels. Will not chip or crack, is stable in color and retains its immaculate, grainless surface regardless of frequency of washing or method of house heating. The free flowing qualities of Banzai Enamel enable the work to be accomplished about 25% faster than with ordinary enamels.



WOOD-STAIN CAN



BANZAI ENAMEL CAN

Its splendid hiding qualities in many instances save the cost of work and time of an extra coat. Its great covering capacity and labor saving characteristics make it more economical to use than the cheaper ordinary enamels—not to consider its greater durability. Banzai Enamel furnishes a safety factor for the architect who demands flawless work, gives the decorator protection against blemishes, and reduces the labor costs, while the building owner gets a far greater durability than with the use of ordinary enamels. Dries dust free in 6 hours, and hardens in 48 hours.

Covers approximately 500 sq. ft. to gal.

NOTE—Portfolio showing reproductions of 30 modern white enamel interiors will be sent to architects or their clients on request.

### General Specifications for New Work.

#### FILLERS

*Open Grained Woods*—Oak, ash, chestnut, mahogany, etc. First fill with Silex Paste Wood Filler. When dry, putty all nailholes, matching color of wood.

*Close Grained Woods*—Maple, birch, Georgia pine, white-wood, poplar, pine, cypress, redwood, gum wood, sycamore. Require no filling. Apply varnish direct to wood. After first coat, putty all nailholes, match color of wood.

NOTE—All knots and sappy places should be coated with shellac to "kill" the pitch.

#### VARNISHES

*Exterior or Exposed Surfaces*—When in condition to receive varnish, and after putting nailholes, apply 3 coats Pitcairn Aged Mast Spar. Rub first and second coats when dry with curled hair.

*Interior Finishing, Cabinet Work, etc.*—After filling open grained woods and putting nailholes, for regular work apply 2 coats Pitcairn Aged Finishing Spar; for extra finish 3 coats. Last coat natural gloss, rubbed dull or polished as desired. If dull rubbed effect is desired without the expense of rubbing, apply Pitcairn Flat Finish in place of last coat of varnish.

NOTE—For use on seats, pews, chairs, desks, etc., specify Pitcairn Aged Church Pew and Seat Finish.

*Floors, Hard or Soft Wood*—After filling open grained woods and putting all nailholes, apply 3 coats Pitcairn Aged Floor Spar. Sand lightly between coats. Leave natural gloss or rub dull, as desired.

NOTE—Do not use liquid fillers, shellac or shellac substitutes on floors.

#### WOOD STAINS

*Close Grained Wood*—Apply Pitcairn Wood Stain, the shade desired, properly wiped after sufficient time has been allowed for stain to penetrate. After 24 hours, apply thin coat shellac and proceed with varnish coats.

*Open Grained Wood*—Apply 1 coat of Pitcairn Wood Stain, the shade desired, properly wiped after sufficient time has been allowed for it to penetrate. After 6 hours, apply paste wood filler tinted with the stain to match. Apply thin coat shellac and proceed with varnish coats.

#### MISSION OR DULL FINISH

Apply 1 coat Pitcairn Wood Stain, 1 coat white shellac for light tints and orange shellac for dark, 2 coats Pitcairn Flat Finish. Finish window seats and sills with 2 coats Pitcairn Aged Mast Spar. After 48 hours, rub to dull finish.

#### WHITE ENAMEL FINISH

*Wood, Plaster and Stone Surfaces, Interior or Exterior*—Priming Coat: Shellac knots, apply a mixture of 1 gal. of Tector, 1 qt. of raw linseed oil and ½ gal. of turpentine, leptyne, or benzene.

Second and Third Coats: Banzai Undercoater as it comes in can.

Fourth Coat: Banzai Gloss or Eggshell Enamel.

Fifth Coat: Banzai Gloss or Eggshell Enamel, as desired.

NOTE—Allow 48 hours between coats, and sandpaper lightly between coats. If enamel or undercoater is too heavy, thin with turpentine.

### Where Purchased.

These goods may be purchased from dealers everywhere, or from any of the warehouses of the Pittsburgh Plate Glass Co.



# PRATT & LAMBERT, INC.

## Varnish Makers

185 Madison Avenue  
NEW YORK

75-97 Tonawanda Street  
BUFFALO

320-330 West 26th Street  
CHICAGO

LONDON

PARIS

FOREIGN FACTORIES  
SYDNEY

BRIDGEBURG, ONTARIO

### Products.

"61" FLOOR VARNISH, "38" PRESERVATIVE VARNISH; "110" CABINET VARNISH; PALEST INTERIOR VARNISH; DULKOTE; ALCOLAC; P. & L. SPAR FINISHING VARNISH; IMPERMALIN; HYGIENIC GLOSS FINISH; OIL STAINS; ACID STAINS; TONETIC ACID STAINS, COATING and FINISHES; VITRALITE ENAMEL; EGGSHELL VITRALITE ENAMEL in White and Tints; VITRALITE ENAMEL UNDERCOATING; PASTE WOOD FILLERS; VITRALITE CEMENT COATING.

### Experience.

In the following specifications we have embodied the fruits of over 69 years' experience in studying wood finishing conditions and working out materials and methods which best fulfil the requirements. The attainment of success is evident from the use of Pratt & Lambert varnishes in finishing some of the world's best known buildings.

### Co-operative Service.

Sample panels showing standard effects obtainable with Pratt & Lambert stains, fillers and varnishes will be sent on request. If some distinctive finish is required, specify the wood to be used and the general color required, and architects' ideas will be carried out on specially made up sample panels. Should information be desired on any wood finishing problem, the opportunity to be of service would be welcomed. Address letters to the Architectural Service Department, at Buffalo—a special department in the P. & L. organization devoted entirely to the interests of architects.

### Complete Specification Book.

Most wood finishing problems are solved in the Pratt & Lambert Specification Book, which gives complete specifications for every kind of finish, and contains thorough, reliable treatises which cover the entire field of wood finishing. A request to the Architectural Service Department will bring it gratis.

The following products, embodied in the specifications on the opposite page, include a varnish, stain, filler or enamel for every architectural purpose; each the perfected result of 69 years of successful varnish making experience.

### "61" Floor Varnish.

The only floor varnish made by this concern, and considered the most durable finish made for the purpose. "61" is marproof, heelproof and waterproof.

### "38" Preservative Varnish.

A pale, transparent varnish for use on interior trim, whether of open or close grain wood. It gives a smooth, even, natural gloss finish that does not grow dull; may be rubbed to a dull finish that will not sweat back to a gloss; takes and retains a high hand polished finish.

### "110" Cabinet Varnish.

Similar to "38," but not quite as light in color, hence not as expensive. Specify it for all interior trim work where quality is important, but where first cost

must also be considered. Dries in a high gloss finish and may be rubbed to a dull finish.

### Pratt & Lambert Palest Interior Varnish.

Intended for interior trim work where only the palest varnish is permissible, such as for use over delicate shades of fillers and stains, and exceedingly pale woods for the natural finish, as of birdseye maple. May be rubbed to a dull finish and will take an unusually high polish.

### Dulkote.

A dull-drying varnish for interior trim that will not gloss up. Gives a semidull finish similar to a rubbed effect, but without rubbing. As it contains no wax, it may be finished over with gloss varnish, if at any time this is desired.

### Alcolac.

A first coater for interior trim of close grain wood, having a fuller body than a regular coat of varnish.

### P. & L. Spar Finishing Varnish.

A weather resisting varnish for exterior work, such as front doors, porch ceilings, etc., and for interior work subject to moisture or frequent exposure.

### Impermalin.

An absolutely waterproof varnish for either outside or inside work, which dries more quickly than a regular "spar" varnish, making it especially suitable for work likely to be exposed to the action of dust or dampness. It is extremely durable and dries with a high luster.

### Hygienic Gloss Finish.

Although Hygienic Gloss Finish is not specified on opposite page, it should be used as final coat with any of the varnish specifications where a finish that possesses an unusually high luster, washable qualities, resistance to fumes of disinfectants and other extreme conditions is desired. Ideal for hospitals and like purposes. Used for final coat only.

### Oil Stains.

These non-fading oil stains give best results on the softer woods, such as pine and cypress, but may be used on any close grain wood. The forest green and weathered oak are also used on open grain woods. They are made in the following colors: Light oak, dark oak, walnut, cherry, rosewood, forest green, mahogany, dark mahogany, golden oak, weathered oak, No. 21 antique.

### Paste Wood Fillers.

Used for filling open grain woods to give a smooth foundation over which to apply varnish and to impart the desired color either alone or in conjunction with acid stains. They are made in the following colors: light oak, dark oak, golden oak, Antwerp oak, black, fumed, white, forest green and mahogany. As they are made from finely ground silex, they adhere to the wood and do not crumble, powder nor perish. The colors are permanent.

### Acid Stains.

The ideal stains for all hard close and open grain



woods, as they in no way cloud or hide the grain of the wood. However, they are not suitable for soft woods, as they raise the grain of such woods, making it difficult to get a smooth varnish surface. Made in the following colors: silver gray, fumed, brier green, pale green, early English, Antwerp oak, English oak, Flemish oak, mahogany, dark mahogany, antique mahogany.

### Tonetic Acid Stains, Coating and Finishes.

For producing the dull effects so greatly desired by architects. This is a new process which is not only economical and very durable, but produces beautiful effects never before obtainable by any method. Recommended in oak, ash and chestnut. 12 colors of stain, and 5 of finish are made, also the coating. From these, a great variety of effects can be obtained.

### Vitalite.

The long life white enamel that lasts longer than paint outside or inside, on wood, metal, concrete, plaster, brick or stone. Will not turn yellow. May be rubbed to a dull finish.

### Eggshell Vitalite Enamel.

**WHITE**—For a dull white enamel finish, without rubbing, on interior work.

**TINTS**—A new addition to the Vitalite line; 36 authoritative tints. The finest gradations of tone are offered, and the shades harmonize perfectly with the prevailing modes in fabrics, wall coverings and upholstery. By this means, the securing of perfect color harmony in interior decoration becomes a simple thing.

### Vitalite Enamel Undercoating.

An undercoating for Vitalite on wood, metal, plaster or Keene cement surfaces, which gives a smooth, opaque foundation in the fewest possible coats and holds out the finishing coats of enamel in full, rich body. Has no tendency to turn the finishing coats of enamel yellow, like lead and oil.

### Vitalite Cement Coating.

An alkali resisting flat coating for cement, concrete, stucco, brick and stone, interior or exterior surfaces, and for wood and metal exterior surfaces. Unexcelled for use as an undercoating for Vitalite, the long life white enamel, on these surfaces.

### Specifications.

#### EXTERIOR WORK

**Open Grained Woods**—1 coat of Paste Wood Filler of desired color; 1 coat of "61" Floor Varnish; 2 coats of Spar Finishing Varnish.

**Close Grained Woods**—If stain finish is desired, coat of Pratt & Lambert Oil Stain of desired shade; for natural finish, omit stain. 1 coat of "61" Floor Varnish; 2 coats of Spar Finishing Varnish.

#### FINE INTERIOR WORK—NATURAL

**Open Grained Woods**—1 coat of Paste Wood Filler; 3 coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

**Close Grained Woods**—1 coat of Alcolac; 2 coats of "38" Preservative Varnish, left in gloss, rubbed dull or polished.

#### REGULAR RUN OF INTERIOR WORK—NATURAL

**Open Grained Woods**—1 coat of Paste Wood Filler; 2 coats of "110" Cabinet Varnish, rubbed dull or left in gloss.

**Close Grained Woods**—1 coat of Alcolac; 2 coats of "110" Cabinet Varnish, rubbed dull or left in gloss.

#### ONE-TONE COLOR EFFECTS

**Close Grained Woods**—1 coat of Oil Stain; 1 coat of Pratt & Lambert Alcolac; 2 coats of Pratt & Lambert "38" Preservative Varnish, left in gloss, rubbed dull or polished.

**Open Grained Woods**—1 coat of Pratt & Lambert Paste Wood Filler of the required shade. If the desired depth of color cannot be obtained with the colored paste wood filler, a coat of Pratt & Lambert Acid Stain should be applied before the filler, followed when dry with a coat of paste wood filler of

the same color. Over acid stain and paste wood filler, 1 coat of pure shellac and 2 coats of Pratt & Lambert "38" Preservative Varnish, left in the gloss, rubbed dull or polished. Over paste wood filler only, 3 coats of Pratt & Lambert "38" Preservative Varnish, left in gloss, rubbed dull or polished.

#### TWO-TONE COLOR EFFECTS

1 coat of Acid stain; 1 coat of Shellac; 1 coat of Paste Wood Filler, of a different color than the acid stain; 1 coat of Shellac; 2 coats of P. & L. Palest Interior or "38" Preservative Varnish, left in gloss, rubbed dull or polished.

**NOTE**—Before applying the first coat, the wood should be sponged thoroughly with cold water; when completely dry, it should be sanded as smooth as possible. This is very important.

**Two-Tone Effects** can be procured only on open grained woods, such as oak, etc., and are produced by the combination of acid stains and a white or tinted paste wood filler of a different color. **Example:** For instance, the Pratt & Lambert Wood Finish Effect No. 7220 is a combination of a dark brown, English Oak Acid Stain and Pratt & Lambert Special Green Paste Wood Filler. A thin coat of white shellac is applied over the acid stain, which is applied first. After this the green filler is applied. This coat of shellac allows the filler to "take" only in the porous part of the wood and the result is a beautiful combination of the brown and green.

#### INTERIOR WORK, DULL FINISH, NO RUBBING

Use the foregoing suggestions for specifications; substituting, however, 1 coat of Dulkote in every case where "38" Preservative, Palest Interior or "110" Cabinet Varnish is specified, and omit rubbing.

**Oak, Ash or Chestnut**—1 coat Tonetic Stain (desired color); 1 coat Tonetic Coating; 1 coat Tonetic Finish (desired color). When last coat is "set," it should be rubbed off across the grain. This completes the process, no varnish being required.

**NOTE**—Before applying the first coat, the wood should be sponged thoroughly with cold water; when completely dry, it should be sanded as smooth as possible. This is very important.

#### ENAMEL WORK

**Interior Work (Wood)**—1 coat of lead and oil; 2 coats of Vitalite Enamel Undercoating; 2 coats of Vitalite, left in the gloss or rubbed.

**Eggshell or Dull Finish, Without Rubbing (Wood)**—1 coat of lead and oil; 2 coats of Vitalite Enamel Undercoating; 1 or 2 coats of Eggshell Vitalite Enamel. If Vitalite tints are used, it will be advisable to tint the undercoating to the approximate shade of the tint selected.

**Interior Work (Metal)**—1 coat of lead and oil; 1 or 2 coats of Vitalite Enamel Undercoating; 1 or more coats of Vitalite.

**Exterior Work (Wood, Metal)**—1 coat of lead and oil; 2 coats of Vitalite Cement Coating; 1 coat of Vitalite.

**Interior or Exterior Work (Cement, Brick, Concrete, etc.)**—2 coats of Vitalite Cement Coating; 1 coat of Vitalite.

**Interior Work (Plaster, Keene Cement, etc.)**—1 coat (bond coat) composed of 1 part Vitalite Enamel Undercoating, 1 part raw linseed oil and 1 part turpentine; 1 or 2 coats Vitalite Enamel Undercoating, and 1 or 2 coats Vitalite Enamel.

#### FLOORS

**Oak and All Open Grained Woods**—1 coat of Paste Wood Filler, natural or of desired color; 2 or 3 coats of "61" Floor Varnish.

**Maple, Pine and All Close Grained Woods**—If stain finish is desired, coat of Pratt & Lambert Oil Stain of desired shade; for natural finish, omit stain. 2 or 3 coats of "61" Floor Varnish.

### A Few Well Known Buildings on Which Pratt & Lambert Products Have Been Used.

White House, Washington, D. C.  
National Capitol, Washington, D. C.  
Public Library, New York, N. Y.  
Kaufmann's Department Store, Pittsburgh, Pa.  
North American Building, Chicago, Ill.  
Merritt Building, Los Angeles, Cal.  
Tutweiler Hotel, Birmingham, Ala.  
Gibson Hotel, Cincinnati, Ohio  
Hotel Barbara Worth, El Centro, Cal.  
Newhouse Hotel, Salt Lake City, Utah  
New York State Educational Building, Albany, N. Y.  
Kansas City Union Station, Kansas City, Mo.  
Insurance Exchange Building, Chicago, Ill.  
Traymore Hotel, Atlantic City, N. J.  
Hudson Bay Co. Building, Vancouver, B. C.  
Congress Hall, Philadelphia, Pa.  
Toronto General Hospital, Toronto, Ont.  
Residence of Sir Henry M. Pellatt, Toronto, Ont.

## STANDARD VARNISH WORKS

90 West Street 2600 Federal Street 55 Stevenson Street 27 Bevis Marks  
 NEW YORK, N. Y. CHICAGO, ILL. SAN FRANCISCO, CAL. LONDON, E. C., ENG.  
 BERLIN PARIS BRUSSELS MELBOURNE  
 TORONTO, CAN., INTERNATIONAL VARNISH CO., LTD.

## INDEX TO PRODUCTS

	Page		Page
ENAMEL		STAINS	
"SATINETTE" ENAMEL.....	1362	"KLEARTONE" OIL STAINS.....	1361
ENAMEL UNDERCOATINGS		"KLEARTONE" ACID STAINS.....	1361
"SATINETTE" UNDERCOAT.....	1362	VARNISH—EXTERIOR	
"SATINETTE" CEMENT UNDERCOAT.....	1363	"ELASTICA" No. 1.....	1357
FILLERS (WOOD)		VARNISH—INTERIOR	
"KLEARTONE" PASTE WOOD FILLER.....	1362	"ELASTICA" No. 2.....	1357
FLOOR VARNISH		"ELASTICA" CABINET FINISH.....	1358
"ELASTICA" FLOOR FINISH.....	1359	WHITE POLISHING VARNISH.....	1359
SEALERS AND COATERS		VARNISH FOR RUBBED EFFECT	
"KLEARTONE" SEALER (Light).....	1362	"KLEARTONE" FLAT VARNISH.....	1360
"KLEARTONE" SEALER (Dark).....	1362	VARNISH FOR FLAT OR MISSION FINISH	
"KLEARTONE" MAHOGANY COATER.....	1362	"FLATTINE" CABINET FINISH.....	1359
"KLEARTONE" SILVER GRAY COATER.....	1362	WAXLIKE FINISH	
		"STANVAR".....	1360
		"STANVAR" UNDERCOAT.....	1361

## INDEX TO SPECIFICATIONS

	Page	Specification No.	
ENAMEL FINISHING:			
ON WOODWORK.....	1363	34	
ON CEMENT, CONCRETE, STUCCO, KEENE'S CEMENT, PLASTER, BRICK OR STONE.....	1363	35	
		Open Grain Woods	Close Grain Woods
EXTERIOR FINISHING:			
NATURAL FINISH (Gloss and Eggshell).....	1357	1	2
STAINED FINISH (Gloss and Eggshell).....			
"KLEARTONE" OIL STAIN.....	1357	4	3
"KLEARTONE" ACID STAIN.....	1357	5	3
FLOOR FINISHING:			
NATURAL FINISH (Gloss and Eggshell).....	1359	16	17
WAXLIKE FINISH (Natural).....	1361	29	30
INTERIOR FINISHING:			
NATURAL FINISH:			
GLOSS AND EGGSHELL FINISH.....	1357	6	7
RUBBED AND POLISHED FINISH.....	1358	11	12
TO FINISH LIGHT COLORED WOODS (where an exceedingly pale varnish is desired)	1359	19	20
RUBBED FINISH (without labor and expense of rubbing).....	1360	24	25
WAXLIKE WOOD FINISH.....	1361	29	30
STAINED FINISH:			
GLOSS AND EGGSHELL FINISH—			
"Kleartone" Oil Stain.....	1358	9	8
"Kleartone" Acid Stain.....	1358	10	8
RUBBED AND POLISHED FINISH—			
"Kleartone" Oil Stain.....	1358	14	13
"Kleartone" Acid Stain.....	1358-59	15	13
TO FINISH LIGHT COLORED WOODS (rubbed and polished finish where an exceptionally pale varnish is desired)—			
"Kleartone" Oil Stain.....	1359-60	22	21
"Kleartone" Acid Stain.....	1359-60	23	21
RUBBED FINISH (without labor and expense of rubbing)—			
"Kleartone" Oil Stain.....	1360	27	26
"Kleartone" Acid Stain.....	1360	28	26
MISSION FINISH—			
"Kleartone" Oil or Acid Stain.....	1359	18	18
WAXLIKE WOOD FINISH—			
"Kleartone" Oil Stain.....	1361	32	31
"Kleartone" Acid Stain.....	1361	33	31

NOTE—Close Grain Woods: Beech, birch, cherry, cypress, gumwood, redwood, yellow pine, white pine, poplar, spruce, whitewood, maple, British Columbia fir, hazel, sycamore.  
 Open Grain Woods: Oak, mahogany, walnut, chestnut, ash.



**For All Exterior Work.**

For finishing front doors and all woodwork exposed to the weather, where greatest durability is requisite. Dries free from dust in 8 to 10 hours. Hardens sufficiently in about 5 days to admit of being rubbed. Possesses the maximum elasticity attainable in any varnish. Produces a beautiful luster over natural, painted or grained woods, and may be rubbed with pumicestone and oil to produce an eggshell finish. "Elastica" No. 1 excels all other finishes or varnishes on the market for use on steamships, yachts, boats, canoes, spars, etc., effectually resisting the action of both fresh and salt water. Does not mar, scratch, white or spot. Resists atmospheric influences better than any other varnish, is waterproof and unaffected by hot or cold water.

**Specifications, "Elastica" No. 1.****SPECIFICATION NO. 1**

**NATURAL FINISH—OPEN GRAIN WOODS** (Oak, Mahogany, Walnut, Chestnut, Ash)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Klear-tone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" No. 1, reduced 10% with turpentine.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Elastica" No. 1.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply third coat STANDARD VARNISH WORKS' "Elastica" No. 1.

*\*For an Eggshell Finish*—After 5 days rub the last coat of STANDARD VARNISH WORKS' "Elastica" No. 1 with felt or burlap, pumicestone and oil.

**SPECIFICATION NO. 2**

**NATURAL FINISH—CLOSE GRAIN WOODS** (Beech, Birch, Cherry, Cypress, Gumwood, Redwood, Yellow Pine, White Pine, Poplar, Spruce, Whitewood, Maple, British Columbia Fir, Hazel and Sycamore)—

*Specify*—Apply 1 coat of STANDARD VARNISH WORKS' "Elastica" No. 1, reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 1 as indicated by asterisks (\*).

**SPECIFICATION NO. 3**

**STAINED FINISH—CLOSE GRAIN WOODS** ("Klear-tone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Klear-tone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Klear-tone" Sealer or "Klear-tone" Coater as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Klear-tone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Klear-tone" Silver Gray Coater over "Klear-tone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" No. 1 reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 1 as indicated by asterisks (\*).

**SPECIFICATION NO. 4**

**STAINED FINISH—OPEN GRAIN WOODS** ("Klear-tone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Klear-tone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Klear-tone" Sealer or "Klear-tone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Klear-tone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Klear-tone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" No. 1 reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 1 as indicated by asterisks (\*).

**SPECIFICATION NO. 5**

**STAINED FINISH—OPEN GRAIN WOODS** ("Klear-tone" Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Klear-tone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Klear-tone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Klear-tone" Sealer or "Klear-tone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Klear-tone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Klear-tone" Silver Gray Coater over "Klear-tone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" No. 1 reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 1 as indicated by asterisks (\*).

**For Finest Interior Work (Gloss and Eggshell Finish).**

Extreme paleness and durability are the distinguishing features of this varnish. It works with surprising freedom, covers the maximum surface area, and produces a brilliant, permanent gloss finish. Dries free from dust in from 4 to 6 hours. May be rubbed in from 3 to 4 days to produce an eggshell finish.

Especially recommended and intended for finishing finest woodwork in residences, apartments, bank, office and hotel buildings.

**Specifications, "Elastica" No. 2.****SPECIFICATION NO. 6**

**NATURAL FINISH—OPEN GRAIN WOODS** (Oak, Mahogany, Walnut, Chestnut, Ash)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Klear-tone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" No. 2 reduced 10% with turpentine.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Elastica" No. 2.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply third coat STANDARD VARNISH WORKS' "Elastica" No. 2.

*\*For an Eggshell Finish*—After 3 to 4 days rub the last coat of STANDARD VARNISH WORKS' "Elastica" No. 2 with burlap, pumicestone and oil.

**SPECIFICATION NO. 7**

**NATURAL FINISH—CLOSE GRAIN WOODS** (Beech, Birch, Cherry, Cypress, Gumwood, Redwood, Yellow Pine, White Pine, Poplar, Spruce, Whitewood, Maple, British Columbia Fir, Hazel, Sycamore)—

*Specify*—Apply 1 coat of STANDARD VARNISH WORKS' "Klear-tone" Sealer (Light).

*After Sealer is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" No. 2 reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 6 as indicated by asterisks (\*).

## SPECIFICATION NO. 8

STAINED FINISH—CLOSE GRAIN WOODS ("Kleartone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" No. 2 reduced 10% with turpentine.

*Incorporate*—That part of Specification No. 6 as indicated by asterisks (\*).

## SPECIFICATION NO. 9

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" No. 2 reduced 10% with turpentine.

*Incorporate*—That part of Specification 6 as indicated by asterisks (\*).

## SPECIFICATION NO. 10

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" No. 2 reduced 10% with turpentine.

*Incorporate*—That part of Specification 6 as indicated by asterisks (\*).

## For High Grade Piano Rubbed or Polished Effect.

This varnish is the highest quality that can be produced from the purest and best adapted materials, by the employment of scientific methods of manufacture.

It produces a beautiful finish of great durability. Dries free from dust in 4 hours and can be rubbed within 3 days, and given a brilliant piano polish, if desired.

"Elastica" Cabinet Finish does not sweat or gloss up after rubbing, as is the case with most high grade architectural varnishes.



## Specifications, "Elastica" Cabinet Finish.

## SPECIFICATION NO. 11

NATURAL FINISH—OPEN GRAIN WOODS (Oak, Mahogany, Walnut, Chestnut, Ash)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish reduced 10% with turpentine.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply third coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish.

*\*For an Eggshell, Rubbed or Polished Finish*—After 3 to 4 days, rub the last coat of STANDARD VARNISH WORKS' "Elastica" Cabinet Finish with burlap, pumicestone and oil for an eggshell finish; or rub the last coat of STANDARD VARNISH WORKS' "Elastica" Cabinet Finish with felt, pumicestone and water for a rubbed finish, then polish with rottenstone and water for a polished finish.

## SPECIFICATION NO. 12

NATURAL FINISH—CLOSE GRAIN WOODS (Beech, Birch, Cherry, Cypress, Gumwood, Redwood, Yellow Pine, White Pine, Poplar, Spruce, Whitewood, Maple, British Columbia Fir, Hazel, Sycamore)—

*Specify*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer (Light).

*After Sealer is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish reduced 10% with turpentine.

*Incorporate*—That part of Specification 11 as indicated by asterisks (\*).

## SPECIFICATION NO. 13

STAINED FINISH—CLOSE GRAIN WOODS ("Kleartone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish reduced 10% with turpentine.

*Incorporate*—That part of Specification 11 as indicated by asterisks (\*).

## SPECIFICATION NO. 14

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish reduced 10% with turpentine.

*Incorporate*—That part of Specification 11 as indicated by asterisks (\*).

## SPECIFICATION NO. 15

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Acid Stain)—



*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

**NOTE**—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Elastica" Cabinet Finish reduced 10% with turpentine.

*Incorporate*—That part of Specification 11 as indicated by asterisks (\*).

### "Elastica" Floor Finish.

This is the one perfect floor varnish. It combines quick and hard drying properties without sacrificing elasticity or durability in any degree, and protects floors under severest wear and frequent washing. Does not mar, scratch, white nor spot. Works easily, dries free from dust in 4 to 6 hours, hardens overnight and can be rubbed. On grained, painted or old floors, linoleum or oilcloth, 1 coat is sufficient. Remove all grease and dirt from floors before applying. Reduce with turpentine when necessary. Do not apply "Elastica" Floor Finish over shellacs, liquid fillers or patent "first coaters."



### Specifications, "Elastica" Floor Finish.

#### SPECIFICATION NO. 16

**NATURAL FINISH**—OPEN GRAIN WOODS (White Oak, Red Oak)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler, natural.

*After 12 to 24 Hours*—First coat STANDARD VARNISH WORKS' "Elastica" Floor Finish, reduced 10% with turpentine.

*After 24 Hours*—Sandpaper lightly with 00 sandpaper. Second coat STANDARD VARNISH WORKS' "Elastica" Floor Finish, full body.

*After 24 Hours*—Sandpaper lightly with 00 sandpaper. Third coat STANDARD VARNISH WORKS' "Elastica" Floor Finish, full body.

*For an Eggshell Gloss*—After 48 hours rub with burlap, pumicestone and oil.

#### SPECIFICATION NO. 17

**NATURAL FINISH**—CLOSE GRAIN WOODS (Maple, Yellow Pine, Beech)—

*Specify*—Same as Specification No. 16, omitting Paste Filler.

**Caution**—Do not apply "Elastica" Floor Finish over shellac, liquid fillers or patent "first coaters."

### For Flat or Mission Finish.

The one satisfactory pigment flat varnish. It dries hard overnight, contains no wax, surfaces well, and produces an even flat or mission finish without rubbing.

"Flatline" Cabinet Finish has proved a very popular finish and is highly recommended for use where a dead flat or mission effect is desired.

This product is a pigment varnish and must be thoroughly agitated before applying; the pigment will settle and care must be used to see that this varnish is properly agitated until the container is empty.



### Specifications, "Flatline" Cabinet Finish.

#### SPECIFICATION NO. 18

**OPEN AND CLOSE GRAIN WOODS**—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. See chart on page 1362.)

**NOTE**—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—Apply first coat of STANDARD VARNISH WORKS' "Flatline" Cabinet Finish.

*After 24 Hours*—Second coat STANDARD VARNISH WORKS' "Flatline" Cabinet Finish.

### White Polishing Varnish for Interior Work (for Use Over Light Colored Woods).

White Polishing Varnish is an interior rubbing and polishing varnish of the highest grade. It is extremely light in color, being intended for use over light colored woods in residences, public buildings, etc., where an exceptionally pale varnish is desired.

Dries free from dust in 4 hours, and can be rubbed and polished in from 3 to 4 days.

### Specifications, White Polishing Varnish.

#### SPECIFICATION NO. 19

**NATURAL FINISH**—OPEN GRAIN WOODS—

*Specify*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' White Polishing Varnish reduced 10% with turpentine.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' White Polishing Varnish.

*\*After 48 Hours*—Sandpaper with 00 sandpaper and apply third coat STANDARD VARNISH WORKS' White Polishing Varnish.

*\*For an Eggshell, Rubbed or Polished Finish*—After 3 to 4 days rub the last coat of STANDARD VARNISH WORKS' White Polishing Varnish with burlap, pumicestone and oil for an eggshell finish; or, rub the last coat of STANDARD VARNISH WORKS' White Polishing Varnish with felt, pumicestone and water for a rubbed finish, then polish with rottenstone and water for a polished finish.

#### SPECIFICATION NO. 20

**NATURAL FINISH**—CLOSE GRAIN WOODS—

*Specify*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer (Light).

*After Sealer is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' White Polishing Varnish reduced 10% with turpentine.

**Incorporate**—That part of Specification 19 as indicated by asterisks (\*).

#### SPECIFICATION NO. 21

**STAINED FINISH**—CLOSE GRAIN WOODS ("Kleartone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

**NOTE**—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' White Polishing Varnish reduced 10% with turpentine.

**Incorporate**—That part of Specification 19 as indicated by asterisks (\*).

## SPECIFICATION NO. 22

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' White Polishing Varnish reduced 10% with turpentine.

*Incorporate*—That part of Specification 19 as indicated by asterisks (\*).

## SPECIFICATION NO. 23

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' White Polishing Varnish reduced 10% with turpentine.

*Incorporate*—That part of Specification 19 as indicated by asterisks (\*).

## For a Rubbed Effect.

For use where a rubbed effect is desired, without the labor and cost of rubbing. Is used over natural or stained woods, and produces a finish closely resembling a gloss varnish, rubbed. Particularly recommended for use over mahogany or mahogany stained woods, as it does not cloud same. "Kleartone" Flat Varnish will produce an exceptionally good finish, it is unaffected by water and, unlike most flat varnishes, does not contain wax or pigment. It does not need stirring and is exceptionally tough and elastic.



**Flat Varnish**  
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## Specifications, "Kleartone" Flat Varnish.

## SPECIFICATION NO. 24

NATURAL FINISH—OPEN GRAIN WOODS (Oak, Mahogany, Walnut, Chestnut, Ash)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer (Light).

*After Sealer is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

## SPECIFICATION NO. 25

NATURAL FINISH—CLOSE GRAIN WOODS (Beech, Birch, Cherry, Cypress, Gumwood, Redwood, Yellow Pine, White Pine, Poplar, Spruce, Whitewood, Maple, British Columbia Fir, Hazel, Sycamore.

*Specify*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer (Light).

*After Sealer is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

## SPECIFICATION NO. 26

STAINED FINISH—CLOSE GRAIN WOODS ("Kleartone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

## SPECIFICATION NO. 27

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—First coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

## SPECIFICATION NO. 28

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—First coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

*After 48 Hours*—Sandpaper with 00 sandpaper and apply second coat STANDARD VARNISH WORKS' "Kleartone" Flat Varnish.

## "Stanvar" Waxlike Wood Finish (Patented).

This product is not a varnish but an oil finish for use in place of wax.

"Stanvar," a waxlike wood finish, is superior to wax for wood finishing, inasmuch as it comes in liquid form and is easily applied with a cloth. It requires no



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polishing with a weighted brush, and produces a beautiful, waxlike finish.

It does not have the dangerous slipperiness which is so evident on floors that are waxed, and is not affected by water, as is wax.

### For New Work Only.

"Stanvar" Undercoat is a spirit coater used in place of shellac, as a priming coat, on new floors and woodwork which are to be finished with "Stanvar."

"Stanvar" Undercoat is applied with a brush (not with a cloth), dries hard in a few hours, and can be sandpapered readily. While possessing approximately the same drying qualities as shellac, "Stanvar" Undercoat does not have the undesirable brittleness of shellac.

### Specifications, "Stanvar."

#### SPECIFICATION NO. 29

NATURAL FINISH—OPEN GRAIN WOODS (Oak, Mahogany, Walnut, Chestnut, Ash)—

*Specify*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler, natural; to be wiped off across the grain of the wood with excelsior or burlap before the Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Stanvar" Undercoat with a brush.

*\*After 5 Hours*—First coat of STANDARD VARNISH WORKS' "Stanvar" (applied with a rag). Saturate a thickly folded rag (preferably cheesecloth) with "Stanvar." Rub it thoroughly into the surface; then wipe lightly with another rag.

*\*After 6 to 12 Hours*—Second coat of STANDARD VARNISH WORKS' "Stanvar" applied exactly like the preceding coat.

*\*After 6 to 12 Hours*—Third coat of STANDARD VARNISH WORKS' "Stanvar" applied exactly like the preceding coat.

#### SPECIFICATION NO. 30

NATURAL FINISH—CLOSE GRAIN WOODS (Beech, Birch, Cherry, Cypress, Gumwood, Redwood, Yellow Pine, White Pine, Poplar, Spruce, Whitewood, Maple, British Columbia Fir, Hazel, Sycamore)—

*Specify*—Same specification as No. 29, omitting the Paste Filler.

#### SPECIFICATION NO. 31

STAINED FINISH—CLOSE GRAIN WOODS ("Kleartone" Oil or Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil or Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Stanvar" Undercoat with a brush.

*Incorporate*—That part of Specification 29 as indicated by asterisks (\*).

#### SPECIFICATION NO. 32

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Oil Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Oil Stain (shade selected).

*After Stain is Thoroughly Dry*—Apply 1 coat of STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading.

*After Sealer or Coater is Thoroughly Dry*—Fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat of STANDARD VARNISH WORKS' "Stanvar" Undercoat with a brush.

*Incorporate*—That part of Specification 29 as indicated by asterisks (\*).

#### SPECIFICATION NO. 33

STAINED FINISH—OPEN GRAIN WOODS ("Kleartone" Acid Stain)—

*Specify*—Stain with STANDARD VARNISH WORKS' "Kleartone" Acid Stain (shade selected).

*After Stain is Thoroughly Dry*—Sandpaper with 00 sandpaper and fill with STANDARD VARNISH WORKS' "Kleartone" Paste Wood Filler (suitable shade, see chart on page 1362); to be wiped off across grain of wood with excelsior or burlap before Filler becomes hard.

*After 24 Hours*—Apply 1 coat STANDARD VARNISH WORKS' "Kleartone" Sealer or "Kleartone" Coater, as required for shade of stain specified. (See chart on page 1362.)

NOTE—Over cherry, mahogany, walnut, tobacco brown, light and dark brown stains, specify "Kleartone" Mahogany Coater. It enriches the color effect and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain, in order to produce the proper color effect.

*After Sealer or Coater is Thoroughly Dry*—Apply 1 coat STANDARD VARNISH WORKS' "Stanvar" Undercoat with a brush.

*Incorporate*—That part of Specification 29 as indicated by asterisks (\*).

### "Kleartone" Oil and Acid Stains.

GENERAL NOTE—Any special shade can be matched if sample is furnished for guidance. Over "Kleartone" Cherry, Mahogany, Walnut, Tobacco Brown, Light and Dark Brown Stains, use "Kleartone" Mahogany Coater. It enriches the color of the stain and prevents fading. It is necessary to use "Kleartone" Silver Gray Coater over "Kleartone" Silver Gray Acid Stain to produce the proper color effect. Unique effects can be obtained by using different colored Fillers on porous woods stained with "Kleartone" Acid Stain.

OIL STAINS—"Kleartone" Oil Stains are labor-saving stains, requiring only 1 brushing operation. They penetrate as deeply as acid stains but, unlike acid stains, do not require that the wood be sponged first nor sandpapered after staining.

"Kleartone" Oil Stains are absolutely uniform in shade, and non-fading, if applied in accordance with directions.

May be had in the following finishes: light mahogany, dark mahogany, extra dark mahogany, brown mahogany, antique mahogany, cherry, walnut, olive green, sage green, dark forest green, light brown, dark brown, tobacco brown, Flemish oak, early English, circassian walnut, dark fumed, light fumed, bog oak, dark oak, light oak, Pollard oak, English oak, golden oak and weathered oak.

ACID STAINS—"Kleartone" Acid Stains are used to produce certain stained effects which are only obtainable with an acid stain. They are the most perfect of their kind, the colors being absolutely fast, and not injurious to the woods or succeeding finishing coats.

May be had in the following finishes: silver gray, ash gray, Hague oak, Holland blue, light fumed oak, dark fumed oak, light mahogany, dark mahogany, extra dark mahogany and antique mahogany.



**For Use on Open Grain Woods.**

This Filler is recommended for the filling of woodwork and flooring in public and private buildings, where open grain woods are used. It is made in a wide variety of shades, of the best and most adaptable raw materials, by experts in this line.

"Kleartone" Paste Wood Filler will not shrink, and the finish applied over it will not "pit." It produces a perfect foundation for the succeeding coats of varnish.

May be had in the following finishes: antique, Antwerp, English brown, fumed oak, forest green, golden oak, mahogany, natural, Philippine mahogany and white. (See chart below for specifying Stains, Fillers and Sealers.)

**"Kleartone" Sealers.**

"Kleartone" Light and Dark Sealers are prepared especially for use in conjunction with "Kleartone" Stains and insure correct results, clearness of tone and uniform lasting color. They are of the proper consistency and should be used just as they come from the can. Do not sandpaper.

**LIGHT "KLEARTONE" SEALER**—Should be used over the following shades of "Kleartone" Stain: olive green, sage green, dark forest green, light fumed, dark fumed, Holland blue, Flemish oak, early English, bog oak, Pollard oak, English oak, weathered oak, circassian walnut, Hague oak and ash gray.

**DARK "KLEARTONE" SEALER**—Should be used over the following shades of "Kleartone" Stain: light oak, dark oak and golden oak.

**"Kleartone" Coaters.**

**"KLEARTONE" MAHOGANY COATER**—Should be used over "Kleartone" cherry, mahogany, walnut, tobacco brown and light and dark brown stains. It is a thin alcohol coater which enriches the color of the stain and positively prevents fading. By the use of the above mentioned stains and "Kleartone" Mahogany Coater, an effect is produced that is matchless and permanent. "Kleartone" Mahogany Coater should not be sandpapered.

**"KLEARTONE" SILVER GRAY COATER**—This is a thin, gray, spirit coater which is especially intended for use over "Kleartone" Silver Gray Acid Stain, it being necessary to use it in order to produce the proper color effect. It prevents the yellowness of the wood from showing through. It works easily and dries quickly. Do not sandpaper.

**KEY TO SPECIFICATION OF "KLEARTONE" SEALERS, COATERS OR PASTE WOOD FILLERS IN CONNECTION WITH EACH SHADE OF "KLEARTONE" ACID STAIN**

"KLEARTONE" ACID STAINS	"KLEARTONE" SEALERS OF "KLEARTONE" COATERS	"KLEARTONE" PASTE WOOD FILLERS
Fumed—		
Dark.....	"Kleartone" Sealer (Light).....	Fumed Oak
Light.....	"Kleartone" Sealer (Light).....	Fumed Oak
Gray—		
Ash.....	"Kleartone" Sealer (Light).....	White
Silver.....	"Kleartone" Silver Gray Coater.....	White
Hague Oak.....	"Kleartone" Sealer (Light).....	Antwerp
Holland Blue.....	"Kleartone" Sealer (Light).....	White
Mahogany—		
Antique.....	"Kleartone" Mahogany Coater.....	English Brown
Dark.....	"Kleartone" Mahogany Coater.....	Mahogany
Extra Dark.....	"Kleartone" Mahogany Coater.....	Mahogany
Light.....	"Kleartone" Mahogany Coater.....	Mahogany

See note under Specification for Oil Stain.



**KEY TO SPECIFICATION OF "KLEARTONE" SEALERS, COATERS OR PASTE WOOD FILLERS IN CONNECTION WITH EACH SHADE OF "KLEARTONE" OIL STAIN**  
(For open grain woods, standard effects)

"KLEARTONE" OIL STAINS	"KLEARTONE" SEALERS OF "KLEARTONE" COATERS	"KLEARTONE" PASTE WOOD FILLERS
Brown—		
Dark.....	"Kleartone" Mahogany Coater.....	Mahogany
Light.....	"Kleartone" Mahogany Coater.....	Antique
Tobacco.....	"Kleartone" Mahogany Coater.....	Antique
Cherry.....	"Kleartone" Mahogany Coater.....	Mahogany
Circassian Walnut.....	"Kleartone" Sealer (Light).....	Antwerp
Early English.....	"Kleartone" Sealer (Light).....	Antwerp
Fumed—		
Dark.....	"Kleartone" Sealer (Light).....	Fumed Oak
Light.....	"Kleartone" Sealer (Light).....	Fumed Oak
Green—		
Dark Forest.....	"Kleartone" Sealer (Light).....	Forest Green
Olive.....	"Kleartone" Sealer (Light).....	Forest Green
Sage.....	"Kleartone" Sealer (Light).....	Forest Green
Mahogany—		
Antique.....	"Kleartone" Mahogany Coater.....	English Brown
Brown.....	"Kleartone" Mahogany Coater.....	Antique
Dark.....	"Kleartone" Mahogany Coater.....	Mahogany
Extra Dark.....	"Kleartone" Mahogany Coater.....	Mahogany
Light.....	"Kleartone" Mahogany Coater.....	Mahogany
Oak—		
Bog.....	"Kleartone" Sealer (Light).....	Antwerp
Dark.....	"Kleartone" Sealer (Dark).....	Antwerp
English.....	"Kleartone" Sealer (Light).....	Antique
Flemish.....	"Kleartone" Sealer (Light).....	Antwerp
Golden.....	"Kleartone" Sealer (Dark).....	Golden Oak
Light.....	"Kleartone" Sealer (Dark).....	Antique
Pollard.....	"Kleartone" Sealer (Light).....	Antwerp
Weathered.....	"Kleartone" Sealer (Light).....	Antwerp
Walnut.....	"Kleartone" Mahogany Coater.....	English Brown

**CLOSE GRAIN WOODS, REQUIRING NO FILLER**—Beech, birch, cherry, cypress, gumwood, redwood, yellow pine, white pine, poplar, spruce, whitewood, maple, British Columbia fir, hazel, sycamore.

**OPEN GRAIN WOODS, REQUIRING FILLER**—Oak, mahogany, walnut, chestnut, ash.

**"Satinette" Enamel.**

"Satinette" Enamel is a special enamel made in a special way. It works freely, sets slowly and produces a surface like choice china—smooth, hard, extremely durable and washable. It is made under the original formula of Pinchin, Johnson & Co., Ltd., London, E. C., England, Established 1834. The STANDARD VARNISH WORKS is the sole licensee for the United States.



**GLOSS WHITE FOR EXTERIOR OR INTERIOR WORK**—Intended for use as final coats over a foundation surface prepared with "Satinette" Undercoat or "Satinette" Cement Undercoat. It will not turn yellow with age, but improves on exposure to light and air. "Satinette" Enamel Gloss White produces a perfect gloss finish, which may be rubbed with pumicestone and water to produce a semigloss finish.

**WHITE RUBBED EFFECT FOR INTERIOR WORK**—Produces the pleasing soft effect of a perfect rubbed job, without the labor and expense of rubbing with pumicestone and water. It is very durable, will not turn yellow, and improves on exposure to light and air. It is intended for use as final coats over a foundation surface, prepared with "Satinette" Undercoat or "Satinette" Cement Undercoat.

**FLAT WHITE FOR INTERIOR WORK**—Produces a durable and smooth flat white enamel finish. Works freely under the brush, hardens quickly and does not turn yellow. It is intended for use as final coats over a foundation surface properly prepared with "Satinette" Undercoat or "Satinette" Cement Undercoat.

**"Satinette" Undercoat.**

For use on woodwork as undercoats on work to be finished with "Satinette" Enamel. Its covering capacity is remarkable; it flows out with surprising freedom and produces a satinlike surface which requires only light sandpapering.

It dries quickly, hard and tough and does not show



brush marks. "Satinette" Undercoat is much superior to white lead in oil, as it will not affect the succeeding enamel coats. The success of an enamel finish depends upon the preparation of the foundation surface.

### "Satinette" Cement Undercoat.

For use on cement, concrete, stucco, Keene's cement, plaster, brick or stone, as undercoats for "Satinette" Enamel.

This material is a scientifically prepared product, solely for the purpose of preparing a suitable foundation on cement, concrete, stucco, Keene's cement, plaster, brick or stone, upon which to apply "Satinette" Enamel, an enamel finish being so desirable on these surfaces in hotels, public buildings, hospitals and similar structures, both from the economical and sanitary standpoints.

"Satinette" Cement Undercoat is the result of exhaustive laboratory research, weather tests and practical experience. It effectually overcomes the disadvantages of other products used for this purpose, in that it has a neutralizing effect and resists chemical action.

It has splendid working qualities and covering capacity. A gallon covers approximately 300 sq. ft., depending upon the porosity of the surface.

### Specifications, "Satinette" Enamel.

#### SPECIFICATION NO. 34

##### FOR FINISHING WOODWORK—

*First or Priming Coat*—For soft woods, such as pine and whitewood, and when undercoating exterior surfaces and such exposed interior surfaces as window sashes, linings and sills, to 1 gal. of "Satinette" Undercoat add 1 pt. of raw linseed oil. For hardwoods, such as birch and cherry, to 1 gal. of "Satinette" Undercoat add 1 pt. of spirits of turpentine. Stir thoroughly and brush well into the surface. Allow 48 hours for drying. Sandpaper lightly with 00 sandpaper or rub with fine steel wool.

*Second Coat*—"Satinette" Undercoat full body, as it comes from the can. Allow 48 hours for drying. Sandpaper lightly with 00 sandpaper or rub with fine steel wool.

*Third Coat*—"Satinette" Undercoat full body, as it comes from the can. Allow 48 hours for drying. Sandpaper lightly with No. 00 sandpaper or rub with fine steel wool.

NOTE—By adding to the last coat of "Satinette" Undercoat 25% of "Satinette" Enamel, an extraordinary result is obtained. Under ordinary conditions 3 undercoats are sufficient, but should they not cover the work evenly, additional coats should be applied.

*Fourth Coat*—"Satinette" Enamel, Gloss White, White Rubbed Effect or Flat White, as desired. Allow 48 hours for drying. Sandpaper lightly with No. 00 sandpaper or rub with fine steel wool.

*Fifth Coat*—"Satinette" Enamel, Gloss White, White Rubbed Effect or Flat White, as desired.

*For Semigloss Finish*—After allowing 72 hours for drying, rub the final coat of Gloss "Satinette" Enamel with pumicestone and water.

GENERAL NOTES—It is essential in order to obtain the best results, that each coat be thoroughly dry before the succeeding coat is applied. If the "Satinette" Enamel or "Satinette" Undercoat is too heavy, reduce only with pure spirits of turpentine. In order to properly finish yellow pine and pitchy woods, it is well to apply a thin coat of pure white shellac over the priming coat of "Satinette" Undercoat. This will effectually prevent the pitch from coming through and discoloring the subsequent coats of Undercoat and Enamel. Open grain woods, such as oak or chestnut, should be paste-filled before applying coats of "Satinette" Undercoat and Enamel.

#### SPECIFICATION NO. 35

##### FOR FINISHING CEMENT, CONCRETE, STUCCO, KEENE'S CEMENT, PLASTER, BRICK OR STONE—

*First or Priming Coat*—"Satinette" Cement Undercoat thinned 10% to 25% with pure spirits of turpentine. Flow it on with a good, clean, wide brush, but do not brush it out for the purpose of extending it, merely to settle it into place. Allow 3 to 4 days for drying.

*Second Coat*—When first coat is thoroughly dry, apply "Satinette" Cement Undercoat, full body, as it comes from the can. Allow 48 hours for drying.

NOTE—While 2 coats of "Satinette" Cement Undercoat are recommended, the condition of the surface may demand more, which should be applied full body as it comes from the can. On some surfaces 1 coat is sufficient, and where only 1 coat is applied, it should not be thinned but applied full body as it comes from the can. By adding to the last coat of "Satinette" Cement Undercoat 25% of "Satinette" Enamel an extraordinary result is obtained.

*Third Coat*—"Satinette" Enamel, Gloss White, White Rubbed Effect or Flat White, as desired. Allow 48 hours for drying. Sandpaper lightly with No. 00 sandpaper or rub with fine steel wool.

*Fourth Coat*—"Satinette" Enamel, Gloss White, White Rubbed Effect or Flat White, as desired.

*For Semigloss Effect*—After allowing 72 hours for drying, rub the final coat of Gloss "Satinette" Enamel with pumicestone and water.

GENERAL NOTES—When applied over an old finished surface, all loose paint should be removed. The surface must be clean and free from dust and dirt. Where a wash coating of cement has been applied, the surface should be wire brushed and thoroughly dry. It is essential, in order to obtain the best results, that each coat be thoroughly dry before the succeeding coat is applied. If the "Satinette" Enamel or "Satinette" Cement Undercoat is too heavy, reduce only with pure spirits of turpentine.

### Service Department.

This department is organized to co-operate with architects in working out finishing problems. Inquiries are welcomed, as well as suggestions calculated to make it of greatest value and assistance.

No matter to what extent the number and variety of Standard finished samples are increased, architects very often fail to find the effect desired. Therefore, the preparation of special finished samples to meet individual ideas and requirements is one of the principal features of this service.

Architects are invited to utilize the facilities of this department to the fullest extent. We are always pleased to place our knowledge of the manufacture and use of wood finishes at their disposal, for we realize that they are just as anxious to have their projects properly finished as we are to have our products properly used.

# THOMSON WOOD FINISHING CO.

## Enamels, Varnishes and Paints

ESTABLISHED 1874

829-835 North Third Street  
PHILADELPHIA, PA.

INCORPORATED 1889

AGENCIES IN PRINCIPAL CITIES

### Products.

Inventors and manufacturers of PORCELITE ENAMEL and UNDERCOATS, SANATONE FLAT WALL FINISH, ZANZIBOLIO VARNISHES, TECHNICAL ENAMELS, Wood Fillers.

### Technical Enamels.

During 30 years of experimentation and specialization this company has manufactured enamels—especially white—for every purpose. This includes baking, air drying, dipping, spraying, and brushing enamels for use on various metals, wood, leather, concrete, etc.

If architects desire any information, address Department T. E.

### Porcelite Enamel.

Porcelite Enamel was the first high grade enamel made in this country. Since 1883 it has been admittedly the standard for enamel finishing. Porcelite dries by oxidation to a degree of hardness never attained by damar, long oil or imported enamels. A durable porcelainlike surface is obtained by the use of Porcelite, which can be rubbed to a dull finish or polished to a mirrorlike surface. It is impervious to steam, soap, acids and antiseptic solutions. Porcelite does not yellow with age, but retains its unexcelled whiteness indefinitely. It will not crack, chip nor craze.

**CAPACITY**—Porcelite covers from 500 to 600 sq. ft. to the gal.

### Advantages and Uses of Porcelite Enamel.

Porcelite is sanitary, beautiful, durable. It can be used to advantage on dwellings and public institutions. Because it does not turn yellow, and withstands the most severe conditions, it has been used on such homes as Carnegie's and Gould's; on the New York Central Railroad, the Carnegie Steel Works, the United States Capitol, the Biltmore Hotel, the Vancouver Hospital, and innumerable other buildings.

### Porcelite Varieties.

No one enamel can fill all requirements. To meet the following conditions, various kinds of Porcelite are manufactured:

PURPOSE	MATERIAL
Interior gloss (rubbing)	Porcelite White
Imitation rubbed effect	Porcelite Matte
Soft Colonial color	Porcelite Special White
Exterior	Porcelite Exterior
Undercoat enamel	Porcelite Undercoat

### Specifications for Porcelite.

**WOODWORK**—Cover knotholes with pure white shellac. Fill all holes, etc., with white lead putty. Apply 3 coats of Porcelite Undercoat (sandpapering lightly), then 2 coats of Porcelite.

**RUBBED WORK**—Last coat to be rubbed with pumicestone and water.

**POLISHED WORK**—Last coat to be rubbed with rottenstone and water.

**PLASTER, BRICK OR CONCRETE**—Dust down thoroughly, apply

2 or 3 coats of Porcelite Undercoat and 2 coats of Porcelite, following same directions as for wood.

**METAL**—Apply 2 coats of Porcelite Undercoat and 2 coats of Porcelite, same specifications as for woodwork. Remove all grease before finishing.

**PORCELITE MATTE**—The same specifications, except specify "Porcelite Matte."

### Zanzibolio Varnishes.

**ZANZIBOLIO EXTERIOR**—A tough elastic varnish for finishing store fronts, verandas, vestibules and all exposed places. It dries as rapidly as is consistent with great elasticity and durability. It can be rubbed after thoroughly dry and hard.

**ZANZIBOLIO INTERIOR**—An exceedingly durable varnish made from the finest materials and used largely for all surfaces for interior finishing. It will not crack nor mar white, and can be rubbed and polished.

**ZANZIBOLIO FLOOR**—Quick drying, tough and elastic, it dries dust free in 5 hours, and may be walked on in 12 hours. Does not mar nor show scratches, can be rubbed or polished, and is water white.

### Sanatone.

Sanatone is a washable, flat wall finish. It dries with a soft velvety luster. Can be used on any surface. When dry, it is thoroughly hard. More sanitary than wall paper, or calcimine. Made in 20 tints.

**SANATONE FOR SCHOOLROOM WALLS**—Particular study has been made of color combinations best fitted for the schoolroom, from the standpoint of light reflection and color psychology.

**CAPACITY**—Sanatone covers approximately 700 sq. ft. to the gal.

### Literature and Samples.

Handsome booklets, specifications, or samples of Porcelite, Zanzibolio Varnishes, and Sanatone will be forwarded on request to any architect or owner.

### References.

The character of our products may be judged by the reputation they have maintained for so many years and by the type of buildings on which they have been successfully used throughout the United States. If so desired, the company will furnish a list of the buildings in any locality for purposes of examination.



MONTEFIORE HOME, NEW YORK, N. Y.  
5,000 gals. of Sanatone and Porcelite used on walls in this Home



# TWIN CITY VARNISH COMPANY

Manufacturers of Varnishes and Japans

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MINNEAPOLIS, MINN.

ST. PAUL, MINN.

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WAREHOUSES

PORTLAND, ORE.

LOS ANGELES, CAL.

## Products.

VARNISHES for every purpose, including WEARETTE, O. M. F., VELVETTE, FLOORETTE, TWIN CITY SPAR, GOVERNMENT INTERIOR\* and other High Grade Varnishes for Architectural Purposes.

## Wearette.

A pale, heavy bodied, durable and brilliant varnish, unequaled for finishing the finest interior woodwork. Has superior wearing qualities; is extremely elastic, flows well; is not affected by hot or cold water; will not crack, blister or turn white.

It may be left in the gloss or rubbed and polished.

**SPECIFICATION**—All open grain woods to be thoroughly filled with a good paste filler. On all close grain woods apply first coat of Kwick Lac, allowing sufficient time to thoroughly dry. If 3 coats of varnish are wanted, sandpaper first and second coats with 00 sandpaper. The third coat should be flowed on evenly. If dull finish is desired, rub with pumicestone and water.

## O. M. F.

Next in quality to Wearette. Intended for ordinary interior work. Pale in color and works easily under the brush. Gives a high and lasting luster.

May be rubbed if desired.

**SPECIFICATION**—Same as for Wearette.

## Velvette.

A flat varnish, differing entirely from other so-called flat varnishes in that it is an absolutely pure, high grade gum varnish, flatted by a scientific but natural process, which does not affect its durability. It is pale in color, dries perfectly in 12 hours, and begins to flat as soon as applied.

**SPECIFICATION**—The same as for Wearette, except rubbing and sandpapering.



*The Varnish of Quality*  
AND WE CAN PROVE IT  
TRADE-MARK

*Wearette*  
THE IDEAL  
INTERIOR FINISH  
TRADE-MARK

**OMF**  
OUR MODERN FINISH  
TRADE-MARK

*Velvette*  
THE PERFECT  
FLAT VARNISH  
TRADE-MARK

## Floorette.

Manufactured especially for the treatment of floors, whether in the natural color of the wood or stained to desired shade. A superior, elastic floor varnish, impervious to water; will not mar and withstands the hard usage to which floors are subjected. It may be left in the gloss or rubbed and polished.

It also makes an excellent finish for oilcloth or linoleum.

*Floorette*  
THE PERFECT  
FLOOR VARNISH  
TRADE-MARK

**SPECIFICATION**—All open grain woods to be thoroughly filled with a good paste filler, properly cleaned off with excelsior wiped across the grain and finished with a rag. On all close grain woods apply first coat of 3 parts raw oil and 1 part turpentine. Allow 24 hours or more to dry, sandpaper lightly, and apply first coat of Floorette, allowing 24 hours to dry, and finishing with 2 or 3 coats of Floorette.

Positively never use any liquid fillers, shellac, hard oil, or any of the so-called first coaters on floors. The last coat may be rubbed or left in the gloss.

## Spar.

Intended for all exposed work, such as porch ceilings, outside doors, window sills, bathrooms and kitchens. It is not affected by salt or fresh water and will withstand alternate sun and rain.

Very elastic and durable.

*Spar*  
WATERPROOF  
VARNISH  
TRADE-MARK

**SPECIFICATION**—On open grain woods use a good paste filler and apply 3 coats of Twin City Spar Varnish. On close grain woods use 3 coats of Twin City Spar Varnish. For best work rub down with pumicestone and water before applying last coat.

## Government Interior.

This is a high grade interior varnish intended for public buildings, and will conform to Government specifications. Works freely and will dry free from dust in six hours; dries hard in 36 hours.

GOVERNMENT  
Interior Finish  
TRADE-MARK

# VALENTINE & COMPANY

## Architectural and Railway Varnishes, Enamels and Colors

456 Fourth Avenue  
NEW YORK, N. Y.

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### Products.

A complete line of ARCHITECTURAL FINISHES, including VALENTINE'S "VALSPAR" VARNISH; "VALSPAR" ENAMELS; "VAL-ENAMEL"; "VAL-ENAMEL" UNDERCOATING; VAL-PRIMERS and VAL-FILLER.

Colors in Oil and Valentine's Superfine Japan Colors.

### "Valspar."

The absolutely waterproof varnish. There are many varnishes which will stand a slight incidental wetting without turning white; but "Valspar" is the only varnish on which water, hot or cold, soapy or clear, has absolutely no chemical or physical effect.

"Valspar" is an original invention, entirely different from any other varnish and not successfully duplicated by any other manufacturer.

The unique waterproofness of "Valspar" has not been attained at the cost of any other varnish virtue. On the contrary, "Valspar" being a long oil varnish is more durable, tough and elastic than any interior varnish heretofore made. It is, in fact, the only long oil varnish which is quick drying enough to be used indoors. "Valspar" dries dust free in 2 hours and hard in 24 hours, regardless of the weather.

"Valspar" is ideally pale, easy flowing and of good body.

"Valspar" is the only varnish fit for kitchens, bathrooms, laundries and pantries, being the only one which will not be ruined under the soapy water exposure. Its waterproofness is also of importance for floors and wainscoting generally; wet feet in the hallway or vestibule, rain or snow from an open window, boiling water from a leaky radiator will do it no harm.

Its astonishing durability compels its use in many places where the use of other varnishes is entirely impracticable.

The "Valspar" finish can be kept in condition by simply washing, and without resort to special oil polishes.

### Exact Examples of the Use of "Valspar."

FOR OFFICE BUILDINGS—The J. P. Morgan Building, New York, and the Curtis Publishing Company Building, Philadelphia, two of the most prominent office buildings, have used "Valspar" extensively.

HOTELS, APARTMENTS, PRIVATE RESIDENCES—Many have adopted "Valspar."



ON STORE FRONTS—The Woolworth stores use it exclusively on their fronts and signs. So do many of the United Cigar stores.

IN DEPARTMENT STORES—Macy's and Lord & Taylor's in New York are typical examples of great stores which use "Valspar" for their floors, trim, show cases, etc.

ON STEEL CARS AND LOCOMOTIVES—Over 300 railroads use "Valspar" on their equipment, inside and outside.

### Specifications Varnish Should Meet for Floor Work.

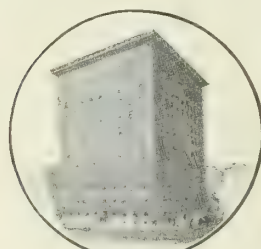
(1) Must be sufficiently pale in color not to discolor maple flooring. (2) Must work freely and flow out smooth. (3) Must dry free from dust in from 2 to 3 hours. (4) Must dry hard enough in 24 hours to receive the next coat. (5) Must dry hard enough in 24 hours to put in use. (6) Must be waterproof—not injured by frequent washing or by hot water from a leaky radiator. (7) Must have sufficient toughness not to scratch white or chip, even after being on the floor for 1 year. (8) Must dry hard enough to be rubbed down for a flat finish in 48 hours, and when rubbed must not sweat out. (9) Must dry out clear and bright after 20 minutes' immersion in boiling water or 10 minutes' immersion in standard soap solution (½ ounce Ivory soap dissolved in 1 gal. warm water).

### Specifications Varnish Should Meet for Exterior Work.

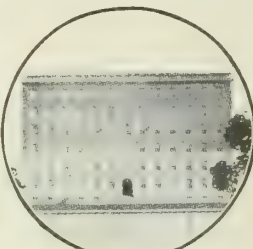
(1) Must be sufficiently pale not to discolor light woods or colors. (2) Must dry free from dust in 2 to 4 hours. (3) Must dry hard enough in 24 hours to receive next coat. (4) Must be waterproof—not injured by dew or rain, no matter how long continued. Panel coated with the varnish must stand immersion in water for 1 week without turning white (test to be made over black surface). (5) Must dry hard enough in 48 hours to be rubbed down to a flat finish, and when rubbed must not sweat out. (6) When dry must be free from tackiness. (7) Must have sufficient elasticity and durability to stand at least 1 year's exposure.

### Specifications Varnish Should Meet for Interior Woodwork.

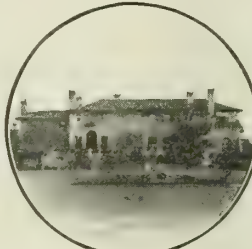
(1) Must be sufficiently pale not to discolor light woods. (2) Must work freely and flow out smooth. (3) Must dry free from dust in 2 to 3 hours. (4) Must dry hard enough in 24 hours to receive next coat. (5) Must be hard and free from tackiness, when dry. (6) Must be waterproof—must not be injured by frequent washing and must not turn white when wet. Panel coated with the varnish must stand 1 week's immersion without turning white (test to be made over black surface). (7) Must dry hard enough in 48 hours to be rubbed down to a flat finish, and when rubbed must not sweat out. (8) Must dry hard enough to be polished in from 4 to 6 days. (9) Must have sufficient toughness not to scratch white or show white when marred. (10) Must have elasticity and durability enough not to crack under changes in temperature.



Foster Building,  
New York



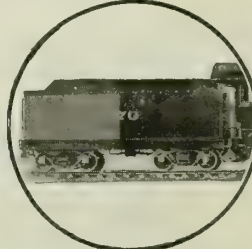
Astor Apartments,  
New York



Country House of  
H. H. Rogers,  
Southampton, L. I.



The Grove Park Inn,  
Asheville, N. C.



Railroads, Cars and  
Tenders

NOTABLE INSTANCES IN WHICH "VALSPAR" HAS BEEN SUCCESSFULLY USED



### Working Specifications for "Valspar" for Interior and Exterior Work, Floors, etc.

Caution—Shellac or other so-called first coaters should never be used as a primer or filler for surfaces exposed to the weather, or on floors.

Ordinary shellac contains a large percentage of water which penetrates the wood and is liable to be brought out by a hot sun in the form of steam that will raise the best varnish into unsightly blisters.

Before varnishing, see that surface is perfectly clean and dry and free from oil, grease, or grit.

#### NATURAL FINISH—

(1) *Open Grain Woods: Oak, Ash, Walnut, Mahogany*—Sandpaper smooth; putty-stop all nailholes in best manner, using putty colored to match wood. Fill thoroughly with Valentine's Val-Filler, Wood; allow filler to set for a few minutes, then rub off clean, rubbing across grain. Allow 24 hours to harden, then sandpaper lightly with No. 00 sandpaper.

(1A) *Close Grain Woods: Cherry, Birch, White Wood, Maple, Pine, Cypress*—Sandpaper smooth; putty-stop all nailholes in best manner, using putty colored to match wood. Use no primer, filler or shellac.

(2) Then apply 3 coats of Valentine's "Valspar" Varnish, giving full, flowing coats. Allow at least 24 hours between coats. Rub first and second coats with curled hair or moss. Then apply the final coat of "Valspar." This will give a bright gloss finish.

(3) If an eggshell gloss or dull finish is desired, 48 hours after the final coat is applied, rub with powdered pumice and water.

(4) For a polished finish, after 6 days polish final coat with rottenstone and oil.

#### STAIN AND VARNISH FINISH—

If staining is to be done, apply stain to bare wood, before filler, in case of open grained woods, coloring filler to match with stain.

If water stain is used, allow 24 hours for water to dry out of wood. If oil stain is used, see that it is thoroughly dry and hard before varnishing.

#### OLD WORK—

*On Old Varnished Woodwork*—If surface is in good condition, sandpaper down and apply "Valspar" direct; if in poor condition, scrape or burn off, apply a light coat of Valentine's Val-Primer, Wood, and proceed with "Valspar." For best results all previous coats should be removed.

*On Metal Work*—The process is same as for wood, except substitute Valentine's Val-Primer, Metal, for Wood Filler or Primer.

### Prices and Covering Capacity "Valspar."

Retail price of "Valspar" is \$5.00 a gal. (July 1, 1917. Price not guaranteed). "Valspar" covers about 450 ft. to a gal. 1 flowing coat.

### "Valspar" Enamels.

These enamels, composed of pigments finely ground in "Valspar," possess all the desirable qualities of "Valspar" itself, for exterior and interior work. Should be used just as they come from the can, after thorough stirring. Apply with flat bristle varnish brush and lay off like a finishing varnish. Air-dry hard over night. Flat White requires no rubbing to bring out a full flat finish.

### "Val-Enamel."

"Val-Enamel" is the highest grade of white en-

amel, which will retain its whiteness under all conditions of interior or exterior service. It works freely under the brush, allowing ample time for the painter to lay off his work on large wall surfaces. It flows out round and full, free from brush marks and sags. Brush out thoroughly—brush marks need not be feared. The use of a bristle flat varnish brush is recommended.

"Val-Enamel" is perfectly sanitary; it presents a non-porous surface that may be washed with hot or cold water. It will wear to better advantage than any other enamel, and stays white. Covering capacity, 700 sq. ft. to the gallon.

**PRACTICAL TEST**—The best practical test of the superiority of "Val-Enamel" over all others is to bring up a panel in the following way:

First divide the panel into 3 vertical sections; give each section the same undercoatings of Flat White, and then apply a coat of "Val-Enamel" in the center. Having selected what you consider to be the two best white enamels hitherto made, which we will call respectively "A" and "B," apply a coat of the "A" on the right-hand section, and a coat of the "B" enamel on the left-hand section. Allow 3 days for drying and apply second coats of the three enamels. When they are all thoroughly dry, divide the panel in half lengthwise. One-half should now be exposed to the weather, and the other half kept indoors for comparison.

In a very short time the "Val-Enamel" on the exposed section will appear whiter, and the enamels on the ends will take on a pink cast, which in time will turn to a brown tinge that will bring the "Val-Enamel" out in white relief.

### Enamel Specifications, Interior and Exterior Work.

(1) *OPEN GRAIN WOODS: OAK, ASH, WALNUT, MAHOGANY*—Sandpaper smooth; putty-stop all nailholes in best manner. See that surface is perfectly clean and free from oil, grease, or moisture.

Apply 1 coat of Valentine's "Val-Enamel" Primer-Filler, allowing at least 24 hours to dry.

(1A) *CLOSE GRAIN WOODS: CHERRY, BIRCH, WHITE WOOD, MAPLE, PINE, CYPRESS*—Omit Primer-Filler, as called for above.

(2) If necessary, sandpaper with No. 00 sandpaper.

(3) Apply 3 coats of Valentine's "Val-Enamel" Undercoating, allowing at least 24 hours between coats.

(4) Apply 2 coats of Valentine's "Val-Enamel," allowing 3 days between coats.

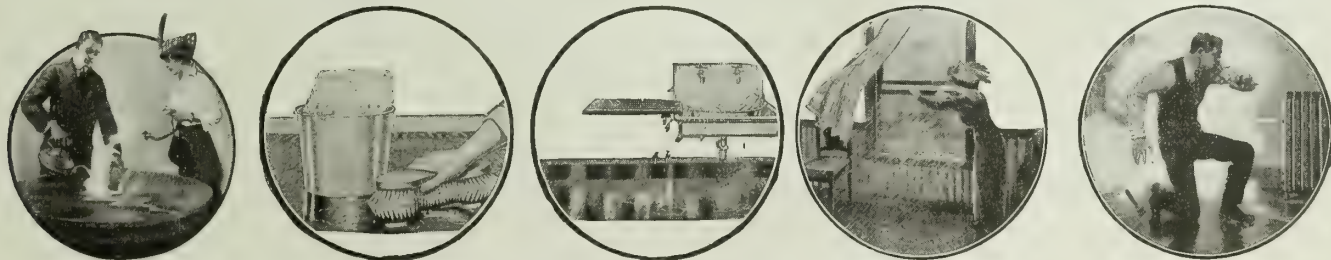
(5) For a rubbed finish, allow at least 1 week for drying, then rub with pumice and water.

Note—If a rubbed effect is desired, specify "Val-Enamel" Eggshell Gloss. If a flat effect is desired, specify "Val-Enamel" Mat.

### Samples.

Samples and literature of our products on file at Architects Samples Co., 101 Park Avenue, New York, N. Y., or sent to any architect for tests on request.

**VALENTINE'S**  
**Val-Enamel**  
TRADE-MARK



(Copyright)

TESTS THAT "VALSPAR" SUCCESSFULLY MEETS

# THE BUTCHER POLISH CO.

Manufacturers of Floor Polish and Floor Wax

356 Atlantic Avenue  
BOSTON, MASS.

## Products.

Manufacturers of BUTCHER'S BOSTON FLOOR POLISH or FLOOR WAX, BUTCHER'S LIQUID POLISH, and BUTCHER'S No. 3 REVIVER, for floors, interior woodwork and furniture; BUTCHER'S WEIGHTED FLOOR-FINISHING BRUSHES.

## Butcher's Boston Floor Polish.

Butcher's Boston Floor Polish is a perfectly transparent finish for floors, interior woodwork, and furniture.

It preserves the natural color and beauty of the wood, and as it is not brittle it will not scratch or deface like shellac or varnish, nor will it become soft and sticky like beeswax.

It has the reputation of being the best floor polish made and the only one without objectional features, and is especially adapted for hardwood floors, bowling alleys and linoleum carpets.

## Application.

APPLICATION—To apply Butcher's Boston Floor Polish to floors or woodwork of oak, black walnut, mahogany or other open grained woods, they should first be properly filled with some good wood filler, after which the surface should be cleaned with cloth or excelsior, and allowed to stand until the filling is dry and hard—24 hours or more.

After the filling is thoroughly dry, put on a coat of the polish evenly with a cloth, and leave it to dry, which will take about  $\frac{1}{2}$  hour. Polish with a long-handled stiff brush (preferably one of our weighted ones), rubbing across the grain first and then with the grain; then place a piece of dry, soft cloth, felt or carpet under the brush to give the finishing gloss.

New floors should be finished with the filler and 1 coat of Butcher's Boston Floor Polish as soon as they are laid, thus preventing the dust and dirt from getting into the grain of the wood.

The second coat of polish should be applied just before the rooms are to be occupied.

## Covering Capacity

COVERING CAPACITY—After surface has been prop-

erly filled, 1 lb. of Butcher's Boston Floor Polish will cover 300 sq. ft.

## Butcher's Liquid Polish.

Butcher's Liquid Polish is used for repolishing floors or furniture. After the floors or other woodwork have been properly finished with Butcher's Boston Floor Polish, and require freshening up, dampen a cloth with Butcher's Liquid Polish, rub over the surface and polish at once by rubbing with a dry, soft cloth.

## Butcher's No. 3 Reviver.

Floors of hard pine, maple, or other close grained woods will not take a filler. For such floors apply a coat of Butcher's No. 3 Reviver, which will give a warm and even color to the wood. It should be left overnight to dry and then treated with the Boston Floor Polish according to the directions given above.

To restore the color of the parts of the floor where the finish is worn off and the wood looks gray and bleached, dampen a cloth with the Reviver and rub over the defaced portions; let it remain 10 or 12 hours to dry; then polish with Butcher's Boston Floor Polish according to directions.

For kitchen, store, and piazza floors that need to be washed often, lay on a thin coat of Butcher's No. 3 Reviver, with an ordinary varnish brush, or dampen a cloth and go over as directed above, rubbing off well before leaving to dry. Repeat when the wood begins to look gray and worn. 1 gal. will cover about 1200 sq. ft. of surface.

## Prices and Territory.

Butcher's products are for sale in all the large cities, by dealers in painters' supplies.

Butcher's Boston Floor Polish is put up in cans as follows: 1 lb., 65¢; 2 lbs., \$1.30; 4 lbs., \$2.50; 8 lbs., \$5.00. Discounts on application.

Butcher's Liquid Polish and No. 3 Reviver are sold as follows:  $\frac{1}{2}$  pt., 30¢; 1 pt., 50¢; 1 qt., 85¢;  $\frac{1}{2}$  gal., \$1.50; 1 gal., \$2.75. The Liquid Polish is also sold in bottles at \$2.75 per doz. Discounts on application.

Brushes, weighted, \$2.75; not weighted, \$1.00. Discounts on application.



# BRIDGEPORT WOOD FINISHING WORKS

OWNED AND OPERATED BY E. I. DU PONT DE NEMOURS & CO.

Manufacturers of Wood Finishing Products and Paints

35th Street and Grays Ferry Road

CABLE:

"HARRISONS, NEW YORK, FOR BREINIG"

PHILADELPHIA, PA.

FACTORIES

NEW MILFORD (STILL RIVER), CONN.

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PERMANENT SERVICE AND DISPLAY DEPARTMENTS

NEW YORK, N. Y., 6 East 39th Street  
Telephone, Murray Hill 507

BOSTON, MASS., 8 Portland Street  
Telephone, Haymarket 107

CHICAGO, ILL., 78 West Lake Street  
Telephone, Randolph 1390

NEWARK, N. J., 272 Passaic Street  
Telephone, Branchbrook 830

MINNEAPOLIS, MINN., 918 South 4th Street  
Telephone, Nicollet 567

## Products.

WOOD FINISHING PRODUCTS and PAINTS, which include:

Wheeler's Wood Filler, Bridgeport Standard Stains, Varnishes, Paints and Enamels.

## Experience.

For over 40 years the products of this company have been the recognized standard, specified and used by leading architects on America's most critical work.

## Service Departments.

In New York, Chicago, Newark, Minneapolis and Boston are the latest effects in modern wood finishing, thousands of finishes and color combinations being illustrated on real house trim, model doors and wall board, which all go to make up the most complete, satisfactory and efficient service on interior finishing.

The same service is now available in many leading cities throughout the country where service departments, duplicating our own in principle, have been established to bring this form of co-operation within the reach of architects everywhere.

These service departments are centrally located and are prepared to work with the architect in securing the highest type of results on all their work.

All the commercial woods used in building construction are exhibited in the form of average house trim, as well as beautiful model Morgan doors, showing the new and staple effects just as they will appear on the finished job.

Architects in above named cities on a trial of this service, which is entirely unobligative, will find it re-

lieves them of many perplexing details, and correspondence is invited from architects in other cities whom we will gladly place in touch with this service locally, or render it direct.

Finished panels of any wood, together with complete specifications for any and all types of finish, will be cheerfully furnished any architect, direct from the main office at Philadelphia.

## Tones.

During the past few years many new soft tones have been developed, which are now so much in vogue in connection with the latest effects in interior decoration.

Special attention is called to the new tones wherein the "loud" shiny surfaces or grains of a former day have been replaced by soft velvety types to meet the modern refined taste.

The range of color effects on all leading commercial woods has been extended more than ever.

## Samples.

Samples are placed with the Architects Samples Co., 101 Park Avenue, New York.

Particular attention is called to our joint exhibit with the National Lumber Manufacturers' Association and the Morgan Sash and Door Co., at the Insurance Exchange Building, Jackson Boulevard, Chicago.

This is by far the most complete collection of practical finishes on all the leading woods in existence.

Representatives, constantly in attendance, will give good service.

# PARKER RUST-PROOF COMPANY OF AMERICA

Licensors of a Chemical Preparation for the  
Prevention of Rust on Iron and Steel

DETROIT, MICH.

## Product.

"PARKER PROCESS," a Rustproof Penetration and Finish for structural and ornamental iron and steel.

## Patents.

The PARKER RUST-PROOF COMPANY OF AMERICA owns and controls all fundamental United States patents covering rustproofing as distinguished from metal plating.



TRADE-MARK

## Description of "Parker Process."

"Parker Process" is the first effective method of rustproofing ever discovered that can be used on a truly commercial scale. It absolutely prevents corrosion.

The process consists of the immersion of iron and steel in a chemical bath heated to 212° Fahr. This bath gives the metal not a chemical coating, but a chemical penetration that sinks into it to a depth that depends on the density of the metal, and is also, in itself, a sufficient finish. One treatment is sufficient. The chemical mixture used is entirely different from oils, resins, paints, metallic compounds, etc., and is vastly superior to them—they fail because, like the metals to which they are applied, they are perishable.

SCOPE OF USE—There is a universal need for rust-proof iron and steel that will resist successfully the elements that cause rust and corrosion. "Parker Process" can be applied to iron and steel in any form used in the building trades—from structural iron beams to small building hardware, locks, door plates, etc. It can be applied to small hand wrought decorative pieces that are used for interior or for exterior decoration.

APPEARANCE—Iron or steel treated with "Parker Process" is pleasing to the eye. Its usual matt texture is much like that of dull black rubber. On delicate metal work there is a matt black or a gunmetal finish, the effect of which is not spoiled by paint, enamel or any filler of any sort. The surface of the metal is meshed with a microscopic etching. There is no veneer to peel off. None of the detail of the delicate design is lost, and the dimensions of the metal are not changed. The extremely adhesive and penetrating qualities of the process make an excellent base for any special final finish or color to be applied with paint, enamel or lacquer.

## Facilities and Plans.

The company is planning to establish plants and carry on a general jobbing business in all the large centers of the metal industry in the United States. In these centers architects' specifications for rustproofing by "Parker Process" will be carried out near the place



LAMP STANDARD TREATED WITH  
"PARKER PROCESS"

where metal treated is to be installed. This jobbing service is available in several large cities at the present time through the branch plants of the company.

"PARKER PROCESS" TO BE LICENSED—The company will also sell a license to use "Parker Process" to manufacturers the scope of whose business warrants the installation of it. The license fee will depend upon the capacity of the tank that is to be used in the application of the process.

## Architect's Approval of "Parker Process."

Many representative architects have proved by actual test that "Parker Process" is technically sound and economically practical, and they are now specifying its application on iron and steel that are to be used for both the exteriors and the interiors of residences, theaters and public buildings. The low cost of the process makes possible the use of iron for outdoor ornamentation where architects formerly had to specify a more expensive metal. It appeals to both architect and client not only æsthetically, but also economically.



A leading member of the American Institute of Architects, whose name will be given to all persons who ask for it, says in approval of "Parker Process":

"In giving you my reasons for specifying your process, I wish to emphasize the fact that there is no greater source of concern to the architect than the devising of ways and means to protect iron and steel from corrosion. This is true as it applies to both structural and ornamental iron and steel, which are today used so extensively in modern buildings.

"In any combination of ornamental iron and steel work, the architect finds it necessary to consider the probable result of unsightly stains due to iron rust and, if economy is not a consideration, bronze is frequently used. I believe that the 'Parker Process' eliminates all cause for worry in this respect, and that it makes possible the use of iron with the same confidence as bronze. As no high heat is required in the 'Parker Process,' the form and finish of iron work are not endangered, and furthermore, delicate metaling need not be filled up with any sort of painters' materials.

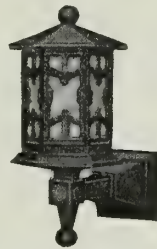
"The adaptability of the process to work assembled or unassembled makes a wide field in the metal industry. And it is my judgment that engineers and architects will find the 'Parker Process' a certain, sure means of protecting all forms of iron and steel from rust and corrosion.

"My experience with the 'Parker Process,' and my observation of its results, lead me to believe that this process will be considered as one of the great commercial achievements of modern science.

"The foregoing is but a very conservative expression of the matter, considering the very great benefit assured the metal industries for all time to come."

### Samples.

In order to give persons who are interested a proof of the efficiency of "Parker Process," the PARKER RUST-



ORNAMENTAL  
BRACKET LAMP  
WITH "PARKER  
PROCESS"  
FINISH



KEY  
ESCUTCHEON  
WITH "PARKER  
PROCESS" FINISH



AND IRON TO WHICH  
"PARKER PROCESS"  
HAS BEEN APPLIED



ORNAMENTAL METAL DOOR AND BALCONY RAILING TREATED  
WITH "PARKER PROCESS"

PROOF COMPANY OF AMERICA offers to apply it, on request, to sample pieces of iron or steel. It is especially desired that metal to be used in architectural work be submitted.

### Co-operative Service and Estimates.

The engineering staff of the company, composed of men trained in the work of design and construction, will aid architects and builders in the solving of their problems and suggest the best way of including "Parker Process" in their specifications, so that there will be a saving to the users of it. Architects and builders are requested to send the company their blue prints.

### Catalogues, etc.

The company will gladly include in its mailing list the name of any architect or builder who wishes to receive from time to time its catalogues, the results of its research work or any other valuable information about "Parker Process."



ORNAMENTAL  
ESCUTCHEON  
AND DOOR  
HANDLE WITH  
"PARKER PRO-  
CESS" FINISH



ORNAMENTAL ENTRANCE GATE AND FENCE FINISHED WITH "PARKER PROCESS"

# AMERICAN CHEMICAL PAINT COMPANY

318 Liberty Building  
PHILADELPHIA, PA.

NEW YORK OFFICE, 149 Broadway

## Products.

Patented Processes, Appliances and Chemicals for Preparing Metals for Painting: LITHOFORM (Patented) for making paint hold to galvanized iron; DEOXIDINE (Patented Process), a Chemical Wash for preparing cold rolled steel for painting; DEOXYLYTE, a Non-rusting Pickle for iron and steel.

Paint, for steel and galvanized iron; Paint Preservatives; Chemicals, for removing and preventing rust; Rustproofing Processes; Cleaners; Primers, for galvanized iron or steel.

## Lithoform (Patented), for Galvanized Iron.

Lithoform means "I make stone," and is a non-metallic material for application to surfaces of galvanized iron, causing paint to adhere firmly thereto. It is a clear, thin, waterylike, non-volatile liquid or solution of certain chemical properties which, when applied, turns the outer surface of galvanized iron into a stony substance resembling pumicestone; the latter is a firm part of the metal and slightly absorbs (like an absorbent stone) the first coat of paint, which on drying becomes inseparable from it—a knife is required to detach the paint from galvanized iron treated with Lithoform. The surface formed by Lithoform can be painted and repainted like wood.

**CHEMICAL PROPERTIES**—Lithoform contains no oils, varnishes, pigments or volatile solvents—it is not a paint. The chemistry of Lithoform and its action on zinc appear in this company's patents, copies of which will be furnished on request.

**HOW APPLIED**—By brushing, spraying or dipping. Full directions accompany each shipment. Old paint on galvanized iron must be removed before application.

**COVERING CAPACITY**—Exceeds that of paint or varnish. When applied with a brush, 1 gal. will cover 1500 to 2000 sq. ft., in less time than is necessary for paint.

**GUARANTEE**—When applied according to directions, the company guarantees that Lithoform will prevent paint from peeling or scaling off galvanized iron and zinc.

**COST**—Treating a surface with Lithoform costs much less than painting it.

## The Deoxidine Patented Process, for Steel.

A positive means of eliminating the development of defects in the finish of steel; it cleans steel and prevents rusting. Causes of rust, such as soldering fluids, non-drying oils, acid runs, hand marks, etc., are removed by this process and prevented from acting under the paint. Gasoline or turpentine has utterly failed to remove the oils; rust still lingers after careful sanding with emery cloth by hand; even the perspiring hands of the sanding operator have left invisible hand marks to show through the painted finish a few weeks later; and, finally, the sand blast, fairly successful in this preparatory course, was expensive to install and troublesome to operate, some grains of sand remaining in the cracks

or seams only to invariably get into the paint at a later period.

The Deoxidine patented process now replaces the sand blast.

**DESCRIPTION**—Deoxidine is a wash, not a paint. This process, composed of ingredients mentioned in the Letters Patent, is a chemical one based on such patents owned by the company—the only process that will clean and prevent rust at same time. It destroys all rust-forming substances and even rust itself; removes all traces of oil; produces a surface that slightly absorbs the first coat of paint, causing the latter to adhere firmly to the steel. The process has been on the market for a number of years, proving Deoxidine to be a positive method of preventing defects in the painted finish.

**ROYALTIES**—No royalties are charged, but the company reserves the sole right to make and sell the chemical agent (Deoxidine).

**SHIPMENTS**—Sold and shipped generally in barrel lots.

**APPLICATION**—Deoxidine may be applied by brushing, dipping or spraying, allowing sufficient time for it to act on the surface and then removing it by wiping with a cloth, washing with water or by other means, depending on the nature of the steel being treated.

**SPECIFICATION DATA FOR PREPARING STEEL FOR PAINTING BY THE DEOXIDINE PROCESS**—Complete directions for processing accompany each shipment.

*Hot and Cold Rolled Steel, Interior Steel Finish, Automobile Bodies, Structural Steel, etc.*—When ready for painting, apply Deoxidine, allow it to act for about 5 minutes, wash off with water, dry with a rag or chamois and allow sufficient time to thoroughly air dry; then paint.

*Work Covered with Grease or Heavy Oil*—Before treating with Deoxidine remove grease or oil with a suitable solvent such as kerosene, gasoline, soda or lye.

*Work Having a Heavy and Thick Covering of Rust*—Before treating with Deoxidine remove loose scales of rust with a scratch brush and scrub with Deoxidine and emery cloth. Finally treat with Deoxidine and wash with water in the regular way.

*Work That Is Not to Be Painted*—Treat with Deoxidine and wipe dry with a cloth, omitting the water.

*Small Parts*—First dip in a tank of Deoxidine; then into a tank of running water, and dry over heat.

**Guarantee**—The Deoxidine process, when used according to directions, is guaranteed to prevent the rusting of steel under the paint.

## Deoxylyte.

A non-rusting pickle for iron and steel. Can be used cold or hot, in the form of a bath or a wash.

To remove rust with Deoxylyte, apply the Deoxylyte to the rusty work with a brush, allow it to remain on overnight, then wash the work with water.

## References.

Extensive lists of steel and iron works; foundries; motor, metal, car, welding, aeroplane, automobile and other industrial corporations; together with various other satisfied users of products of this company will be mailed to architects and other interested persons on request.



# AMERICAN BITUMASTIC ENAMELS COMPANY

## Manufacturers of Preservative Coatings

17 Battery Place  
NEW YORK, N. Y.

PHILADELPHIA

BRANCH OFFICES  
CLEVELAND

SAN FRANCISCO

### Products.

HERMASTIC SOLUTION and HERMASTIC ENAMEL, Preservative Coatings for iron, steel and concrete exposed to atmospheric moisture, electrolysis, acids, acid fumes, sewage, brine, gases, alkalis, etc., buried in the ground or submerged in fresh or salt water.

### Description of Hermastic Compounds.

Hermastic compounds are so treated in manufacture as to eliminate all the useless and harmful substance which is present in the raw material. They contain no linseed oil, turpentine or benzine, and are free of those ingredients which limit the life and usefulness of ordinary coal tar and asphaltum compositions.

**HERMASTIC SOLUTION**—A brilliant black paint of superior preservative properties and mechanical strength. It dries quickly with a high, glossy finish, forming a hard, yet tough and elastic coating, with a bond that preserves its adhesion during expansion, contraction and bending. Under conditions of moderate severity, where the average coating lasts only a short time, the solution gives splendid protection for long periods.

Used as a protection against acid fumes, sewage, brine, water, gases, alkalis, moisture, electrolysis, etc. In industrial plants it is extensively used on structural steel, boiler fronts, smokestacks, coal bunkers, brine systems, tanks, pipe lines, sheet iron and steel, and other places around such plants. In the engineering field its uses are too numerous to mention.

**Method of Application**—The surfaces of the steel to be coated must be thoroughly clean and free from rust, scale, paint, oil and moisture. Hermastic coatings can not be applied to wet, frosty or greasy surfaces, and when rain or snow is falling no painting should be done on surfaces to be coated.

We recommend, when applying Hermastic Solution to smokestacks, boiler fronts, hot water and steam pipes and other heated surfaces, that it be put on when the metal is slightly warm. This allows the solution to work into the pores of the steel and better results are obtained.

Two coats are necessary on metal, the second following the first after an interval of 12 to 24 hours. If used on wood, three coats are recommended.

**Covering Capacity**—Properly applied, is as follows: On steel, 1 coat, 1 gal. to 300 to 350 sq. ft.; 2 coats, approximately 250 sq. ft. On cast iron, covering capacity is a trifle less; on concrete surfaces, approximately 100 sq. ft. to the gal.

Put up in 1-gal., 2-gal. and 5-gal. cans and in 50-gal. barrels, and is adaptable for use on any surface to which paint may be applied.

**HERMASTIC ENAMEL**—Used in all instances of severe requirements where lasting protection is of the utmost importance. It is a solidified bituminous composition, applied hot over a priming coat of Hermastic

Primer to such thickness as may be desired (usually  $\frac{1}{16}$  in.). It forms a bright black coating, which hardens immediately, ready for service.

Both the enamel and the primer are extremely ductile, strongly adhesive and will not chip or peel. They form an impervious coating, proof against moisture, alkali, chemical fumes, sulphuric gases, salt water, salt atmosphere, many acids and other corrosive agents. Their insulating capacity is high. For this reason they are an effective protection against electrolysis. Owing to its exceptionally penetrating and adhesive nature, the coat of primer forms an intimate bond with the surfaces covered. The base of the two coatings being identical, they combine chemically, the result being a leathery, elastic coating, impervious and enduring under service conditions.

**Adaptability and Method of Application**—Hermastic Enamel is particularly recommended for the following: internal and external coating of pipe lines; penstocks; trash racks; for internal surfaces of coal bunkers; cooling towers; for all types of tanks, either drinking water or manufacturing tanks containing acids, etc. It is sanitary, tasteless and odorless.

Hermastic Enamel is applied on the job or at point of fabrication, whichever is preferable and consistent with best results, either by dipping, brushing or pouring, as may be required by specific exigencies of the work. It is usually applied by our own workmen. The enamel is broken up, melted and heated to about 300° Fahr. and applied while in molten state, after the primer has had an opportunity to dry. Sets immediately. Covers 2 to 3 sq. ft. per lb. when applied about  $\frac{1}{16}$  in. thick.

### Specifications.

The form of specification for Hermastic products is dependent upon the nature of the material to be coated, and the exposure to which surfaces are subjected. A thoroughly protective specification under any given condition will be furnished on application.

### Comparative Protection and Costs of Paint and Hermastic Products.

The various paints available for prevention of rust and corrosion provide relatively temporary and insecure protection. In the first place, paints have comparatively low initial adhesive strength, which grows constantly less after application, due to the volatilization of the carrying constituents. Furthermore, ordinary red lead and graphite paints are not impervious to external influences, and because of their frail nature are unfit for use as dependable protective coatings for iron and steel. Linseed oil, which is a component of red lead paints, is a glyceride of fatty acids and it may be saponified by the action of water alone.

Because of their long life and the resultant freedom from maintenance expenses, the Hermastic coatings will be found to constitute protection that is not only reliable but of remarkably low ultimate cost as well.

# THE VORTEX MANUFACTURING CO.

Manufacturers of Paints, Enamels and Specialties

GENERAL OFFICES

1836 Euclid Avenue

CLEVELAND, OHIO

## Products.

VORTEX OILPROOF COATING; ACID RESISTING PAINT; INTERIOR FIRE RETARDING WHITE; SULPHURPROOF INTERIOR WHITE; DURABLE GREEN STRUCTURAL IRON PAINT; GRAPHITE PAINTS; FLAT WALL FINISHES; FACTORY WHITES; INTERIOR ENAMELS; CONCRETE PAINTS; VORCOFLOR CEMENT PAINT; VORCOLASTIC OUTSIDE and INSIDE FACTORY PAINT; "BRUSH-ON" LIQUID ROOF CEMENT.



## Durable Green Structural Iron Paint.

Years of practical tests have proved Durable Green will outwear any other paint for structural iron work.

## Graphite Paints.

Made from pure linseed oil with pure amorphous graphite, in natural graphite, black and colors.

## Flat Wall Finishes.

An easy working flat oil paint for wall and woodwork. Can be stippled, is washable, durable, does not show brush marks or laps, and does not skin in the package. Made in white and all tints.

## Factory Whites.

Oil paints in flat and gloss finish of superior light reflecting qualities. Sanitary, durable and washable. Average covering capacity, 250 sq. ft. per gal., 2 coats.

## Interior Enamels.

For breweries, packing houses, dairies, bakeries, warehouses, schools, apartment houses, office buildings, etc. Impervious to moisture. Can be scrubbed. Dries with a hard tilelike finish of unsurpassed durability and wearing qualities.

## Concrete Paints.

For interior concrete, brick, plaster or stone surfaces. Made in white, and all colors. Resists moisture; is beautiful and durable. Can be applied with a paint spray gun.

## Vorcoflor Cement Paint.

In white and desirable colors, makes cement floors clean, hard, waterproof and dustless.

## Vorcolastic Outside and Inside Factory Paint.

A most practicable and durable paint for all exterior and interior surfaces. A pure linseed oil vehicle, combined with a durable elastic gum. Has wonderful wearing qualities and is inexpensive compared with competitive interior and exterior paints. Made in all desirable colors.

## "Brush-on" Liquid Roof Cement.

Makes a new roof over an old one. Costs less than 1¢ per sq. ft. A combination of asbestos fiber and heavy asphaltum oils. Fire retarding and extremely durable. Gives years of added service to any roof.

## Co-operative Service.

THE VORTEX MANUFACTURING CO. are paint specialists. They are in a position to efficiently solve any paint problems submitted to them. Inquiries for special paints for any purpose are solicited. There is a Vorco product for every particular need. Write for particulars.

## Vortex Oilproof Coating.

The only successful oilproof paint on the market. Will permanently resist mineral oil or any mineral oil product. Easily brushed, elastic, and durable. Intended primarily as an oilproof coating for concrete tanks, built for the storing of fuel and other oils, and to prevent seepage of oil through walls and floors.

SPECIFICATION No. 1—*For Concrete Storage Tanks*—Surface to be coated should be thoroughly dry; even and free from frost. Apply 3 coats; first coat will penetrate concrete of usual mixture  $\frac{1}{8}$  to  $\frac{1}{4}$  in. in depth, second coat fills pores of concrete and third coat gives a smooth, glossy, hard and durable surface; 8 to 12 hours should be given for drying between coats. Approximate covering capacity, 150 sq. ft. per gal., 3 coats. The above application will positively prevent leakage in concrete oil storage tanks.

SPECIFICATION No. 2—*For Oilproofing Factory Floors to Prevent Seepage of Oil Through Floors and Ceilings*—Used as a coating over building paper laid between rough wood flooring and finished flooring. Apply 2 coats. First coat should be applied to paper and allowed to dry 8 to 12 hours. Top flooring can be laid while second coat is still wet, if desired. Approximate covering capacity, 250 sq. ft. per gal., 2 coats. This application insures dry ceilings and walls for factories.

## Acid Resisting Paint.

A coating for the interior of acid tanks, pickling vats, etc. Will greatly increase the life of containers used for this purpose. Has wonderful resistance to sulphuric acid, or solutions of same. Apply with brush; 3 coats recommended.

## Interior Fire Retarding White.

The result of years of experimenting. Can be applied to any interior surface. An ideal spray paint. For new work as well as for re-coating over cold water or other paints. A wonderful fire retarder. Renders a wood interior practically fireproof and preserves the wood itself. Dries with a beautiful white finish. Not affected by acid or sulphur fumes. Stays white. A revolution in interior factory painting. Dries hard and will not rub off.

## Sulphurproof Interior White.

A beautiful flat white oil paint for interior walls and woodwork. Not affected in any way by ammonium hydro-sulphide fumes or gases.



# BELKNAP-MORAN-ALLEN CO., INC.

Special Putties, Paints and Roofing Cement

5 Ainslie Street  
BROOKLYN, N. Y.

## Products.

"BELKNAP'S" LEAD AND ZINC PUTTY, for wood sash, etc.

"HOLDFAST" PUTTY, for metal sash, etc.

"ELASTICO" GLAZING COMPOUND.

"ELASTICO" EXTERIOR OIL PAINT.

"NEW-TYNT" INTERIOR OIL PAINT.

"KONKRETO," a Concrete Wall and Floor Waterproofing and Dustproofing Coating.

"ELASTICO" ROOFING CEMENT.

## "Belknap's" Lead and Zinc Putty.

This putty, for wood sash, skylights, etc., is a combination of pure white lead-zinc oxide and whiting, mixed by machine to the proper consistency. After hardening, it holds the glass firmly in position, but with a flexibility which prevents disintegration at any time.

"Belknap's" Lead and Zinc Putty is warranted to give long and efficient service, under all conditions. Price is a little higher than that of the regular linseed oil putties.

## "Holdfast" Metal Sash Putty.

This putty is made from a formula which is the result of long research for a putty that is fire resistant and will meet all other requisites for metal sash service at a low cost.

It works as easily and smoothly as ordinary putty, reducing the cost to the metal sash glazing contractor. It adheres firmly to the sash without shrinking and hardens quickly without sagging or wrinkling.

Price is no more than ordinary putty; yet "Holdfast," is warranted efficient and durable under all types of service.

"Holdfast" is used very extensively by largest contractors.

## "Elastico" Glazing Compound.

A putty that hardens only to the consistency of soft rubber and is waterproof under all conditions, expanding and contracting with the weather.

It adheres to glass, metals, concrete, stone, wood, expansion joints in steel, etc. 1 lb. will glaze about 12 ft. of 1/2-in. sash. Made in any shade.

## "Elastico" Exterior Oil Paint.

An elastic protective coating, scientifically composed of inert pigments, carefully and uniformly ground with pure linseed oil and high grade asphalt gums. It is proof against alkali and acid and is particularly adapted for service, on wood or metal, where resistance to moisture and industrial gases is essential.

"Elastico" does not require priming with any other paint, and is warranted to remain elastic for 5 years.

Spreading capacity on structural steel, 500 to 600 sq. ft. per gal., 1 coat.

## "New-Tynt" Sanitary Interior Oil Paint.

A modern, sanitary, light reflecting paint for plaster and brick walls, wood trim and metal work. It produces a rich, velvety surface that will not fade or turn yellow and that can be freely washed with soap and water. Recommended for use in residences, schools, offices, factories, auditoriums, etc.

"New-Tynt" produces a satisfactory finish with 2 coats, and is warranted not to peel, chalk or blister when properly applied.

Covering capacity 500 sq. ft. per gal., 1 coat; 300 sq. ft. per gal., 2 coats.

## "Konkreto."

A tough, waterproofing and wearproofing oil paint for concrete wall and floor surfaces. Dries with a glossy surface which will not stain from oils and can be readily cleaned with soap and water. Will give long wear under the hardest traffic, protecting concrete floors from dusting and disintegrating.

Made regularly in maroon, chocolate brown, steel gray, and white; also, in any other desired shade on order.

Covering capacity, 500 sq. ft. per gal., 1 coat.

## "Elastico" Roofing Cement.

An elastic cement especially adapted for tile and slate roofs. It is composed of non-drying special oils and remains elastic for years. Not affected by fumes from industrial buildings. Guaranteed waterproof and weatherproof.

## Facilities, etc.

This company is the oldest and largest putty manufacturing concern in the United States. Capacity is 28,000 lbs. every 9 hours.

With large modern facilities and its many years of experience it is in a position to offer the building world a line of products of distinctive merit. These products should not only be *specified*, where quality service is required, but they should also be insisted upon afterwards.

## References.

The following are a few of the many buildings in which "Holdfast" Putty was specified and used:

Ford Motor Co., Long Island City, N. Y.  
Printers Building, New York, N. Y.  
Wright-Martin Aircraft Co., New Brunswick, N. J.  
Singer Sewing Machine Co., Bridgeport, N. J.

ESTABLISHED 1889

# H. B. FRED KUHLS

Manufacturer of Elastic Glazing Composition and Seam Paint

OFFICE AND FACTORY  
6411-6423 Third Avenue  
BROOKLYN, N. Y.

## Products.

ELASTIC GLAZING COMPOSITION and ELASTIC SEAM PAINT.

## Elastic Glazing Composition.

GENERAL GLAZING—For bedding and glazing in general; skylights, conservatories, etc.

For new work, after sash has been primed, apply Elastic Glazing Composition in same manner as ordinary putty.

For old work, clean sash thoroughly and putty as above.

For bedding and glazing on a ½-in. margin, 1 lb. will spread 10 ft.

Architects' specifications should read, "All sash to be glazed with Elastic Glazing Composition, manufactured by H. B. FRED KUHLS, Brooklyn, N. Y."

CALKING—For calking of window frames.

For new work, before putting on staff bead, fill joint thoroughly with Elastic Glazing Composition so that it becomes flush with frame.

For old work remove staff bead. If joints are wide, calk with oakum to within ½ in. from surface, then fill with Elastic Glazing Composition.

Between 2 and 3 lbs. required for a window 7 by 3 ft., according to size of opening.

Architects' specifications should read "Calk all window frames with Elastic Glazing Composition manufactured by H. B. FRED KUHLS, Brooklyn, N. Y."

POINTING UP—For pointing up of stonework, flashings, joining of tin roofs to walls, etc.

After joints have been cleaned out thoroughly, paint with Special Elastic Seam Paint, then fill with Elastic Glazing Composition with a pointing tool or knife. Special colors to match the stone.

Architects' specifications should read, "Paint all joints with Special Elastic Seam Paint and fill with Elastic Glazing Composition manufactured by H. B. FRED KUHLS, Brooklyn, N. Y."

## Features.

Elastic Glazing Composition adheres readily to galvanized and raw iron, steel, wood, glass, stone, concrete, etc. Never becomes very hard, always remaining elastic and flexible, and prevents glass from cracking. Withstands heat, cold and moisture. Vibration has no effect upon it, thus it is ideal for setting wire glass, which has no tendency to crack when embedded in this composition.

It is more economical than white lead putty, as it



TRADE-MARK

is double the bulk, and wears ten times as long, therefore it is the cheapest glazing material obtainable, service considered.

## Color.

Stock color is a light gray, but can be made in any shade.

## How Shipped.

Put up in kegs of 12½, 25 and 50 lbs., and in barrels of about 800 lbs.; also in cans of 1, 2 and 5 lbs.

## Testimonials.

NEW YORK, March 21, 1917.

DEAR SIR:

Replying to your inquiry of March 16th, referring to mine of August 9, 1916, and requesting information regarding the Elastic Glazing Composition furnished in April, 1916, which I was using on the skylights of the New York Terminal of the Brooklyn Bridge, I would inform you that this composition was applied on May 2, 1916, to the skylights on the south side of the main roof of the New York Station. It was examined on March 19, 1917, and found to be in good condition, still having a firm hold and remaining pliable.

This is the most satisfactory article we have used on our skylight repairs.

Yours very truly,

(Signed) CALVIN I. CROCKER,  
Engineer in Charge.

NEW YORK, June 9, 1917.

DEAR SIR:

Your Elastic Glazing Composition has been used by me in calking metal window frames at the "German Liederkrantz" and I find it very successful in keeping out the draft and will continue using it.

Yours truly,

(Signed) JOHN PH. VOELKER, Architect,  
979 Third Avenue.

PITTSBURGH, PA., Oct. 29, 1913.

DEAR SIR:

Beg to acknowledge receipt of yours of the 24th. Beg to advise you that the Elastic Glazing Composition sent me last May I had used and it is in perfect condition today. At the same time I had some sash glazed with the ordinary putty and it is beginning to crack already. Am satisfied that your putty will do all you claim for it.

Very truly yours,

(Signed) J. M. McCOLLUM, Architect,  
1001 Berger Building.

## References.

A few buildings on which Elastic Glazing Composition has been used:

Pennsylvania Terminal, New York, N. Y., 20 tons for glazing  
Woolworth Building, New York, N. Y., 5 tons for glazing and pointing up

Plaza Hotel, New York, N. Y., 1 ton for pointing up  
Racquet & Tennis Club, New York, N. Y., 2¼ tons for glazing  
Newcastle Leather Co., Wilmington, Del., 1½ tons for glazing  
Paragon Film Co., West Fort Lee, N. J., 2 tons for glazing  
Singer Sewing Machine Co., Elizabethport, N. J., 3 tons for glazing

Massachusetts Institute of Technology, Cambridge, Mass., 2 tons for glazing

Further reference and information on request.  
Over 70 agents in United States and Canada. Send for booklet. Prices on application.



SHOWING METHOD OF APPLYING  
ELASTIC GLAZING COMPOSITION



# WEATHERPROOF CALKING COMPANY

757 Washington Avenue, North  
MINNEAPOLIS, MINN.

## BRANCH OFFICES

CHICAGO, ILL., 231 Insurance Exchange Building  
DES MOINES, IOWA, 709 Hubbell Building  
DETROIT, MICH.

NEW YORK, N. Y., 33 Stone Street  
CLEVELAND, OHIO  
KANSAS CITY, MO., 523 Locust Street

MILWAUKEE, WIS., SUPERIOR CALKING Co. (Wisconsin Agency), 608 Caswell Block

## Products and Services.

Manufacturers of and Contractors for the application of HENNEN'S ELASTIC CALKING PASTE for sealing joints around window and door frames.

Hennen's Superior Glazing Putty, and Hennen's Liquid Greenhouse Putty.

## Hennen's Elastic Calking Paste.

The use of Hennen's elastic calking paste insures a windproof, dustproof and waterproof joint between frame and masonry. It is adhesive to both wood and metal frames as well as to all kinds of masonry and adheres permanently, remaining sufficiently elastic to admit of expansion and contraction of frames in wet and dry weather, heat and cold.

Hennen's calking paste is a combination of the derivatives of mineral and vegetable elements, the mixing of which produces a permanently adhesive and elastic compound which, owing to its consistency, is not affected by heat or cold and is absolutely waterproof.

It gives equally efficient results on brick, stone, terra cotta, concrete or stucco buildings, new or old.

The durability of Hennen's calking paste is evidenced by the fact that work done 12 years ago is in the same condition as when executed.

The calking can be done in any season of the year, from the outside, without annoyance to the occupants and without injury to any part of the building.

## Advantages.

Hennen's elastic calking paste has been on the market so long that there can be no doubt of its efficiency and permanency if properly installed.

Where oakum and elastic cement are specified to be installed by the contractor, in the majority of cases he estimates an insufficient amount of money for this work and consequently too little of the materials are used; so that no matter how good the materials may be the results secured are not satisfactory.

This company, by employing men experienced in this particular work, and providing them with steady employment, and because of persistent and continued inspection of the jobs, insures absolutely effective and permanent results.

So much more work is accomplished per day that service is assured at a smaller cost than would be paid to the general contractor.

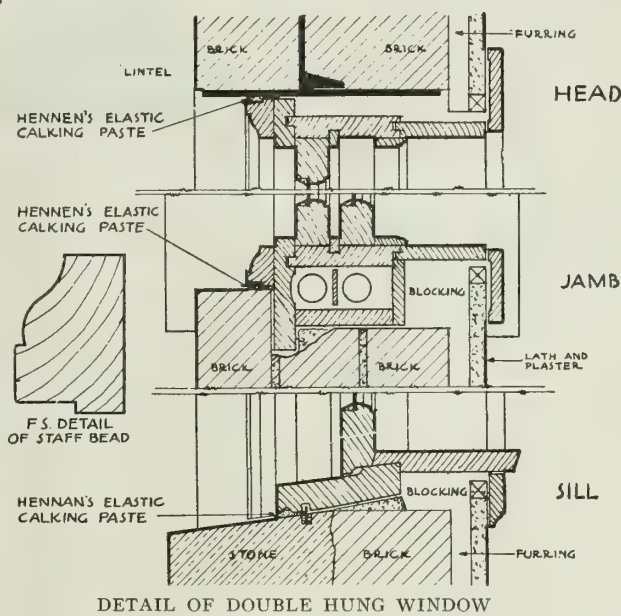
## Application.

Where it is preferred, we calk behind the staff beads, using oakum, which serves as a backing and fills the large voids, then apply Hennen's elastic paste, which seals the joints, making them perfectly weatherproof.

If it is desired to obviate the expense of removing and replacing staff beads, calking can be taken care of as per detail illustration. In this case, staff beads are permanently nailed. Oakum is used to fill the large voids, after which Hennen's elastic paste is thoroughly

worked into the joint, making a neat job. The paste is then painted and finished to match the frame. Taking care of the work in this way, there can be no disfigurement of the masonry. This method is preferable, because it insures a weatherproof joint on the outside, and if defects occur by reason of settling, they can be seen and easily remedied.

If the frames are found to be loose in the masonry opening, they are anchored to the masonry in a substantial manner before the calking is done.



Showing staff bead and how to properly install Hennen's elastic calking paste to insure a windproof, dustproof and waterproof joint between frame and masonry

## Estimates.

Upon application estimates or other information will be furnished.

## Guarantee.

This company aims to, and always does, execute this work so that a guarantee is superfluous; but in order to reinforce the confidence of those customers who are unacquainted with its work and reputation, a satisfactory guarantee, covering material and workmanship, will be given.

## References.

For 12 years Hennen's elastic calking paste has been used with absolute effectiveness on buildings of all types throughout the country and has received the universal indorsement of leading architects, builders and owners.

ESTABLISHED 1862 BY SMITH BOWEN

INCORPORATED 1911

# PECORA PAINT COMPANY

Mortar Stains, Enamels and Wall Finishes, Elastic Cement Specialties  
Fourth Street and Erie Avenue  
PHILADELPHIA, PA.

## Products.

PECORA MORTAR STAINS, CALKING COMPOUND, CUTICLE ENAMEL PAINT, MILL WHITE, ROOFING CEMENT, METAL-SASH PUTTY.

## Pecora Mortar Stains.

**ADVANTAGES**—Manufactured in heavy paste or pulp, for in that form only is it possible to produce a *chemical* (not an acid) mortar stain, which has the advantage of being absolutely fadeproof, and which gives that deep, rich tone, so often sought and so seldom found. It has the added advantage of being most easily and thoroughly mixed with the mortar. After much experiment, this company has found that the only sure method of producing a fade-proof, exceptionally strong and withal economical stain is by mixing finely ground ores with dissolved chemicals, and therefore offers "Pecora" in pulp or paste form only.

**PROPERTIES AND DESCRIPTION**—Being a fast stain or dye, and differing in that respect from ordinary coloring mediums, it forms a chemical union with the mortar and strengthens, rather than weakens, the mortar joint. It is far more easily and thoroughly mixed in than dry powder.

Economically it is unapproached as, *being 50% to 100% stronger than any mere mineral coloring material*, it is much less costly in the long run. Being manufactured from carefully selected, finely ground and richest ores in combination with extenders and fixatives, the color becomes permanent after the mortar is set, making rich, clean, clear shades, free from streaks or spots. Pecora Mortar Stain does not cause or increase unsightly efflorescence on the face of brick walls.

The company's many years of successful and constantly growing business have *proved the superiority of pulp stain*; and while a small detail in building construction, it is an important one, the correct knowledge and use of which helps to build a lasting quality reputation for both architect and contractor.

Booklet showing colors and giving full details, testimonials and photographs of important buildings, sent on request.

**COLORS**—Shades below are always in stock. Special shades made to order.

Black	Windsor	Fern Green
Brown	Amber	Colonial Drab
Seal	Buff	French Gray
Red	Salmon	Terra Cotta

**SPECIFICATIONS**—Many architects have found that specification by name only has resulted in the substitution of inferior goods, the fading of which necessitates expensive tuck pointing. Therefore, be particularly careful to specify in full, naming the desired color as follows:

All mortar to be colored or stained with Pecora Mortar Stain, manufactured by PECORA PAINT COMPANY, Philadelphia, Pa., using by measure 1 bucket to 7 buckets of white front mortar.

*Further Specifications*—Should it be desired to enlarge on

the above, add the data under "Directions for Use" and "Proportions by Weight" given below.

**DIRECTIONS FOR USE**—Mortar must be cold before mixing in stain. To secure a uniform and smooth shade, "hoe in" stain thoroughly. For very fine press-brick work, strain the stained mortar through a coarse sieve. Keep soft in package by covering with water. Pour this off before using. Do not allow stain to freeze.

**PROPORTIONS BY WEIGHT**—Depending upon the depth of shade desired, use per 1000 brick, ordinary stretchers, as follows:

50 to 60 lbs., Red, Windsor, Terra Cotta, Amber, Seal, Fern Green, Salmon.  
40 to 50 lbs., Buff, Brown, Colonial Drab, French Gray.  
25 to 35 lbs., Black.

## Pecora Calking Compound.

**ADVANTAGES**—This material meets the demand for something which *permanently* fills in the open space between window frame and masonry in old or new buildings, preventing leakage of air, dust, soot, etc., a common cause of excessive coal consumption, and the ruin of paint and hangings on the inside of window frames.

It is invaluable for glazing subject to severe conditions.

Do not confuse it with putty or mixtures of oakum and white lead, tar, cement or ordinary roofing or elastic cements, which eventually dry and fall out, for this compound, being designed especially for its own field, remains elastic and pliable, staying in place and forming a permanent building seal.

**DESCRIPTION**—Stock color, light gray; other shades to order. Consistency is about the same as ordinary putty. Easily applied, and adheres to iron, steel, wood, glass, stone, concrete or brick. *It does not become hard with age*, but remains elastic and pliable, expanding and contracting, yet adhering firmly, whether used for calking or glazing. Its elasticity prevents glass from cracking when used in the latter way.

**SCOPE OF USE**—Nothing except calking around frames with a *permanent* material will insure occupants of office buildings, hotels, hospitals and residences, new or old, such freedom from draughts around window frames and from expense of redecorating made necessary by damage due to seepage of dust, soot, etc.

This compound is also invaluable for glazing and bedding skylights, conservatories, railroad trainsheds, pointing up stone work, setting tile, and for making joints in terra cotta cornices, etc.

Clients can be saved the cost of calking frames in one winter by the saving in fuel alone, or if Pecora Compound is used for glazing, by the saving in glass and labor incident to the purchase and installation of new window lights.

**QUANTITIES REQUIRED**—*For Calking*—For old or new buildings, 2½ lbs. for a 7 by 3-ft. opening (20 running feet) if compound is put in ¼-in. wide by ½ in. deep. More will be necessary if openings are exceptionally wide.

*For Glazing*—Figure 1 lb. for bedding or glazing 10 running feet on ½-in. margin.

**SPECIFICATIONS**—*For Calking*—Before putting on staff-bead, fill cavity between frame and masonry with plumbers' oakum to within ½ in. of outside, calking remaining space with Pecora Calking and Glazing Compound, manufactured only by the PECORA PAINT COMPANY, Philadelphia, Pa. After placing staff-bead in position, seal edges with same material.

*For Glazing*—Glaze all window lights with Pecora Calking and Glazing Compound, manufactured by the PECORA PAINT COMPANY, Philadelphia, Pa.



TRADE-MARK  
Registered



**Pecora Cuticle Enamel Paint.**

Produced a number of years ago to equal the highest grade imported enamels, it has been improved in many ways, and still heads the procession.

Pure white in color, not blue-white or yellow-white. Elastic, yet so tough that the finger-nail can not be forced into it when thoroughly dry.

It bends or dents with the surface painted, without cracking.

Repeated washings do not affect it, and it is impervious to the action of bichloride of mercury, chloride of lime, peroxide of hydrogen, alcohol, ether and nitrate of silver (dilute). For this reason it is invaluable for hospital and laboratory use.

Exceptionally resistant to the weather and can be successfully used outside.

Covers approximately 500 sq. ft. to the gal., 1 coat. Ease of application is such that the workman can cover large surfaces with a saving of about 25% in time.

**SPECIFICATIONS**—Should read as follows:

All woodwork and walls to be finished with Pecora Primer and Pecora Cuticle Enamel, manufactured by the PECORA PAINT COMPANY, Philadelphia, Pa.

**Plaster, Interior**—Size with any good varnish sizing, and apply 3 coats of Pecora Primer, letting dry 24 hours between coats. Sandpaper first and last coats lightly. Then apply 2 coats of Cuticle Enamel (gloss or flat), allowing 3 days between coats, and lightly sandpaper first coat. If a less expensive finish is desired, 2 coats Primer and 1 coat Enamel will do. If 25% of Cuticle is added to last priming coat it will give even better results.

**Wood, Interior**—Shellac all knots, then continue as with plaster, omitting size. The same rule applies as to a less expensive finish. If 25% of Cuticle is added to last priming coat it will give even better results.

**TESTIMONIAL**—

WOMAN'S HOSPITAL  
110th Street, New York City.

GENTLEMEN:

Enclosed please find an order which we would like filled as soon as possible.

We tested your sample of Pecora Cuticle Enamel with bichloride of mercury, chloride of lime, peroxide of hydrogen, alcohol, ether and nitrate of silver (dilute), any or all of which we would be apt to use on or near the article painted, and it stood the trial perfectly, when various other enamels were inadequate.

Our engineer wants to know if the "undercoating" is equally impervious to acids, etc.

Yours truly,  
FRANCES E. FOWLER,  
Superintendent.

**Pecora Mill White.**

Made in gloss, eggshell and flat. A high grade, light reflecting, oil paint, made by a secret process of oil manipulation. Not being dependent on varnish gums, Pecora Mill White does not become brittle and crack off in a short time.

Constant vibration can not break the tough and tenacious oil film, and under the same conditions Pecora will stay white longer than most mill paints now offered.

Is a *white* white, not a blue white or of a yellowish cast. A large percentage of light can be lost through not using the proper kind of white. Perfectly opaque, washable and sanitary.

Flows so freely that one man can cover large surfaces.

**SPECIFICATIONS**—Should read as follows:

All woodwork and walls to be finished with 2 coats Pecora Mill White (gloss, eggshell or flat, as desired), manufactured by the PECORA PAINT COMPANY, Philadelphia, Pa.

**Pecora Roofing Cement.**

Something durable has long been sought for pointing up cap flashings; for sealing joints of tile or stone coping, the hip and ridge roll, as well as joints of clay or shale tile roofs, and for sealing nailholes and joints of slate roofs.

This the company has supplied in its Elastic Roofing Cement. It possesses every feature which makes an elastic cement perfect for general repair or for new work.

Made in three standard shades—red, brown and slate. Other shades to order.

Easily and rapidly spread with an ordinary trowel, and once in place clings tightly without washing out. Expands and contracts with extremes of temperature, remaining in a rubberlike consistency for years. On account of this durability, it can be used in any climate. Pecora has been used in the cold Northwest, and in large quantities on the buildings at the Panama Canal, with equal success.

Specification of this material for the following suggested uses will insure against complaint from contractor or owner, and guarantee them freedom from the annoyance of leaks, assuring their appreciation of the architect's attention to the smallest detail.

Adapted for bedding or laying slate or tile roofs; pointing around dormer windows, skylights and chimneys; sealing joints of tile or stone copings; for making weathertight breaks, cracks or holes in roofs of all kinds. It will adhere to metal, glass, wood, asbestos or composition roofing.

**Pecora Metal-sash Putty.**

White lead, litharge and ordinary putties, being found unsuitable for glazing metal sash, the company perfected Pecora Metal-sash Putty, which is made for use in metal sash only, and embodies the essential feature of retaining its elasticity and staying in place, regardless of the difference in coefficient of expansion between glass and steel.

This putty remains soft in the package, and on removal is immediately ready for use.

It is "long," therefore readily applied by the workman, and not requiring any manipulation enables the contractor to reduce his cost of installation.

Standard shade, dark red. Other shades made to order.

Does not set too quickly, yet will not sag or wrinkle. Adheres firmly, preventing glass from falling out or leakage of water and air.

The specification of Pecora Metal-sash Putty will be a trouble saver, for thousands of pounds have been used on some of the largest buildings with the greatest success.

Sample on request.

**REFERENCES**—A few of the large buildings where this material has been used by David Lupton's Sons Co. of Philadelphia, Pa., are:

Bethlehem Steel Co., South Bethlehem, Pa.  
General Electric Co., Schenectady, N. Y., and West Lynn, Mass.  
Fore River Ship & Engine Building Co., Fore River, Mass.  
Dayton Electric Co., Dayton, Ohio.  
S. L. Allen & Co., Philadelphia, Pa.  
Central R.R. of N. J., Elizabethport, N. J.  
United States Government, Torpedo Boat Destroyer  
League Island Navy Yard, Philadelphia, Pa.  
Keokuk Electro Metals Co., Keokuk, Iowa



# CLINTON METALLIC PAINT COMPANY

Mortar and Cement Colors, Protective Paints and Cements

100 Clinton Road  
CLINTON, N. Y.

## Products.

Manufacturers of CLINTON MORTAR and CEMENT COLORS, in dry and pulp forms.

Clinton Iron Oxide Protective Paints, Silk Fibre Roof Cement, Asbestos Furnace Cement, Stove Putty and Putty Cement, Clinton High Heat Fire Brick Cement.

## Clinton Mortar Colors.

Made in various shades of red, brown, buff, purple and black, from richest and purest ores obtainable, and mixed and carefully sorted. The ores are passed through a special process of drying, grinding and air floating, and come out reduced to a very high degree of fineness and purity, having great staining power and permanence.

**QUALITY IN MORTAR COLORS**—Colors made from shale or rock, silicious in nature, possess little staining power; and those made from by-products of acid manufacture are almost certain to weaken mortar or to cause efflorescence. Fine grinding gives a color greater staining power, even though finer grades look lighter than coarser kinds.

Since color is usually bought by the pound but mixed in bulk, and since a shovelful of coarse color weighs about half as much again as a shovelful of properly ground color, it is clearly evident that a finely ground color, like the "Clinton," is far more economical to use than the weak staining coarse grades.

**QUANTITY REQUIRED**—Coloring mortar for 1000 brick  $\frac{1}{8}$ -in. joint requires approximately as follows:

Dry Colors: 25 pounds Red.

30 pounds Brown, Buff, Double Strength Black, Purple.

Pulp Colors: 35 pounds Red.

40 pounds Brown, Buff, Double Strength Black, Purple.

For wider joints use proportionately more color.

The quantity of color necessary depends of course upon the shade desired, but the figures given represent amounts required under fair average conditions.

**MIXING COLORS**—Colors should first be uniformly mixed with dry sand. Slaked lime should then be added and thoroughly incorporated. The more thorough the mixing the less color is required.

## Importance of Specifying Reputable Color.

Lack of definite specifications often results in the

use of a low priced color which fades out after the job is completed. In numberless instances costly buildings have thus been practically ruined. To avoid this embody the following in specifications:

All mortar to be colored with Genuine Clinton Mortar Color manufactured by the CLINTON METALLIC PAINT COMPANY of Clinton, N. Y. All lime must be thoroughly slaked and cooled for at least 24 to 48 hours before adding the color.

Use 1 lb. of color to 15 lbs. of the *dry materials* used in the mortar. Mix thoroughly.

## Imitations; Labels.

Colors of inferior grade appear from time to time which are claimed to be "Clinton Colors." To guard against these fraudulent imitations, be sure that all barrels and kegs bear our head label and yellow side label, and that all bags bear the yellow side label. Labels are shown below.



HOTEL UTICA, UTICA, N. Y.  
Clinton Mortar Colors used



YELLOW SIDE LABEL



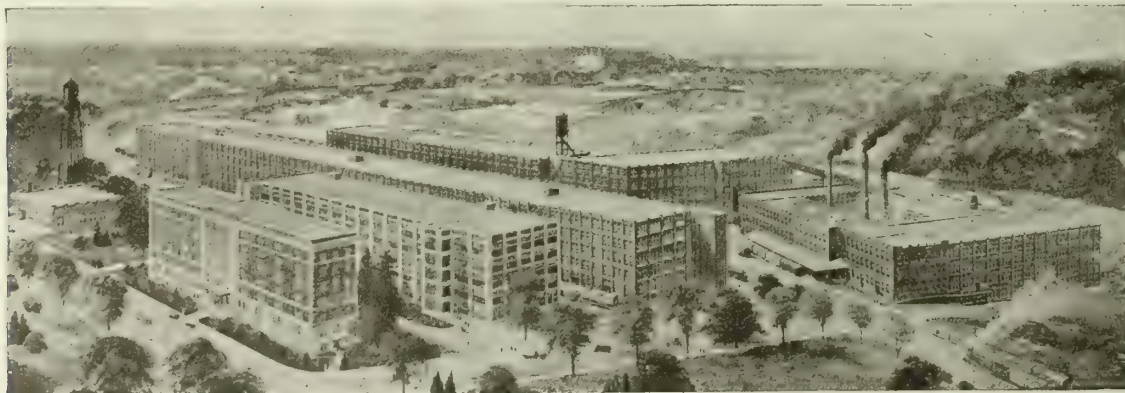
HEAD LABELS

## Packages.

Barrels and kegs in which Clinton mortar colors are shipped are made in our own cooperage plant of best material. This insures greatest strength and durability, and protects from loss. Waterproof, paper lined bags are of highest quality obtainable.

## Shipments.

Prompt shipments are guaranteed. A large stock is constantly carried on hand, and order is usually shipped same day it is received.



PLANT OF FISK RUBBER COMPANY, CHICOPEE FALLS, MASS.—CLINTON MORTAR COLORS USED THROUGHOUT



# DEXTER BROTHERS CO.

## Shingle Stains

105-107 Broad Street  
BOSTON, MASS.

SELLING AGENTS CARRYING STOCKS

NEW YORK, N. Y., JOHNSTON & OSWALD CO.

GRAND RAPIDS, MICH., F. H. McDONALD

SYRACUSE, N. Y., F. P. COLLINS PAINT CO.

RICHMOND, VA., SOUTHERN DISTRIBUTERS, R. McC. BULLINGTON & Co.

### Products.

DEXTER SHINGLE STAINS; PETRIFAX CEMENT COATING; ROMAN CALX FLAT WALL FINISH.

### Dexter Shingle Stains.

These stains are made of the very best ground colors, combined with penetrating and preserving oils. The finest pigments obtainable are used in their preparation.

Leading architects throughout the country have used Dexter stains for 25 years, and have found that they possess many superior advantages.

**ADVANTAGES**—(1) Retain brightness and full, strong color for an exceptionally long time. (2) Do not wash off or mildew. (3) Excellent wood preservatives. (4) Have no offensive odor, and are non-poisonous. (5) Shingles retain their natural "furze," giving a soft velvety appearance, which has great beauty. (6) Can be used on any kind of surface—smooth surface boards, all wood shingles, latticework, etc. (7) Cheaper than paint; ingredients used do not congeal and form a skin coat to retain water and cause shingle to rot on under or unprotected surfaces. (8) Unaffected by elements.

**COLORS**—In great variety, including soft wood-browns, greens, silver and weathered gray, whites, reds, mauve, and terra cotta, for exterior or interior use.

**Weathered Gray**—This effect, peculiarly pleasing and difficult to obtain, is now possible by the introduction of Dexter No. 54 Stain. This is similar to other Dexter stains excepting that it contains no pigments, and is perfectly transparent. Results are obtained at once. Such historic houses as the birthplace of Paul Revere, Boston, and Hawthorne's House of Seven Gables, Salem, Mass., have been refinished with this stain because of its perfect reproduction of the natural results of age. It can be used on all wood shingles except California redwood and cypress. Large sample shingle on request.

**Old Colonial Whites**—Popular for country homes and estates. Produces a whitewash effect but with a permanent and preservative stain. A large sample shingle sent on request.

**RE-STAINING**—Great care should be used in the selection of a stain color to be used for re-staining shingles. The best plan is to send a sample shingle, showing the present condition of the old stain, which will permit of the proper selection of Dexter stain to produce the desired effect.

**SAMPLES**—Sample stained boards will be sent when requested; but on account of their small size they give but a vague idea of what the final result will be.



**SPECIFICATION DATA**—*Brushcoat*—All surfaces to be given 1 brush coat of Dexter stain of color selected. Stain to be used exactly as received from manufacturer, delivered on the job in its original package, and to be kept well stirred while using.

*Dipping*—All shingles dipped two-thirds their length (butt end) in Dexter stain of color to be selected. Stain to be used exactly as received from manufacturer, and to be kept well stirred while using. All cut shingles to be retouched after they are laid.

*Dipping and Brush Coat*—All shingles to be dipped two-thirds their length (butt end) in Dexter stain of color selected. Stain to be used exactly as received from manufacturer, and to be kept well stirred while using. After shingles are laid they are to be given 1 brush coat of same color when directed.

One gallon will dip about 500 shingles two-thirds their entire length, or will brush about 125 sq. ft.

**How to Dip Shingles**—If stain is in keg or barrel, break in head and stir thoroughly before using. If stain is in can, cut out bottom, when possible, and dump contents into some larger container. It is always a good plan to arrange a sort of trough in which shingles may be placed after dipping, in such a position that surplus stain may drip back into container. Stain must be kept well stirred while using. Shingles are usually dipped about two-thirds their length. Do not soak them in stain, but dip in, and take out immediately, drawing across a piece of burlap which has been wound around a stick and fastened to head of barrel in such a way that it will brush stain into shingles. Place in trough and allow to dry.

**RECOMMENDATION**—It is a fact that shingles shrink, and if a brush coat only is applied, a white streak shows between the shingles after they have been laid. Dipping remedies this by coloring and preserving the shingle for two-thirds its length.

Frequently only a single brush coat of stain is given, or shingles may merely be dipped. For best results dipping shingles, following with a brush coat after they are on building, is strongly recommended. Shingles must be dry and free from frost.

When using No. 54, either dipping or 1 brush coat is sufficient.

### Petrifax Cement and Brick Coating.

Petrifax is manufactured from a mineral base and is carried into the pores of the cement or bricks by a volatile liquid, which readily evaporates, leaving a hard surface which will not chip, crack nor peel off. To dampproof a wall, Petrifax should be applied to the pressure side.

Covering capacity variable according to the surface.

### Roman Calx Flat Wall Finish.

Roman Calx is a flat oil finish for plaster or wooden walls, being washable and sanitary.

Covering capacity about 350 sq. ft. per gal.

# SAMUEL CABOT, INC.

## Manufacturing Chemists

NEW YORK, N. Y.  
1133 BROADWAY

141 Milk Street  
BOSTON, MASS.

CHICAGO, ILL.  
24 W. KINZIE STREET

### PRINCIPAL AGENCIES

ATLANTA, GA., SCIPLE SONS  
BALTIMORE, MD., NATIONAL BUILDING SUPPLY CO.  
BIRMINGHAM, ALA., MOORE-HANDLEY HARDWARE CO.  
BUFFALO, N. Y., M. A. REEB (Quilt); SCHUELE & Co. (Stains)  
CINCINNATI, OHIO, L. MENDENHALL CO.  
CLEVELAND, OHIO, CLEVELAND BUILDERS' SUPPLY CO.  
COLUMBUS, OHIO, ONYX PAINT CO.  
DALLAS, TEX., SUMNER & MCCREIGHT CO.  
DAYTON, OHIO, DELSCAMP-ROEMHILDT CO.  
DENVER, COLO., COLORADO BUILDERS' SUPPLY CO.  
DETROIT, MICH., UNITED FUEL & SUPPLY CO.  
DULUTH, MINN., THOMSON-WILLIAMS CO.  
GRAND RAPIDS, MICH., W. P. WILLIAMS  
HOUSTON, TEX., W. L. MACATEE & SONS  
JACKSONVILLE, FLA., GILL & MULHOLLAND  
KANSAS CITY, MO., DAY K. SMITH  
KNOXVILLE, TENN., W. W. WOODRUFF & SONS  
LOS ANGELES, CAL. (Stains), MATTHEWS PAINT CO.;  
(Other goods), WATERHOUSE & PRICE CO.  
LOUISVILLE, KY., NATIONAL ROOFING & SUPPLY CO.

MEMPHIS, TENN., FISCHER LIME & CEMENT CO.  
MINNEAPOLIS, MINN., JOHNSON, JACKSON & CORNING CO.  
NEW ORLEANS, LA., ZIMMERMANN'S BUILDING SPECIALTIES  
Co.; FRITZ JAHNCKE, INC.  
OMAHA, NEBR. (Stains), PIONEER GLASS & PAINT CO.;  
(Quilt), McCaffrey Bros. Co.  
PHILADELPHIA, PA., SAMUEL H. FRENCH & Co.  
PITTSBURGH, PA., HOUSTON BROTHERS CO.  
PORTLAND, ORE., TIMMS, CRESS & Co.  
ROCHESTER, N. Y., W. STUART SMITH CO.  
ST. LOUIS, MO., HUNKINS-WILLIS LIME & CEMENT CO.  
SAN ANTONIO, TEX., WEST END LUMBER CO.  
SAN FRANCISCO, CAL., PACIFIC BUILDING MATERIALS CO.  
SEATTLE, WASH., S. W. R. DALLY  
SIOUX CITY, IOWA, HANSEN GLASS & PAINT CO.  
SYRACUSE, N. Y., ALEX. GRANT'S SONS  
TAMPA, FLA., KNIGHT & WALL CO.  
TOLEDO, OHIO, TOLEDO BUILDERS' SUPPLY CO.  
WACO, TEX., NASH-ROBINSON CO.  
WASHINGTON, D. C., LALLY & ROHLADER

### Products.

CABOT'S "CREOSOTE" SHINGLE STAINS; OLD VIRGINIA WHITE; WATERPROOF STUCCO STAINS; WATERPROOF BRICK STAINS; "CONSERVO" WOOD PRESERVATIVE; DAMPPROOFING; PROTECTIVE PAINTS; MORTAR COLORS; SHEATHING and DEAFENING "QUILT."

### Cabot's "Creosote" Shingle Stains.

Cabot's "Creosote" Shingle Stains are the original shingle stains invented by Samuel Cabot over 30 years ago.

USES—Although at first used only upon rough wood, like shingles, boards, undressed siding, etc., they are now widely used on dressed lumber of all kinds, especially half-timbering, cornice and trimmings of cement houses, and dressed siding.

COLORING EFFECTS—They are made of the finest and strongest pigments, ground impalpably fine in pure linseed oil and suspended in a vehicle of specially refined creosote. The coloring effects are therefore soft and rich, and also transparent, so that the wood is beautifully colored without covering the grain. The colors are guaranteed fast.

WOOD PRESERVATION—The creosote penetrates the wood and thoroughly preserves it against decay or insects.

"Creosote is the best wood preservative known."—TRAUTWEIN.

"Wood treated with it is not subject to dry rot or other decay."—CENTURY DICTIONARY.

IMITATIONS—Can be recognized by coarse pigments; tawdry, opaque colors; and the smell of kerosene, benzine, or similar cheapener. Cabot's stains contain no petroleum distillate or other adulterant.

APPLICATION—Shingles may be dipped before laying; or dipped, and brushed once after laying (the most thorough method), or merely brush-coated twice after

laying. The coloring effect is the same, but dipping preserves the shingles better. Other woodwork is stained with the brush. Always use 2 coats, and 3 coats are advisable on smooth wood.

COVERING CAPACITY—One gallon covers 100 sq. ft., 2 coats, on rough wood, or 200 to 250 sq. ft. on smooth wood;  $2\frac{1}{2}$  to  $2\frac{3}{4}$  gals. will dip 1,000 shingles two-thirds their length, 3 gals. will dip and brush coat.



RESIDENCE OF RALPH PETERS,  
PRESIDENT L. I. R. R. CO.

AYMAR EMBURY, II, Architect, New York, N. Y.

Shingles stained with Cabot's "Creosote" stains; cement stucco stained with Cabot's waterproof cement stains. Walls lined with Cabot's Quilt for warmth

SAMPLES—Samples of stained wood, showing the colors on cedar, will be furnished on request.

SPECIAL COLORS—Special colors and shades will be made for architects who wish to produce special effects and will send samples to match or suggestions to follow.

SPECIFICATION—Specify: "Cabot's 'Creosote' Shingle Stains, in original packages bearing Cabot's trade-mark. Color to be selected by architect or owner." State whether work is to be dipped or brush-coated, or both, and that stains must be thoroughly stirred and be applied without dilution or adulteration, to dry wood only. This will insure uniform color and durability.



**Cabot's Old Virginia White.**

Gives a clean, brilliant "whitewash effect," combining the soft, cool whiteness of whitewash with the wearing qualities of paint; but it is not opaque and heavy like paint. It is more transparent, covering the surface as a good coat of whitewash covers it, and not with the hard, veneering surface that paint forms. It



WALLS FINISHED WITH CABOT'S OLD VIRGINIA WHITE;  
ROOF FINISHED WITH NO. 346 DARK GRAY  
CREOSOTE STAIN  
WALTER BOSCHEN, Architect, St. Joseph, Mo.

faithfully reproduces the peculiarly desirable qualities of whitewash; but is finer in tone and texture, simple and easy to apply, clean and lasting. Many attempts have been made to obtain this result with paint, but without success, because the hard, cold "paintiness" of paint is so essentially different from the soft brilliancy of whitewash.

**Cabot's Old Virginia Tints.**

These are made by softly tinting the Old Virginia White and they produce a "pastel" effect that is unique and most picturesque.

**ADAPTABILITY**—The best effects are obtained on shingles, sawn siding and other undressed lumber; but fine results are also had on all kinds of dressed lumber, excepting the most impervious resinous woods. Use extra coats on dressed lumber, where heavier results are desired.

**APPLICATION**—Apply with a brush or by dipping. If dipped, shingles should be brushed off when dipped and 1 or 2 brush coats applied after laying; or dip in White Shingle Stain No. 1168 and apply 2 brush coats of Old Virginia White.

One gallon covers 125 to 150 sq. ft., 2 coats, on shingles and other undressed wood, and it goes about twice as far on smooth wood. Apply with a brush only. If dipping is desired for the first coat, use White Stain No. 1166 for the dip coat, followed by 2 coats of Old Virginia White.

**Cabot's Waterproof Stucco Stains.**

These stains enter and seal the pores of cement plaster, or concrete, making them rainproof and producing beautiful coloring effects without weakening the cement.

They sink into the surface, and form no skin, so that they can not chalk or peel like paints and other coatings. Being transparent, they show the variations of texture, tone and density of the concrete almost as perfectly as in its uncolored state.

Made in all colors. One gallon covers from 100 to 250 sq. ft., 2 coats, depending upon the surface.

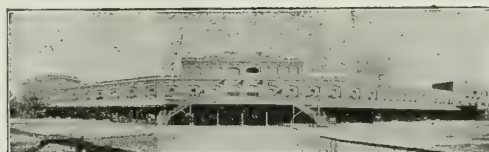


STAINED WITH CABOT'S STUCCO STAIN  
HARLAND A. PERKINS, Architect, Boston, Mass.

**Cabot's Waterproof Brick Stains.**

Make brickwork permanently waterproof and color it in natural tones with no "painty" effect. For evening up off-colored and mismatched brick, or restoring the color of old, faded and discolored walls, they are unequalled.

One gallon covers about 200 sq. ft., 2 coats, on the average brick. Made in all colors, and colorless.



NORTH GERMAN LLOYD PIERS, HOBOKEN, N. J.  
Waterproofed with Cabot's Clear Brick Waterproofing

**Cabot's Clear Brick Waterproofing and Cabot's Clear Cement Waterproofing.**

Transparent liquid waterproofings applied to the surface with a brush. They penetrate and seal the pores, making the surface completely and permanently rainproof.

One gallon will cover from 200 to 300 sq. ft., 2 coats, on common brick or smooth concrete.

**Cabot's Dampproofing.**

For direct plastering on brick and concrete walls and stonebacking on marble and other delicate stones. A permanently waterproof and adhesive coating that forms a perfect bond between the plaster and the wall, making furring and lathing unnecessary. It penetrates both plaster and wall, knitting them firmly and permanently together.

One gallon covers 80 to 100 sq. ft., 2 coats. The first coat should stand 24 hours before the second is applied, and the second should stand 24 hours before the plaster is applied. This insures perfect adhesion and a complete bonding.

**Cabot's Protective Paint.**

A chemically pure pitch paint, thoroughly clarified and refined, which forms an elastic, non-oxidizable bituminous coating that permanently protects iron and steel from rust, electrolysis and corrosion. Linseed oil paints will not last on metal construction, because oxidation and electrolytic action destroy them. Cabot's Protective Paint will not oxidize, is not affected by acids or electrolysis, will not crack nor peel. It is permanent and a perfect protection, and costs only half as much as linseed oil paint.

One gallon covers 300 to 400 sq. ft., 2 coats.

**Cabot's "Quilt."**

**PURPOSES**—For lining houses, stables, factories, etc., to make them warm in winter and cool in summer; for insulating cold storage and ice houses, breweries, refrigerators, etc., and for deadening sound in floors and partitions of schools, apartments, hospitals, lodges, etc.

**DESCRIPTION**—"Quilt" is a matting of cured eel grass stitched between 2 layers of very strong, tough paper.

It is so strong that a web of the "Quilt" will sustain a weight of almost 900 lbs.

The ribbons of eel grass cross each other at every angle and form innumerable small cells of "dead" air, so that the "Quilt" is a cushion of these air spaces.

It is therefore not a mere felt or paper, but a scientifically built structure similar to the plumage of a bird and gives the most perfect conditions for isolating heat and deadening sound.

The "dead" air can not circulate, so that heat conduction is prevented; and the sound waves are broken up and absorbed.

"Quilt" is made in a continuous web 3 ft. wide, which can be divided into narrower strips if desired, and is shipped in rolls containing 250 sq. ft. each.

**GRADES**—"Quilt" is regularly made in 5 grades, as follows:

	THICKNESS	WEIGHT (Per roll of 250 sq. ft.)
Single-ply	$\frac{1}{3}$ in.	40 lbs.
Double-ply	$\frac{1}{2}$ "	65 "
Triple-ply	$\frac{3}{4}$ "	90 "
Asbestos (fireproof)	$\frac{1}{2}$ "	90 "
Waterproof	$\frac{1}{2}$ "	80 "

**EFFICIENCY**—Actual scientific tests show that 1 layer of single-ply "Quilt" is equal to 28 layers of common, cheap building paper.

The double-ply is better than 40 layers. It is warmer and more permanent and much cheaper than back plastering.

As a sound deadener, the most exhaustive tests ever made (by Professor Norton for the New England Conservatory of Music) proved it to be far superior to all other methods, and also much cheaper, lighter, and more adaptable.

**WHY EEL GRASS?**—"Quilt" is made of eel grass because of the really wonderful qualities of this salt water plant, which no other fiber possesses, to wit:

It has a long, flat fiber, which, when matted in "Quilt," makes the "dead" air spaces (a round fiber like straw would make air circulation easy).

It is indestructible by decay.\*

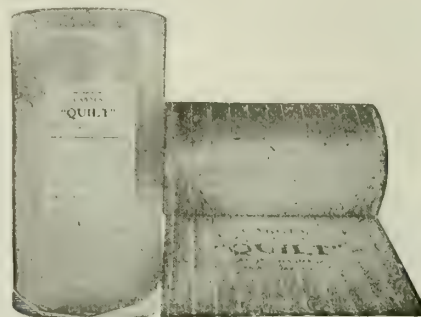


OLD PIERCE HOUSE, DORCHESTER, MASS.  
Built about 1635

\*The walls of the old Pierce House, Dorchester, Mass., were stuffed with eel grass when the house was built, about 1635, and the grass is still in a perfect state of preservation. We have a sample of this 275-year-old eel grass in our office

It repels moths and other insects and vermin.

It is almost non-inflammable, because it contains silicon in place of the carbon that is present in plants that grow in the air, and it is therefore an effective fire retardant.



ROLLS OF "QUILT"

It is very tough, and never loses its elasticity.

**APPLICATION**—"Quilt" can be applied in any way that any common felt or paper can be, and with vastly better results.

The drawings shown here are merely suggestions of a few methods of heat insulation in dwellings, etc., and of sound deadening in floors and partitions.

**ADAPTABILITY**—Single-ply is sufficient for lining houses and for all other ordinary heat insulation; double-ply is for sound deadening, cold storage and similar insulation where the conditions are more severe; triple-ply is for cold storage and other work where unusual conditions prevail.

Asbestos "Quilt" is for work where fireproofing as well as insulation and deadening are required. It is the only deadener that is fireproof, and the only fireproofing that is an efficient deadener.

Waterproof "Quilt" is double-ply with waterproof paper.

**SPECIFICATION**—Specify Cabot's "Quilt," and state what grade shall be used.

**Cabot's "Conserve" Wood Preservative.**

For preserving all kinds of woodwork from decay, worms, and insects.

At a cost of 2¢ or 3¢ per stick, "Conserve" will almost double the life of piles, posts, sills; bridge, mine, wharf and dam timbers, and all kinds of planking.

It is as perfect a preservative as can be made with the present scientific knowledge of the subject. It gives a butternut brown tone.

One gallon covers about 200 sq. ft. of dressed lumber with 2 coats.

Apply with a brush, as heavily as possible, or dip the lumber before using.

**Cabot's Mortar Colors.**

For 30 years the strongest and most durable colors for mortar.

Made in pulp form to insure uniform mixing and to save labor.

**Samples**

Samples of all materials, with full information, promptly furnished on request.



**SHINGLE or SLATE ROOF INSULATION**

Double ply Quilt

Rafters

**"QUILT" TRADE MARK**

Shingles

Double ply "Quilt"

Sheathing

**SLAG ROOF INSULATION.**

Slag Roofing

T&G Sheathing

Furring

Rough pine sheathing

Blocking

Two layers of Triple ply "Quilt"

Steel beam or top member of truss

C.I. Bearing plate

**SECTION at A-A**

Double ply Quilt

Rafters

**SLAG ROOF INSULATION.**

Sleepers

T&G sheathing

Roofing

Rough pine sheathing

Two layers of Triple ply "Quilt"

Blocking

Steel beam or top member of a truss.

**SECTION at A-A**

**SECTION at A-A**

Furring Plaster

Triple ply "Quilt"

Finished flooring

Triple ply "Quilt"

Sleepers

Rough floor

Joists

Two layers of Triple ply "Quilt"

Joists

**SECTION at A-A**

Floor DEADENING - EXTRA HEAVY, using two layers of Triple ply "Quilt" under sleepers and one between sleepers and finished floor.

**SECTION at A-A**

Furring Plaster

Double ply Quilt

Finished flooring

Sleepers

Double ply "Quilt"

Rough flooring

Joists

**SECTION at A-A**

Floor DEADENING - FLOATING TYPE, using one layer of double ply "Quilt". Note that sleepers are laid loosely over Quilt and flooring nailed to sleepers but not to Quilt.

**SECTION at A-A**

Plaster

Furring

Triple ply "Quilt"

Finished flooring

Triple ply "Quilt"

Furring strips

Beam

Beam

**SECTION at A-A**

Floor DEADENING - CONCRETE FLOOR, Three ply "Quilt" for deadening and floating type of floor above it.

**SECTION A-A**

Plaster

Siding

Sheathing

Double ply "Quilt"

Nailing strip

Stud

**PLAN**

**WALL INSULATION, usual method of insulating with one layer of Double ply "Quilt".**

**SECTION A-A**

Stucco

Sheathing

Water proof paper

Double ply "Quilt"

Water proof paper

Sheathing

Stud

**PLAN**

**WALL INSULATION, a single layer of double ply "Quilt" laid on studs under sheathing for outside plaster finish.**

**SECTION A-A**

Plaster

Shingles

Standard Single ply "Quilt"

Sheathing

**PLAN**

**WALL INSULATION, a layer of Standard single ply "Quilt" is laid on the sheathing under shingles or siding.**

**SECTION at A-A**

Joist

Triple ply "Quilt"

Furring

Joist

Plaster

**SECTION at A-A**

Joist

Triple ply "Quilt"

Furring

Joist

Plaster

**SECTION at A-A**

CEILING INSULATION or DEADENING

**SECTION A-A**

Plaster

Stud

Double ply Quilt

Stud

**PLAN**

**PARTITION DEADENING, usual method of deadening sound with two layers of double ply "Quilt".**

**SECTION A-A**

Cement plaster on metal lath

wired through "Quilt" to the channel irons.

Double ply "Quilt"

Steel studs

Metal lath

**SECTION**

**PARTITION DEADENING, THIN FIREPROOF, A layer of double ply "Quilt" laid between iron studs and metal lath.**

**SECTION A-A**

Plaster

Double ply Quilt

Stud

**PLAN**

**PARTITION DEADENING - STAGGERED, a method of weaving "Quilt" through studs to deaden sound.**

**SECTION A-A**

Plaster

Triple ply Quilt

Stud

**PLAN**

**PARTITION DEADENING - DOUBLE STUDDED, Extra heavy sound deadening using three layers triple ply "Quilt" and double partition.**

"QUILT" can be used in any way that any other similar material is used, with better results. Its value does not depend upon any peculiar manipulation. The above sections illustrate a few methods that have proved especially satisfactory.

DETAILS SHOWING APPLICATION OF CABOT'S "QUILT" FOR HEAT INSULATION AND SOUND DEADENING



# CARBOLINEUM WOOD PRESERVING COMPANY

36 Greene Street  
NEW YORK, N. Y.

## Products and Services.

### PROTEXOL WOOD PRESERVATIVE.

Also, a complete line of other Wood Preserving Oils according to chemical specifications; Shingle Stains; Treated Timber; Timber Treatment Accessories; Heating Tanks; Thermometers; Brushes; Spray Outfits.

Services include Chemical Analyses, Timber Inspection, Reports, Estimates for covering capacity on submitted timber schedules and all matters pertaining to Consulting Practice on the subject of Timber Preservation.

Upon receipt of details of requirements and conditions, suggested specifications will be prepared for any wood preserving problem.

## Technical Description.

Protexol is a non-volatile, heavy oil, derived from the highest boiling distillate of coal tar. Its constituents belong to the anthracene group, the permanent antiseptic properties of which are generally acknowledged. After filtration and refining, the oil is chemically treated to improve its character and to increase its efficiency. It readily penetrates wood, imparting a durable nut-brown color, and is highly toxic.

## Trade-name.

The adoption of the American trade-mark Protexol in place of the trade-name Avenarius Carbolineum is a recognition by us of changed conditions resulting from the war and legislation enacted because of the war. The discontinuance of the old trade-name, so favorably known for more than 40 years as representing the standard wood preservative, is due to conditions beyond our control.

In Protexol there is not one single new, untried, untested, unproved substance or combination—not one which has not filled a fully tested function as a valuable constituent in Avenarius Carbolineum, which, since 1876, has commanded the respect and confidence that made it the recognized standard wood preservative for surface treatments.

To those who have used or specified Avenarius Carbolineum, we guarantee that the product Protexol is a change in name only.

## Specifications.

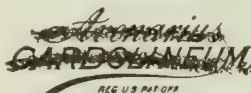
### PRESERVATIVE TREATMENT (PAINTING)

After trimming or framing, all timbers shall receive one brush coat of the preservative known as Protexol. This wood-preservative oil shall be heated in a suitable iron container to a temperature of 150° Fahr. This material is not a linseed oil paint and should be heavily applied and not brushed out thin. Run all cracks full of oil and give extra heavy coating to knotty spots, mortises, tenons and cut ends.

Before erection, and after allowing as much time as possible for the preservative to penetrate into the wood, a second heavy coating shall be applied to all cut ends or bearing surfaces. This shall likewise be applied with the preservative at a temperature of 180° Fahr.



PRESERVES WOOD EVERYWHERE  
TRADE-MARK



FORMER TRADE-MARK

All dowels, bolts, spikes or nails, before driven, shall be dipped in this preservative.

Cost, including labor and material, \$4.50 per 1000 ft. b. m.

### LUMBER PRESERVATIVE (SPRAYING)

All the timber shall receive two liberal applications, and joints and bearing points an extra application of a wood preservative known and sold as Protexol, which is to be applied by means of spraying or paint machines, with the preservative heated to 180° Fahr. After allowing 24 hours for the first application to be absorbed by the timber, one liberal application shall be given to all joints or bearing surfaces, into all of which this preservative is to be run most liberally; 24 hours shall elapse before the second application to the complete structure is made.

Timber wet by rain shall not be treated within 48 hours after a heavy rain or 24 hours after a light shower during the summer or within 3 days after a rain during the winter, provided the weather has been clear and dry.

Cost of this treatment, 3/4¢ per sq. ft.; this including material, labor and appliances.

### WOOD PRESERVATIVE (OPEN TANK)

After framing, all timbers shall be immersed in a bath of Protexol heated to 200° Fahr., and the timbers shall be kept submerged below the surface of the oil for a time varying with the thickness of the timber. The minimum period to be no less than 10 minutes; 5 minutes in the duration of the treating bath shall be added for every inch in the thickness of the timber above 2-in. planking. All dowels, bolts, spikes or nails shall be dipped in Protexol before driven.

Average cost of treatment, \$10.00 per 1000 ft. b. m., varying between \$8.00 and \$12.00, according to surface exposed. This includes material, labor and treating outfit.

## Covering Capacity.

Average figures for estimating:

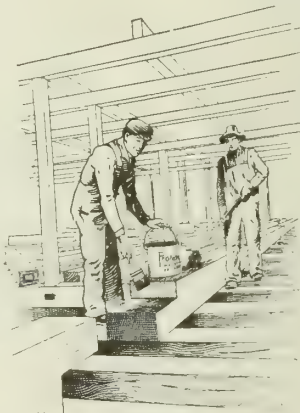
5 gals. per 1000 ft. b. m. for one brush coat  
8 gals. per 1000 ft. b. m. for two brush coats  
12 gals. per 1000 ft. b. m. for an immersion as above indicated

## Conclusion.

The above suggested specifications apply to structural timber. Where special conditions such as roof timbers exposed to condensing steam, nailing strips for carpets, acid conditions, etc., must be met, it is best to obtain the opinion of our Consulting Department before preparing specifications.

Cost estimates will be prepared when schedule of timber is submitted.

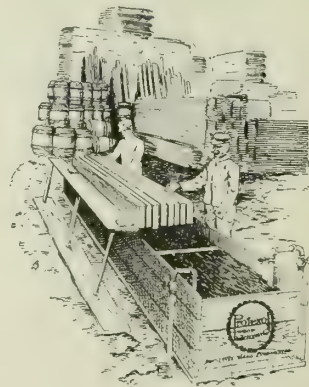
Protexol is the culmination of the knowledge gained in the wood preserving field from years of successful experience.



Brush



Spray



Open Tank

THREE METHODS OF APPLYING PROTEXOL WOOD PRESERVATIVE



ESTABLISHED 1867

INCORPORATED 1911

# THE NORTHEASTERN COMPANY

## Manufacturers of Wood Preservative

80 Beverly Street  
BOSTON, MASS.

NEW YORK OFFICE, 76 Wall Street

### Products.

LETTENEY WOOD PRESERVATIVE, a carbolineum of the highest quality.



TRADE-MARK

### Experience.

"Letteney" has an unequaled record of more than 50 years of effective timber treatment.

### Description of "Letteney."

"Letteney" is a liquid compound manufactured from by-products of wholly bituminous coal tar. Guaranteed to contain at least 99.5% pure coal tar oil. Contains no light volatile matter.

"Letteney" is not a surface coating, but penetrates the wood and remains there permanently. It is a powerful antiseptic, prevents decay, and prolongs the life of the wood. Not soluble in water and will not wash out.

Permanent color is dark red brown.

### Application of "Letteney."

**BRUSH TREATMENT**—The oldest and simplest process of wood preservation. As the term implies, it is the application of the preservative to the surface of the wood with a brush. By this method, Letteney can be used at any location, on any kind of wood, without affecting the cost of treatment to an appreciable extent.

Letteney may be applied either cold or hot, but better penetration and a more effective preservation will result when the preservative is applied at a temperature of from 150° to 200° Fahr. In cold weather, or when treating only partly seasoned wood, heating is essential, and is recommended in all cases.

**Specifications**—When the wood is dry, and after cutting and fitting, thoroughly apply Letteney Wood Preservative with a broad, flat, stiff bristle, wire-bound brush; the second coat to be applied after the first has been absorbed. All season checks, ends of timbers, gains, mortises and cuts of any description should have extra heavy treatment. When heated, the preservative should be applied at a temperature of from 150° to 200° Fahr.

**OPEN TANK TREATMENT**—Consists of immersing the timber in a tank partly filled with preservative, and is most economically used where a considerable quantity of lumber is to be treated.

This method has certain advantages over brush treatment, in that the preservative can be more easily heated and maintained at an even temperature, giving a deeper and more uniform penetration; it insures a thorough treatment of all checks, knotholes and other defects.

The proper tank depends largely upon its location, permanency and quantity and dimensions of timber to be treated. The essential features are that it should be tight, strong, firmly set, and long enough to take the maximum length of timber to be treated. It should be provided with some means for heating the preservative and a dripboard to avoid waste of preservative when the timber is removed from the tank.

Wooden metal lined tanks are the most generally used. They should be built of not less than 2-in. plank, well braced, and lined with heavy tin; a steam coil brought in and out at the top and laid on the bottom.

A semiportable tank of ¼-in. sheet iron, with fire-box below for direct heating, and flue to carry off the smoke, will answer the purpose for small dimension timber. A more permanent tank of sheet iron, well protected on the outside with wooden braces and heated by a steam coil, is preferable.

Small timber may be handled in and out of the tank by hand, using long-handle tongs. Where power is available, a derrick is quicker and cheaper, as several timbers, separated by cleats to give the preservative access to all surfaces, may be lowered into the tank, submerged and removed with one operation, leaving a bundle of timber on the dripboards while another one is being lowered into the tank. Large timber must by necessity be handled with a derrick.

**Specifications**—After cutting and fitting, completely immerse all lumber for from 10 to 20 minutes in a tank containing Letteney Wood Preservative, which must be maintained at a temperature of from 175° to 210° Fahr.

**SPRAY TREATMENT**—Carried out by thoroughly covering the surface of the wood by the use of an ordinary paint spraying pump, and can be economically used for large surfaces of lumber in place.

**Specifications**—All wooden surfaces shall be thoroughly covered by spraying on Letteney Wood Preservative at a temperature of approximately 170° Fahr. All season checks, knot-holes, joints, and cracks to be treated to refusal point.

### Packages.

Letteney Wood Preservative is put up ready for use in the following sizes: 5-gal. cans; 10-gal. cans; 25-gal. barrels; half barrels; 50-gal. barrels and steel drums.

### Handbook.

Handbook "How to Use Letteney" will be mailed on request.

# H. B. WIGGIN'S SONS CO.

## Manufacturers of Woven Wall Coverings

233 Arch Street  
BLOOMFIELD, N. J.

BRANCH OFFICE: CHICAGO, ILL., 160 Jackson Boulevard

### Products.

FAB-RIK-O-NA WOVEN WALL COVERINGS: Finished Products—DYED TAPESTRY BURLAPS; METALLIC FINISHED BURLAPS; PEARL KO-NA; ART KO-NA and KRAFT KO-NA CLOTHS; FAB-RIK-O-NA INTERWOVENS.

Unfinished Products (on which Paint or Calcimine is to be applied)—LINING KO-NA (Muslin); OIL KO-NA (Muslin); FAB-RIK-O-NA MUSLIN; PREPARED SHEETING; KO-NA CANVAS; PREPARED CANVAS; SHEL KO-NA BURLAP; LINING BURLAP; FILLED BURLAP; PREPARED BURLAP; PAINTED BURLAP.

KLING KO-NA, an Undercoating for Paint Work on Plaster; a Size for Hanging Wall Coverings.

### Description of Finished Wall Coverings (Fast to Sunlight).

DYED TAPESTRY BURLAP—Even in texture and coloring. Prepared to hang easily. About 50 colors, including metallic finish. 36 ins. wide. (See illustration on following page, Fig. 1.)

PEARL KO-NA—A material of bold texture in delicate pastel shades, with silklike finish. Made in plain colors and in gold thread finish. 36 ins. wide.

ART KO-NA AND KRAFT KO-NA CLOTHS—Made of canvas, more delicate material than burlap. Colors in one-and-two-tone effect and gold finish. 36 ins. wide.

FAB-RIK-O-NA INTERWOVENS—Made of a canvas material having a characteristic horizontal weave. Furnished in plain colors and in brocade designs. (See illustration on following page, Fig. 2.)

### Description of Wall Coverings Prepared for Painting or Calcimining.

The following products are manufactured ready for hanging on the wall in the same manner as wall paper. They are fully prepared for the final application of paint or calcimine. The covering capacities of paint set forth below are approximate, being based on results obtained with a well-known brand of ready mixed flat paint. These goods, from light muslin to heavy burlap, are furnished in widths from 36 to 108 ins.

LINING KO-NA—A light weight muslin, inexpensive, to be used only on plastered walls in good condition. 36 ins. wide.

Covering capacity, 1 gal. of paint to 450 sq. ft.

OIL KO-NA—Same as Lining KO-NA with the addition of a priming oil coat. 36 ins. wide.

Covering capacity, 1 gal. of paint to 700 sq. ft.

FAB-RIK-O-NA MUSLIN—A heavier material than Lining KO-NA. It gives increased strength and protection to the wall, has bolder texture effect. 36 ins. wide.

Covering capacity, 1 gal. of paint to 325 sq. ft.

PREPARED SHEETING—For use on ceilings and side walls. Average ceiling requires but two strips, leaving only one seam. 82 and 99 ins. wide.

Covering capacity, 1 gal. of paint to 425 sq. ft.

KO-NA CANVAS—Made on a bleached cotton base for fine work on plaster walls. Has a smooth and highly finished surface. 36 ins. wide.

Covering capacity, 1 gal. of paint covers 420 sq. ft.

PREPARED CANVAS—Made on heavy bleached cotton canvas. A very high-grade decorator's canvas for the best work on plaster walls; gives the maximum protection to the walls. The surface is of extra fine finish for taking paint. 36 ins. wide.

Covering capacity, 1 gal. of paint to 390 sq. ft.

SHEL KO-NA BURLAP—A high grade material with a sized face. For use on plaster walls where prominent fabric surface is desired. 36, 54 and 72 ins. wide.

Covering capacity, 1 gal. of paint to 240 sq. ft.

LINING BURLAP—An inexpensive prepared burlap, filled on both sides. 36 ins. wide.

Covering capacity, 1 gal. of paint to 280 sq. ft.

FILLED BURLAP No. 2—An inexpensive material similar to Lining Burlap filled on one side only, other side sized. 36 ins. wide.

Covering capacity, 1 gal. of paint to 120 sq. ft.

PREPARED BURLAP—Similar to Lining Burlap, but a higher grade material, with a face more highly finished. For use on plaster walls for finest paint or enamel work. 36, 54 and 72 ins. wide.

Covering capacity, 1 gal. of paint to 360 sq. ft.

PAINTED BURLAP—Thoroughly filled and coated with a priming coat of paint. For use on plaster walls subject to excessive wear and abuse, such as schools, hotels and public buildings. It gives maximum protection to the walls. 36, 54, 72 and 108 ins. wide.

Covering capacity, 1 gal. of paint to 480 sq. ft.



**Kling Ko-Na.**

A dry powder to be prepared for use by mixing with boiling water. For some purposes linseed oil may be added.

As a foundation coat over plaster walls which are to be painted it produces a surface of uniform suction, saving paint and labor. Fine stipple effect obtained by stippling Kling Ko-Na coat, it being unnecessary to stipple subsequent paint coats. Linseed oil may be added to Kling Ko-Na when using it as priming coat for paint work.

Kling Ko-Na is the best size coat for preparing walls for hanging products of this company or any other wall covering hung with paste. Material may be hung over a painted or varnished surface, no paint remover of pearlash being necessary.

Booklet "Kling Ko-Na Questions and Answers" mailed on request.

**Advantages of Using Fab-Rik-O-Na Woven Wall Coverings.**

**FINISHED COLORED MATERIALS**—(1) Colors fast to sunlight. (2) Rich decorative effect of texture. (3) Wall protected from cracking and injury. (4) Goods adhere firmly to wall without shrinking at joints. (5) Goods easily hung in the same manner as wall paper.

**MATERIAL FOR PAINTING AFTER HANGING**—(1) A surface of uniform suction is produced saving paint and labor—a surface that does not show where holes and cracks in plaster have been repaired. (2) Wall is protected from injury by peeling off or cracking of paint and is not easily defaced. (3) Additional decorative effect of texture is secured. (4) These materials are easily hung, adhere firmly, and do not shrink open at joints. (5) They cover easily with paint, do not show laps, and dry out in uniform manner.

**Specifications for preparing Walls for hanging Fab-Rik-O-Na Woven Wall Coverings.**

**NEW WALLS**—Size with glue or Kling Ko-Na; wash any hot spots containing strong alkali with vinegar, and size again. Allow to dry thoroughly.

**OLD WALLS**—Wash off any old wall paper or calcimine; cut out and fill

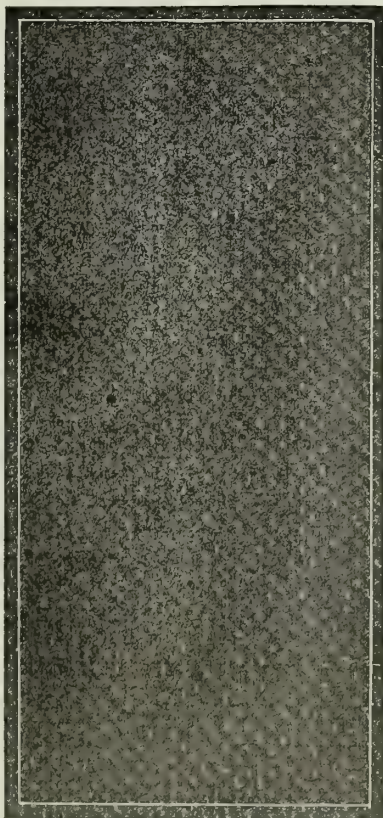


FIG. 1. DYED TAPESTRY BURLAP

all cracks and holes as when preparing for papering. Size wall as described under new walls. If ceiling varnish, shellac or paint be on the wall and hold firmly, size with Kling Ko-Na. If walls are greasy or painted with wax paint, same must be removed; if ceiling varnish encountered is flaky or does not hold firmly to the wall it must be scraped off entirely before sizing.

**SOFT OR SAND-FINISHED WALLS**—Give these walls 1 or 2 coats of heavy Kling Ko-Na; when dry, glue size may be applied to give proper slip for easy hanging.

**Specification Data for Hanging.**

After wall has been prepared as described above and thoroughly dry, hang wall coverings in the same manner as wall paper, butting the joints; trim all goods, even those which are trimmed in manufacturing; use heavy homemade flour paste. In hanging unpatterned colored materials, use the strips in the same order as they are cut from the roll, reversing alternate strips to bring same edge on both sides of joint, thus avoiding shaded seams. To insure tight joints, brush a strip of paste on the wall where butts are to be made.

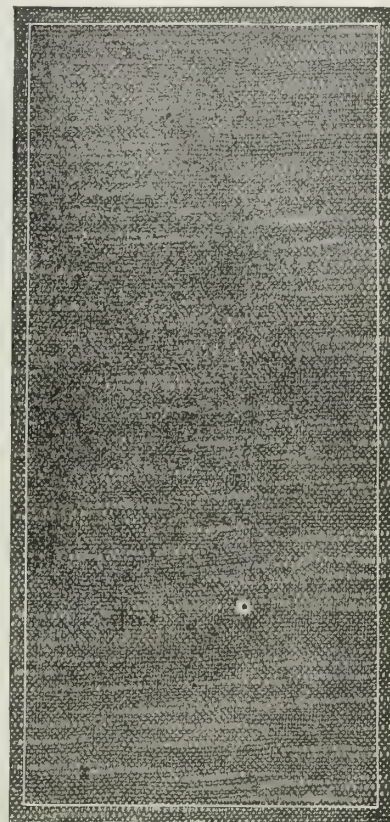


FIG. 2. FAB-RIK-O-NA INTERWOVENS

**HANGING LINING KO-NA AND OIL KO-NA**—These should be trimmed dry, and hung by pasting the wall and not the goods.

**HANGING PREPARED SHEETING**—Paste ceiling or wall, roll the dry goods on the pasted wall, lap joint about 1 in., run a sharp knife through the lap, remove the trimming, repaste the upper edge and press to a butt joint.

**High Quality.**

Fab-Rik-O-Na woven wall coverings are the standard of quality, fabric, color and workmanship. Colors are fast to sunlight. The trade-mark of the company is stamped on back of all 36-in. widths.

**Samples and Prices.**

Samples, prices and further information freely furnished on request.



# ARMSTRONG CORK COMPANY

LINOLEUM DEPARTMENT

Manufacturers of Linoleum and Cork Carpet

LANCASTER, PA.

## Products.

ARMSTRONG'S BATTLESHIP LINOLEUM; ARMSTRONG'S PLAIN LINOLEUM; ARMSTRONG'S JASPÉ LINOLEUM (moiré effect); CORK CARPET; NONPAREIL WATERPROOF LINOLEUM CEMENT; ARMSTRONG'S LINOLEUM PASTE.

Armstrong's Straight Line and Granulated Inlaid Linoleums; Granite Linoleum; Carpet Inlaid Linoleum; Armstrong's Printed Linoleum.

## Linoleums.

Armstrong's Linoleums are made of oxidized linseed oil, clean ground cork, wood flour, high grade driers and gums, and pure pigments. The burlap used is strong and evenly woven. The entire process of manufacture is carried on with the greatest possible care by skilled workmen, and the final inspections are exceedingly rigid. The plant is the most modern in America.

## Advantages of Linoleum.

Few floors can boast the advantages of linoleum; those that do will be found to be far more expensive, and scarcely more durable. Linoleum does not tire the feet like marble, tile and hardwood, and it is more silent, less expensive, far less slippery, and equally easy to clean. It is thoroughly sanitary and conducive to good health, for the oxidized linseed oil it contains tends to kill disease germs. From an artistic standpoint, a linoleum of solid color, or suitably figured design, leaves little to be desired.

## Where Linoleum Can Be Used.

In Europe, linoleum is literally used all over the house in private residences, besides being the most popular and generally accepted floor for public and semi-public buildings. Its use is rapidly spreading in America. In the 1918 Armstrong Line, the architect will find new patterns and designs especially appropriate for any of the following rooms and places:

Banks, barber shops, bar rooms, bathrooms, bedrooms, billiard rooms, churches, clubs, dens, dining rooms, display windows, hallways, hospitals, hotel lobbies, kitchens, laundries, libraries, living rooms, lodge rooms, museums, nurseries, offices, pantries, playrooms, railway stations, reception halls, restaurants, schools, sewing rooms, sleeping porches, stairways, stores, sun parlors, theaters, vestibules, etc.

The new colorings and patterns in Armstrong's Linoleum lend themselves readily to the most artistic

**Armstrong's Linoleum**

For Every Room in the House

TRADE-MARK

conceptions of modern interior decoration. As a floor upon which to throw fabric rugs, these new lineolums harmonize perfectly in color tone with walls and draperies. Architects are specifying such linoleum floors in an increasing number of high class residences.

## Battleship and Plain Linoleum.

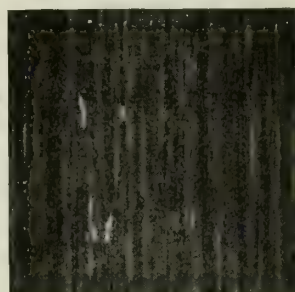
For offices, factories, hospitals, restaurants, vestibules, and for all buildings of a public or semi-public nature, Armstrong's Battleship Linoleum meets the requirements admirably. It is made in seven colors—color No. 20, brown; color No. 21, green; color No. 22, dark gray; color No. 23, light gray; color No. 24, tan; color No. 25, light blue; color No. 26, rose. All Armstrong's Battleship Linoleum is manufactured regularly 2 yds. wide only. Goods 2½, 3 and 4 yds. wide can be made to order, if the quantity specified is sufficiently large. The grades are as follows:

Grades	Thickness, ins.	Colors
Battleship ¼ in.	.250	Nos. 20, 21, 22
Battleship Heavy	.235	Nos. 20, 21, 22
Battleship Medium	.185	Nos. 20, 21, 22
A Plain	.142	Nos. 20, 21, 22, 23, 24, 25, 26
B Plain	.119	Nos. 20, 21, 22, 23, 24, 25, 26
C Plain	.095	Nos. 20, 21, 22, 23, 24, 25, 26
D Plain	.080	Nos. 20, 21, 22, 23, 24, 25, 26

The three heaviest grades are called Battleship Linoleum, because they were first manufactured for use on battleships. Plain Linoleum is of the same quality as Battleship Linoleum, but lighter in gauge. With the wide range of thicknesses in which these materials are obtainable, it is possible for the architect to select in each instance the most economical grade for the purpose in question. Armstrong's Battleship Linoleum meets the exacting specifications of the United States Navy Department (dated September 1, 1916—No. 29L-1C).

## Jaspé Linoleum.

Made in 6 grades and 6 colors.



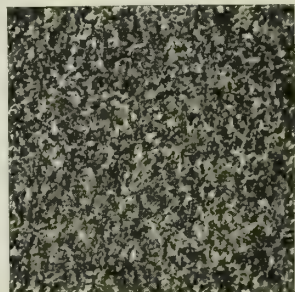
ARMSTRONG'S JASPÉ LINOLEUM

For living rooms, dining rooms, bedrooms, libraries, theaters, banks, stores, offices, etc. Obtainable in 6 colors and 6 grades. Made 2 yds. wide only



ARMSTRONG'S PARQUETRY INLAID PATTERN NO. 661

One of a number of accurate reproductions of hardwood. Especially desirable for reception halls, dining rooms, living rooms, banks, director's rooms, public buildings, etc.



ARMSTRONG'S GRANITE LINOLEUM

An excellent linoleum floor in terrazzo effect. Widely used in halls, libraries, banks, restaurants, billiard rooms, clubrooms, sun parlors and sleeping porches. Made 2 yds. wide only, in 4 colors



### Cork Carpet.

Silence, (the deadening of sound), often is demanded of floor coverings for churches, libraries, theaters, etc., and for such use Armstrong's Cork Carpet is very specifically recommended. Cork carpet is made from clean ground cork and refined linseed oil, keyed to a burlap foundation. The process used is not greatly different from that employed in producing battleship linoleum. More cork, a softer binder, and less compact calendering give cork carpet a warmer, softer and more silent surface than battleship linoleum. At the same time Armstrong's Cork Carpet is quite durable. It can be laid on any base—wood, concrete or metal.

Armstrong's Cork Carpet can be had in 4 colors—color No. 30, brown; color No. 31, blue; color No. 32, green; color No. 33, terra cotta. It is made in rolls 6 ft. wide only, in 3 grades:

Grades	Thickness, ins.
XXX Cork Carpet, unpolished.....	.264
XX Cork Carpet, unpolished.....	.230
X Cork Carpet, unpolished.....	.181

Any of the above grades may be had with either unpolished or polished (sanded) surface. Polished cork carpet is approximately .020 in. thinner than the same grade unpolished. All grades are made in all 4 colors.

### Method of Laying Linoleum and Cork Carpet.

There is only one satisfactory way to lay linoleum or cork carpet over concrete and wood, and that is to put it down over a layer of heavy felt paper. Ordinary gray, unsaturated building or deadening felt is first pasted to the floor, and the linoleum is then pasted to the felt, and the seams and edges glued down with waterproof cement. Laid in this manner, linoleum will wear longer and retain its resiliency indefinitely. There will be no trouble from buckling or shrinking. The work of laying can be done expeditiously. No retrimming is required.



ARMSTRONG'S CARPET  
INLAID PATTERN NO. 700

One of 8 distinctive designs in soft-toned carpet effects, which are recommended for living rooms, bedrooms, sewing rooms, nurseries, offices, etc. Made 2 yds. wide only

### Specifications for Laying Linoleum or Cork Carpet over Felt Paper.

(1) Contractor shall remove from the floor all refuse (plaster, dust and other dirt); shall clean the surface thoroughly; and see that it is perfectly dry and smooth before laying the linoleum.

(2) Owner shall make provision for maintaining a temperature of 70° Fahr. in all locations where linoleum is being laid, from the time unrolling is begun until the completion of the contract.

(3) The linoleum shall not be unrolled until it has been subjected continuously to a temperature not less than 70° Fahr. for at least 48 hours.



BLACK AND WHITE LINOLEUM USED IN DINING ROOM

Expressive of cleanliness, cheerfulness and comfort

(4) The contractor shall furnish unsaturated building felt of good quality weighing 1½ lbs. to the sq. yd., sufficient to cover the whole area on which the linoleum is to be laid. He shall also furnish Armstrong's Linoleum Paste for cementing the felt to the floor, and the main area of the linoleum to the felt, and in addition shall supply Nonpareil Linoleum Waterproof Cement for gluing down the seams and edges.

(5) The contractor shall employ the following method in laying the felt: After cutting the felt in suitable lengths, a good coat of Armstrong's Linoleum Paste shall be applied to the back of the felt, which shall at once be smoothly and accurately fitted to the base, and the entire surface rolled thoroughly with a 150-lb. iron roller. The same process shall be repeated for each width in turn. The edges of the felt shall be butted carefully, and no ridges shall be left under the linoleum. The strips of linoleum shall be laid in the opposite direction to the strips of felt.

(6) Not less than 24 hours after the felt has been pasted in place, the entire upper surface shall be swept clean and the linoleum laid in the following manner: The linoleum shall be accurately fitted to the walls and around all pipes and other projections in the floor. Armstrong's Linoleum Paste shall then be applied to the surface of the felt in sufficient quantity to insure firm adhesion, except for a space 4 ins. in width at those points where the edges and joints in the linoleum fall (which spaces shall be left bare for the later application of Nonpareil Linoleum Waterproof Cement). The linoleum shall be placed in position immediately after the paste is applied to the felt, and the surface rolled thoroughly with a 150-lb. iron roller, until all air blisters are smoothed out.

The seams of all printed and inlaid linoleum laid under this specification shall be made tight by butting the edges of the several strips snugly together, care being taken to preserve the symmetry of the pattern. The seams in all plain, battle-



GYMNASIUM, NICHOLAS SENN HIGH SCHOOL, CHICAGO, ILL.

More than 2,600 sq. yds. of Armstrong's Cork Carpet were used in this school.

An ideal floor for theaters, churches, gymnasiums, or any place where a soft, resilient, silent floor is desired





OFFICES, REMINGTON TYPEWRITER COMPANY,  
NEW YORK, N. Y.

More than 5,000 sq. yds. of Armstrong's Brown Battleship Linoleum were used for flooring in these offices. The material was also employed as a desk top covering, and as the baseboard on the partitions

ship, granite and jaspé linoleum (and cork carpet), shall be made tight by lapping the edges of the several strips approximately  $\frac{1}{2}$ -in., when pasting them to the under layer of felt, and later cutting through both thicknesses simultaneously with a sharp knife.

Along all seams, edges and joints in the linoleum, Nonpareil Linoleum Waterproof Cement shall be used to secure the material firmly to the felt. At all such points the edges of the linoleum shall be lifted, and the cement applied thickly to the surface of the felt as far back under the linoleum as the edge of the coating of paste. The cemented edges of the linoleum shall then be pressed firmly into place and thoroughly rolled until the surface is smooth and even. All seams, edges and joints shall be weighted down with pressed bricks, sandbags or other suitable weights, for not less than 24 hours.

(7) Any cement coming in contact with the surface of the linoleum shall be removed with alcohol at once.

(8) The contractor shall remove the bricks or other weights after the cement has set and clean up all debris or dirt.

### Waterproof Cement and Paste.

Nonpareil Linoleum Waterproof Cement is guaranteed to make a waterproof joint at seams and edges, when properly applied. It has marked adhesive power and possesses ample covering capacity. A gallon will cover from 60 to 80 sq. ft. Because of its uniformity and high quality, its use is strongly recommended wherever Armstrong's Linoleum is laid.

Armstrong's Linoleum Paste is a high grade non-waterproof adhesive intended for use in fastening the paper felt to the floor and the center of the linoleum to the felt. A gallon will cover approximately 100 sq. ft.

### Literature and Samples.

Quality samples of any grade of Armstrong's Linoleum or Cork Carpet will be

sent cheerfully to any architect, contractor or builder on request. The following literature is also offered to those interested: (a) "Detailed Specifications for Laying Armstrong's Linoleum and Cork Carpet," prepared in the form as recommended by the American Institute of Architects. These "Detailed Specifications" give the essential information needed by the profession for specifying Armstrong's Linoleum and Cork Carpet in building specifications. (b) Pocket Size Pattern Book, showing all the 380 Armstrong Patterns in color; (c) Pocket Size Quality Sample Book containing 16 actual samples of various grades of plain, printed and inlaid linoleum; (d) "The Art of Home Furnishing and Decoration," by Frank Alvah Parsons, the American authority on interior decoration, in which the artistic possibilities of Armstrong's Linoleum as a floor for every room in the house are set forth in detail.

### Exposition Award.

Armstrong's Linoleum and Cork Carpet received the Grand Prize at the Panama-Pacific Exposition, the highest possible award, conferred on no other brand of linoleum, foreign or domestic.

### Installations.

Armstrong's Battleship Linoleum and Cork Carpet have given years of satisfactory service in scores of offices, stores, hospitals, gymnasiums, libraries and hotels throughout the country.

A few recent installations include the Hotel McAlpin, New York, N. Y.; United States Military Station, Bedloe's Island, N. Y.; Remington Typewriter Company Building, New York, N. Y.; Phoenix Insurance Company, Hartford, Conn.; Elizabeth Steel Magee Hospital, Pittsburgh, Pa.; Bell Telephone Building, Buffalo, N. Y.; Delaware Hospital, Wilmington, Del.; International Harvester Company, Chicago, Ill.; Quaker Oats Company, Chicago, Ill.; Joseph T. Ryerson & Co., Chicago, Ill.

Armstrong's Linoleum has been used on many of the war vessels of the United States and of foreign nations.



AN INLAID LINOLEUM FLOOR IN HARDWOOD EFFECT IN LIVING ROOM  
With the simple wood panelled walls, this floor expresses culture and taste



# C. C. BAILEY COMPANY

## Linoleum, Linoleum Cement and Concrete Hardeners

48 Canal Street  
BOSTON, MASS.

### Products.

LINOLEUM CEMENT.

LINOLEUM.

CONCRETE HARDENER and WATERPROOFING COMPOUND.

### Dreadnought Linoleum Cement.

Dreadnought linoleum cement was produced by this company with the aid of the most prominent chemists at considerable expense, after years of exhaustive study and critical tests.

As is generally known, great difficulty has been experienced in successfully cementing linoleum and cork carpet to various kinds of floors with cheap, ordinary cements, which, as a general rule, contain alkali and water, and are not made expressly for the purpose.

This company collaborated with the largest linoleum manufacturers in an effort to obtain first-hand information as to the kind of oils, pigments, gums, etc., entering into the manufacture of their products, with the result that Dreadnought cement contains no matter having an injurious effect on any grade of linoleum.

A close study and exhaustive tests were made of well-known brands of concrete cement and the various sands of almost every state. The company's chemists established the fact that alcohol, which is a component part of most linoleum cements, creates a chemical reaction when it comes in contact with concrete, or particles of lime and plaster which may be on the floor. This chemical reaction forms destructive gases, causing the linoleum to blister, therefore no alcohol is used in the manufacture of Dreadnought cement.

Dreadnought cement is guaranteed to be absolutely waterproof and to have no deleterious effect on linoleum in any way by the action of salt water. It sets very quickly.

**COVERING CAPACITY**—On very porous floors, 1 gal. of Dreadnought cement will cover about 10 sq. yds.; on extra smooth floors with granolithic finish, 1 gal. will cover about 15 sq. yds.

**DIRECTIONS FOR USING**—Full directions for laying linoleum or cork carpet with Dreadnought cement will be sent to interested parties on request.

**SPECIFICATIONS**—Dreadnought cement meets the specifications of the United States Navy Department (dated August 1, 1910), No. 29C2.

**TESTS**—The following tests were made in accordance with the United States Navy specifications:

**Adherence Test**—12 pieces of linoleum, 1 in. wide and 12 ins. long, were cemented with Dreadnought linoleum cement, and they averaged a pull of 47 lbs.

**Salt Water Test**—After submerging for 24 hours and drying as per government specifications, the same test was given as above and the average pull was 42 lbs.

### Dreadnought Linoleum Cement No. 1.

The best cement on the market for cementing linoleum or cork carpet to concrete floors of all kinds.

It is waterproof, quick setting, meets all government requirements, and has been subjected to severe tests.

It contains no free acids, water, silicate or alkali. It contains nothing that will react on the concrete or harm the burlap base of the linoleum. It will not powder, as it contains no hard or cheap gums. It is made with an asphalt base, the best gums, and other ingredients which neutralize the otherwise injurious effects of any gas or calcium carbon that may arise from the concrete.

This cement is equally effective when used in connection with Dreadnought Everlastic and floors of similar construction, as they contain the same ingredients as the regular Battleship linoleum, the only difference being that they are cured or oxidized in a different manner.

### Dreadnought Linoleum Cement No. 2.

Adapted for use on wood or steel floors. It is quick setting, thus it offers a distinct advantage over cements which require a long time to set, with the resultant swelling of the wood.

For use on battleships and on steel or iron decks, it has no equal.

This cement was used on most of the extensive government work done by this company.

### Linoleum.

This company's 1/4-in. Battleship linoleum is especially adapted to very severe wear. In 3 tests as to wear and appearance, out of 17 kinds of floor coverings submitted, 1/4-in. Battleship linoleum was selected on account of its marked superiority.

Battleship linoleum has no equal, especially when placed over concrete floors. It will expand and contract with the concrete, will not show any cracks which may appear in the floor, and is very easily cleaned.

Below is given a partial list of this company's linoleum installations:

State House, Boston, Mass.....	18,000 sq. yds.
Little Building.....	15,000 sq. yds.
Brewer Building.....	16,000 sq. yds.
Scollay Building.....	8,000 sq. yds.
Massachusetts General Hospital, Boston, Mass....	8,000 sq. yds.
Massachusetts State Hospitals.....	15,000 sq. yds.
Longfellow Apartments, Cambridge, Mass.....	7,000 sq. yds.
Portland High School, Portland, Me.....	7,000 sq. yds.

### Floor Hardening and Waterproofing Compound.

This company's "Floor Neutralizer" is used for waterproofing and dustproofing concrete floors of all kinds. Floor Neutralizer prevents the escape of any gases or moisture that may be contained in the cinders or concrete. It is particularly valuable where floors are exceptionally rough or have a considerable amount of cinder concrete, which contains sulphur and other gases. The Neutralizer does not change the color of the floor.

**DIRECTIONS FOR USING**—*First Coat*—Sprinkle 4 parts of hot water and 1 part of Neutralizer on the floor with a watering can and brush lightly with a broom.

*Second Coat*—After 24 hours have elapsed, sprinkle floor with 3 parts of hot water and 1 part of Neutralizer and brush floor lightly.

*Third Coat*—24 hours after second coat has been applied, go over the floor with cold water and brush well into floor.

After this has been done, the floor will be as smooth as glass.

# L. W. FERDINAND & CO.

Manufacturers, Importers and Exporters of  
Linoleum Cements, Waterproof Liquid and Marine Glues

BOSTON, MASS.

## Products.

20TH CENTURY LINOLEUM GLUE-CEMENT; JEFFERY'S MARINE GLUE and WATERPROOF LIQUID GLUE.

### 20th Century Linoleum Glue-Cement.

We recommend our Grade A for attaching any kind of floor covering to any kind of floor. We have never had occasion to qualify this statement; 20 years' experience in making and selling linoleum cement enables us to produce an article filling every requirement.

This cement is a combination of chemicals, with minimum quick drying and maximum toughness as its principal properties.



BRAND MARK

### Directions for Cementing All Kinds of Floor Coverings to All Kinds of Floors.

In cementing linoleum to various floors, it should be borne in mind that method of applying is similar to that of gluing 2 pieces of wood together with animal glue, viz.: (1) Too much or too little cement should be avoided; if too much is used it will dry out slowly, and if too little it will not hold when dry. Experience will show thickness of coat necessary to produce best results. (2) As with animal glue, it is necessary that contact should be perfect; that is, that linoleum should be held tight to floor during drying out or setting process. Unless this is attended to carefully, bulges or blisters are liable to occur. (3) It takes time; 48 hours is about the limit of time when weights can be safely removed. Tenacity and toughness are essential in linoleum cement. A quick drying cement must be brittle and will be sure to produce unsatisfactory results sooner or later.

The linoleum should first be laid on the floor without cementing until all stretch and roll is taken out of it.

To cement down linoleum, if best result is desired, surfaces of both floor and linoleum should receive a fairly heavy coat of cement. Satisfactory results are, however, obtained by coating floor only with cement, and often seams and edges alone are cemented. Where surface of floor is covered with cement, 1 gal. will lay about 12 sq. yds.; on cement floors, if porous, a little more will be required; if hard and smooth, a little less.

After cement has been applied and linoleum laid, roll down thoroughly with a long handled cast iron roller such as is used for lawns. This not only takes the roll out, but is quite an assistance in placing it properly in position. Roll from center to edges; this will force out any air which may collect and prevent air bubbles or blisters. It is then ready for weights or uprights. Should any blisters be discovered, a small puncture will let out the air; sufficient cement should then be forced into the hole, using for the purpose an engineer's oiler with a spring bottom. That spot must be especially weighted to attach it properly.

One of the best methods of weighting is by using canvas sand bags 25 to 50 lbs. in weight, which will conform to any uneven surface of floor, or by laying planks and covering them with some heavy substance. These planks should be laid along edges and seams, and not less than 18 ins. apart over entire surface; weight with any material heavy enough to keep contact perfect between linoleum and floor. The United States Government specifications call for 12 lbs. to the sq. in. for 48 hours at a temperature of 70° Fahr.

Send for booklet with complete directions for use, and general specifications.

REGISTRATION—20th Century Linoleum Glue-Cement, Grade A, has been registered with the Building Data League, Inc.

This means:

1. That the League has submitted this material to a thorough investigation including analysis, laboratory tests, investigation of its record in service, and inspection of the factory, in order to verify our claims as to its qualities and reliability.

2. That the truth of our claims is certified to by the League's technical committee on Miscellaneous Products appointed by the Board of Governors of the League, a board composed of disinterested architects, engineers, chemists and physicists.

3. That a record of this investigation, how it was made, what tests were made, what companies or individuals were communicated with, is now filed with the League.

4. That a "Findings" on the material including a complete report of the investigation is available to members of the League.

REFERENCES—Adopted and specified by United States Government and used in numberless Custom Houses and Post Offices through the country, as well as in Institutions, Colleges, etc. Recently supplied to the Universities of Wisconsin, Michigan and Minnesota, also to Wellesley College.

### Jeffery's Marine Glue.

The purposes for which the various grades of marine glue are intended are detailed below:

Use No. 1 Extra Quality for filling deck and hull seams of yachts and motor boats.

Use No. 2 First Quality Ship Glue or No. 3 Special Navy Glue for filling deck and hull seams of merchant vessels.

Use No. 7 Soft Quality Glue for filling and waterproofing canvas for covering boats and canoes, cabin tops, decks and flying boats.

Send for Booklet "Marine Glue, What to Use and How to Use It."

For sale by all yacht, boat and canoe supply houses and hardware and sporting goods dealers.

### Jeffery's Waterproof Liquid Glue.

It is ready for use and needs no heating. Simply open the can and paint it on, like ready mixed paint.

All the prominent builders of flying boats use this glue in combination with linen between the veneer of the diagonal planking on all their flying boats, pontoons and floats. It is not only waterproof and elastic, but will waterproof and preserve the linen indefinitely. Experience has shown that when this glue is used, owing to its elasticity, the inside layer of diagonal planking will remain perfectly watertight, although the outside layer may be badly broken.

This glue will also attach canvas, cork, felt, rubber, leather and linoleum to steel, iron or wood.



BRAND MARK



# KOKEN BARBERS' SUPPLY CO.

ESTABLISHED 1874

ST. LOUIS, MO.

## Products.

BARBERS' CHAIRS; FURNITURE; WALL CASES; CHILD'S HAIRCUTTING CHAIRS; SHOE SHINING STANDS; COSTUMERS' SEATING CHAIRS; CHIROPODY FURNITURE; BEAUTY PARLOR, MANICURISTS', and HAIR DRESSERS' CHAIRS, FURNITURE and FIXTURES.



TRADE-MARK  
(Reg. U. S.  
Pat. Off.)

## Facilities.

The Koken factory, the world's largest making barbers', chiropodists' and hairdressers' chairs and furniture, is prepared to equip shops of any magnitude completely to the minutest detail. The annual output is over 9,000 barber chairs. Over 135,000 Koken chairs now in active service throughout the world.

## Descriptive Specifications.

Constructed of iron, snow white porcelain enameled. Castings of malleable iron when extra strength is needed. All exposed metal parts either highly polished solid cast German silver or heavily nickelplated brass or iron. Equipped with Koken Congress hydraulic one lever mechanism, which raises, lowers, revolves and reclines the chair. It is the simplest, strongest and most efficient mechanism manufactured.

The luxurious cushions are built to last a life time. The finest lacquered steel springs are firmly anchored together to prevent slipping or bulging, and are covered with 7 alternating layers of moss, tow, burlap and hand picked curled hair. Upholstered in genuine leather with all edges perfectly drawn, reinforced and secured with binding strips and upholstering tacks. The headrest is adjustable to 3 different degrees of forward tilt, and may be lowered completely out of the way, in back, for hair cutting.

## Designs.

The complete unity of design found in every Koken

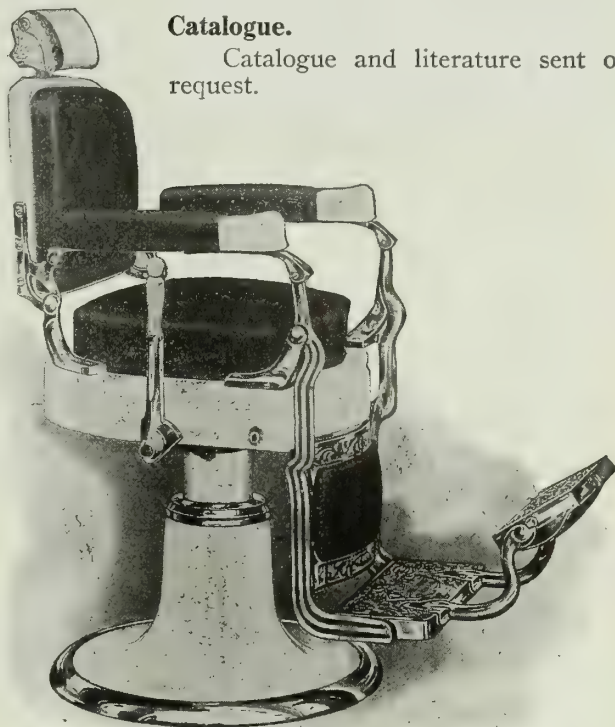
chair embodies the finest principles of delineation and harmonizes perfectly with modern standards of artistic draftsmanship. Over 150 different designs.

## Estimates.

Estimates furnished for complete equipments from plans.

## Catalogue.

Catalogue and literature sent on request.



KOKEN NO. 506 BARBERS' CHAIR  
IRON PORCELAIN ENAMELED  
Raising, lowering, revolving, reclining

## Users.

Koken chairs are found in barber shops throughout the world, in the largest office buildings, hotels, clubs, railroad terminals and steamship lines.

Grand Central Terminal, New York. South Station, Boston. Union Station, Kansas City. Union Station, St. Louis, and many other large terminals.

Equitable Building, New York. Woolworth Building, New York. Oliver Building, Pittsburgh. Marshall Field & Co., Chicago. Railway Exchange Building, Chicago. Peoples Gas Building, Chicago, and hundreds of other office buildings and department stores.

Detroit Athletic Club, Detroit. Missouri Athletic Association, St. Louis. Cleveland Athletic Club, Cleveland. Minneapolis Athletic Club, Minneapolis.



GRAND CENTRAL TERMINAL, NEW YORK, N. Y.  
(Equipped with Koken chairs and barbers' furniture)

# MURPHY WALL BED CO.

Crocker Building  
SAN FRANCISCO, CAL.

## SALES OFFICES AND DISTRICTS

CHICAGO, ILL., MURPHY DOOR BED CO. of CHICAGO, entire 4th floor, Majestic Building, 22 W. Monroe Street  
For Illinois, Indiana, Ohio, Wisconsin, Minnesota, Iowa, Nebraska, North Dakota, South Dakota, New York, New Jersey, Pennsylvania, West Virginia  
DETROIT, MICH., MURPHY WALL BED CO. of DETROIT, Kresge Building  
For Michigan  
BOSTON, MASS., MURPHY DOOR BED CO. of NEW ENGLAND, 105 Portland Street  
For six New England States  
ATLANTA, GA., MURPHY DOOR BED CO. of ATLANTA, 648 Trust Co. of Georgia Building  
For Georgia, Florida, North and South Carolina  
INDIANAPOLIS, IND., MURPHY DOOR BED CO. of ALABAMA, 1428 North New Jersey Street  
For Alabama and Tennessee  
DENVER, COLO., COLORADO BUILDERS SUPPLY CO., 1435 Blake Street  
For Colorado and Southern half of Wyoming  
SALT LAKE CITY, UTAH, J. T. KEITH, 70 East North Temple Street  
For Utah  
OTTAWA, CAN., H. TAPLIN, 205 O'Connor Street  
For Eastern Canada, including Toronto, Montreal and Ottawa  
VANCOUVER, B. C., LESLIE-TAYLOR CO., LTD.  
For Western Canada

EDMONTON, CANADA, WESTERN SUPPLY & EQUIPMENT Co.  
For the neighborhood of Edmonton and Calgary  
ST. LOUIS, MO., MURPHY DOOR BED CO. of ST. LOUIS, Chemical Building  
For Missouri, Kentucky, Mississippi, Arkansas, Kansas, Oklahoma  
LOS ANGELES, CAL., D. WOODHEAD, 8th and Alameda Streets  
For Arizona, New Mexico, Texas, Louisiana  
LOS ANGELES, CAL., SOUTHERN CALIFORNIA HARDWOOD & Mfg. Co.  
For Southern California  
SACRAMENTO, CAL., JOHN BREUNER Co.  
For Sacramento and San Joaquin Counties  
SAN FRANCISCO, CAL., MARSHALL & STEARNS, Phelan Building  
For San Francisco and Adjoining Counties  
PORTLAND, ORE., J. McCRAKEN Co., 45 Fourth Street  
For Oregon  
SEATTLE, WASH., F. T. CROWE & Co., 1103 First Avenue  
For Washington  
RENO, NEV., MRS. BESSIE ETNIER, 701 Lander Street  
For Nevada  
BUTTE, MONT., ARCHIBALD J. MAHAN  
For Montana and Northern Wyoming  
POCATELLO, IDAHO, T. C. MARTIN  
For Southern Idaho

### Products.

WALL BEDS, CONCEALED BEDS, DISAPPEARING BEDS, or BUILT-IN BEDS.

### Description.

Fig. 1 shows the position of the Murphy In-A-Dor bed when in the room at night, and when concealed in the closet during the day. It is fully made up while in the closet, as all bedding is held firmly in place by friction clamps at the foot. One may enter the closet while the bed is on the floor or while it is in the closet.

To pivot the bed into the room and lower it for use, or to put it back in the closet, is so simple and easy an operation, that even a child can do it in a few seconds.

Fig. 2 shows how the Murphy In-A-Dor bed is balanced perfectly in any position by means of a patented spring balance. No counterweights. No danger in handling. Only two things fold, the headboard and legs at the foot. The bed itself does not fold. Drop frame allows perfect resiliency at edge of bed and the friction clamps which hold the bedding can be quickly pressed down or released.

Fig. 3 shows available space in living room, library, dining room, etc., when Murphy In-A-Dor bed is concealed. No one would suspect that all the conveniences of a bed chamber are available just beyond the closet door.

Fig. 4 shows the transformation effected when the bed is brought from its place of concealment. A full size, comfortable bed is ready for occupancy.

### Advantages and Superiority.

Not only is the Murphy In-A-Dor bed the cheapest of all concealed beds to put in a building, but it is the only one that is the equal in every respect of the ordinary high quality metal beds which are on the market. It is the only one that is mechanically perfect; that can not get out of order; that at all times rests its whole weight directly on the floor and therefore its operation is not affected by the settling of the building or the

shrinkage and warping of any woodwork. It is the only one that, when not in use, is perfectly hidden from the mind as well as the eye, because it is concealed behind the ordinary closet door. It is the only one which requires no special construction, as hanging and storage space is unimpaired.

These are the reasons why over 75,000 Murphy In-A-Dor beds have been installed from coast to coast within the last six years.

### Technical Service.

A technical service department is maintained to co-operate with architects in arranging their floor plans to obtain the greatest efficiency from the use of the Murphy In-A-Dor bed. This service is free.

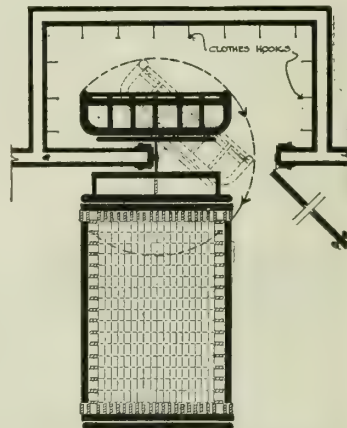


FIG. 1. SHOWING POSITION OF BED WHEN CONCEALED AND WHEN IN THE ROOM

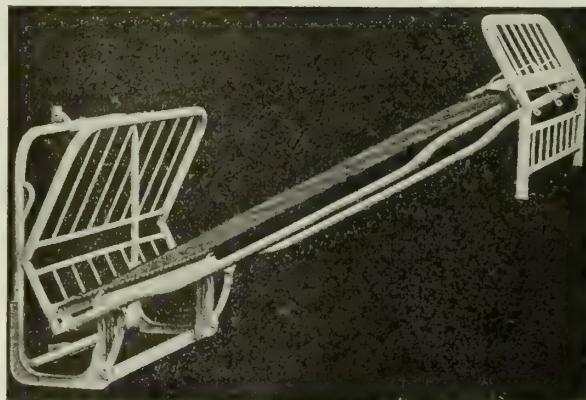


FIG. 2. MURPHY IN-A-DOR BED  
Showing perfect balance





FIG. 3. By Day



FIG. 4. By Night

HOW A MURPHYIZED ROOM LOOKS

The bed is always in its proper place. It is not necessary to move it about the room, thereby marring furniture and woodwork

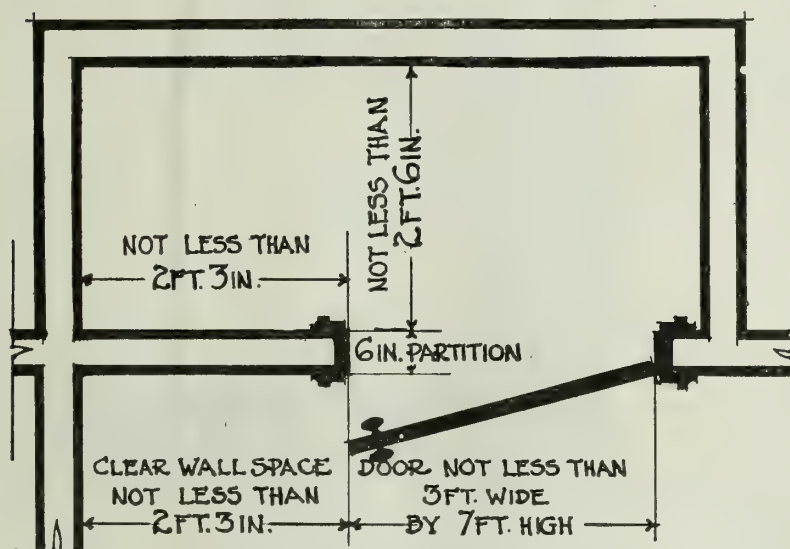


FIG. 1. BED ATTACHED TO LATCH JAMB  
(SPECIFY BEDS WITH 4½ IN. PIVOT ARMS)

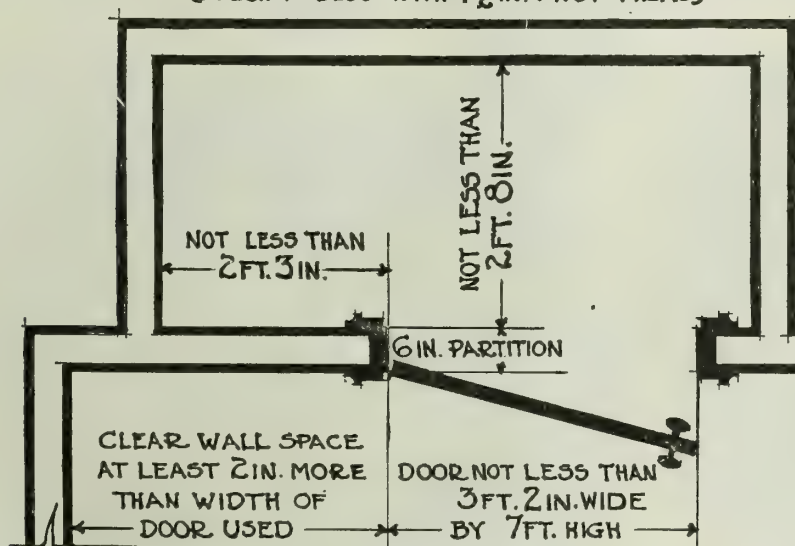
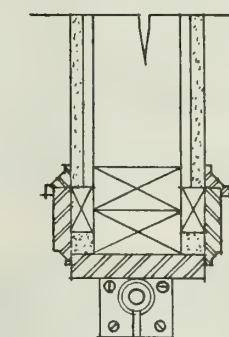
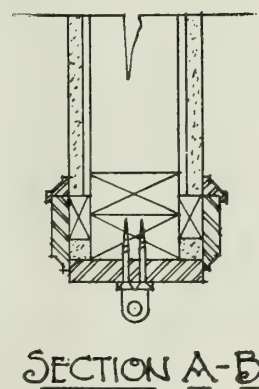


FIG. 2. BED ATTACHED TO HINGE JAMB  
(SPECIFY BEDS WITH 7 IN. PIVOT ARMS)

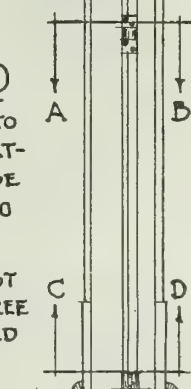


SECTION C-D

FINISHED JAMB TO WHICH BED IS ATTACHED MUST BE NAILED SOLID TO WOOD BUCK

DOOR KNOB MUST BE AT LEAST THREE FT. FROM FINISHED FLOOR

NOTE:—  
IN EITHER INSTALLATION BED REQUIRES 7 FT. 8 IN. CLEAR SPACE TO LET DOWN



JAMB  
ELEVATION

FIG. 5. SPECIFICATION FOR 4 FT. 6 IN.-MURPHY IN-A-DOR BED

# SORLIEN CEILING BED CO.

Manufacturers of Invisible Ceiling Beds

406-416 Sixth Avenue South

MINNEAPOLIS, MINN.

## Product.

THE SORLIEN CEILING BED (Patented).

## Adaptability.

Used in either new or old buildings, apartments, duplexes, bungalows, flats, porches, or any home where additional space and convenience are desirable, without increasing the size of building.

## The Sorlien Ceiling Bed.

An iron bed, with legs and sagless spring, which, together with mattress and bedding, disappears within the ceiling. When not in use, it may remain in ceiling without collecting dust or getting the mattress and bed clothing disarranged, and is always ready for use. Bed is raised or lowered with a removable crank. Transmission drum is concealed in wall by means of a hinged door 15 by 16½ ins. set flush with wall.

SPACE OCCUPIED—No closet room or wall space; floor space used only when in service.

## Specification Data.

INSTALLATION—Rough opening in ceiling is cut in the manner of a stairway opening. For ceiling with attic above, 2 by 4 or any size joists suffice (Fig. 3); with floor above, 2 by 10 joist is adequate; larger joist may be used, smaller joist must be furred down to equal 9½ ins. in width. Where a floor is above ceiling, two 4-in. channel irons are laid across opening, notched into headers with 2 by 4 wood strips inserted to support and nail floor (Fig. 1). In lining box for rough opening, ball bearing pulleys are set in place with pivot bolts; lower edge of box projects ¾ in. below edge of joists, so that edge of box will be flush with finished ceiling. Four ⅝-in. rustproof steel cables, tensile strength of 790 lbs. each, connected to drum and four corners of lower ceiling panel, pass over pulleys in lining box, through wood tubing across joists notched into joist, to

pulleys at wall, down between two studdings set 16 ins. centers to drum in wall (Fig. 4).

**False Ceiling Panels**—An upper false ceiling panel rests on top of bed within ceiling; the 4 cables pass through this panel which automatically settles down in ceiling as bed is lowered (Fig. 2). Lower false ceiling panel, hitched to cables, carries bed up or down and automatically separates itself from the spring when bed reaches floor and rests on its legs (Fig. 4). When bed is raised into ceiling receptacle, the bed is absolutely and completely lost to view (Fig. 1). False ceiling panels are made of wood composition and can be papered, painted, rough casted or decorated to match perfectly the ceiling proper.

**Paneling**—The usual paneling is inexpensive and consists of 1 in. boards about 3½ ins. wide, of wood to match millwork. Beamed ceilings may be used if desired.

**Operation**—The bed is raised or lowered with ease in 15 seconds, as noiselessly as a clock and automatically; instantly locks itself at any point when turning of crank ceases.

## Directions and Plans.

Full directions and working plans for installing bed and paneling accompany each shipment. Two good carpenters can install from five to ten beds per day in buildings under construction, and from one to two beds per day in finished houses.

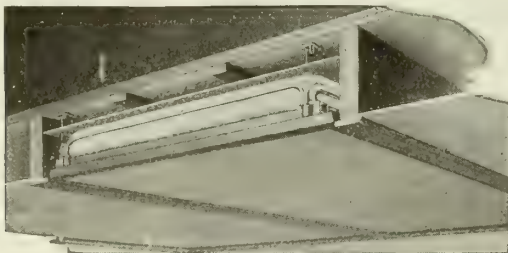


FIG. 1. VIEW SHOWING BED IN CEILING

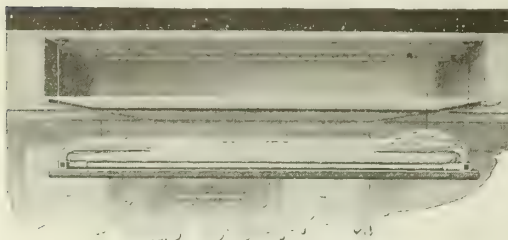


FIG. 2. BED EMERGING FROM CEILING

Upper false ceiling panel automatically closes opening, leaving ceiling complete

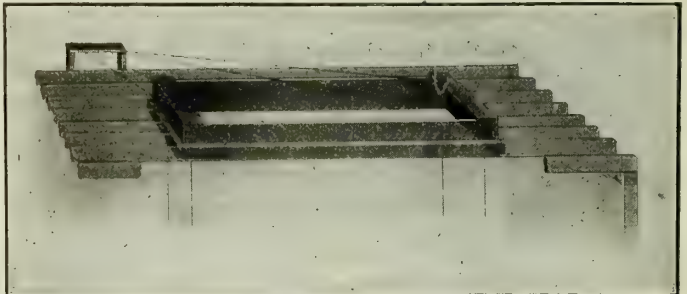


FIG. 3. INSTALLATION OF BED IN CEILING WHERE THERE IS AN ATTIC ABOVE BED

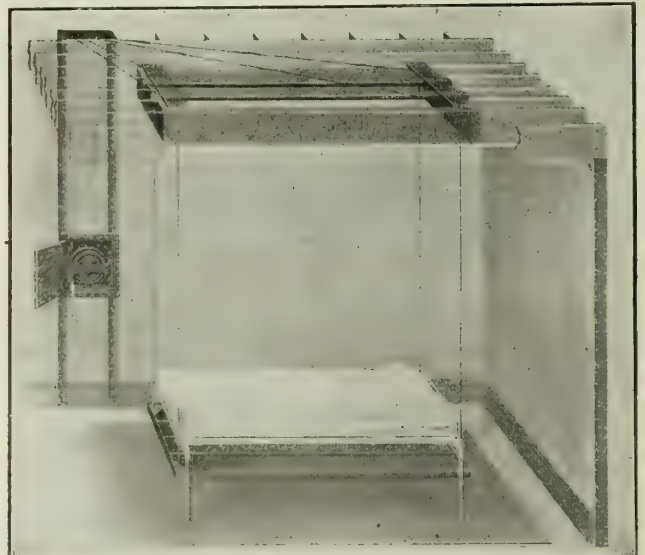


FIG. 4. INSTALLATION OF BED WHERE CHANNEL IRONS ARE USED TO SUPPORT FLOOR ABOVE BED



# JOHN KNAPE MACHINE CO.

Manufacturers of Extension Clothing Carriers and Cabinet Hardware

North Street and Muskegon Avenue  
GRAND RAPIDS, MICH.

NEW YORK, N. Y.

ST. LOUIS, MO.

BRANCH OFFICES

CHICAGO, ILL.

SAN FRANCISCO, CAL.

## Products.

ADJUSTABLE SHELF SUPPORTS.  
EXTENSION CLOTHING CARRIERS.  
GARMENT HANGERS.  
Wardrobe Hardware.  
Cabinet Hardware.

### Adjustable Shelf Supports (Patented).

These newly improved adjustable shelf supports are used to great advantage in shelving and wall cases without grooving the wood.

Can easily be adjusted to  $\frac{1}{2}$  in., and insure absolute alignment of shelves.

STANDARD No. 226—Nickelplated.  
 $1\frac{1}{8}$  ins. wide,  $\frac{1}{2}$ -in. adjustment.

Stock sizes, 24, 30, 36, 48, 60 and 72 ins.

Any length up to 12 ft. to order.

STANDARD No. 226A—Bright cold rolled steel.  $\frac{7}{8}$  in. wide,  $\frac{1}{2}$ -in. adjustment.

Stock sizes, 24, 30, 36, 48, 60 and 72 ins.

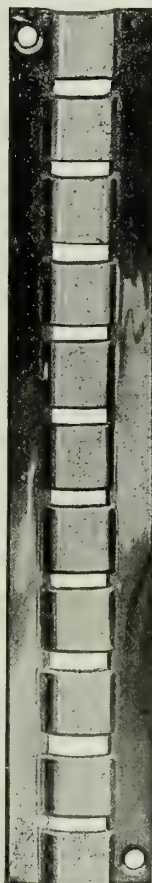
Any length up to 12 ft. to order.



No. 227. SHELF SUPPORT

Nickelplated.  $1\frac{1}{4}$  by 1 in.

No. 227A—Bright cold rolled steel,  $\frac{3}{4}$  by  $\frac{3}{4}$  in.



No. 226  
STANDARD  
SHELF  
SUPPORT

mounted on heavy roller bearings which insure ease in operation. It is noiseless in action.

Screwed to underside of shelf together with a number of Twentieth Century garment hangers.

A slight pull moves the slide forward, bringing all garments beyond face of wardrobe. Carriers and hangers may be purchased separately if desired.

Nickelplated. Special finish to order.

Sizes, 15, 17, 19, 22, 24 and 28 ins.

### Columbia Clothing Carriers.

The three greatest essentials of a practical clothing carrier are simplicity, durability and ease in operating.

The Columbia has all three of these and more. It is so constructed that it will move with the slightest touch, having roller bearings throughout, and is highly finished.

Nickelplated. Special finish to order.

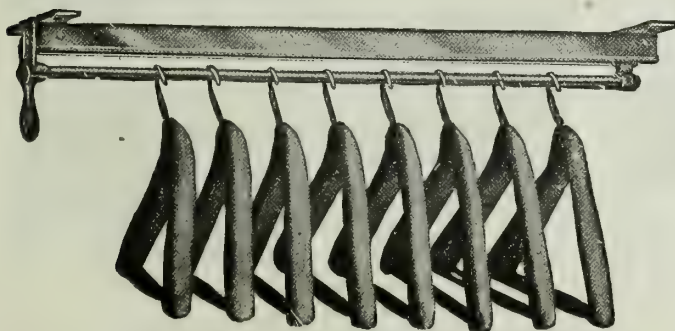
Sizes, 30, 36, 42, 48 and 54 ins.



COLUMBIA EXTENSION CLOTHING CARRIER

### Twentieth Century Clothing Carrier.

The Twentieth Century telescoping carrier is



TWENTIETH CENTURY CLOTHING CARRIER

### Built-in-flush Sanitary Wardrobes.



BUILT-IN-FLUSH SANITARY WARDROBES EQUIPPED WITH  
TWENTIETH CENTURY CARRIERS AND HANGERS  
Note that all garments are clear of wardrobe face, insuring accessibility

### Catalogue.

Complete catalogue, wherein all products of this company are fully described, will be sent on request.

# THE MARBLE & SHATTUCK CHAIR CO.

TELEPHONE:  
EDDY 129

GENERAL OFFICES AND PLANT  
CLEVELAND, OHIO

CABLE ADDRESS, "CHAIRS"  
W. U. and Private Code

## BRANCH OFFICES

NEW YORK, N. Y., A. B. HUNN, 815 Marbridge Building  
CHICAGO, ILL., H. G. HUNN, 515 Harvester Building  
SEATTLE, WASH., J. A. CLORETY, 10009 Waters Avenue

RICHMOND, VA., T. A. DAFFRON, 1426 Porter Street  
HARTFORD, CONN., E. C. CLAPP

## Products.

Manufacturers of a guaranteed line of high grade "M & S" SPECIAL CHAIRS, DIRECTORS' and PUBLIC BUILDING CHAIRS, SETTEES, etc., for offices, banks, libraries, hospitals and other public institutions.

Various designs of Chairs suitable for hotels, cafés, clubs, dining rooms, bedrooms, etc.

## Specification Data.

To assist architects in preparing specification for chair equipment, Marble & Shattuck general specifications are given herewith. They have been so drawn as to insure the construction of thoroughly reliable high grade chairs.

**GENERAL**—Chairs to be built of quartered sawn Ohio or Indiana white oak when specified in oak, and of best grade of Cuban mahogany of hard and firm texture except saddle seats of Honduras when specified in mahogany. All lumber is to be first thoroughly air dried for an approximate period of one year to each inch of thickness, then kiln dried, then cut into stock of proper sizes and shapes for the various parts of chairs, these parts then to be rekiln dried until all "go and come" has been taken out of the wood. No knots, shakes, checks, sap or other defects will be permitted in any of the wood. All materials, such as glue, varnish, hardware, leather, etc., to be the best of their respective kinds.

**CABINET WORK**—Chairs to be of tenon and dowel construction, the form of joint in each instance to be the one which will give the strongest joint in that particular instance. All curved backs to be bent or shaped out of the solid wood; all leg chairs to have box seat construction, with hand fitted corner blocks under seat to insure strong joints for holding rails and post firmly in place. All rotary chairs to have reinforcing seat frame under seat. All parts of the chairs to be first sawn and shaped to a true line; then carefully sanded to a smooth and even surface, no saw or machine marks to show. All parts to be slightly warmed before gluing to insure perfect glue joints. All joints to be hand fitted, and where screws are used, heads of screws to be concealed with wooden plugs. Saddle wood seats to be deeply shaped to give the maximum of sitting comfort. All parts of the chair are to be completely machine sanded before assembling.

**UPHOLSTERY**—Leather used to be the very best grade of No. 1 M. B. furniture leather, of strictly No. 1 selection, equal to the leather manufactured by E. S. Ward & Co. Leather to be bound with leather gimp and fastened to the edges with solid leather headed nails.

All spring seats to have close webbed foundation securely



TRADE-MARK

tacked to frame; best grade black-edge webbing to be used. Oil tempered springs securely tied with best grade twine. All edges to be stitched in burlap. All seats to be covered in muslin before leather is put on.

**CHAIR IRONS**—Chair iron used to be the equal of the new "M. & S." non-breakable and rigid rotary chair mechanism and to be enamel finish of a dark maroon shade. Chair irons to have solid steel shaft supports to raise and lower, but when set at any given height, to revolve there without raising or lowering. To have two springs to govern the tilting, each spring to have an adjusting hand wheel for tightening or loosening tension of springs. The raising or lowering of the iron to occur in the upper iron, so that shaft does not project below the bottom of hub in base of chair. All parts of iron to be closely fitted, so as to prevent all play and lost motion, the machinework so done as to insure a firm and stable support for the chair without wobbling or creaking.

**FINISH OF WOOD PARTS**—All chairs before taking the finishing process must first have all excess glue removed from the surface; then carefully hand sanded to a smooth and even surface; then given one coat of best pure silex filler, which is to be rubbed off across the grain so as to leave the pores of the wood smoothly filled. After thoroughly dry, to be given one coat of denatured alcohol pure gum shellac. When dry, to be carefully hand sanded to a smooth surface; then given three coats of high grade pure gum and turpentine varnish, allowing 24 hours between the first and second coats and 48 hours between the second and third coats; each coat to be rubbed to an even surface before applying next coat. After the final coat, chairs to stand one week; then rubbed to a smooth egg-shell dull gloss finish.

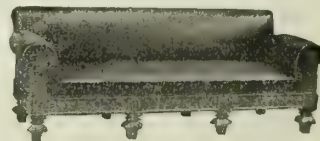
**CASTERS AND METAL SLIDING TIPS**—All rotary chairs to be equipped with brass casters. The quality of casters to be carefully specified by manufacturer's name and number. All leg chairs are to be fitted with hardened steel slides.

**GUARANTEE**—All chairs to be guaranteed against defective workmanship or materials, and should any such defects appear in any chair within one year, same will promptly be replaced or repaired at the expense of the manufacturer.

**GRADE**—The above is intended to indicate the best grade of cabinet work, upholstery and finish, and all is intended to indicate the finest grade of chairs equal to those manufactured by THE MARBLE & SHATTUCK CHAIR CO.

## Service.

To insure prompt deliveries the company carries a large stock of finished chairs of all patterns. A large stock of chairs in the white for special finish orders is also carried.



SPECIAL FURNITURE MADE FOR CLEVELAND'S NEW CITY HALL

Illustrating a type of high grade special furniture this company is prepared to design and construct in quantity for use of banks, corporations and public buildings



### Prices and Catalogues.

Write for further information and full particulars as to prices, estimates, etc.

Office and dining room chairs shown in separate catalogues. Either catalogue sent on request.

### Installations.

A partial list of installations and firms using "M. & S." chairs follows:

#### CITY HALLS

Springfield City Hall, Springfield, Mass.  
Chicago City Hall, Chicago, Ill.; Holabird & Roche, Architects  
Cleveland City Hall, Cleveland, Ohio; J. Milton Dyer, Architect

#### COURTHOUSES

Bronx County Courthouse, New York, N. Y.  
Essex County Courthouse, Newark, N. J.  
Hudson County Courthouse, Jersey City, N. J.  
Cuyahoga County Courthouse, Cleveland, Ohio; J. Milton Dyer, Architect

#### STATE HOUSES AND STATE CAPITOLS

Arkansas State House, Little Rock, Ark.  
Minnesota State Capitol, St. Paul, Minn.  
Pennsylvania State Capitol, Harrisburg, Pa.  
Bay State House, Worcester, Mass.

#### PUBLIC LIBRARIES

New York Public Library, New York, N. Y.  
Cleveland Public Libraries, Cleveland, Ohio

#### SCHOOLS AND ASSOCIATIONS

Y. M. C. A., Brooklyn, N. Y.  
Y. W. C. A., New York, N. Y.  
State Educational Building, Albany, N. Y.

#### BANKS AND TRUST COMPANIES

Federal Reserve Bank, New York, N. Y.  
National City Bank, New York, N. Y.  
J. P. Morgan & Co., New York, N. Y.  
Bankers Trust Co., New York, N. Y.  
Guaranty Trust Co., New York, N. Y.  
Chase National Bank, New York, N. Y.

#### HOTELS

Hollenden Hotel, Cleveland, Ohio; George Hammond, Architect  
Gunder Hotel, San Antonio, Tex.  
Hotel Taft, New Haven, Conn.  
Muehlebach Hotel, Kansas City, Mo.  
Hotels Statler, Detroit, Mich., and Cleveland, Ohio; Geo. B. Post & Son, Architects  
Newhouse Hotel, Salt Lake City, Utah  
Hotel Deshler, Columbus, Ohio; Holabird & Roche, Architects  
Robert Treat Hotel, Newark, N. J.

#### CORPORATIONS

Western Union Telegraph Co.  
American Telephone and Telegraph Co.  
Ford Motor Co.  
Swift & Co.  
General Electric Co.  
American Sugar Refining Co.  
United Cigar Stores Co.  
Manning, Maxwell & Moore  
Yale & Towne Mfg. Co.  
H. W. Johns-Manville Co.  
Equitable Life Insurance Co.  
Metropolitan Life Insurance Co.  
Pennsylvania Railroad Co.  
New York Central Lines



No. 2033



No. 2313



No. 2347



No. 2515



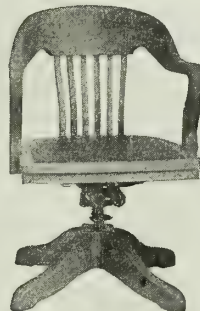
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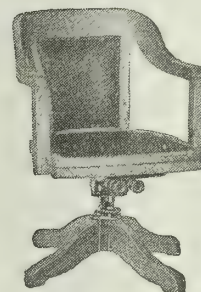
No. 1843 1/2



No. 1907 1/2



No. 2005 1/2



No. 1929 1/2



No. 1077 1/2



No. 2031



No. 2323



No. 1877 1/2



No. 143



No. 11

SEVERAL PATTERNS OF CHAIRS STANDARDIZED BY THE MOST PROMINENT BANKS, CORPORATIONS AND PUBLIC BUILDINGS  
The company endeavors to carry a large stock of these chairs on hand

# THE MATHEWS MANUFACTURING CO.

Woodworkers, and Manufacturers of Wooden Garden and Lawn Products

Lakewood  
CLEVELAND, OHIO

## Products.

"MATHEWS CRAFT" WOODEN GARDEN FURNITURE, including Garden Seats, Benches, Chairs and Tables; Trellis; Arched Trellis and other forms thereof; Trellis Seats; Trellis Trainers, for roses; Tree Boxes; Plant Boxes; Garden Gates; Garden Bridges; Picket Fences; Lattice Fences; Tea Houses; Pergolas; Summer Houses; Children's Playhouses, etc.

## Co-operative Services.

THE MATHEWS MANUFACTURING CO. is a specialist in garden craft products, shipments having been made to all parts of the United States. The company maintains an architectural department which is continually making special designs to meet the artistic and practical requirements of definite locations throughout the country.

To make a garden livable, to combine attraction and utility, to arrange cosy nooks and shady spots, and to provide furniture suitable for a real "outdoor living room" are the objective points to which the skill of the Mathews garden craft experts is directed. The knowledge and experience of these skilled workmen are placed at the service of the Mathews' customers. Special designs submitted by architects will be faithfully executed.

Correspondence is solicited. Inquiries for suggestions as to the proper garden furniture necessary for

certain requirements or involving special conditions will receive prompt attention and reply.

## Mathews Garden Furniture.

The Mathews garden furniture consists largely of replicas of old-world originals (old English and French pieces).

A growing interest in the art of Japan is observable throughout the United States, which is evidenced by an annually increasing number of American gardens done in the Japanese style. The company is prepared to make seats, tea houses, bridges, etc., for such gardens.

A few of the many types of Mathews garden furniture and accessories are illustrated on this and succeeding page. These products are taken principally from the company's catalogue, which will be sent to architects, landscape architects and engineers on request. Mention SWEET'S ARCHITECTURAL CATALOGUE.

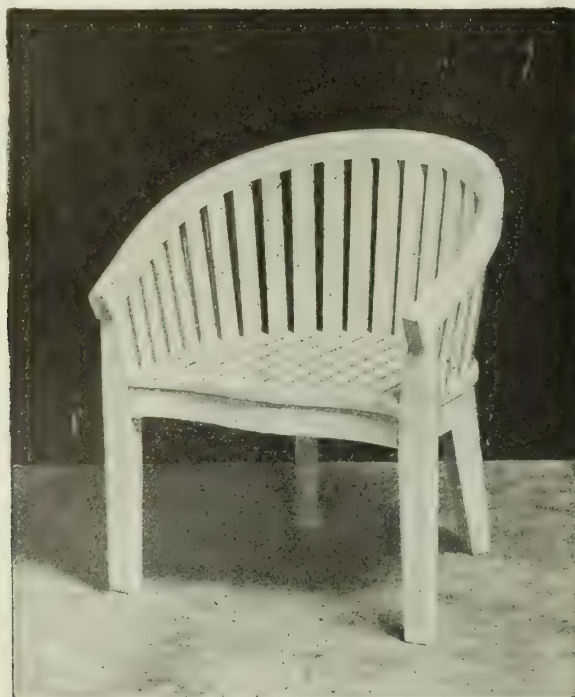
HALL-MARK—A sign of sincere craftsmanship—which means that materials are selected with care and that designs are authentic to minutest detail—is engraved in the wood of each bench, chair, table, etc.

## Uses.

The Mathews wooden garden products are suitable for outdoor gardens, winter gardens, conservatories, porches, balconies, loggias, etc.



HALL-MARK



GARDEN CHAIR NO. 337

A 7-ft. seat is made to match; also a small chair and 3-ft table





No. 370. ARBOR AND SEAT  
Semicircular, 4 ft. wide



No. 374. ROSE ARCH  
4 ft. wide, 7 ft. high



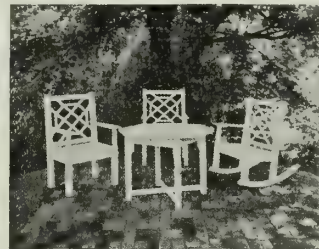
No. 371. SEAT AND TRELLIS  
4 ft. wide, 7 ft. high



No. 365. HOODED SEAT  
6 ft. wide, 7½ ft. high



No. 301. GARDEN SEAT  
6 ft. long



No. 359. GARDEN SET  
Table 3 ft. wide



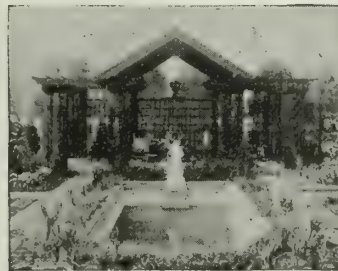
No. 333. CURVED SEAT  
9½ ft. long; front radius 6 ft.



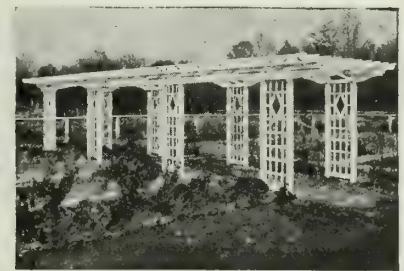
No. 305. GARDEN SEAT  
6 ft. long



No. 400. PERGOLA  
With roof in center



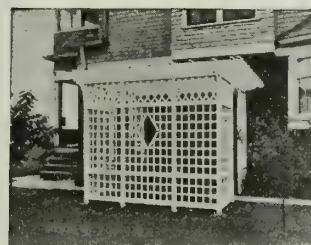
TEA HOUSE  
Specially designed



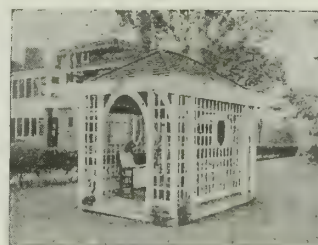
LIGHT PERGOLA  
Specially designed



No. 389. ROSE TEMPLE  
Special size



LATTICE ARBOR  
Specially designed



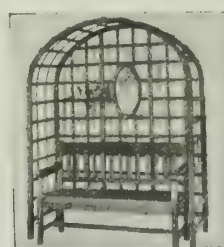
SUMMER HOUSE  
Made from No. 387



LATTICE ARBOR  
Over a pool



No. 346. GARDEN SEAT  
Placed under trellis



No. 363. ARBOR AND SEAT  
Seat 4 ft. long



No. 366. ARBOR WITH SEATS  
8 ft. wide; 4½ ft. long



# THE FISCHER & JIROUCH CO.

Garden Furniture

4821 Superior Avenue  
CLEVELAND, OHIO

## Products.

GARDEN FURNITURE.

## Garden Furniture.

The modern tendencies in garden building, their enormous expansion in recent years, their relation to architecture follows that the essence of garden craft is to give the maximum of pleasure through the medium of beauty.

It is a pleasure to realize—and encouraging to anyone alive to the value of the fine arts and especially the fine art of gardening—that during the last generation, and more noticeably the last decade, there has been a very considerable garden awakening among the American people.

Although the palatial gardens of the Renaissance are too grand in scale for our average scheme, nevertheless they are full of suggestions in the way of vases and furniture and make us again turn to Italy, where we look for inspiration in this, as in other arts.

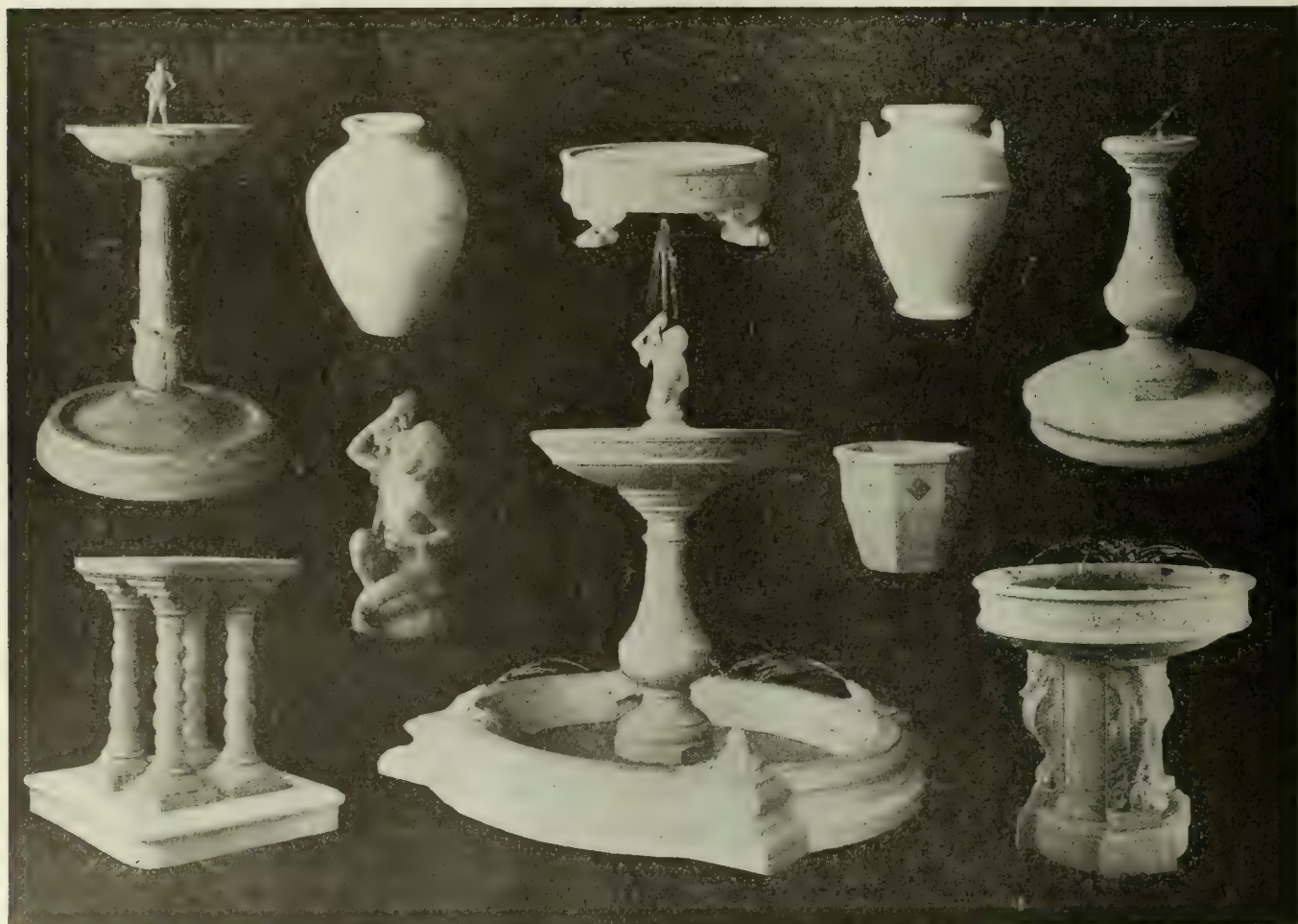
## Material.

THE FISCHER & JIROUCH Co. models are executed in art stone and Caen stone cement and will stand the American climate. Special designs are artistically and promptly carried out.

Composition or mixtures are made to resemble the real stone of different aggregates, according to the kind of stone requested, and any color from pure white to vivid red can be matched in the mixing, the base of which is cement. The Caen stone cement is a fine buff color and is a very pleasing tint to the eye, and especially so in a garden as well as in the interior of a home, as it is an ideal cement for mantels, flower boxes and vases for a solarium and sun room and tones in very nicely with the interior decorations.

## Catalogue.

Complete Garden Furniture Catalogue sent on request.



EXAMPLES OF GARDEN FURNITURE



# THE FISCHER & JIROUCH CO.

## Decorative Sculptors

4821 Superior Avenue  
CLEVELAND, OHIO

### Products.

DECORATIVE ORNAMENTS in STUCCO, FIBROUS PLASTER, WOOD and PLASTER COMPO, PAPIER-MACHÉ and CEMENT.

Wood Carving and Modeling is a specialty.

### Stock.

A complete line of stucco ornaments and details made from exterior and interior composition and weatherproof materials in all styles and sizes is carried in stock.

The imitation wood composition is a perfect imitation of the natural wood, showing same grain as in wood, and makes a good substitute for hand carving.

### Facilities.

THE FISCHER & JIROUCH Co. is unrivaled in tech-

nical resources for high class decorative work; is equal to any demand, and is prepared to accept and promptly execute orders of any style and size.

The company can meet any competition where quality as well as price is considered.

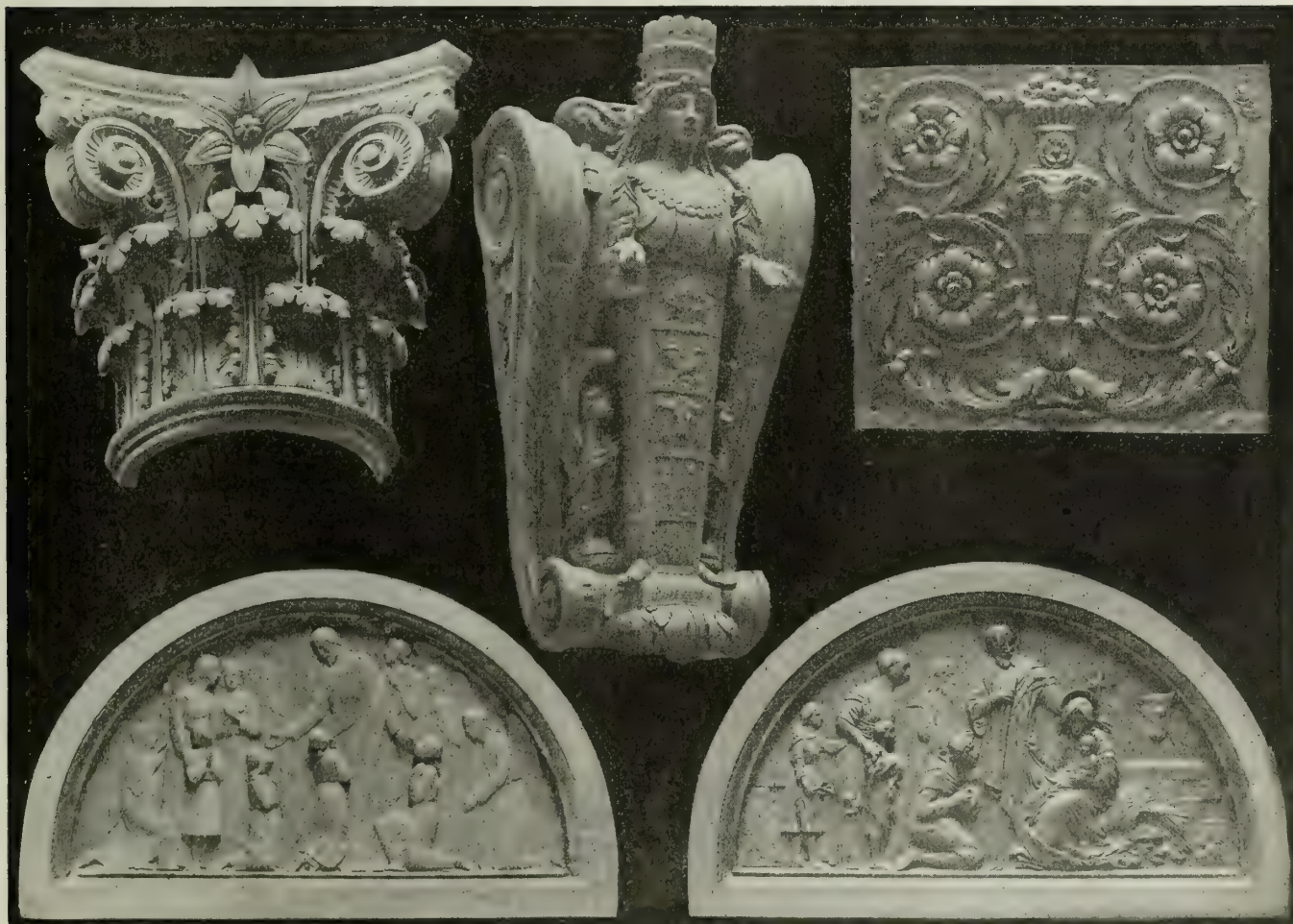
### Catalogue.

Careful study has been taken, and neither expense nor sacrifice has been spared to make an attractive catalogue, interesting as well as instructive to architects and others.

### Co-operative Service.

Architects and others will be furnished at any time with estimates or any other information they desire, and to that end correspondence is invited.

Complete illustrated catalogue sent on request.



EXAMPLES OF DECORATIVE ORNAMENTS



# THE BERGER MANUFACTURING CO.

Manufacturers of Steel Office Furniture, Lockers, Bins and Shelving  
CANTON, OHIO

## BRANCHES

NEW YORK, N. Y., S. E. Cor 22nd Street and 11th Avenue  
PHILADELPHIA, P. A., Cor. 16th Street and Washington Avenue  
SOUTH BOSTON, MASS., 450-56 Broadway

CHICAGO, ILL., 20 North Market Street  
ST. LOUIS, MO., 16 South Tenth Street  
MINNEAPOLIS, MINN., 300-312 10th Avenue, South  
SAN FRANCISCO, CAL., 1120 Mission Street

## Products.

**STEEL FILING CASES** for filing correspondence, checks, documents, cards, invoices and books, including Upright Cases, Vertical Cases, Counter Height Cases, Card Index Cases, High Line Cases, Unit Storage and Transfer Cases; **BINS and SHELVING**; **STEEL LOCKERS**.

For Concrete Reinforcement and Metal Lath, see pages 202-05; for Metal Lumber, see pages 176-82; for Steel Ceilings, see page 417.

## Steel Filing Cases.

**MATERIALS**—Constructed of special analysis, open hearth steel; pickled, cold rolled and annealed—free from scale and other imperfections. All plates are patent stretcher-leveled to remove buckle. Gauges of material used for case construction range from Nos. 10 to 20, and for drawers, from Nos. 18 to 24, U. S. standard.

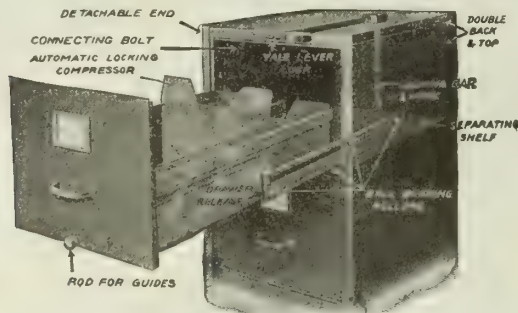
**CONSTRUCTION**—Reinforced construction rigidly connected by means of rivets, screws, and gas or electric welding, whichever method is best for the particular requirements. Trimmings, such as pulls and label holders, are solid cast brass for the "1300" line, and stamped brass for the "600" and "1400" lines.

**FINISH**—The standard finish of Berger equipment is a neutral olive green, with 4 coats of oven baked enamel. Special finishes can be furnished.

**CLASS OR LINES**—All lines mentioned here are illustrated and fully described in our new complete catalogue, sent on request.

**"1300" Line**—These cases have separating shelves between drawers, and double walls throughout, including drawer heads for increased fire resistance. Hand rubbed finish. Outer walls of the double sides are detachable, and in battery or group arrangement, need only be applied on the end cases.

Drawers are carried on ball bearing roller suspensions. Equipped with automatic locking compressors, noise preventing rubber stops, hinged drawer releases to provide for entire removal of drawer from case, auto-



BERGER "1300" STEEL UNIT

Showing a few special features that make it ideal for efficient filing purposes

SWEET'S CATALOGUE



TRADE-MARK

matic locking devices and safety catches. Filing capacity, 23 ins.

Size, 51 ins. high by 26 ins. deep.

**"1400" Line**—Similar to the "1300" line, having detachable finishing ends, but single walls elsewhere. Spray coat finish; stamped brass trimmings.

**"600" Line**—These cases have single walls and solid ends. Both these and the "1400" line units are for use in the slow burning type of buildings and compare favorably with wood in price.

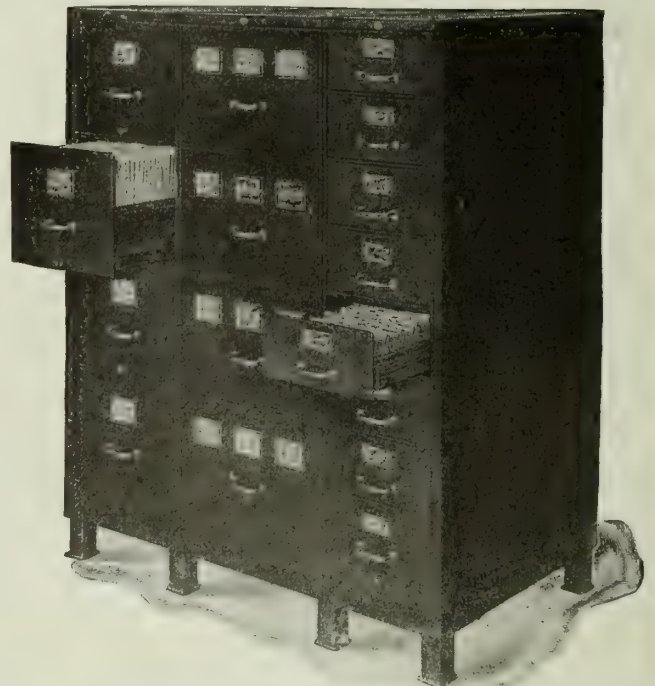
**Counter Height Cases**—Furnish both filing and counter facilities. 39 $\frac{1}{8}$  ins. high.

**High Line Cases**—Especially suited for storing documentary records. They line up in height and depth with the unit storage shelving, and save expense of special made equipment.

72 $\frac{1}{2}$  ins. high by 14 $\frac{1}{2}$  ins. deep.

**Unit Storage Shelving**—Standard heights, 45 $\frac{1}{8}$ , 72 $\frac{3}{8}$  and 96 ins. Shelf widths, 24, 30, and 36 $\frac{3}{4}$  ins. Shelves are adjustable.

**Transfer Cases**—The following are standard sizes, inside measurements. Ledger Size: 12 $\frac{3}{16}$  ins. wide, 12 $\frac{3}{4}$  ins. high, 25 $\frac{3}{8}$  ins. deep. Letter Size: 12 $\frac{3}{16}$  ins. wide, 10 $\frac{1}{4}$  ins. high, 25 $\frac{3}{8}$  ins. deep. Cap Size: 15 $\frac{3}{16}$  ins. wide, 10 $\frac{1}{4}$  ins. high, 25 $\frac{3}{8}$  ins. deep. Bill Size: 10 $\frac{1}{16}$  ins. wide, 9 ins. high, 25 $\frac{3}{8}$  ins. deep.



BATTERY OF "1300" UNITS

With applied end panels and mounted on sanitary base

Continued on next page



**Berger's Steel Bins and Shelving.**

For convenient, systematic and safe storage of materials of all kinds. This equipment is fire resistant; indestructible—can not warp, split nor crack; will carry heavy loads; provides 25% more storage capacity than wood, requiring less floor space; and is good for a lifetime of service.

**TYPES**—To provide for a varied storage and stock-room contingency, 2 distinct types are manufactured—"closed" and "skeleton." The closed type, being the most popular, is illustrated and briefly described on this page. Full particulars of this and the other type are given in Catalogue R. S., sent on request.

**CONSTRUCTION**

—The backs extend the entire height and length of the assemblies. One back is necessary for each unit and acts either as a back to a single face assembly or as a dividing wall in a double face assembly.

The uprights are attached at right angles to the back with 5/16-in. bolts through holes in a back flange and corresponding holes in the back.

The uprights and backs are all punched for the attachment of shelves, which are connected by means of bolts through holes in the side and back flanges. Thus the uprights and backs each carry a portion of the shelf load.

The standard bin construction is such that an assembly of plain shelving can be made into a bin construction by simply attaching a bin front in connection with the front face of the shelf. The bin front and the

shelves, being bolted to the frame, tie the entire construction together, insuring strength and rigidity.

**FLEXIBILITY**—Berger's steel bins and shelving are flexible in arrangement, providing easy removal of entire equipment, or quick adjustment of shelves and compartments. The 3-in. vertical adjustment of shelves and the 6-in. horizontal adjustment of dividers, provide sufficient range for any storage space desired.

**SIMPLICITY**—No rods, clips or clamps are necessary. Any man with a screwdriver can readily adjust the shelves, as well as take them down and re-assemble the entire equipment elsewhere, without loss of materials.

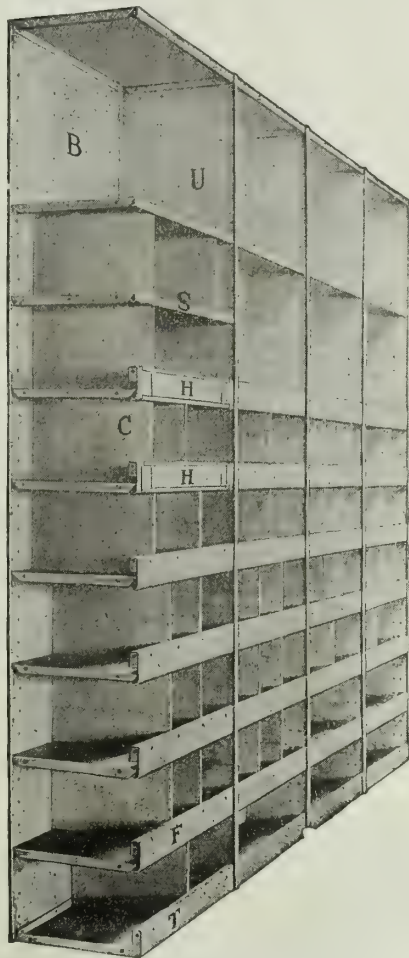
**FINISH**—Standard finish is a neutral green paint.

**ENGINEERING SERVICE DEPARTMENT**—This department will make a study of conditions, work out complete plans and designs, and furnish estimates.

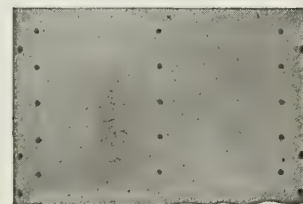
**A Few Installations of Steel Bins and Shelving.**

This equipment is installed in hundreds of plants, throughout the country, of which the following are a few:

Packard Motor Car Co., Detroit, Mich.  
Goodyear Tire & Rubber Co., Akron, Ohio  
Hyatt Roller Bearing Co., Detroit, Mich. (and Branches)  
The Duff Manufacturing Co., Pittsburgh, Pa.  
The Ferro Machine & Foundry Co., Cleveland, Ohio  
Stewart - Warner Speedometer Corporation, Chicago, Ill.  
Pennsylvania Railroad Co., Verona, Pa.  
Lyon & Healy, Chicago, Ill.  
Marshall Field & Co., Chicago, Ill.  
Ford Motor Co., Detroit, Mich.  
Elliott-Fisher Co., Harrisburg, Pa.  
United States Government

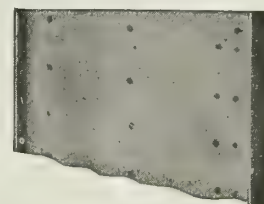


DETAIL OF STEEL BINS



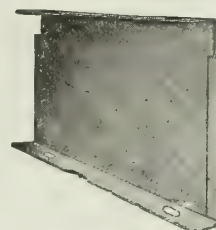
(B) BACK

Flat piece No. 18-gauge sheet steel, punched for attachment to back and uprights



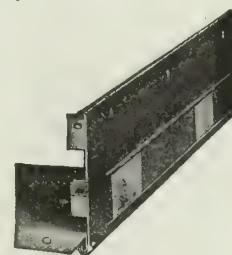
(U) UPRIGHT

No. 18-gauge sheet steel, with folded edges punched for attachment of shelves and fronts



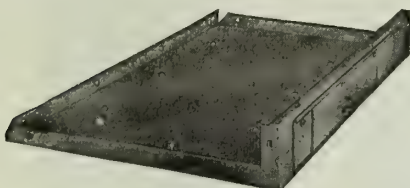
(C) COMPARTMENT DIVIDER

Flat piece of No. 18- or No. 20-gauge sheet steel, punched at top and bottom for attaching to upper and lower shelves. Adjustable horizontally



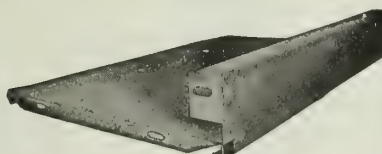
(H) LABEL HOLDER

Bolted to bin fronts. Card slides in grooves as shown



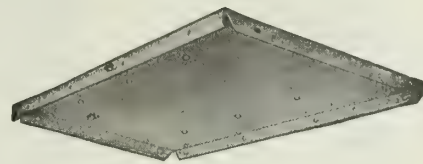
(T) BOTTOM SHELF

No. 16-gauge sheet steel turned upon 3 sides and punched for bolts



(F) BIN FRONT

Formed of No. 16-gauge sheet steel, bolted to uprights with side flanges. Can be attached at any time



(S) INTERMEDIATE SHELF

Flat piece of No. 16-gauge sheet steel, with formed edges for attachment to back and uprights



**Berger Steel Lockers.**

Combined attractiveness and strength make them ideal for schools, colleges, clubs, public buildings, gymnasiums, manufactories, etc. They are sanitary, fire resisting, proof against rodents and pilferers, and require small floor space.

**MATERIALS**—Backs, sides, tops, bottoms and shelves, No. 22-gauge U. S. standard. Doors, No. 16-gauge U. S. standard.

**CONSTRUCTION**—All parts are formed in a manner which gives the highest degree of strength and rigidity.

The doors are solid plates of steel 1/16 in. thick, flanged at all edges and welded at all corners. All doors wider than 15 ins. are reinforced.

For ventilation, extra large hooded slots or louvers are embossed in the field of the doors, thus allowing abundant air circulation while giving full protection to the contents of the lockers. Also, any type of perforated door can be supplied.

The doors of double tier lockers are hung on two fast pin wrought steel concealed hinges. The doors of single tier lockers are hung on three of these hinges.

All parts of these lockers being formed and punched in standard dies, all corresponding parts are interchangeable.

All bolts with heads exposed on the outside surface have slotless oval heads.

The unit principle of construction, which is followed throughout, gives great flexibility of arrangement. Rearrangement of an equipment of Berger steel lockers is easily and quickly accomplished. Small groups may be joined together in one long group, or a long group may be divided into as many small groups as may be desired. Single face lockers may be arranged back to back, or back to back lockers may be arranged in single face groups. All this can be done without cutting or altering a single piece.

**EQUIPMENT**—All single tier lockers are equipped with 3-point locking device, hat shelf, etched brass number plate, and three 2-prong rust-proof coat hooks. The equipment of double tier lockers is the same, except that no

hat shelf is furnished and a 2-point (instead of a 3-point) locking device is used.

Standard lockers are furnished with 6-in. sanitary legs adjustable to uneven floors.

Lockers can be furnished with sloping tops, if desired, at a slight advance in price.

**STANDARD FINISH**—Best quality olive green enamel, baked-on.

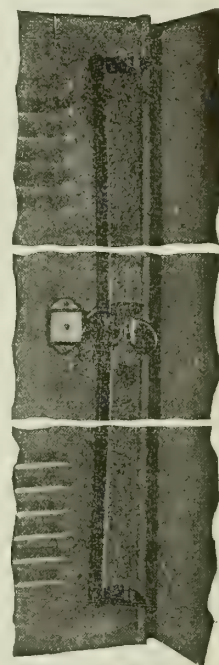
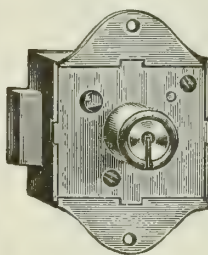
**ERECTION**—As a majority of lockers are shipped knocked down for erection by the buyer, particular attention has been paid to economy in erection in the designing of these lockers. Construction has been simplified as much as possible, so that erection cost has been reduced to the lowest practicable point.

**STANDARD 3-POINT LOCKING DEVICE**—Securely fastens the door at center and near top and bottom by the movement of the operating cam at the center.

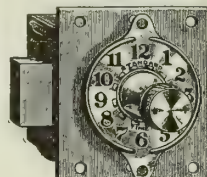
The movement of this cam can be controlled by any one of the 3 locks shown below, or by a padlock if desired.

**A Few Installations of Berger Steel Lockers.**

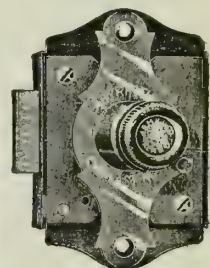
Procter & Gamble Co., Cincinnati, Ohio  
 Armour & Co., Chicago, Ill.  
 Quaker Oats Co., Akron, Ohio  
 Chicago & Western Indiana R. R., Chicago, Ill.  
 Boston High Schools, Boston, Mass.  
 Security Coal Mines, Duquoin, Ill.  
 University of Minnesota, Minneapolis, Minn.  
 University of Cincinnati, Cincinnati, Ohio  
 Y. M. C. A. Building, Canton, Ohio  
 Omaha Country Club, Omaha, Nebr.

**3-POINT LOCKING DEVICE**

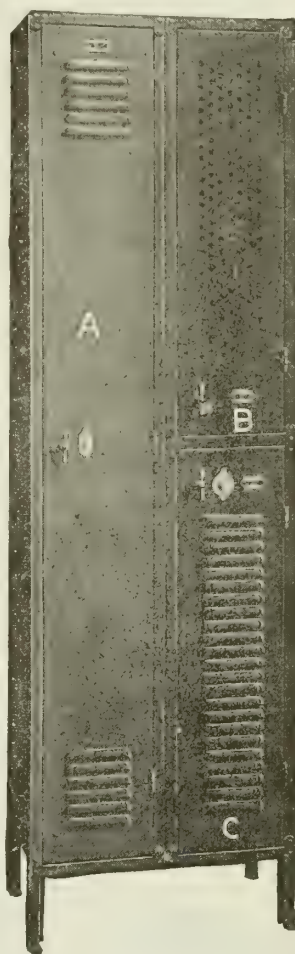
**NO. 51. FLAT KEY, MASTER-KEYED**  
 2 nickelplated keys with each lock. Unlimited key changes



**NO. 52. COMBINATION LOCK**  
 Operated either by sight or click. Unlimited combination changes



**NO. 53. COMBINATION LOCK**  
 Operated by click only. Simple in construction. Unlimited combination changes

**STEEL LOCKERS**

(A) Type SS  
 Single tier, standard louver door with Yale lock  
 (B) Type DP  
 Double tier, perforated metal door with padlock  
 (C) Type DF  
 Double tier, full louver door with combination lock

**SOME STANDARD SIZES, STEEL LOCKERS**

SINGLE TIER			DOUBLE TIER		
Width, ins.	Depth, ins.	Height, ins.	Width, ins.	Depth, ins.	Height, ins.
12	12	60 or 72	12	12	36 or 42
12	15	60 or 72	12	15	36 or 42
12	18	60 or 72	12	18	36 or 42
15	15	60 or 72	15	15	36 or 42
15	18	60 or 72	15	18	36 or 42
18	15	60 or 72	18	18	36 or 42
18	18	60 or 72	18	21	56
24	24	72			



# EDWARD DARBY & SONS COMPANY, INC.

Steel Lockers, Factory Equipment and Wire Cloth

412-420 North 18th Street  
PHILADELPHIA, PA.

## Products.

"PEN-DAR" UNIT SYSTEM STEEL EQUIPMENT: Lockers, Steel Shelving, Stock Racks, Trays and Tote Boxes.

Brass, Copper, Steel and Galvanized Wire Cloth.

Wire Work, Brushes, Screens, Riddles, Sieves, Window Guards, Baskets, Bank and Office Grilles, Partitions and Enclosures.

## "Pen-Dar" Locker Construction.

All "Pen-Dar" lockers are built on the unit system. The basic frame is constructed of 1 by 1 by  $\frac{1}{8}$ -in. rolled steel angle, giving an extremely rigid and durable locker. To this framework is fitted the sheet steel or expanded metal panels. The vertical corner angles of each unit are continuous from the top of the locker to the floor; the 6-in. legs are therefore a part of the locker itself.

All doors are formed from single sheets of steel with turned and folded edges; the result is a perfect fitting door that will not sag or buckle. The doors are hung on 2 by 2-in. tight pin wrought steel hinges, 2 rivets to each leaf. The sheet steel used is cold rolled, planished and double annealed, and entirely free from blemish, scale or rust. No. 16-gauge is used for doors, No. 22-gauge for tops, bottoms and shelves, and No. 24-gauge for the backs. Expanded metal, when used, is No. 16-gauge and  $\frac{3}{4}$ -in. mesh. All rivets are spaced 6 ins. on center and castings, where used, are of malleable iron.

## Standard Locker Equipment.

All lockers have 1 shelf (except 2-tier lockers which have no shelves except when specially ordered) 3 coat hooks, brass number plate, 3-point locking device, flat key rim lock (2 keys for each), all different and master-keyed; 6-in. sanitary legs, adjustable pocket type shoes with  $\frac{1}{2}$ -in. adjustment for uneven floors.

A choice of finish is offered in olive green, French gray or black enamel, 2 coats baked on at a temperature of 350° Fahr. for 3½ hours.

## Locks.

The Miller flat key rim lock is the standard for "Pen-Dar" lockers. Corbin key locks, padlocks, Miller standard time and combination locks or labyrinth click locks are furnished when specified.

Keys for all locks are numbered to correspond to number plate on locker, and since a record is kept of all keys sent out, duplicates may be ordered at any time by sending serial number and lock number.

## Shipment of Lockers.

Lockers are usually shipped knocked down crated to save excessive freight charges, and since all component parts are accurately made to gauge and are interchangeable, the units are extremely easy to assemble.

## Special Finishes for Lockers.

Extra colors are offered in maroon, white and imitation wood grains in oak and mahogany, using the baking enamels and varnishes. As special care is necessary in the baking and more coats are required for these colors, they will be furnished at slightly additional cost.

STANDARD LOCKER SIZES, IN INCHES

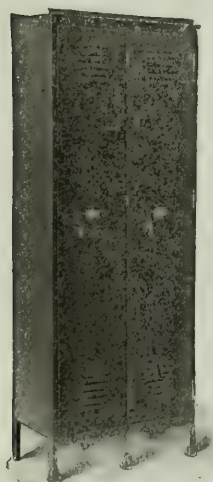
SINGLE TIER,		DOUBLE TIER,	
12 x 12 x 60	12 x 12 x 72	12 x 12 x 36	12 x 12 x 42
12 x 15 x 60	12 x 15 x 72	12 x 15 x 36	12 x 15 x 42
15 x 15 x 60	15 x 15 x 72	15 x 15 x 36	15 x 15 x 42
15 x 18 x 60	15 x 18 x 72	15 x 18 x 36	15 x 18 x 42
18 x 18 x 60	18 x 18 x 72	18 x 18 x 36	18 x 18 x 42
	18 x 24 x 72		
	24 x 24 x 72		

NOTE—All sizes given are inside dimensions of locker, the 6 in. legs are to be added for over-all height.

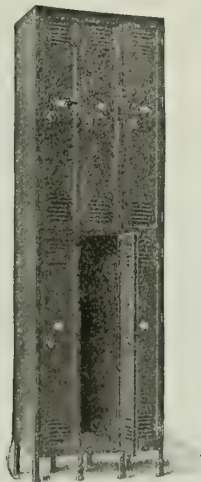
## Special Equipment.

This company specializes in designing and manufacturing interior steel equipment, consisting of book racks, shelving, tables, partitions, filing cabinets, etc. These are made in such a variety of designs that it is impossible to adopt any one style as standard, consequently they are manufactured according to specifications.

Estimates or special designs furnished on request.



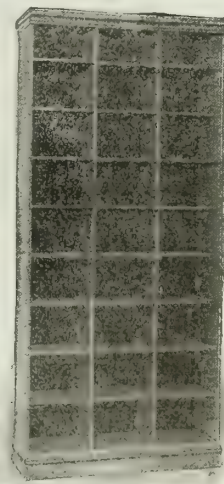
DESIGN 500, STEEL  
WARDROBE



DESIGN 503, DOUBLE  
TIER LOCKER



DESIGN 295, MATERIAL LOCKER



DESIGN 800, STOCK RACK

# THE EDWARDS MANUFACTURING CO.

INCORPORATED 1901

Steel Factory and Office Equipment, Lockers, Shelving and Bins  
CINCINNATI, OHIO

## BRANCH OFFICES AND WAREHOUSES

NEW YORK, N. Y., 81-83 Fulton Street  
PHILADELPHIA, PA., 723 Chestnut Street  
DALLAS, TEX., 1635-39 Pacific Avenue  
LOS ANGELES, CAL., 1610 North Spring Street  
CLEVELAND, OHIO, 401 Leader-News Building  
MINNEAPOLIS, MINN., 119 South 10th Street  
BOSTON, MASS., 6 Beacon Street  
WASHINGTON, D. C., 1419 G Street, N. W.

DETROIT, MICH., Builders' and Traders' Exchange  
NORFOLK, VA., Arcade Building  
OMAHA, NEBR., 601 Bee Building  
KANSAS CITY, MO., 323 Reliance Building  
PORTLAND, ORE., 17 Ainsworth Building  
SEATTLE, WASH., 401 Central Building  
DAVENPORT, IOWA, 49 Davenport Savings Bank Building  
ATLANTA, GA., Healey Building

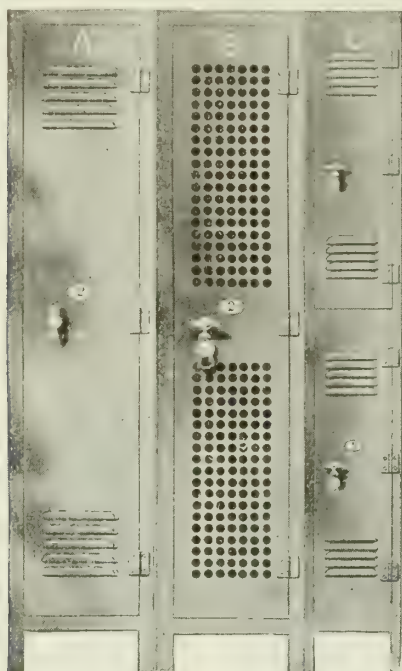
### Products.

STEEL FACTORY and OFFICE EQUIPMENT of all classes, embracing Lockers, Shelving, Bins, Racks, Tables, Benches, etc., for foundry machineshops, public offices, schools, banks, libraries, public garages, stores, etc.

For Sheet Steel Building Material see pages 418-419; for Rolling Doors and Shutters, see pages 664-65.

### Edwards Steel Lockers.

Simplicity in construction, quality of materials, and workmanship, plus durability, are eminently discernible in Edwards lockers. They are fire retardant, sanitary, proof against filth and vermin. A minimum of floor space is required.



EDWARDS STEEL LOCKERS

- A—Type S-L, single tier, standard louver door with Yale lock  
B—Type S-P, single tier, perforated metal door with padlock  
C—Type D-L, double tier, standard louver door with padlock

#### STANDARD SIZES

Single tier, ins.			Double tier, ins.		
Width	Depth	Height	Width	Depth	Height
12	12	60 or 72	12	12	36 or 42
12	15	60 or 72	12	15	36 or 42
15	12	60 or 72	15	12	36 or 42
15	15	60 or 72	15	15	36 or 42
15	18	60 or 72	15	18	36 or 42

**MATERIALS**—Made of select sheet steel; pickled, rerolled and leveled stock.

**CONSTRUCTION**—All parts are accurately sheared, punched and formed, so that every unit is interchangeable at any point without disturbing the balance of lockers in a section. Only 6 principal parts are required—a completely assembled front, back, top, shelf, bottom and side.

Doors are provided with either louver or perforated ventilation, thus providing ample circulation of air.

Frames are made of steel angles, 1 by 1 by  $\frac{1}{16}$  in., oxy-acetylene welded at corners. All doors are fitted and attached to the frames before shipment, thus eliminating delay and expense in the field. All fixtures are attached to doors in the factory, including locks, hinges, locking device, number plate, etc.

**LOCKING DEVICE**—Single tier lockers are equipped with a 3-way multiple locking device, fastening doors at top, bottom and center. Malleable iron handles are attached, operating either flat key or padlocks.

**LOCKS**—Eagle, Yale or any other reliable make of lock.

**SETTING UP**—On account of the few parts and simple construction, Edwards lockers are undoubtedly the quickest and easiest to set up in the field, thus the cost in this connection is reduced to the lowest practical point.

**FINISH**—Olive green or black baking enamel, baked on at a temperature of 240° Fahr. This enamel is very flexible and durable.

**EQUIPMENT**—All lockers are completely equipped with 3 coat hooks, hat shelf, lock and number plate. Standard lockers are all furnished with 6-in. sanitary legs.



Type S-L

Type S-P

EDWARDS STEEL LOCKERS



**Edwards Steel Shelving and Bins.**

Edwards shelving weighs more and will carry more load than other types. It is built on the sectional system, providing a most efficient and available system for modern industrial use.

Edwards shelving is adapted to all uses. It is built to serve any requirement.

It automatically adjusts its use to the stockroom.

**CONSTRUCTION**—All sections are accurately finished and provided with a perforated adjustment. Every 3 ins. are centers. The uprights are constructed of No. 16 U. S. gage sheet steel, with two 1 by 1 by  $\frac{1}{8}$ -in. steel angles electrically spot-welded at both front and back. This construction is undoubtedly the most rigid and will carry extremely heavy loads.

Shelves are made of No. 16-gage steel, flanged at front, back and sides, with necessary reinforcements.

Backs are of No. 20-gage steel, with adjustment arrangement.

Bin fronts are of No. 18-gage steel, flanged and reinforced, and are furnished to several standard dimensions.

Edwards shelving requires no bars, rods or other special attachments for fastening the units. All that is necessary is an ordinary screwdriver and wrench in the hands of an unskilled workman.

Bolts will fasten shelving together more permanently, and prevents swaying or sagging.

Edwards shelving is made in a number of different types, embracing bins, both skeleton or open type shelving, tire racks, etc.

**Services.**

This company has quite an extensive engineering department and will be pleased to discuss any arrangement and offer useful suggestions, which undoubtedly will assist in planning a new building or factory. This service is free and without any obligation whatever.



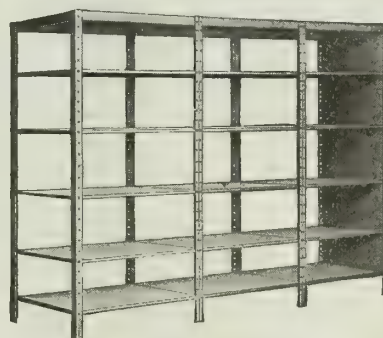
Bin Front Type

Open Front Type

EDWARDS STEEL SHELVING



Bin Type

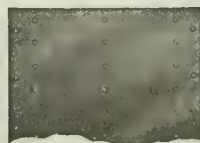


Skeleton Type

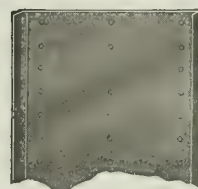
EDWARDS STEEL SHELVING



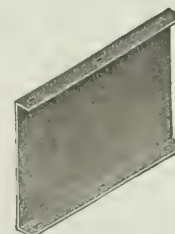
Sectional View



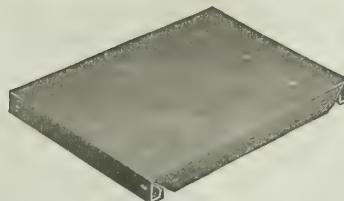
B—Back



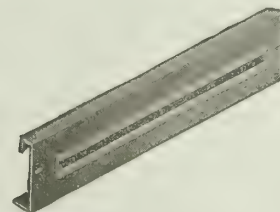
C—Upright Partition



D—Divider



E—Shelf



F—Bin Front

**DETAILS OF EDWARDS STEEL SHELVING**

All sections are provided with perforations for adjustment, so that practically any arrangement can be had

# FEDERAL STEEL FIXTURE COMPANY

4545 West Homer Street  
CHICAGO, ILL.

SALES OFFICE: CHICAGO, ILL., Security Building

## Products.

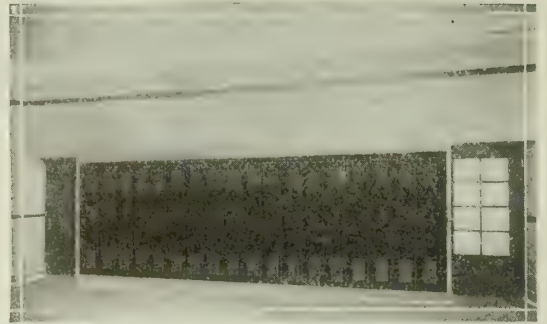
STEEL LOCKERS; STEEL SHELVING, RACKS, BINS, BOXES.

METAL FURNITURE: Desks, Filing Cabinets, Omnibuses, Tables, Benches, Cupboards, Wardrobes.

Special Steel Equipment.



TRADE-MARK



FEDERAL INSERTED TYPE WALL LOCKERS

The ventilating of this entire building is done through the lockers

## Federal Unit Steel Lockers.

The Federal locker has a body of No. 20 U. S. gauge and a door of No. 16 U. S. gauge, re-rolled, stretcher levelled, double annealed sheet steel, all free from rust or scale, and entirely supported with angle steel frames; 1 by 1 by  $\frac{1}{8}$  inch, welded, for the fronts and  $\frac{3}{4}$  by  $\frac{3}{4}$  by  $\frac{1}{8}$  inch, riveted, for the backs and for the reinforcing door panels.

**OXY-ACETYLENE WELDED FRAME**—The oxy-acetylene welded front frame, the angle framed back and the unit construction with angle frame bolted to angle frame throughout the entire height of the locker; these features of the Federal locker provide a lasting squareness, rigidity and bridgelike strength which assures against sagging, swaying frames and binding doors.

**REINFORCED DOOR**—The door, overlapping the locker frame and reinforced with complete supporting panels of  $\frac{3}{4}$  by  $\frac{3}{4}$  by  $\frac{1}{8}$ -in. angle steel, makes a neat, close fit, with ample clearance between locker frame and door frame. Federal locker doors can not bind.

**HARDWARE**—The hooks are 2-prong of special design, with sherardized rustless finish. The legs are adjustable. The hinges are  $2\frac{1}{2}$ -in., heavy, of known strength, with flanges concealed. The locking device, 3-way, large, strong, silent in operation.

**PERFORATION**—Either the embossed louver perforation, as illustrated, or an expanded metal type of door is furnished.

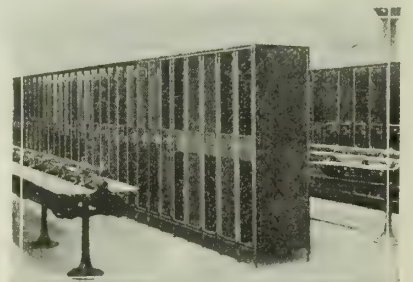


STANDARD TYPE SINGLE TIER LOCKER

**VENTILATION**—The problem of ventilation for lockers, and also for an entire room, has had our careful study; and we have developed four ventilating systems, each designed for a different condition.

**BAKED ENAMEL FINISH**—Absolutely the most durable and best rust resistant that can be applied to steel.

For our black enamel, only a pure carbon black is used; the base of the color enamels is zinc white. Both of these pigments cost decidedly more than others that could be used, but these have been selected because of their very marked superiority.



FEDERAL EXPANDED METAL LOCKERS, FAIRBANKS, MORSE & CO., BELOIT, WIS.

**STANDARD SIZES**—The standard locker may be had in any combination of

- 12 ins. wide, 12 ins. deep, 36 ins. high, on 6-in. legs.
- 15 ins. wide, 15 ins. deep, 42 ins. high, on 6-in. legs.
- 18 ins. wide, 18 ins. deep, 48 ins. high, on 6-in. legs.
- 20 ins. deep, 60 ins. high, on 6-in. legs.
- 72 ins. high, on 6-in. legs.

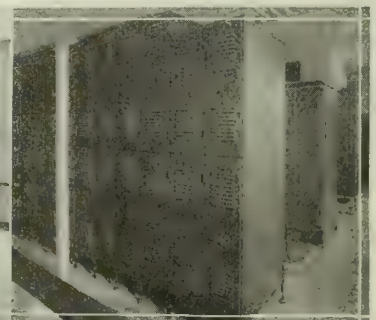
The 36- and 42-in. sizes are made two lockers in height.



FEDERAL LOCKERS ON SOLID BASE VENTILATORS, Y. M. C. A. TRAINING SCHOOL, CHICAGO, ILL.



FEDERAL SLANT TOP LOCKERS, BOYS' HIGH SCHOOL, LOUISVILLE, KY.



FEDERAL DOUBLE TIER LOCKERS, IRVING PARK FIELD HOUSE, CHICAGO, ILL.



**Federal Adjustable Steel Shelving.**

Federal steel shelving is designed for "carrying strength." A maximum load-increased capacity; elimination of unnecessary, non-weight carrying rack material.

**STRENGTH OF DESIGN—** Federal steel shelving and racks centralize their carrying strength at the vital points.

The verticals have their maximum strength at the shelf corners.

The shelves, specially formed, have triple strength in the front and rear flanges and at the corners.

The shelves are locked to the upright members by an ingenious attachment, providing for instant adjustment and increased strength.

Our specially formed and locked No. 18 U. S. gauge shelf has a carrying strength in excess of the conventional No. 16 U. S. gauge shelf lacking our construction.

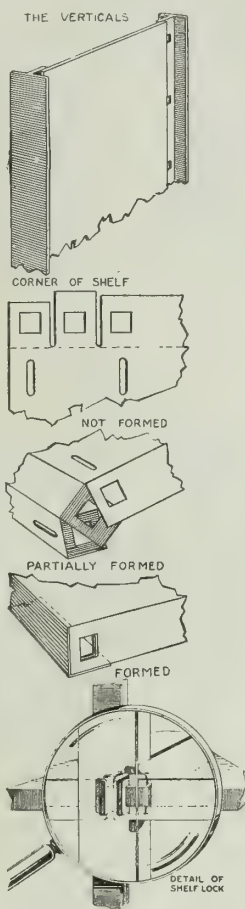
The intermediate verticals, etc., have no raw, exposed, tearing edges.

The open type rack, the closed shelving, the bin members, the box compartment, or the hinged or sliding door members, all build up from the initial units, consisting of vertical tee irons and shelves.

**SPECIFICATIONS —** Our standard shelving has uprights of  $1\frac{1}{2}$  by  $1\frac{1}{2}$  by  $\frac{1}{8}$ -in. tees, with No. 20 U. S. gauge sheet steel sides, backs and intermediate verticals.

The shelves and bin fronts are of No. 18 U. S. gauge steel.

**BAKED ENAMEL FINISH—**Only the best rust resisting pigments are used—carbon black, rather than black asphaltum japan; zinc white, rather than lithopone, white lead, etc.



FEATURES OF CONSTRUCTION OF FEDERAL SHELVING  
Patented

The enamel is applied to perfectly cleaned surfaces, after all the operations of manufacture are done, thus leaving no raw, exposed, unenameled edges. It is such details which make for perfectness.

**STOCK SIZES****SHELVES**

Length, 18, 24, 30, 36, 42, 48 and 54 ins.  
Depth, 9, 12, 15, 18, 21, 24, 27, 30 and 36 ins.

**VERTICALS**

Depth, 9, 12, 15, 18, 21, 24, 27, 30 and 36 ins.  
Height, any multiple of 3 ins.

**BACKS**

Length, 18, 24, 30, 36, 42, 48 and 54 ins.  
Height, any multiple of 3 ins.

**BIN FRONTS**

Length, 18, 24, 30, 36, 42, 48 and 54 ins.  
Height, 3, 4 and 6 ins.

**SHELF DIVIDERS**

Depth, 9, 12, 15, 18, 21, 24, 27, 30 and 36 ins.  
Height, 6, 9, 12, 15, 18, 21 and 24 ins.



FEDERAL ADJUSTABLE SHELVING, WITH SHELF DIVIDERS

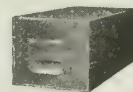
FEDERAL ADJUSTABLE STEEL SHELVING, BINS, BOXES AND SPECIAL EQUIPMENT

**Federal Metal Furniture.**

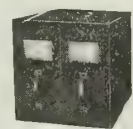
Federal metal furniture—desks, omnibuses, filing cabinets, etc.—is of the highest type of construction, workmanship and material.

We use the modern flush front, square lined construction, and a 3-coat, gold striped, hand rubbed, baked enamel finish.

Special cabinets for special purposes receive individual consideration by our systems specialists.



CARD FILE



DOCUMENT FILE



FEDERAL ADJUSTABLE STEEL SHELVING, LEDGE TYPE



FEDERAL-OMNIBUS-CARD FILE DESK  
Patent Pending



# THE GENERAL FIREPROOFING COMPANY

Metal Office Furniture and Filing Devices

YOUNGSTOWN, OHIO

BRANCH OFFICES

NEW YORK, N. Y., 395 Broadway  
BOSTON, MASS., 125 Federal Street  
SEATTLE, WASH., 1310 Alaska Building

CHICAGO, ILL., 325 West Madison Street  
WASHINGTON, D. C., 721-722 Woodward Building  
ATLANTA, GA., Third National Bank Building

AGENCIES IN ALL PRINCIPAL CITIES

## Products.

METAL FURNITURE and FILING EQUIPMENT for every need, including Vertical Sections, Horizontal half width and full width Sections, Counter Height Sections, Office Safes, Roller Shelf and Document Files for vaults, Adjustable Shelving, Desks, Tables, Letter Trays, Waste Baskets, Bond Boxes and Filing Supplies.

Quotations made on Equipment that can not be supplied from our complete standardized line, and therefore must be built to order.

For Metal Lath Reinforcement, see pages 210-13; for Waterproofing, Dampproofing and Technical Paints, see page 42.

## GF Allsteel Standard Equipment.

This company is the oldest and largest organization devoted to the manufacture and sale of stock steel office furniture and filing equipment.

This line includes sections for every kind and size of business record, in several different types of devices. GF Allsteel has been standardized to such an extent that only the most unusual requirements make special designing an absolute necessity; the result is that the client or owner saves money. Standardized equipment costs less; delay in securing the equipment is eliminated. Agents in all principal cities carry stocks of GF Allsteel, and large stocks are always on hand at the factory. There is no loss when standardized equipment must be moved; it fits anywhere, and is always open to change to meet the needs of an expanding business.



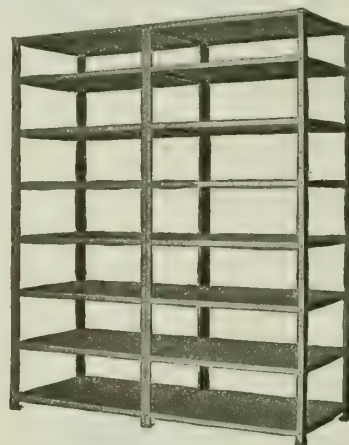
PORTION OF GF ALLSTEEL EQUIPMENT OF OVER 16,000 UNITS  
Installed for Great Northern Railway, St. Paul, Minn.

GF Allsteel is solidly built by electric and acetylene welding so that it can never come apart. Mechanical details of construction, such as roller suspensions on which the drawers operate, locks, hardware, and trim, are in keeping with the high standard to which GF Allsteel is manufactured. Furnished regularly in olive green, oak and mahogany.

## GF Allsteel Economy Shelving.

A recently perfected GF Allsteel product that finds a use in almost every line of business. Simple, strong, durable and flexible in the utmost. It will meet almost every shelving requirement.

GF Allsteel economy shelving is composed of standardized parts, carried in stock at the factory, and by dealers throughout the country. These parts can be assembled into shelving to suit each individual need. Uprights or posts made in heights from 3 ft. 3 ins. to 10 ft. 3 ins., all stocked. Shelves made in 3 widths and 4 depths, from 24 by 12 ins. to 36 by 30 ins. Backs and partitions furnished in sizes to coincide with shelf sizes. Bin fronts, backs, sides and dividers also provided. Doors, in 4 heights, 3, 4, 5 and 6 ft., and 3 widths, 15, 18 and 24 ins., also standardized, all carried in stock. Doors can be applied between uprights to any part of an installation at any time.



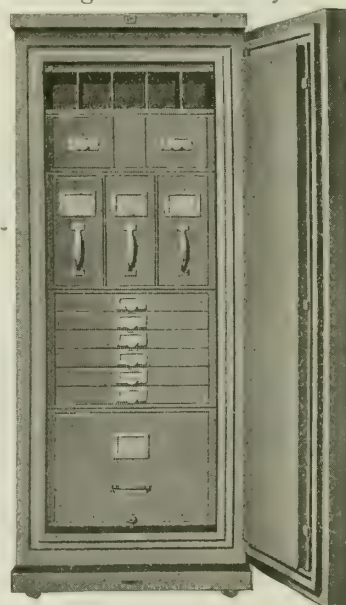
PLAIN OPEN SHELVING  
Backs and doors in stock

Shelves held in place by bolts, adjustable in height on 2-in. centers, thus they can be spaced to suit merchandise or material to be stored. Easily erected and dismantled.

GF Allsteel economy shelving is used in many businesses—in offices, vaults, storerooms, warehouses, retail stores, department stores, wholesale houses, garages, printing plants and banks. Architects find it of distinct advantage, because it meets their clients' needs and is economical to install. Complete catalogue and details on request.

## GF Allsteel Safes.

GF Allsteel safes are taking the place of vaults in many banks and office buildings. They mean convenience as well as protection. Safe interiors built up from stock sections to meet every requirement.



LARGE SINGLE UNDERWRITER'S  
MODEL SAFE



# THE E. F. HAUSERMAN COMPANY

Steel Lockers, Bins, Shelving, Factory Specialties

729 East 22nd Street  
CLEVELAND, OHIO

## Products.

STEEL BINS, SHELVING, LOCKERS, DOORS, PARTITIONS, TOTE BOXES, BENCH DRAWERS, STOOLS, MACHINESHOP TABLES, CARD FILES, SPECIAL SHOP FILES, BENCHES.

## Bins and Shelving.

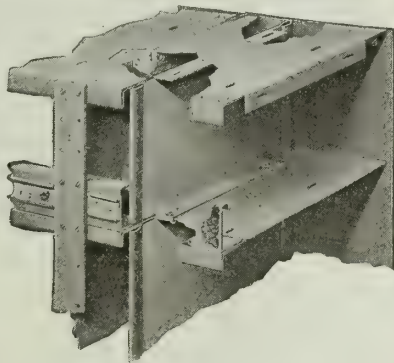
Hauserman bins and shelving have been designed after a careful survey of general requirements, with a view to flexibility in adjustment, durability, strength, compactness and good appearance at a minimum cost.

Spacing of shelves and vertical members can be made in any multiple of 3 ins.

The addition or removal of a section or sections can be made readily.

The space available for storage in proportion to the total space occupied is a maximum.

Standard shelves are made to carry loads varying from 100 to 1200 lbs. per sq. ft. at proportionate costs.

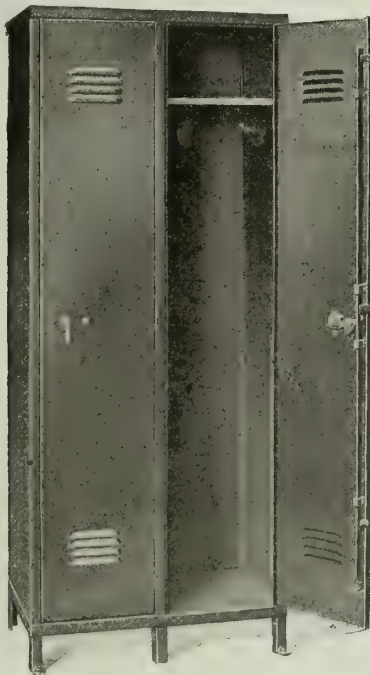


DETAILS OF CONSTRUCTION OF  
HAUSERMAN STEEL SHELVING

## Lockers.

Hauserman lockers are stock and custom built in all sizes for:

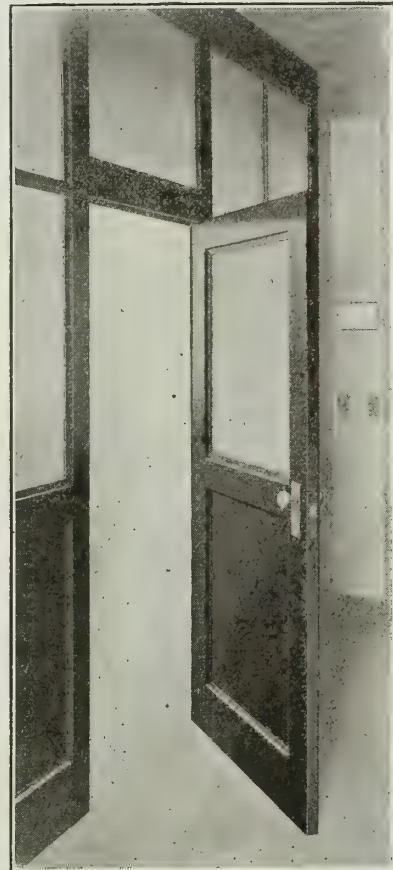
Colleges, schools, public buildings, clubs, offices, gymnasiums, hospitals, factories, warehouses.



HAUSERMAN STEEL LOCKERS

## Doors and Partitions.

Hauserman doors and partitions are of special hollow steel construction, are rigid, fireproof, sanitary, and neat in appearance, suitable for offices, toilets, shops, assembly rooms, and wherever a substantial door or partition is required.



TYPE OF HAUSERMAN DOOR AND PARTITION

## Hauserman Stock Articles.

Tote boxes, bench drawers, factory stools, machineshop work tables, standard Hollreth card files, special shop files, etc., are carried in stock and can be shipped on short notice.

## Hauserman Bench Department.

Where standard types do not meet requirements, this company is prepared to furnish special types and sizes built from specifications.

## Quotations.

Complete submission drawings, prices and descriptions will be furnished on request. Our Engineering Department is prepared to submit drawings and detailed suggestions, showing the adaptation of Hauserman products to the requirements.

# THE HART & HUTCHINSON CO.

## Steel Lockers

NEW BRITAIN, CONN.

### BRANCH OFFICES

BOSTON, MASS., 654 Oliver Building  
CHICAGO, ILL., 463 Peoples Gas Building

NEW YORK, N. Y., 9 East 40th Street  
PHILADELPHIA, PA., Real Estate Trust Building

### Products.

STEEL LOCKERS.  
Steel Shelving.

### Brief Specification of Standard Lockers.

All sheet metal used is best grade cold rolled U. S. standard gage, free from scale and buckle. Partitions (intermediate sides and ends), tops, shelves and bottoms No. 21 gage. Backs No. 20 gage. Door frames and doors No. 14 gage.

**DOOR FRAMES AND BACKS**—Made from one sheet each, flanged 1-in. on both edges, formed at bottom to provide 6-in. legs.

**SIDES**—Securely bolted to door frame and back.

**TOP MEMBER**—Projects over and locks on to front frame, giving a finish. Flat top is standard.

**BOTTOMS**—Formed without ledges so they can be brushed out easily.

**LOCKING DEVICE**—Operated by rustproof T-handle, engages door frame at three points. So arranged that manipulation of latch is impossible when thrown.

**DOORS**—Type "B-C," 6-louvered openings top and bottom; one piece with steel channel reinforcing; hung to door frame with three solid 2-in. fast pin butts.

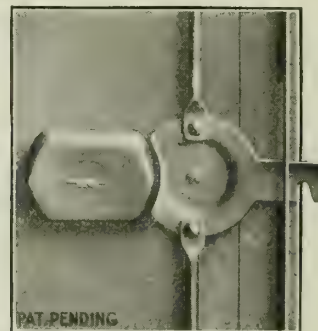
Type "A-C," same as "B-C," except square panel is perforated with  $\frac{5}{8}$ -in. square holes on 1-in. centers.

**EQUIPMENT**—All standard lockers have a solid brass, pin tumbler, paracentric, master-keyed lock, with two keys to each lock; 5000 changes.

This lock is of the highest type used where service and strength are essential factors. Its use as locker equipment is distinctive to H. & H. lockers and is consistent with the quality of the locker itself.



Unlocked position



Locked position

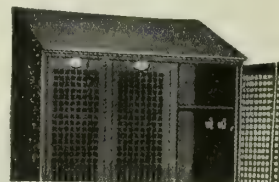
BACK OF DOOR SHOWING LOCK COVER

Each locker has suitable number of 2-prong rustproof hooks of ramshorn design, a towel or coat hanger rod and a solid brass number plate with  $\frac{1}{2}$ -in. numerals etched in black. Single tier lockers have hat shelf 3 ins. below top with rounded front edge. No shelf in double tier.

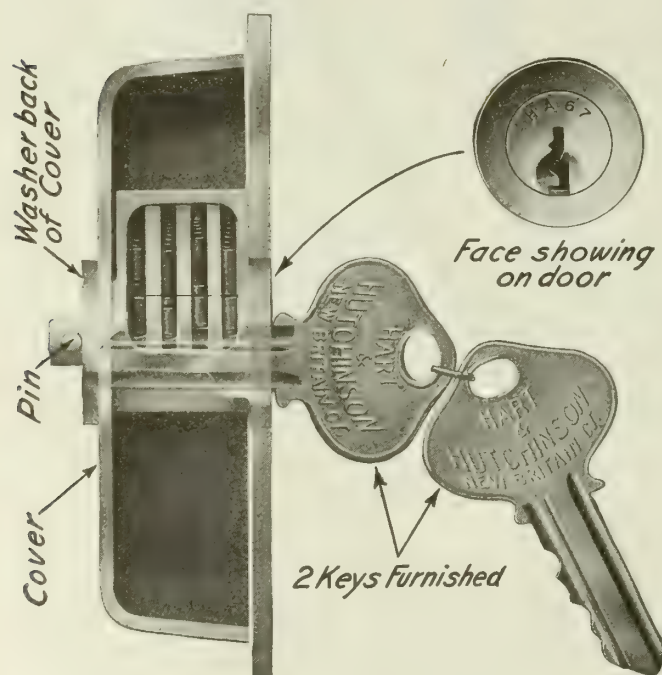
**Optional Equipment**—21° angle sloping tops. Combination and keyless locks or padlock attachment.

Extra shelves for storage.

**FINISH**—Standard olive green or black. Special finishes are produced to suit requirements.



SLOPING TOP



FULL SIZE OF LOCK, SHOWING DETAILS

**SHIPPED**—Knocked down flat, with assembling instructions. Or shipped erected and crated, or erected in place by an efficient corps of trained mechanics.

**SIZES**—Sizes tabulated are carried in stock for prompt shipment.

### References.

A long list of satisfactory installations in practically any locality will be furnished on request.

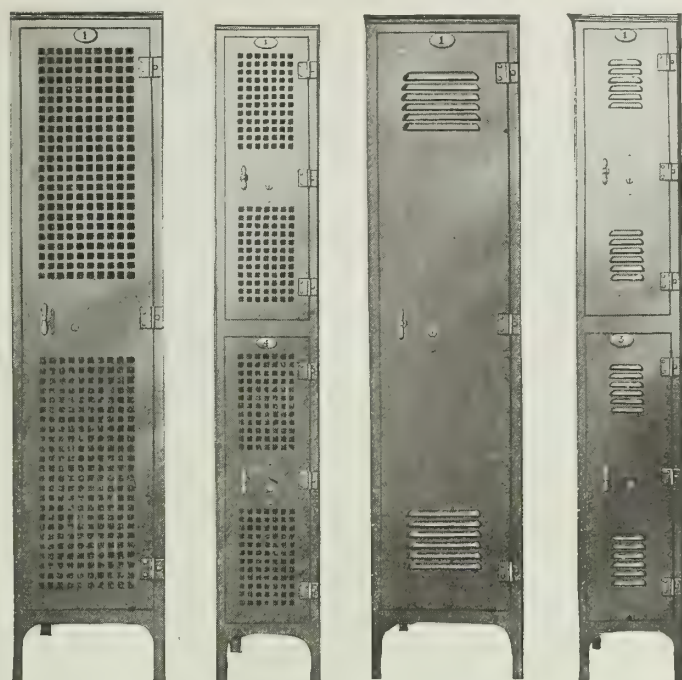
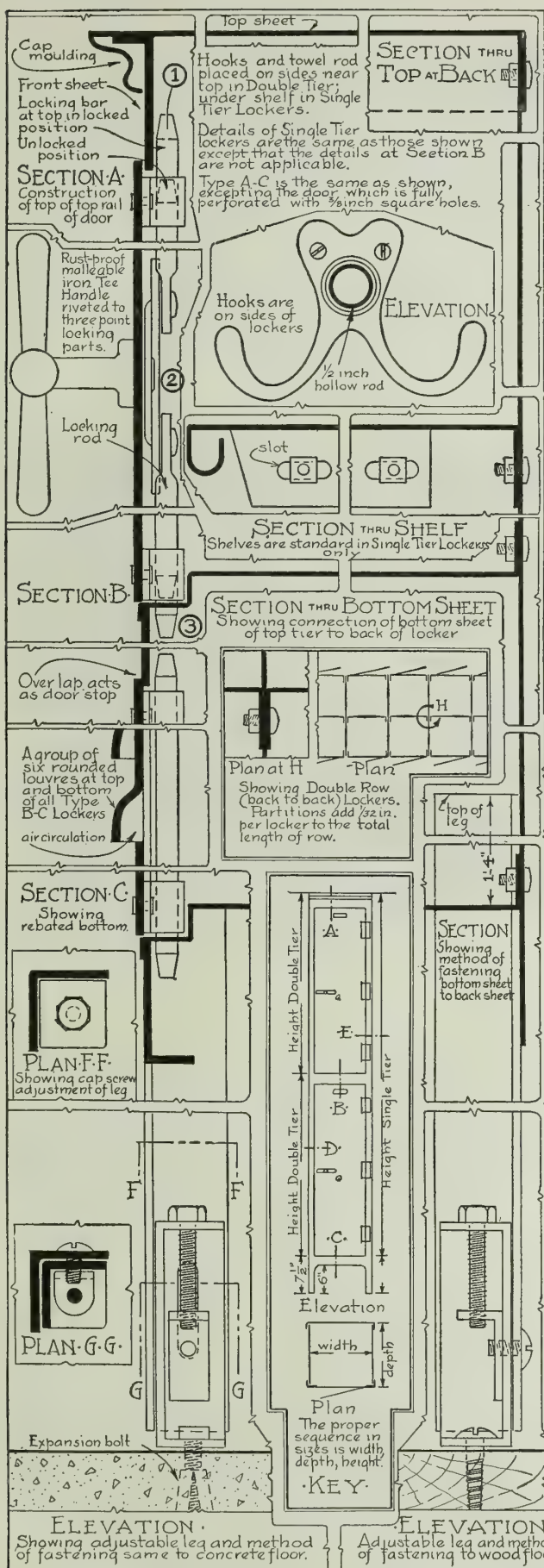
SIZES AND SHIPPING WEIGHTS  
STANDARD LOCKERS

SINGLE TIER			DOUBLE TIER		
Dimensions, ins.	Weight, lbs.		Dimensions, ins.	Weight, lbs.	
W D H			W D H		
12 x 12 x 60	65		12 x 12 x 36	35	
12 x 15 x 60	75		12 x 15 x 36	40	
12 x 18 x 60	75		15 x 12 x 36	45	
15 x 12 x 60	70		15 x 15 x 36	50	
15 x 15 x 60	75		15 x 18 x 36	55	
15 x 18 x 60	80				
18 x 15 x 60	80		12 x 12 x 42	40	
18 x 18 x 60	85		12 x 15 x 42	45	
18 x 24 x 60	95		15 x 12 x 42	50	
24 x 18 x 60	100		15 x 15 x 42	55	
24 x 24 x 60	110		15 x 18 x 42	60	
12 x 12 x 72	75		12 x 12 x 48	50	
12 x 15 x 72	80		12 x 15 x 48	55	
12 x 18 x 72	85		15 x 12 x 48	60	
15 x 12 x 72	85		15 x 15 x 48	65	
15 x 15 x 72	90		15 x 18 x 48	70	
15 x 18 x 72	95				
18 x 15 x 72	95				
18 x 18 x 72	100				
18 x 24 x 72	115				
24 x 18 x 72	125				
24 x 24 x 72	135				

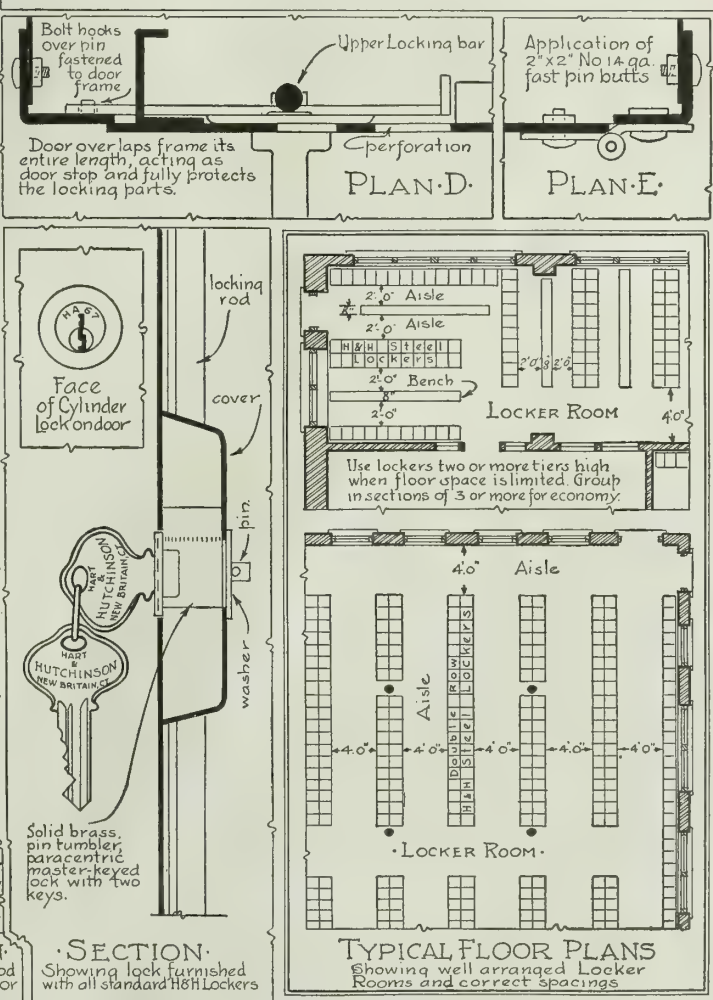
In double tier style each compartment constitutes a locker.

Carried in stock for prompt shipment.





"A-C" Single Tier "A-C" Double Tier "B-C" Single Tier "B-C" Double Tier  
REPRESENTATIVE UNITS, "H & H" STEEL LOCKERS  
Furnished in sections of any number of units



DETAILS OF "H & H" STEEL LOCKERS, TYPES "A-C" AND "B-C" SINGLE AND DOUBLE TIER

FOUNDED 1876

# LIBRARY BUREAU

Manufacturing Distributors of Library, Bank and Office  
Equipment in Steel and Wood

EXECUTIVE OFFICES  
CAMBRIDGE, MASS.

CAMBRIDGE, MASS.	ILION, N. Y.	FACTORIES CHICAGO	NEW YORK	OTTAWA	LONDON
		SALES OFFICES			
BOSTON	NEW YORK	CHICAGO	PHILADELPHIA		

OFFICES IN FORTY LEADING CITIES IN THE UNITED STATES, GREAT BRITAIN AND FRANCE

## Products.

LIBRARY, BANK and OFFICE EQUIPMENT:  
Book Stacks (Steel)—standard bracket type and slotted upright type.  
Newspaper and Folio Shelving.  
Storage Shelving in steel—unit type.  
Book Shelving in wood—unit type.  
Vault Shelving and Fittings in steel.  
Museum Cases of bronze and plate glass.  
Card and Filing Cabinets in wood and steel.  
Filing Systems and Cabinets.  
Book Trucks of wood and steel.  
Card Record Trucks of wood and steel.  
Card Record Desks of wood and steel.  
School Library Equipment.

## Material.

The material principally used is open hearth furniture steel, full cold rolled, reannealed, full pickled to remove all scale, and patent leveled to insure freedom from warp and buckle; steel square tubing, and extruded bronze. Exterior trim of cabinets is of solid cast bronze, natural finish, with baked lacquer. Handle and label holders are interior bolted to the drawer fronts.

All work is finished in several coats of baked enamel, in either plain colors or special hand grained finishes in imitation of any wood. Each coat is properly baked in specially prepared ovens, the final coat being rubbed in pumice and oil to a dull eggshell gloss.



TECHNICAL LIBRARY EQUIPMENT, SCHENLEY HIGH SCHOOL, PITTSBURGH, PA.

## Facilities.

The LIBRARY BUREAU steel factory is completely equipped for the manufacture of library bookstack, bronze and plate glass museum cases, unit steel shelving, steel filing cabinets, and bank and office equipment. The wood working factories are completely equipped for the manufacture of card and filing cabinets, technical library furniture and office equipment.

Catalogues, describing library bookstacks in detail, will be mailed on request.

## Standards of Steel Bookstack for Libraries.

The following standards give general information in planning stack room installations. As individual conditions, however, must to a certain degree govern such arrangements, specific information will in most cases be necessary. This organization is pleased to consult with architects and librarians and offers the services of an experienced representative. This service will be rendered without charge or obligation.

Single story standard bracket stack is made 7 ft. 6 ins. high; multistory stack 7 ft. 6 ins. from floor to floor; double faced ranges with 8-in. shelves are 17 ins. face to face; wall ranges with 8-in. shelves are 10¼ ins. from front of shelf to wall. The standard length for shelves is 3 ft. on centers. The standard shelf depths



LIBRARY BUREAU MULTISTORY STANDARD BRACKET STACK, STACK ROOM, PRINCETON UNIVERSITY LIBRARY



are approximately 8, 10, and 12 ins.; the 8-in. depth being regularly furnished as standard.

The width of the main and range aisles of a stack room are controlled somewhat by existing conditions. For open stack rooms, the ranges are ordinarily set 4 ft. 6 ins. apart on centers, giving a range aisle of approximately 3 ft. Range aisles may be as narrow as 2 ft. 6 ins.; but this is not advisable where the stack room is in general use. Main aisles should be 3 ft. 6 ins. wide if possible, and not less than 3 ft.

### Shelf Capacity.

In figuring the amount of shelving required to accommodate a certain number of volumes, the following schedule will be of assistance:

	Volumes per shelf ft.	Volumes per 3-ft. double faced section
Fiction .....	9	378
General literature.....	8	336
Reference books.....	7	294
Law books.....	5	210

### Co-operative Service.

LIBRARY BUREAU offers to all architects its service, based on over 40 years' experience in furnishing equipment for banks, insurance companies, public service buildings and commercial houses. Special representatives will co-operate in planning the interior equipment for such buildings.

### Catalogues, Booklets and Prints.

Steel Bookstack.  
Library Supplies.  
Unit Wood Book Shelving.  
Museum Cases.  
Charging Desks.  
Unit Steel Storage Shelving.  
Card and Filing Cabinets in Wood.  
Card and Filing Cabinets in Steel.  
Unit Book Cases.  
School Libraries.  
Library, Bank and Office Furniture.  
Any of the above sent on request.

### References.

A partial list of installations of Library Bureau bookstack:

BUILDING	ARCHITECT
University of California	John Galen Howard
University of Chicago	
Harper Memorial Library	Shepley, Rutan & Coolidge
Geology and Geography Building	Holabird & Roche
New Haven County Law Library	Allen & Williams
Illinois State Library	W. Carlys Zimmerman
Bates College Library, Maine	Herts & Tallant
Newton Free Library, Mass.	Lewis H. Bacon
Smith College Library, Mass.	Lord & Hewlett
Worcester Free Library, Mass.	Earle & Fisher
Chelsea Public Library, Mass.	Guy Lowell & Edward Tilton
John Hay Memorial Library, R. I.	Shepley, Rutan & Coolidge
Clark University Library	Frost, Briggs and Chamberlin
Deborah Cook Sayles Library, R. I.	Cram, Goodhue & Ferguson
Peoples Library, R. I.	Clarke, Howe & Homer
St. Louis Public Library, Mo.	Cass Gilbert
Plainfield Public Library, N. J.	Wilder & White
Charleston Public Library, S. C.	McGoodwin & Hawley
Wentworth Memorial Library	Coolidge & Carlson
N. H. College of Agriculture	George Totten
Trenton Public Library, N. J.	E. L. Tilton
Syracuse University Library, N. Y.	Revels & Hollenbeck
Buffalo Public Library, N. Y.	Eisenwein & Johnson
American Institute, New York, N. Y.	
City Public Library, Mexico, F. D.	
Oswaldo Cruz Institute and Library, Rio Janeiro, Brazil	
Waltham Public Library, Mass.	Loring & Leland
Tufts College Library, Mass.	
St. John's Boston Ecclesiastical Seminary, Mass.	Maginnis & Walsh
Harvard University, Medical Library, Mass.	Shepley, Rutan & Coolidge
Colby College Library, Maine	
Massachusetts General Hospital	Coolidge & Shattuck
Central Library, Indianapolis, Ind.	Paul P. Cret and Zantzinger, Borie & Medany
Boston Public Library	Joseph McGinnis
Forbes Library, Northampton, Mass.	
Princeton University Library	



DELIVERY HALL, CARPENTER MEMORIAL LIBRARY BUILDING, MANCHESTER, N. H.  
View of specially designed delivery desk and card catalogue cases



LIBRARY BUREAU STANDARD BRONZE FRAME MUSEUM CASES, WADSWORTH ATHENAEUM AND MORGAN MEMORIAL, HARTFORD, CONN.  
Showing general type of case used throughout the library

# LYON METALLIC MFG. CO.

## Manufacturers of Steel Shelving and Steel Lockers

### AURORA, ILL.

CHICAGO OFFICE, 835 Peoples Gas Building  
NEW YORK OFFICE, 467 Hudson Terminal Building  
DETROIT OFFICE, 812 Penobscot Building

CINCINNATI OFFICE, 2305 Union Central Building  
PITTSBURGH OFFICE, 629 Oliver Building

#### Products.

LYON ADJUSTABLE and EXTENSIBLE STEEL SHELVING and STORAGE RACKS; STEEL LOCKERS.

Steel Cabinets, including Blue Print and Stationery Cabinets; Steel Boxes, Barrels, Tool Boxes and Bench Drawers; Steel Benches and Tables; Steel Factory Desks, and Steel Enclosure Panels.

#### Standardization of Shelving and Racks.

Lyon shelving and racks are thoroughly standardized in every particular. All parts and attachments are interchangeable, reversible and adjustable, and racks are easily rearranged to meet changing conditions.

Every type of shelving, such as the "Open" or "Skeleton" Type, and the "Closed" Type, is assembled from the same standard parts, no special construction being needed for any style.

#### Suggestions for the Use of Lyon Shelving.

The following suggestions for the use of both Lyon Standard and Commercial Shelving, a lighter type of shelving than the Standard, are the results of 15 years' experience in the solving of shelving and storage problems to meet practically every requirement.

The Sales Engineering Department is ready at all times to go into details, make a study of conditions, work out complete plans and designs, and furnish estimates without charge.

**LYON STANDARD SHELVING FOR HEAVY LOAD SERVICE**—Built on the principle of putting shelves under compression. Each shelf is placed on two  $\frac{7}{8}$ -in. diameter rods which are threaded at one end and tapped at the other. Threaded ends of these rods pass through upright face strips into tapped ends of next rods, rods shouldering against face strips, so that when drawn up, the shelf is put under compression. Thus every shelf adds to rigidity of rack.

Lyon shelving will support heavier loads per weight of metal used than any other design of rack made. Standard shelves will support from 200 to 350 lbs. per sq. ft., depending upon area, with ample factor of safety.

**Uses for Standard Open or Skeleton Type**—For metal pattern storage in foundries; in wholesale hardware houses, machinists' supply houses, etc., for material and heavy packages which pile or stack; for paper stock and the like in printing establishments, binderies, etc.; in factories, warehouses, etc., for storage of heavy package goods and supplies not requiring bins or pockets.

**Uses for Standard Closed Type**—In stockrooms, public service corporation shops, warehouses, tool rooms, supply houses, machine shops, etc., for quantities of bulk material requiring bins and pockets.

**LYON COMMERCIAL SHELVING FOR ORDINARY LOAD SERVICE**—Consists primarily of three members—the uprights, the shelves, and the shelf supporting clips. The shelves are adjustable and interchangeable, and may be adjusted on  $1\frac{1}{2}$ -in. centers. It is easily and quickly erected and adjusted—a screwdriver being the only tool required.



#### SIZES OF LYON STANDARD RACK PARTS

**PART NO. 1. UPRIGHT PARTITIONS**  
Heights. 48"-54"-60"-66"-72"-78"-84"-90"-96"-102"-108"-114"-120"  
126"-132"-144"-156"-168"  
180" 192" 216"-240"  
Depths. 12"-15"-18"-24"-30"-36"-42"-48"

**PART NO. 18. SKELETON UPRIGHTS**  
Same as Upright Partitions

**PART NO. 2. SHELVES**  
Widths. 18"-24"-30"-36"-42"-48"  
Depths. 12"-15"-18"-24"-30"-36"-42"-48"

**PART NO. 34. BACKS**  
Heights. Same as Upright Partitions  
Widths. 18"-24"-30"-36"-42"-48"

**PART NO. 4. CROSSWISE DIVIDERS**  
Heights. 5"-8"-11"-14"-17"-20"-23"  
Depths. 12"-15"-18"-24"-30"-36"-42"-48"

**PART NO. 42. LENGTHWISE DIVIDERS**  
Heights. 5"-8"-11"-14"-17"-20"-23"  
Widths. 18"-24"-30"-36"-42"-48"

**PART NO. 5. BIN FRONTS**  
Heights. 2" 3"-4"-5"-6"-8"  
Widths. 18"-24"-30"-36"-42"-48"

**PART NO. 8. HALF SHELVES**  
Widths. 18"-24"-30"-36"-42"-48"  
Depths. 12"-15"-18"-24"

**PART NO. 7. DIVIDING BACKS**  
Heights. 48"-54"-60"-66"-72"-78"-84"-90"-96"-102"-108"-114"-120"  
Widths. 18"-24"-30"-36"-42"-48"

**PART NO. 15. LABEL HOLDERS**  
Heights.  $\frac{7}{8}$ "-2"  
Widths. 18"-24"-30"-36"-42"-48"

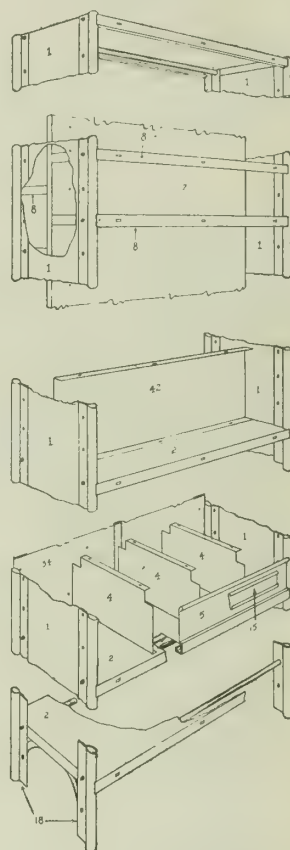
#### Uses for Commercial Open or Skeleton Type

—In wholesale drug houses, mercantile establishments, wholesale groceries, stationery houses, etc., for package goods, general merchandise, etc., not requiring bins or pockets; for display purposes in hardware stores, garages, retail supply houses, etc.; for wood pattern storage in foundries, etc.

**Uses for Commercial Closed Type**—In repair shops, garages, retail hardware stores, etc., where small quantities of bulk material, such as supplies, repairs, light hardware, etc., requiring bins, pockets, etc., are kept.

#### A Partial List of Lyon Shelving Installations, Each Amounting to More than \$20,000.00.

American Can Co., various Plants  
American Locomotive Co., Providence, R. I.  
Anheuser Busch Brewing Association, St. Louis, Mo.  
Bethlehem Steel Co., South Bethlehem, Pa.  
Bosch Magneto Co., Springfield, Mass.  
Boston Store, Chicago, Ill.  
City of New York  
Chicago Telephone Co., Chicago, Ill., various Divisions  
Dayton Engineering Laboratories, Dayton, Ohio  
Eastman Kodak Co., Rochester, N. Y.  
Fisk Rubber Co., Chicopee Falls, Mass., and Milwaukee, Wis.  
Ford Motor Co., Detroit, Mich.  
General Electric Co., various Plants and Branches  
General Motors Co., various Divisions  
General Vehicle Co., Long Island City, N. Y.  
Goodyear Tire & Rubber Co., Akron, Ohio, and Branches  
International Harvester Co., various Plants and Branches  
International Silver Co., various Plants and Branches



CONSTRUCTIVE VIEW, LYON STANDARD RACK PARTS



**Features of Lyon Standard Steel Locker.**

(1) Door opening always true and square; reinforced welded one-piece door frame.

(2) Gravity actuated locking device; a single forward pull operates locking device and opens door; engages automatically by merely pushing door shut; simple, strong, secure.

(3) All corner joints have double overlapping flanges.

(4) Back legs strengthen and stiffen entire locker base.

(5) Overlapping flanges at door corners.

(6) Door will always shut and latch properly.

(7) Impossible to pry door open; three locking fingers and three door jambs interlock.

(8) Locker door, because of rigid reinforcing, will not get out of alignment.

(9) Hinge can not be forced; securely riveted and bolted in position.

**SPECIFICATIONS AND EQUIPMENT—****DOOR AND DOOR FRAME**

**Construction**—Full pickled, cold rolled furniture steel .0375 in. thick. Double folding both edges of door sheet, to form the tubular reinforcement, provides double thickness of metal where hinges, locking device, lock and handle are attached. Tubular reinforcement, as shown in illustration.

Upright member  $1 \times 1 \times \frac{1}{8}$  in. hard steel angles. Horizontal member  $1\frac{1}{2} \times \frac{3}{4} \times \frac{5}{16}$  in. steel channels. All joints are butt-welded and lap-welded.

**Hinges**—Double butt hinge riveted to door frame and bolted to door. Number of hinges to be determined by height of door as follows:

72 ins. high, 4 hinges	42 ins. high, 2 hinges
60 ins. high, 3 hinges	36 ins. high, 2 hinges

**Locking Device**—Gravity actuated, controlled by special pivot handle and locked with either flat key, master-keyed Yale & Towne lock, or ordinary padlock. Number of locking points to be determined by height of door as follows:

72 ins. high, 3 locking points	42 ins. high, 2 locking points
60 ins. high, 3 locking points	36 ins. high, 2 locking points

**Ventilation**—By means of either "louver" or "standard" ( $\frac{1}{2}$  in. round hole) perforations in doors. "Half" perforation as shown, or "full" perforated doors (perforations full length).

**BODY**

**Backs and Sides**—Full pickled, cold rolled steel .025 in. thick, flanged four sides. Reversible and interchangeable with others of same size.

**Top**—Full pickled, cold rolled steel .025 in. thick. Either flat or sloping. Flat tops and bottoms of same sizes are interchangeable.

**Bottom**—Full pickled, cold rolled steel .025 in. thick. Bottom is offset to fit inside and flush with top of cross channel of door frame. Bottoms are interchangeable with others of same size. Bottoms and flat tops of same sizes are interchangeable.

**Legs**— $1 \times 1 \times \frac{1}{8}$  in. hard steel angle, 6 ins. long; adjustable; have feet punched for securing to floor.

**HAT SHELF**

In single tier lockers only, placed  $9\frac{1}{2}$  ins. from top in 72-in. lockers and 8 ins. from top in 60-in. lockers.

**HOOKS**

All lockers have 1 double prong ceiling hook. Lockers 12 ins. wide to have 1 single prong hook on back and 1 on each side. Lockers over 12 ins. wide to have 2 single prong hooks on back and 1 on each side.

**FINISH**

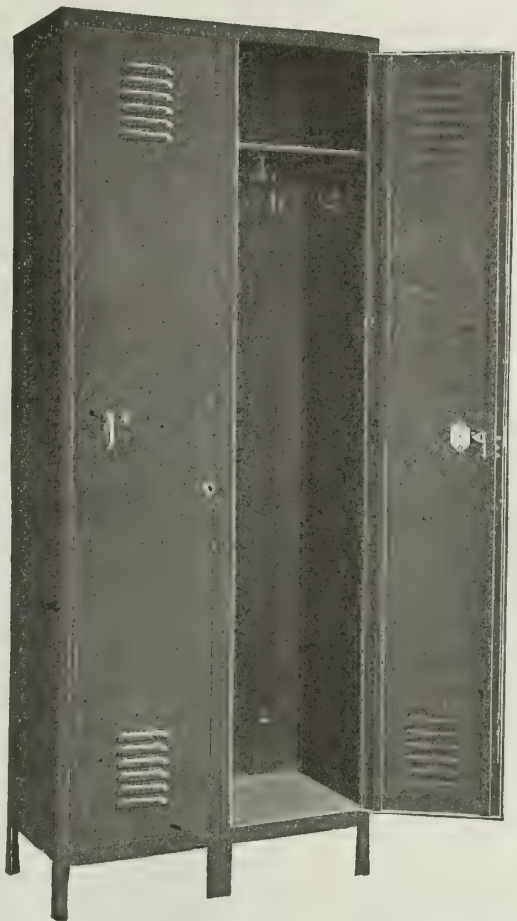
Two coats of olive green or black enamel baked on at a temperature to secure maximum toughness and durability.

**NUMBERING**

Each locker to be numbered by means of an etched aluminum plate with black enameled sunken figures.

**METHOD OF SHIPMENT**—Lockers are shipped either set up or knocked down as may be the most economical according to existing conditions and quantity required. Quotations on the complete installation delivered and erected in position, ready for use, when desired.

**SPECIAL SIZES**—While we make special sizes of lockers to meet certain particular requirements, their use

**LYON STANDARD STEEL LOCKER**

One section of two lockers, single tier, single row

**STANDARD SIZES**

SINGLE TIER			DOUBLE TIER		
Depth	Width	Height	Depth	Width	Height
12 ins.	12 ins.	60 ins.	12 ins.	12 ins.	36 ins.
15 ins.	15 ins.	72 ins.	15 ins.	15 ins.	42 ins.
18 ins.	18 ins.		18 ins.	18 ins.	
24 ins.	24 ins.				

Height does not include 6-in. legs.

Any combination of the above sizes makes up a Standard Locker.

is not recommended unless absolutely necessary, on account of the cost being invariably higher than that of standard sized lockers.

Better service and lower prices can be given on standard sized lockers, because they are made in large quantities and our stock is maintained, as nearly as possible, to take care of practically all requirements.

**INFORMATION FOR PRICES**—Locker prices are based on quantity, size and arrangement. As these factors vary with every installation, complete information of the installation desired should be furnished so that we may quote lowest prices f.o.b. destination.

If the requirements are not definitely determined upon, the approximate quantity, sizes and sectionizing may be submitted, or, on receipt of information as to the department to be equipped, our engineering department will make suggestions as to the arrangement of the lockers, the size required, interior fittings, etc., basing their suggestions on 15 years' experience in this line. Please advise on the following:

- (1) Quantity.
- (2) Size.
- (3) Arrangement: Single row (wall lockers); double row (back to back).
- (4) Sectionizing. Number of lockers or openings to each section in the above arrangement.
- (5) Furnish sketch of floor plan if possible.

# MANUFACTURING EQUIPMENT & ENGINEERING CO.

## Metal Lockers and Shelving

136 Federal Street  
BOSTON, MASS.

WORKS AND MAIL ADDRESS, FRAMINGHAM, MASS.

### Products.

METAL LOCKERS, STOCK and STORAGE RACKS, SHELVING, VAULT FIXTURES, BINS.

Steel Stools and Chairs with Inset Wood Seats; Drawing Stands.

For Washbowls and Bubbling Fountains see page 847.

### Metal Clothes Lockers, Cabinets, etc.

Standard types to any specification desired; knocked down or erected in place.

SIZES — Some common standards:

SINGLE TIER	DOUBLE TIER
12" x 12" x 6"	12" x 12" x 36"
12" x 15" x 72"	12" x 12" x 42"
15" x 15" x 72"	12" x 15" x 36"
15" x 18" x 72"	12" x 15" x 42"
20" x 24" x 72"	
20" x 24" x 78"	

### Special Lockers.

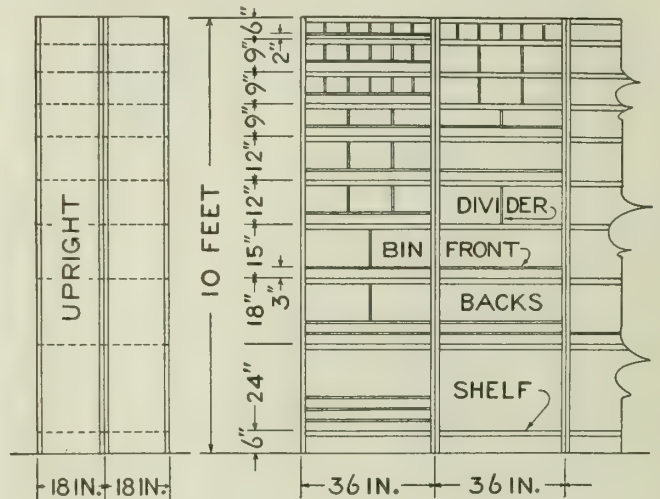
For armories, railroads and school buildings.



FIG. 201. SINGLE TIER LOCKER, LOUVERED PANEL



FIG. 206. SINGLE TIER LOCKER, EXPANDED METAL PANEL



DETAILS OF UNIT RACKS AND SHELVES

### Metal Shelving.

Stock and pattern storage racks, shelving, vault fixtures, blue print cabinets and other metal specialties made to meet all requirements.

### Inquiries.

When writing for quotations the following information should be given:

- (1) Space to be used.
- (2) Articles to be stored.
- (3) Weight to be carried per shelf foot.
- (4) Whether to be used from one or both sides.
- (5) A rough sketch showing special arrangement required.

### References.

Pratt & Whitney, Providence, R. I.  
Yale & Towne, Stamford, Conn.  
Boston & Maine Railroad, Boston, Mass.  
Fore River Shipbuilding Corporation, Quincy, Mass.



TYPICAL INSTALLATIONS OF METAL SHELVING RACKS AND BINS



METAL FURNITURE



ESTABLISHED 1873

**FRED MEDART MFG. CO.**

Manufacturers of Steel Lockers and Shelving

Potomac and DeKalb Streets  
ST. LOUIS, MO.**Products.**

MEDART STEEL LOCKERS; STEEL SHELVING and RACKS; GYMNASIUM and PLAYGROUND APPARATUS.

**Steel Lockers.**

In the selection of steel lockers it is important to consider the mechanical features and structural details as well as the size, equipment and finish.

A common fault frequently found in lockers of heavy angle iron construction with light sheet metal bodies is lack of rigidity. The heavy angle in many types now on the market is built to carry *unnecessarily large loads* while the sheet, being too light to insure rigidity, tends to wind and buckle, throwing units out of plumb and interfering with the proper operation of the locking devices.

Light sheet metal doors reinforced with heavy angle frame (not of necessity rigid) increase the weight at the most undesirable place, the front of the locker, making it liable to fall toward the front unless securely fastened to the floor.

**Medart Steel Lockers.**

Medart lockers (Fig. 1) are built on the principle of using correct materials, weights and reinforcements to obtain the best results, and the use of heavy angle construction is avoided, excepting for the back of the locker where the sheets are electrically welded to the angle iron frame and where the load is imposed. Heavy sheets of steel are used in the body and doors, formed to give the best results for strength and rigidity and for the perfect balancing of the unit.

That Medart lockers are made for service is evidenced by the finish which consists of *two coats* of baked enamel (after an acid bath) hard to distinguish from one coat work when installed but shows a marked difference after a few years service.

**Specification Data for Lockers.**

**GAUGES OF METAL**—Door and frame No. 16 U. S. gauge, pickled, rerolled and leveled sheet steel. Balance of locker No. 22 gauge. Back  $\frac{3}{4}$  by  $\frac{3}{4}$  by  $\frac{1}{8}$  in. angle iron frame electrically welded to sheet.

**DOOR FRAMES**—Door frames formed with rounded edges, oxy-acetylene welded, ground smooth, with joints invisible, forming a one-piece frame.

**DOORS**—Doors are flanged and beaded for rigidity, corners electrically welded. Single tier doors hang on three heavy hinges, double tier doors on two heavy hinges.

**LOCKING DEVICE**—All doors equipped with noiseless 3-point locking device (patented) controlled by rotating handle, arranged for padlocks when wanted.

**VENTILATION**—Two styles, louvered or perforated.

**LEGS**—Screw adjustable legs. Bottom of locker 7 ins. above floor, giving a clearance of  $4\frac{1}{2}$  ins. between bottom of cross piece and floor. Cabinet base, without extra charge.

**FINISH**—Olive green or black enamel. All parts given two coats of enamel, both baked on, after an acid bath.

**EQUIPMENT**—3 double prong coat hooks for single and double tier lockers up to 15 ins. in width or depth. Lockers of greater width or depth have one additional ceiling hook for coat hanger. Single tier lockers provided with hat shelf 9 ins. from top of locker. All lockers have brass number plates.

**ARRANGEMENTS**—As desired.

**INSTALLATION OF EQUIPMENT**—We install lockers when desired.

**SHIPMENT**—Lockers are shipped knocked down. Parts fit

accurately and are easily bolted together. Outside bolts are flat head, unslotted. All bolts and nuts are electro-galvanized.

**STANDARD SIZES OF LOCKERS**

**DOUBLE TIER**  
36" or 42" high  
12" wide x 12" deep  
12" wide x 15" deep  
15" wide x 12" deep  
15" wide x 15" deep  
15" wide x 18" deep

**SINGLE TIER**  
60" or 72" high  
12" wide x 12" deep  
12" wide x 15" deep  
12" wide x 18" deep  
15" wide x 12" deep  
15" wide x 15" deep  
15" wide x 18" deep  
18" wide x 15" deep  
18" wide x 18" deep  
18" wide x 24" deep  
24" wide x 18" deep

Heights specified do not include legs.



FIG. 1. MEDART STEEL LOCKERS

**Medart Steel Shelving.**

Shelving and racks (Fig. 2), constructed on the principle of rigidity and carrying capacity, are made to suit individual requirements. Complete plans and specifications furnished on request.

Main divisions for the units are spaced to fit the conditions desired; adjustable shelves and dividers are spaced for the proper size of compartments; card holders and bin fronts are attached as wanted; counter added, and in fact practically any arrangement can be produced for convenience, strength and economy of space.

This shelving is so constructed and contrived that the taking down and rearrangement to meet new requirements are simple operations that can be easily performed by any ordinary mechanic.



FIG. 2. MEDART STEEL SHELVING

**Gymnasium and Playground Outfits.**

Our book for architects, "The Planning of a Gymnasium," with Catalogue K, descriptive of gymnastic apparatus, and Catalogue W, descriptive of playground apparatus, will be sent on request.

**Co-operative Service.**

Our Engineering Department is at the disposal of architects and their clients, and information given is accurate and reliable.



FOUNDED IN 1849

# THE SNEAD & CO. IRON WORKS, INC.

## Manufacturers of Metal Bookstacks and Shelving

MAIN OFFICE AND WORKS

TELEPHONES:

RECTOR 5097, NEW YORK CITY  
BERGEN 1185-1186, JERSEY CITY94 Pine Street  
JERSEY CITY, N. J.

CABLE ADDRESS:

"SNEAD, JERSEY CITY"

BRANCH OFFICE, TORONTO, CANADA

### Products.

Sole makers of the SNEAD STANDARD STACK, GREEN-SNEAD BOOKSTACK, SNEAD NEWSPAPER STACK, BRACKET BOOKSTACKS, METAL SHELVING for all purposes, METAL and GLASS MUSEUM CASES and EXHIBIT EQUIPMENT.

Iron Castings, Floor Plates, Trench Covers, "Macdonald Roller Ramming Moulding Machines," Pattern Drawing Machines.

### Facilities.

THE SNEAD & CO. IRON WORKS, INC., is the pioneer manufacturer of library bookstacks. Experienced stack designers are at the service of architects planning stack installations. Catalogue of bookstack and library construction giving many plans and illustrations of libraries sent on request; technical information also furnished free.

### Description of Snead Standard Stack.

The Snead standard stack is installed throughout the Library of Congress at Washington and the New York Public Library. The simple construction fits it for use not only in large but also in smaller libraries with but a single or a few stack tiers (stories), and for offices and private libraries requiring only plain wall shelving. The interchangeability of parts and adaptable construction allow the stack, in case of remodeling, to be reset and extended both horizontally and vertically. Stack consists of solid or openwork cast iron and steel uprights extending full width of ranges, and spaced shelf length apart by fixed shelves at top and bottom. The adjustable shelves may be of the ordinary solid plate type, or preferably of the special open bar construction, light, strong, resilient, and with dust collecting surfaces reduced to a minimum. Uprights are each the height of one tier, and may be bolted one above the other to obtain a stack of any number of stories.



SNEAD STANDARD STACK

16-in. double faced range with removable cornice. Designed to receive future second tier. Similar single faced wall ranges of any size required also supplied

The uprights (  ) in section) oc-

cupy no available book room, and have no space wasting, dirt and rust collecting hollow members. Deck floors or galleries between tiers give direct access to all shelves. The distance between the main floors of the building should be an even multiple of the stack tier height (preferably 7 ft. or 7 ft. 6 in.), so as to line up the main building floors with stack deck floors. The deck floor construction is carried by the uprights and firmly anchored to the walls of the stack room. Floors of rooms above (without concentrated loads) are economically carried on stack construction. Cover plates at top protect books from dust and injury, and cornice gives a neat finish. Openwork construction of uprights and shelves, and slits in the deck floors, allow stack to be heated and ventilated as one room. The system can be adapted to meet any requirement of architecturally planned design.

Adjustable shelves are completely finished at shop with baked rubber japan. Fixed metal parts are preferably finished after erection with air drying enamel; baked enamel is unsuitable, as it can not be renewed in place. Maximum distribution of light is obtained by using openwork construction where possible, and finishing fixed parts in white, which avoids the cheerless "shut-in" effect common to ordinary stack rooms.



PERSPECTIVE DETAIL OF SNEAD STANDARD STACK, WITH WIDE FIXED BOTTOM SHELVES AND PROTECTED DECK SLIT





SNEAD STANDARD STACK, NEW YORK PUBLIC LIBRARY,  
PATENTS ROOM  
CARRERE & HASTINGS, Architects

### Prices.

Cost of stacks depends largely upon arrangement and quantity. Specifications, drawings and estimates furnished free on request. Bookstacks are built on contract. Four or five months should be allowed ordinarily for the completion of a stack of about 100,000 volumes' capacity.

#### BOOK CAPACITIES

Average per lineal foot of shelf

U. S. Patent Specifications	2 volumes
Law, public documents, bound periodicals	6 volumes
Medicine and science	7 volumes
Reference and general literature	8 volumes
Economics and fiction	9 volumes
Circulating books	9 to 10 volumes

#### STANDARD STACK DIMENSIONS

Special sizes built to order if quantity warrants

Shelf widths—For books, 8, 9, 10 and 12 ins.; newspapers, 18 and 22 ins.

Shelf lengths—3 ft. usual—varied to suit conditions

Tier heights—7 ft. and 7 ft. 6 ins.

Aisle widths—Main, 2 ft. 6 ins. to 5 ft.; minor, about 28 ins. minimum; 30 to 36 ins. average.

#### STANDARD STACK WEIGHTS

Uprights and shelves	7 to 10 lbs. per cu. ft. of range
Books	20 to 25 lbs. per cu. ft. of range
Deck framing	5 lbs. per sq. ft.
Deck flooring, 3/4-in. glass	10 lbs. per sq. ft.
Deck flooring, 1 1/4-in. marble	18 lbs. per sq. ft.



SNEAD STANDARD STACK, WIDENER MEMORIAL LIBRARY,  
HARVARD UNIVERSITY  
HORACE TRUMBAUER, Architect

### Metal Shelving.

Our products cover shelving for special requirements and conditions, and for all purposes where fire-proof storage convenience and durability are essential.

### Exhibit Cases and Museum Equipment.

Built from stock, or special designs, of steel or bronze and glass. Sizes and devices to meet architects' requirements. Our designs embody the modern principle of providing maximum glass area by making structural members substantial and compact. Special attention given to making cases dustproof and insect-proof and to attaining a graceful architectural appearance. Types include sloping top, flat top or upright cases, with solid or sanitary base, hinged or sliding doors, removable panels or lids. Write for particulars.



SNEAD STEEL TREASURE ROOM CASES, WIDENER MEMORIAL  
LIBRARY, HARVARD UNIVERSITY  
HORACE TRUMBAUER, Architect

### Typical Bookstack Installations.

BUILDING	ARCHITECT
Library of Congress	E. P. Casey, B. R. Green, Eng.
New York Public Library	Carrere & Hastings
Amherst College Library	McKim, Mead & White
Notre Dame University	Edward L. Tilton
Wisconsin State Capitol	George B. Post & Sons
Arkansas State Capitol	Cass Gilbert
Portland Public Library	Doyle, Patterson & Beach
Ohio State University Library	Allen & Collins
Brookline Public Library	R. Clipston Sturgis
Phila. College of Physicians	Cope & Stewardson
University of Chicago Library	Shepley, Rutan & Coolidge
Denver Public Library	Albert R. Ross
Michigan University Library	Albert Kahn
New Hampshire Hist. Society	Guy Lowell
Boston Athenæum	Bigelow & Wadsworth
Johns Hopkins Univ. Library	Parker, Thomas & Rice
Am. Museum, Natural History	Trowbridge & Livingston
Sage Foundation Building	Grosvenor Atterbury
St. Paul Public Library	Electus D. Litchfield
San Francisco Public Library	Geo. W. Kelham
Sacramento Public Library	Loring P. Rixford
Montreal Public Library	Eugene Payette
Mass. Institute of Technology	William Wells Bosworth
Maryland Hist. Society	Wyatt & Nolting
Hill Memorial Library	Electus D. Litchfield
Vermont State Library	Densmore & Le Clear
Ontario Legislative Library	Geo. W. Gouinlock
British Columbia Prov. Library	F. M. Rattenbury



# TERRELL'S EQUIPMENT CO.

Manufacturers of Sectional Steel Shelving and Lockers  
GRAND RAPIDS, MICH.

## REPRESENTATIVES

NEW YORK, N. Y., TERRELL'S EQUIPMENT Co., 395 Broadway  
ATLANTA, GA., J. M. VAN HARLINGEN, Candler Building  
PITTSBURGH, PA., SIMONS, BRITAIN & ENGLISH, 1703 Oliver Building  
PHILADELPHIA, PA., PHILADELPHIA METAL FURNITURE Co., Ninth and Sansom Streets

BUFFALO, N. Y., THE NEAL COMPANY, 75 Builders Exchange  
SAN FRANCISCO, CAL., C. F. WEBER & Co., 365 Market Street  
LOS ANGELES, CAL., C. F. WEBER & Co., 222-24 South Los Angeles Street  
PORTLAND, ORE., NORTHWEST SCHOOL FURNITURE Co., 244 Third Street

## Products.

STEEL SHELVING, RACKS and BINS for stockroom equipment in factories, warehouses, stores, etc.; LOCKERS; WARDROBES; CUPBOARDS.

## Terrell's Steel Shelving.

Built on the unit principle. Length of each unit is measured by length of shelves between uprights. All parts standardized and interchangeable.

FLEXIBLE FEATURES—(1) Shelves in each unit can be raised or lowered without disturbing contents of adjoining units. (2) Shelves can be adjusted at back of uprights, without use of bolts, and back edge of shelves is fastened to back by rows of extruding catches in the latter.

OTHER ADVANTAGES—Steel shelves occupy less space than wood shelves; never wear out; need no repairs; are not breakable or inflammable; easily adjustable.

FINISH—Standard finish is black enamel *baked on the metal*; also, olive green.

STANDARD SIZES—*Uprights*—Height, from 3 to 12 ft.; depth, 12, 15, 18, 24, 30 and 36 ins.

*Shelves*—Depth, 12, 15, 18, 24, 30 and 36 ins.; length, 24, 30, 36 and 40 ins.

WHEN ORDERING—Send rough sketch showing elevation and depth of shelving, total length of sections and quantity of shelves per unit.

SHIPMENT AND ERECTION—All shelving is shipped in knocked down form, packed flat. All necessary bolts and fittings supplied. No special tools necessary for erection, which can be performed by any ordinary workman.



TYPICAL INSTALLATION OF SECTIONAL STEEL SHELVING



TYPICAL INSTALLATION OF STEEL SHELVING



CASE CRI-L

Assembly combining regular standard cupboards and open type shelving as shown in illustration type CRI



STEEL SHELVING, TYPE CRI

Elaborate construction, intended for use in offices, vaults, libraries, etc. The shelves are adjusted, without bolts, on 1-in. centers



## Terrell's Steel Lockers.

**MATERIAL SPECIFICATIONS OF LOCKERS**—All lockers are built on the unit principle.

**Frames**—The supporting frames are made of special drawn steel angles 1 by 1 in. of not less than No. 14-gage U. S. S. steel. The corners are mitered and acetylene-welded.

**Bodies**—High grade steel and smooth surface of not less than No. 24-gage U. S. S. or No. 22-gage B. & S. S.

**Ends**—Reinforced with two strips of No. 20-gage steel welded inside of panel.

**Tops and Bottoms**—Reinforced with flanges on all sides.

**Backs**—The backs have a flange on all sides.

**Doors**—No. 18-gage U. S. S. or No. 16-gage B. & S. S. high grade steel with smooth surface. Reinforced with special channels drawn from smooth strip steel. Panels are welded to the frames.

**STANDARD EQUIPMENT**—**Locks**—The following types can be furnished: (1) master-keyed flat key locks; (2) combination keyless locks; (3) master-keyed padlock or padlock attachment without locks.

**Locking Device**—All doors fitted with 3-way locking device which is operated by the door handle.

**Hat Shelf**—In the 60-in. and 72-in. lockers. Rounded edge across front, and flanged at both sides and rear.

**Hooks**—Three 2-prong steel hooks, enameled.

**Number Plates**—Made of brass with etched figures arranged in serial numbers.

**Hinges**—Bright wrought steel hinges for each door, size 2 ins., with a tight pin  $\frac{3}{16}$  in. in diameter fastened so that the hub only is exposed.

**Legs**—Special design formed from No. 16-gage steel, with a practical adjustment which works on a thread. The height of the lockers is listed exclusive of legs; 6 ins. should be added for the legs to arrive at the over all height.

**Finish**—Baked enamel; color: black or olive green; also grained mahogany or oak.

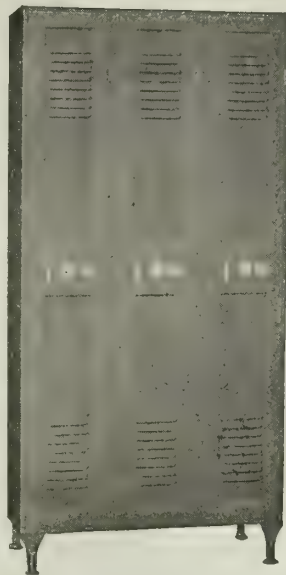
**Standard Sizes**—Width, 12, 15 and 18 ins.; depth, 12, 15, 18 and 24 ins. Height: double tier, 36 and 42 ins.; single tier, 60 and 72 ins.

**Ventilation**—Louver type as shown in N-L; diamond perforations as in D-P-D; also round holes.

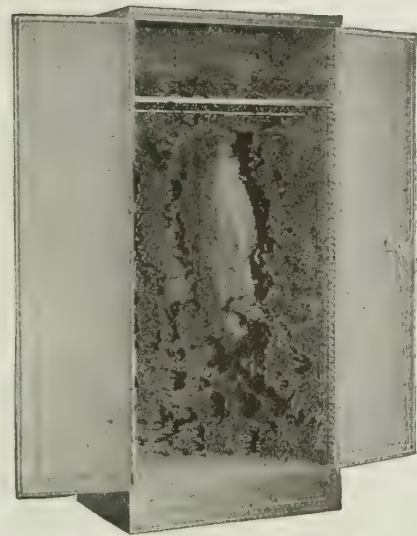
## Terrell's Steel Wardrobes and Cupboards.

**WARDROBE**—An ideal receptacle for the storage and protection of garments of every description. Suitable for use in offices, hotels, hospitals, garages; also for home use.

**Equipment**—Master-keyed flat key lock and two



SINGLE TIER N-L LOCKER



STEEL WARDROBE

Width, 24, 30 and 36 ins.; depth, 12, 15, 18 and 24 ins. Height, 60 and 72 ins. plus 6-in. base

keys, hat shelf, four 2-pronged hooks, and rod for hangers.

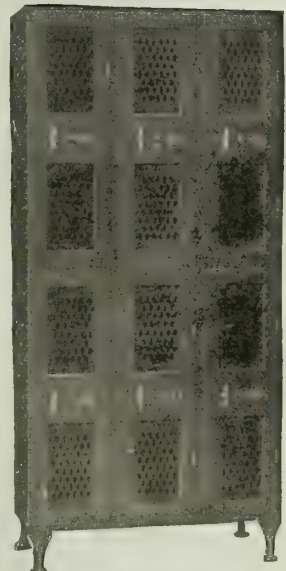
**CUPBOARD**—For the storage of supplies; shelf adjustment on 1-in. center without bolts. Shelves can be punched on 2-in. centers for vertical dividers and dividers furnished.

**CONSTRUCTION**—**Framework**—Consists of drawn metal angles especially designed to insure maximum strength and rigidity. Corner joints are acetylene-welded. Tops and ends have slip joints, so that only a few bolts are used in assembling.

**Doors**—Made of No. 18-gage U. S. S. steel and are reinforced with frames of drawn metal channels. No. 20-gage U. S. S. steel is used for the ends.

**Shelves**—Formed from No. 18-gage steel. All material used is high grade throughout.

**FINISH**—Baked enamel; olive green or black; also grained mahogany or oak.



DOUBLE TIER D-P-D LOCKER



STEEL CUPBOARD

Width, 24, 30 and 36 ins.; depth, 12, 15, 18 and 24 ins. Height, 36, 42, 60 and 72 ins. plus 6-in. base

## Shipment.

Can be packed knocked down flat for shipment, or shipped assembled if preferred.

## Detail Drawings.

Drawings showing complete details as to construction of parts and adjustment of any of our equipment will be sent on application.

# THE VAN DORN IRON WORKS COMPANY

## Steel Office Furniture and Equipment

FACTORIES AND HEAD OFFICES

CLEVELAND, OHIO

NEW YORK, N. Y.

BRANCH OFFICES  
WASHINGTON, D. C.

PITTSBURGH, PA.

### Products.

OFFICE FURNITURE and EQUIPMENT, including Steel Desks, Chairs, Filing Cabinets, Plan Files, Safes, Stationery Cupboards, Wardrobe Lockers, Counter-height Cases, High Cases; Shelving and Locker Installations, and Steel and Bronze Interior Work, with Counters and Grilles.

For Steel Joist Hangers, Post Caps and Bases, see pages 254-55; for Steel Jail Equipment, see page 1489.

### Manufacturing Methods and Materials Used.

Standardized manufacturing methods, modern equipment and skilled labor is maintained in the VAN DORN IRON WORKS COMPANY organization.

*Van Dorn*

TRADE-MARK

MATERIAL—High quality material is used in the Van Dorn steel equipment.

WELDING—Oxyacetylene gas, also electric.

ENAMEL—High grade, carefully selected to insure a durable and elastic finish.

COLOR—Olive green is standard; other colors furnished at slight additional cost.

For further descriptive matter ask for Steel Furniture Catalogue No. 100 or Locker Shelving Catalogue No. 101.



STEEL CHAIR  
Made to match desk



STEEL DESK  
Flat or roll top, various sizes and types



A COMPLETE VAN DORN STEEL FILING CABINET AND OFFICE FURNITURE INSTALLATION, IN THE HOME OF THE HARTFORD FIRE INSURANCE COMPANY, HARTFORD, CONN.



SIX OF THE 25 DIFFERENT VAN DORN STEEL UPRIGHTS

### Installations.

A few Van Dorn installations:

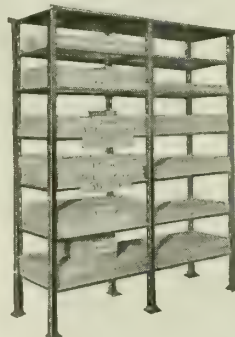
Banks: Adirondack Trust Co., Saratoga Springs, N. Y.  
Corporations: Colt's Patent Fire Arms Co., Hartford, Conn.  
City Buildings: City of Chicago, Chicago, Ill.  
State Buildings: Land Office Building, Austin, Tex.  
Libraries: Allegheny County Law Library, Pittsburgh, Pa.  
County Buildings: De Kalb County, Auburn, Ind.  
Government Buildings: National Museum, Washington, D. C.



VAN DORN STEEL OMNIBUS  
Unit and wide sections to cover every office requirement



VAN DORN LIGHT WEIGHT SAFES  
Various sizes, with interior arranged from unit and wide sections



VAN DORN STEEL ADJUSTABLE SIMPLEX SHELVING  
For office and factory



BLOCK OF STEEL LOCKERS  
Single or double tier, open or closed type doors



# WATSON MANUFACTURING COMPANY, INC.

Steel and Bronze Business Equipments

JAMESTOWN, N. Y.

NEW YORK OFFICE, Architects Building, 101 Park Avenue

REPRESENTED IN ALL PRINCIPAL CITIES

## Products.

BANKING ROOM FURNITURE and FIXTURES, LIBRARY and COURTHOUSE EQUIPMENT:

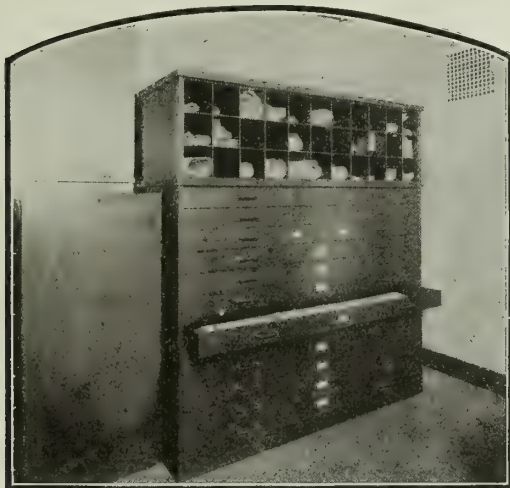
Grilles, Cages, Bankers' Trucks or Omnibuses, Partitions, Counters, Vault Equipment, Cupboards, Filing Cases, Filing Devices, Adjustable Roller and Plain Shelves, Standard Library Stacks, Stairways, Doors (Steel and Bronze with Trim), Wardrobes, Lockers, Tables, Desks, Safes, etc.

For Insect Screens, see page 798.

## Built-to-order Equipments in Steel and Bronze.

Covering all requirements of banks, city, county and state municipal buildings, public and private libraries, commercial offices, etc. Installations of Watson roller shelves, document filing cases and map drawers have reached a high development. Such work as counters, counter screens, omnibuses, cages for cashiers and tellers, special furniture for officials, bookkeepers, clerks, has been made a lifetime study by the engineers and designers in the employ of this company.

The services of this division are offered to architects, without obligation.



Plan Storage Cases



Special Curtain Safe

BUILT TO ORDER CASES IN THE EQUIPMENT OF HOGGSON BROS., ARCHITECTS AND BUILDERS, NEW YORK, N. Y.



BRONZE AND MARBLE SCREEN, FIRST NATIONAL BANK OF GIRARDVILLE, PA.  
Wm. H. Lee, Architect



LIBRARY STACK, LAW LIBRARY, PUBLIC SERVICE RAILWAY CO., NEWARK, N. J.

# THE SAFE-CABINET COMPANY

Originators and Manufacturers of The Safe-Cabinet and Its Equipment

MARIETTA, OHIO

FOREIGN DEPARTMENT, MARIETTA, OHIO

Agencies and Dealers Everywhere (Refer to Telephone Book)

## Product.

This company is the exclusive manufacturer of THE SAFE-CABINET.

## Description.

THE SAFE-CABINET is the highest grade fire resisting product for general office and home use, and the company devotes the entire plant to its manufacture.

CONSTRUCTION—THE SAFE-CABINET has double walls of sheet steel, interlined with a thoroughly tested, heat resisting composition, which will not deteriorate with age.

Grooves and door joints are fitted with asbestos gaskets.

Doors overlap, closing with tongue and groove union, independent bar fastening and 100 number combination locks.

THE SAFE-CABINET is constructed in such a manner that it is practically one piece throughout. The outer walls are welded together and the inner walls locked and interlocked with these without the use of bolts, screws or rivets. Construction is fortified to resist concussion and impact.

FINISH—THE SAFE-CABINET is regularly finished in olive green, imitation oak, or mahogany. The enamel which is used is thoroughly baked and rubbed, finally appearing in a dull finish of depth and richness.

INTERIOR EQUIPMENT—Consists of metal filing units in the form of drawers, shelves and lockers, which are suspended in THE SAFE-CABINET by adjustment strips fastened to the inner walls of the safe.

PATENTS—THE SAFE-CABINET is covered by patents which protect the basic principle of its construction.



In this country, and in most foreign countries, the name is registered.

## Advantages.

THE SAFE-CABINET (S-Cientest model) furnishes the largest measure of protection for its contents with the least bulk and weight. Under actual fire conditions it has been proved that it will protect its contents for 2 hours with an average heat of 1900°

Fahr. on all four sides.

THE SAFE-CABINET is equipped with ball-bearing casters, so that even the largest sizes can be easily moved about like any other piece of office furniture.

## Specification.

In order to avoid substitutions, specify as follows:

"The fire resisting filing cabinets used in this building shall be those known as THE SAFE-CABINET, manufactured by THE SAFE-CABINET COMPANY of Marietta, Ohio."

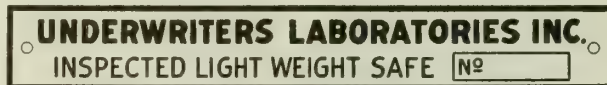
## Sizes.

THE SAFE-CABINET is made in 17 styles and sizes. The interior dimensions of these sizes vary as follows:

Width, from 20 to 42¼ ins. Height, from 25 to 72 ins. Depth, from 12 to 27½ ins.

## Underwriters' Approval.

The S-Cientest model of THE SAFE-CABINET bears the label of the Underwriters' Laboratories, Inc.—"Inspected Light Weight Safe."



UNDERWRITERS' LABEL

## Blue Prints.

On receipt of full information this company will be glad to make blue prints of SAFE-CABINETS, showing suitable sizes and interior equipment.

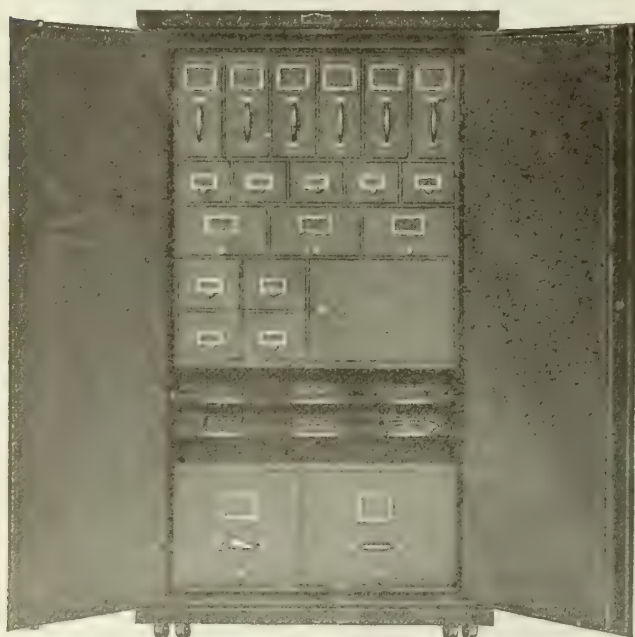
## Catalogue.

A catalogue giving full description of THE SAFE-CABINET, and proof of what it has done under most strenuous fire conditions, will be sent on request. The company will be glad to further explain how THE SAFE-CABINET can be adapted to plans of the architect and builder.

## Used by.

The United States Government in all departments, including Foreign Consulates; life and fire insurance companies; representative banks, bonding houses, public institutions, manufacturing concerns.

THE SAFE-CABINET is supplanting built-in vaults and old-fashioned heavy iron safes in many of the great office buildings of this country and abroad. A number of sizes of THE SAFE-CABINET are made to accommodate the filing devices of the manufacturers. By purchasing a SAFE-CABINET of the proper size, protection can, therefore, be given to such articles as vertical letter files, wooden filing cases, etc., which in themselves offer little or no resistance to fire.



THE SAFE-CABINET, SHOWING STEEL FILING DEVICES WITHIN (ADJUSTABLE)



# THE HALL'S SAFE CO.

CABLE ADDRESS:

"HALL'S SAFE, N. Y."

P. O. BOX 846

CINCINNATI, OHIO

SALESROOM: NEW YORK, N. Y., THE WALKER SAFE CO., INC., 388 Broadway

## Products.

SAFES and VAULT EQUIPMENT:

Vault Fronts  
Heavy Wall Safes  
Single Door Safes  
Double Door Safes  
Manganese Safes  
Tabernacles  
Messenger Boxes  
Conductor Safes  
Grilles  
Gates  
Filing Safes  
Omnibus  
Burglarproof Safes  
Light Weight Safes  
Wall Safes  
Car Safes  
Safe Linings  
Deposit Boxes  
Locks, Time and Combination  
Interiors, Wood or Steel



TRADE-MARK

## Fireproof Safes.

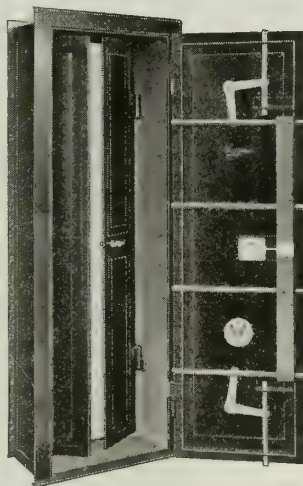
Hall's safes are made with a special patent filling, which is made up of hermetically sealed cement tubes and special cement filling; by this method our safes are made stronger, lighter and free from dampness. Superior quality goes with the name THE HALL'S SAFE CO.



NO. 10AA FIREPROOF VAULT FRONT

## Fireproof Vault Doors.

This company makes a specialty of fireproof vault fronts which are standardized as shown in schedule below. All the outer doors have 1-in. diameter bolts checked with a 4-tumbler combination lock set up on a hardened plate, and the inner doors are folding, made of No. 14 iron reinforced with 1 3/4-in. by 3/16-in. bars, having flat up and down bolts and checked with a key lock. The vestibules are made of No. 14 iron. The workmanship is the very best. The finish is black with gold striping.



TILE "AA" VAULT FRONT

DATA, FIREPROOF VAULT DOORS

No.	Wall opening, ins.			Door plate, in.	Door on edge, in.	Bolts			Bolt frames, ins.	Door	Weight, lbs.
	High	Wide	Deep			Cross	Up	Down			
Title A	76	26	13 1/2	1 1/2	3/8	2	1	1	Angle, 2x2x 3/8	Single	500
Title AA	76	26	13 1/2	1 1/2	3/8	4	1	1	Angle, 2x2x 3/8	Single	510
1-A	79	32	20	1 1/2	1 1/2	2	1	1	Angle, 2x2x 3/8	Single	620
1-AA	79	32	20	1 1/2	1 1/2	4	1	1	Angle, 2x2x 3/8	Single	635
1-AAA	79	32	20	1 1/2	1 1/2	3	1	1	Angle, 2x2x 3/8	Single	635
2-B	79	32	20	1 1/2	1 1/2	2	1	1	Bar 1 1/4 x 7/8	Single	815
2-C	79	32	20	1 1/2	1 1/2	8	2	2	Bar 1 1/4 x 7/8	Single	910
2-D	79	32	20	1 1/2	1 1/2	4	1	1	Bar 1 1/4 x 7/8	Single	820
3-B	79	32	20	1 1/2	1 1/2	2	1	1	Bar 1 1/4 x 7/8	Single	915
3-C	79	32	20	1 1/2	1 1/2	8	2	2	Bar 1 1/4 x 7/8	Single	1050
3-D	79	32	20	1 1/2	1 1/2	4	1	1	Bar 1 1/4 x 7/8	Single	950
10-AA	82	44	24	1 1/2	1 1/2	8	2	2	Angle, 2x2x 3/8	Double	1000

## Omnibus.

This bus is used in all banks and offices as the safest and most convenient system that can be obtained.

It is not only a convenience for the filing system, ledgers, books and papers at the desk, but can be wheeled into the aisle of the vault at night and therefore affords fire protection.

The construction consists of heavy angle iron frames reinforced with sheet metal and a partition in the center with adjustable steel shelves on 1-in. adjustable racks. The top is made of 1/2-in. solid oak, and nickel-plated handles are attached to both ends with bronzed tips. A set of rubber tired roller bearing casters are applied, making it noiseless, and convenient to be placed in any position desired on the floor.

The use of our wood files is advised. The fire protection at night does not require the additional expense of metal files.

The fronts of files finished in natural oak.

The finish of bus in olive green or any other color desired.

Standard bus measurements are 44 ins. high, 44 ins. wide and 15 1/2 ins. deep. Weight 400 lbs.



OMNIBUS

## Co-operative Service.

This company maintains a department for co-operating with architects or clients in solving problems encountered in selecting and installing safes. Prices and estimates will be promptly furnished on application.

# HERRING-HALL-MARVIN SAFE COMPANY

GENERAL SALES OFFICE AND FACTORIES  
HAMILTON, OHIO

## BRANCH OFFICES

NEW YORK, N. Y., 400 Broadway  
CHICAGO, ILL., 211 West Washington Street  
SAN FRANCISCO, CAL., 214 California Street

BOSTON, MASS., 63 Sudbury Street  
BIRMINGHAM, ALA., 2124 First Avenue

## Products.

BURGLARPROOF BANK and SAFE DEPOSIT VAULTS;  
SAFE DEPOSIT BOXES; FIREPROOF VAULT DOORS in various sizes and styles.

Fireproof Safes in all standard and special sizes;  
Steel Lined Safe Deposit Safes for hotels and clubs;  
Silver Safes and Special Safes and Vaults for residences; Burglarproof Chests, Messenger Boxes, etc.

## Fireproof Vault Fronts.



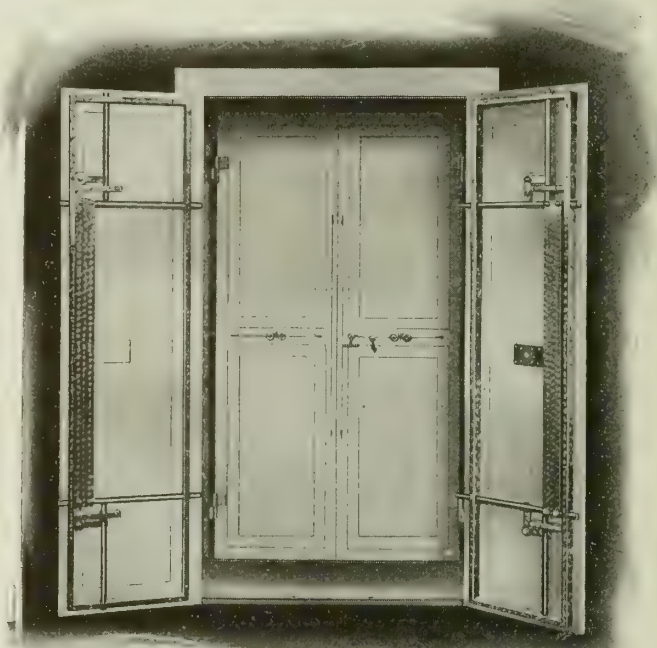
FIREPROOF VAULT FRONT NO. 21

DIMENSIONS—Outside 80½ ins. high, 33½ ins. wide, and 20 ins. deep. Wall opening required, 81½ ins. high, 34½ ins. wide. Clear opening through vestibule, 77¾ ins. high, 29½ ins. wide

SPECIFICATIONS—Sides and top No. 16, bottom ⅝-in. sheet steel. Front frame formed of 3¾ by 3/16-in. open hearth steel bars, riveted at the bottom into 2½ by ¼-in. sill bars, fastened at the top by bar clips. Securely fastened to this frame are the 1 by ¾-in. filling bars. To the filling bars is securely riveted the 1½ by 1½ by 3/16-in. open hearth steel angles. These bars are so placed that between the outside frame and angles, a groove is formed on the right hand side of the vestibule jamb, into which groove the tenon on the rear of the door interlocks when closed.

The rear frame is formed of 1¼ by 1¼ by 3/16-in. open hearth angles, securely fastened to the vestibule. Removable bars 4 by 3/16 ins., of open hearth steel, are fastened on the back of the rear angles. These bars may be removed until the vestibule is set into the wall, after which they are to be replaced, thus holding the vestibule securely in position.

Outer door plate formed of 3/16-in. open hearth steel, reinforced on sides, top and bottom by 2 by ¼-in bars, making doors 7/16-in. thick on edge. Doors swing to the right unless otherwise specified.



FIREPROOF VAULT FRONT NO. 14

DIMENSIONS—Outside 80 ins. high, 43 ins. wide, 20 ins. deep. Wall opening required, 81 ins. high, 44 ins. wide. Clear opening through vestibule, 77½ ins. high, 36½ ins. wide

## Burglarproof Vault Equipments.

Factories are fully equipped to manufacture both the simplest and cheapest, and the heaviest and most elaborate vault equipments of every description. Our record and reputation established through a period of continuous service covering seventy-five years, are so well known as to require no comment.



BURGLARPROOF VAULT DOOR

## Co-operative Service.

The Engineering Department is at your disposal, and will gladly submit designs, specifications and estimates promptly. All inquiries will receive immediate attention.



ESTABLISHED 1882

# YORK SAFE AND LOCK CO.

FACTORY AND GENERAL OFFICE  
YORK, PA.

BRANCH OFFICES AND SALESROOMS IN ALL PRINCIPAL CITIES

## Products.

We are designers and manufacturers of BANKERS' SAFES and CHESTS; FIREPROOF and BURGLARPROOF SAFES, with Steel Lined Outer Doors; BANK and SAFE DEPOSIT VAULTS and DOORS.

MANGANESE STEEL BANK SAFES, SAFE DEPOSIT BOXES, FIREPROOF VAULT DOORS, SPECIAL SAFES for Fireproof Buildings, etc.

## The York Safe.

The ordinary system of building fireproof safes has been completely revolutionized by the new construction and materials used by this company only.

CONSTRUCTION—All these safes are made of the best fire resisting materials known.

The York Improved Filling (patented) radiates heat instead of conducting it; is perfectly dry, extremely light and pliable in texture, indestructible, and, unlike the cement-filling in other safes, it never deteriorates through evaporation.

This Silicious Fireproof Compound is a combination of the best known fire resistants, namely, electro vulcan, asbestos and magnesian talc.

Ordinary fireproof safes are made in many sizes and styles, with single or double doors, interior arrangements as required, etc. (Fig. 2).

## Vaults and Vault Doors.

We build many styles of vaults and vault doors, from the simplest and cheapest to the heaviest and most expensive. Plans and specifications furnished free of

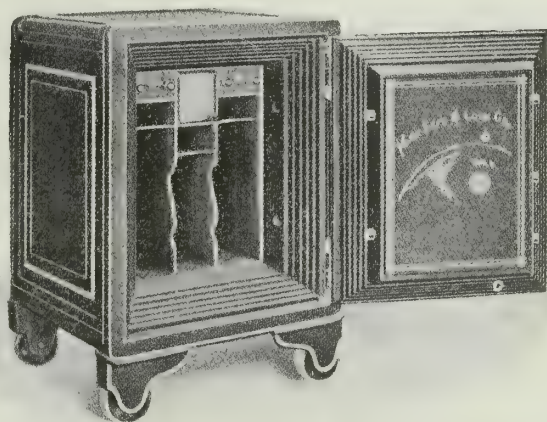


FIG. 2. SEVEN-FLANGE, SINGLE DOOR, FIREPROOF SAFE

cost. Send exact requirements, measurements of ground space, elevation and position in building, etc., for full information and cost of erection (Figs. 3 and 4).

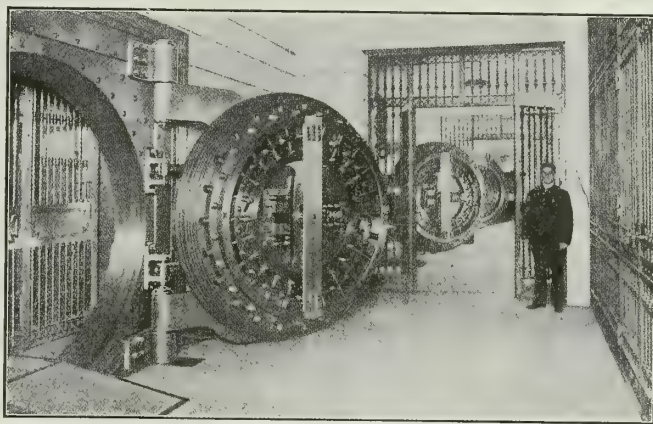


FIG. 3. VAULT DOORS, AMERICAN SAVINGS AND TRUST CO., CHICAGO, ILL.

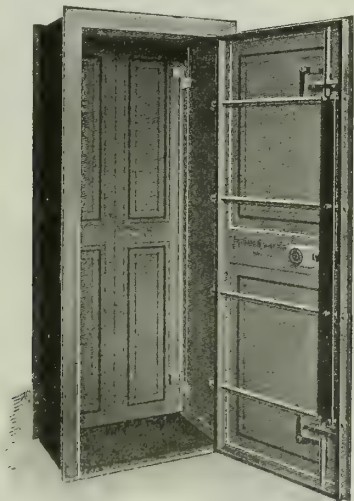


FIG. 1. FIREPROOF VAULT DOORS

For wall openings 78½ ins. high by 31½ ins. wide.

Standard door is for wall 20 ins. thick, but this can be reduced to any thickness desired.

Outside door is locked by combination lock, inside doors by key lock

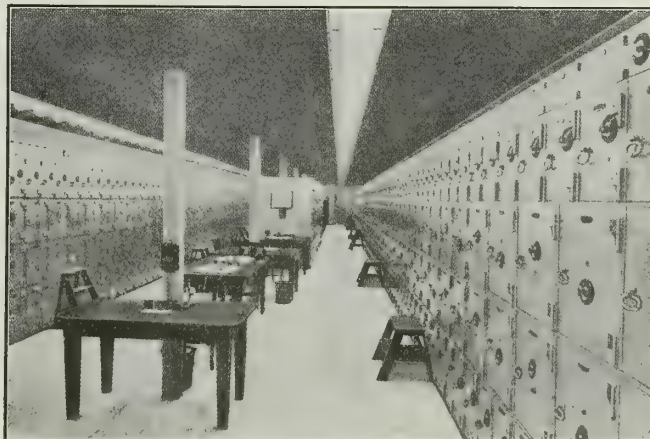


FIG. 4. INTERIOR OF NEW YORK STOCK EXCHANGE VAULT



## BUILDING DIRECTORIES, BULLETIN &amp; SIGN CO.

TELEPHONE:  
FRANKLIN 1960

FACTORY AND OFFICE  
235 Canal Street  
NEW YORK, N. Y.

**Products.**

"GREELEY" CHANGEABLE LETTER DIRECTORIES, for office buildings, clubs, hotels, department stores, regimental rosters, hospitals, churches, stock boards, etc.

**General Description.**

"Greeley" directories and bulletin boards are made in three styles: one is a solid, grooved, broadcloth covered board (Figs. 1 and 3), and the other two consist of unit interchangeable grooved strips which are fitted into the bulletin frame (Figs. 2 and 4). The principle of applying the letters is the same in all styles (Figs. 3 and 4). The letters, having two groove tongues each, can never be set in any but an upright position.

The care of the systems is very simple; and, being sold outright, they involve practically no upkeep cost.

**Styles.**

Style No. 1 is adapted to most purposes of a directory or announcement board, and is made in an improved manner to prevent warping. It is recommended as neat, efficient and economical.

Styles Nos. 2 and 3 differ only in the fact that the one is covered with broadcloth and the other is not. They are the most perfect and most adaptable bulletin systems devised. With these improved styles a name or line may be made up, upon a unit strip, away from the directory or bulletin, and fitted into its proper position between others already in place, without disarranging the rest of the system.

**Letters.**

The letters are of one piece (including the groove tongues) and are of half-hard brass covered with four coats of a special ivory white solution. They are made in  $\frac{1}{4}$ -,  $\frac{1}{2}$ -,  $\frac{3}{4}$ -, 1- and  $1\frac{1}{2}$ -in. sizes, and are supplied in any quantity desired.

**Broadcloth.**

The broadcloth used on Styles Nos. 1 and 2 is of a fine durable quality and can be supplied

in black, maroon, dark blue, or green.

**Frames.**

The various styles of directories and bulletins are furnished with or without frames.

"Greeley" frames are made in the best cabinet manner, and may be had in either wood, iron or bronze. Standard types of frames can be modified to harmonize with surroundings.

**Sizes, etc.**

In all sizes from 30 by 36 ins., the full alphabet is included; and from 30 by 50 ins. upward, the title of the building or other heading in  $1\frac{1}{2}$ -in. letters is applied. Smaller size bulletins will be fitted with headings in appropriate size letters, when required.

The table gives the data in connection with the usual sizes specified.

Sign Size, ins.	Size of letters, in.	Capacity of names		Columns
		Style No. 1	Style No. 2 and No. 3 in $1\frac{1}{2}$ -in. size only, ins.	
10x22	$\frac{1}{4}$	40		1
	$\frac{1}{2}$	25	11x22	1
20x30	$\frac{1}{4}$	75		2
	$\frac{1}{2}$	50	22x22	2
	$\frac{3}{4}$	25		1
30x36	$\frac{1}{4}$	200		4
	$\frac{1}{2}$	100	33x30	3
	$\frac{3}{4}$	50		2
30x50	$\frac{1}{4}$	300		4
	$\frac{1}{2}$	150	33x44	3
	$\frac{3}{4}$	75		2
40x54	$\frac{1}{4}$	400		5
	$\frac{1}{2}$	250	44x54	4
	$\frac{3}{4}$	125		3
50x62	$\frac{1}{4}$	600		6
	$\frac{1}{2}$	350	55x61	5
	$\frac{3}{4}$	150		3

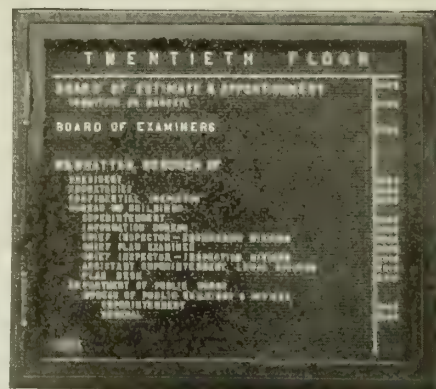


FIG. 1. FLOOR DIRECTORIES IN MUNICIPAL BUILDING, NEW YORK, N. Y.  
Size over all, 38 by 34 ins.

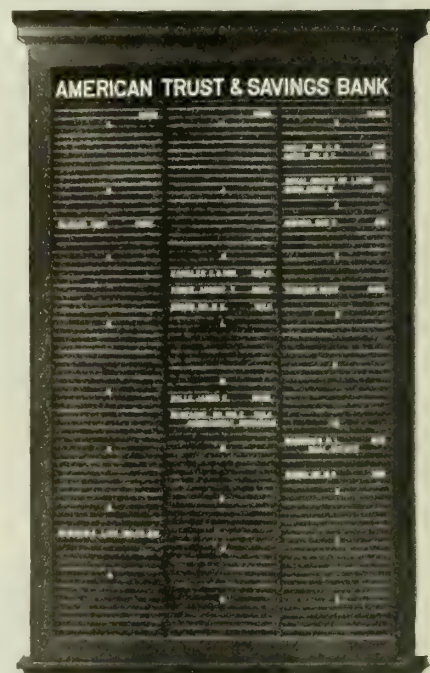


FIG. 2. BULLETIN BOARD (STYLE NO. 3) IN BANK BUILDING, EVANSVILLE, IND.

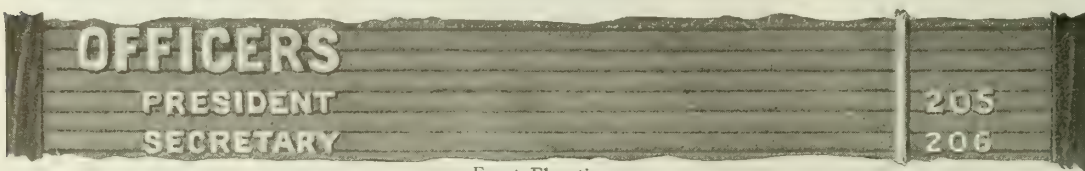


FIG. 3. ELEVATION AND SECTION OF STYLE NO. 1 "GREELEY" DIRECTORY BACKBOARD

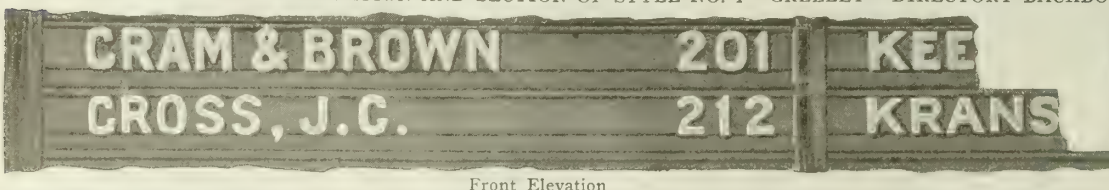


FIG. 4. ILLUSTRATING PRINCIPLES OF STYLES NOS. 2 AND 3, "GREELEY" DIRECTORIES  
Unit strips are held in place by spring clips. Style No. 2 differs from Style No. 3 only in the fact that the latter is of a black metal, uncovered (as shown); while the former is of same construction but covered with broadcloth in any one of several standard or special colors



# UNITED STATES CHANGEABLE SIGN COMPANY

C. M. KINNEY CO., SUCCESSORS

## Manufacturers of Building Directories and Bulletin Boards

TELEPHONE:  
MURRAY HILL 9783

18 East 41st Street  
NEW YORK, N. Y.

### Products.

DIRECTORIES for Office Buildings, ROSTERS for Armories, ANNOUNCEMENT BOARDS for Hotels and Clubs, TIME TABLES for Tourist Agencies or Railroads, HONOR ROLL BOARDS for Clubs and BULLETINS for every need.

### Suggested Uses.

These directories are particularly suitable for the following uses: Apartments, Churches and Sunday Schools, City Halls, Clubs (list of officers and members); Dry Goods Stores (special sales); Fire Department (calls, stations); Golf Clubs (officers, members, handicaps); Hospitals (visiting doctors and house staff); Hotels, Clubs (steamship sailings, theaters, announcements); Office Buildings, Police Department Bulletins (day's instructions); Public Buildings, Public Schools (lecture rooms); Railroad Bulletins (time tables of special trains); Real Estate Offices (lists of property for rent or sale); Armories and Naval Vessels (rosters); Salesmen's Competitive Bulletins; Steamship Announcements (tours, sailings); Steamship Bulletins (daily log, concerts, wireless reports); Theater Bulletins; Tourist Offices (special railroad and steamship excursions).

### Letters.

This is the original changeable letter system. The backboard is grooved and covered with cloth. It is made solid, or in interchangeable strips, each strip holding a name or line of matter. The letters, of white durable plastic material, have firmly attached springs fitting into the grooves of the backboard, and are removable and replaceable with perfect ease. They are made of a solid material and will not crack or chip; therefore their surface will not become defaced.

With complete equipment there is no further outlay. "First Cost the Only Cost."

### Interchangeable Strip Backboard.

A recently invented system of interchangeable units enables the removal and replacement of entire names or lines without rearranging contiguous names. See illustration.

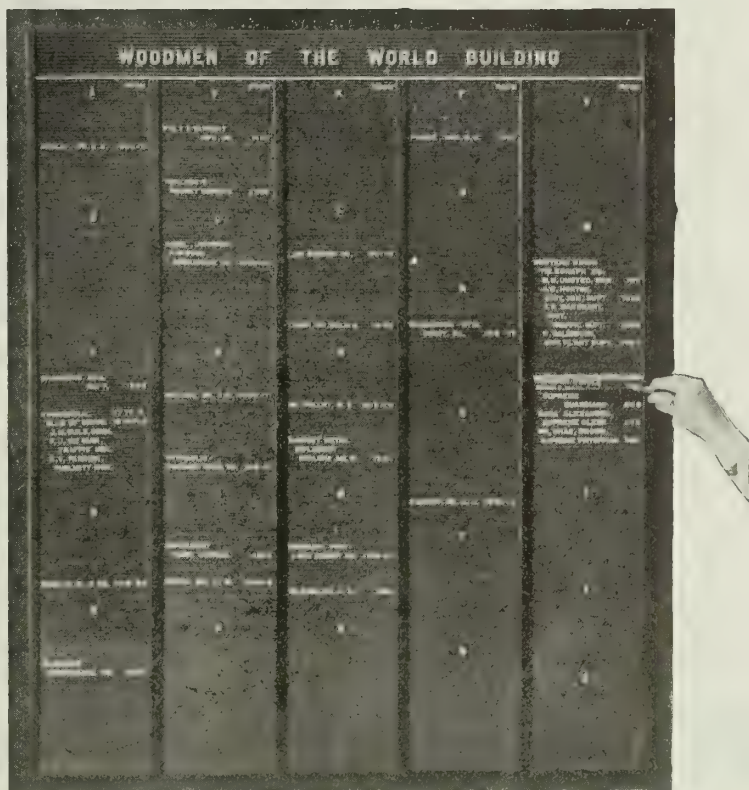
### Directory Frames.

Catalogue designs in wood, iron or bronze, as shown. These may be modified to harmonize with surroundings. "Architects' and special designs followed, if desired.

The backboard can be adjusted to frames furnished by other manufacturers.

### Co-operative Service.

In specifying the United States Changeable Directory it is advisable that the architect consult the company on essential points, such as space necessary for requisite number of names, etc.



DIRECTORY WITH INTERCHANGEABLE STRIPS

### Information to Architects.

Information for calculating space required for backboards of the UNITED STATES CHANGEABLE SIGN COMPANY, C. M. Kinney Co., Successors:

**PATENTED SOLID BACKBOARD**—*Thickness*—1½ ins. from the inside face of the door to the back.

*Width*—Using ½-in. letters for the names and room numbers, 12 ins. for each column; using ¼-in. letters, 10 ins. for each column.

*Height*—Using ½-in. letters, ¾ in. for each line or name; using ¼-in. letters, ½ in. for each line or name.

**IMPROVED INTERCHANGEABLE STRIP BACKBOARD**—*Thickness*—1½ ins. from the inside face of the glass in the door to the back.

*Width*—Using ½-in. letters for the names and room numbers, 12¾ ins. for each column.

Using ¼-in. letters, 10¾ ins. for each column of names and room numbers.

*Height*—¾ in. for each line or name using either ½-in. or ¼-in. letters.

**NUMBER OF NAMES**—Calculate upon two names to each office, in a building containing 200 offices or less. One and a half names to each office in a building containing over 200 offices.

**QUANTITY OF LETTERS REQUIRED**—Calculate upon 17 letters to each name, including room number.

**SPACE FOR TITLE**—If title or name of the building is required to be placed at the top of the backboard, add 3 ins. to the height.



# THE TABLET & TICKET CO.

ESTABLISHED 1870

## Office and Loft Building Directories

381-383 Broadway  
NEW YORK, N. Y.

TELEPHONE, FRANKLIN 2411

624-630 West Adams Street  
CHICAGO, ILL.

TELEPHONE, HAYMARKET 3883

111 New Montgomery Street  
SAN FRANCISCO, CAL.

TELEPHONE, DOUGLAS 250

### Products.

WILLSON'S PATENT BUILDING DIRECTORIES, for office and loft buildings, also for floors of large buildings and apartment houses: Club Membership "In" and "Out," Golf Handicap; Telephone Calls; Fire Alarm Running Cards; Time Schedule for universities and schools; Church Pew Directories; Department Directories for banks and institutions; Floor Directories.



TRADE-MARK

### Frame.

The outside frame is made of ornamental iron; finished in bower-barff, verdé green, or electroplated to match the metal work in the building. The sections to hold names are made of steel, bower-barff finished, fitted with beveled plate glass, protecting names, and require no door that will be in the way when making changes.

### Advantages.

Willson's changeable and alphabetical directory is the only directory kept alphabetically correct; alignment accurate, letters uniform and correctly spaced. The simplest, most practical and satisfactory; "each name a unit," can at all times be inserted, removed or changed; placed "right" without special efforts or waste of time. Requires less space than any other directory where space is a factor.

### Space Required.

The space required for the directory should be provided for in the architect's plans, when expensive marble can be saved and frame inserted; or frame can be placed on marble, when desired.

### Names.

The names are made with white letters on black strips, which can be easily moved up or down, enabling the operator to insert each name in alphabetical order, and also, when removing names, to take out desired strip, move names together, and fill in vacant space left at bottom with blank strips.

The average number required is 2 names for each room, which will permit placing the individual names, as well as the names of firms or corporations, that are necessary on the directory. Figure on 30 names to the vertical foot.

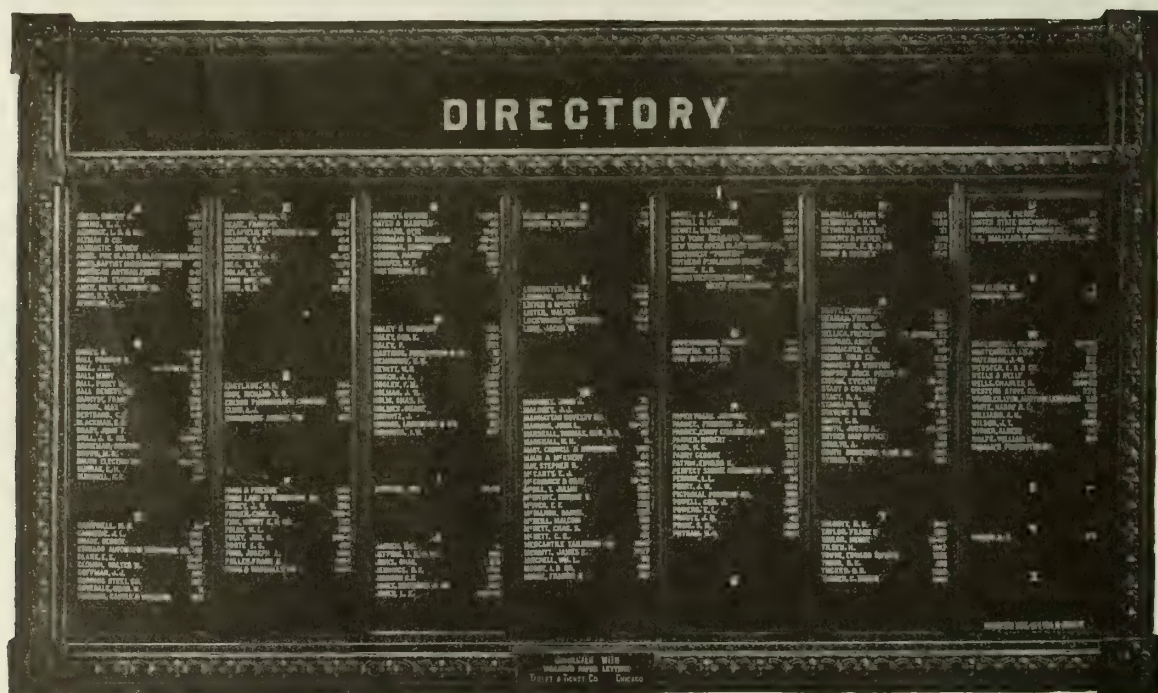
### Special Frames.

Of ornamental iron or bronze, designed by the architects and provided for in specifications and on

# THE TABLET & TICKET CO.

# 222

NAME STRIP, ACTUAL SIZE



TYPICAL OFFICE BUILDING DIRECTORY



plans, are made by the contractors in accordance with our details, blue print of which will be furnished.

HEADING—Headings in special frames are usually made of metal, but can be made same as shown on this page, and fitted with beveled plate glass, or omitted, if desired.

Sections.

Panels or sections are made in the following sizes: 7½ by 18½ ins., 7½ by 26¾ ins., 7½ by 32¾ ins., 7½ by 40¾ ins. In order to avoid mistakes in these frames exact size of the sight opening of the frame is given here.

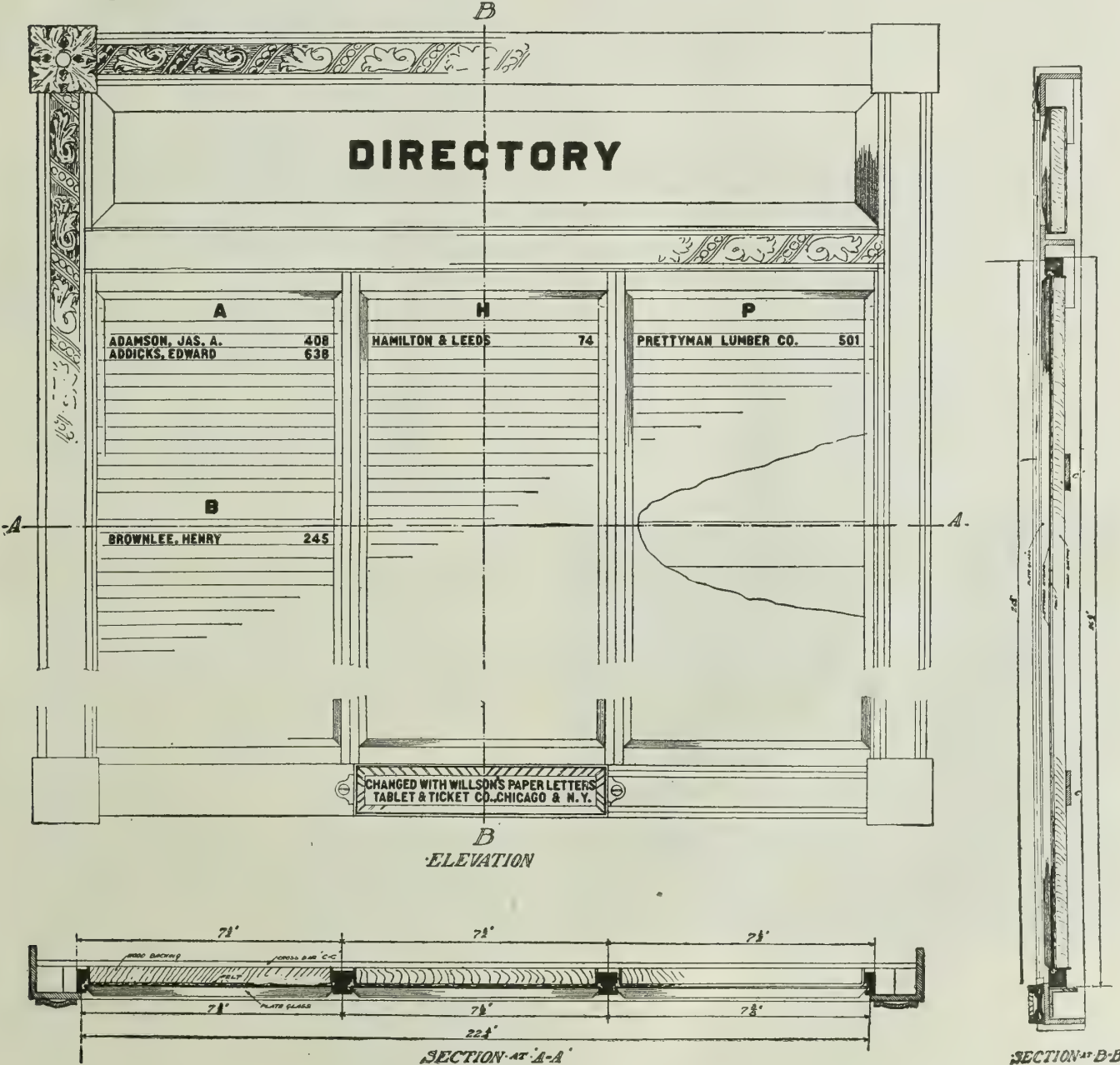
Particulars.

On request, we will furnish drawing or blue prints

with exact measurements suitable for any size building or number of rooms, so that architects can arrange for space required; or they can send sketch and size of space provided for directory, and full details of directory suitable for space will be forwarded.

A Few References.

- Lumber Exchange Building, Chicago, Ill.
- David Whitney Building, Detroit, Mich.
- Woolworth Building, New York, N. Y.
- Oliver and Frick Buildings, Pittsburgh, Pa.
- L. C. Smith Building, Seattle, Wash.
- R. A. Long Building, Kansas City
- Hibernian Building, New Orleans, La.
- Brown-Marx Building, Birmingham, Ala.
- And 2900 others.



SIZES OF 26¾-IN. SECTIONS									SIZES OF 32¾-IN. SECTIONS								
Frame sections.....	3	4	5	6	7	8	9	10	Frame sections.....	3	4	5	6	7	8	9	10
Height, ins. ....	26	26	26	26	26	26	26	26	Height, ins. ....	32½	32½	32½	32½	32½	32½	32½	32½
Width, ins. ....	22 1/8	29 1/8	37 3/8	44 1/8	52 3/8	59 3/8	67 3/8	74 1/8	Width, ins. ....	22 1/8	29 1/8	37 3/8	44 1/8	52 3/8	59 3/8	67 3/8	74 1/8
Capacity, names ...	100	150	200	250	300	400	450	500	Capacity, names....	200	250	300	400	450	500	600	700

Special size sections where actually necessary.

# VAN KANNEL REVOLVING DOOR CO.

## Building Directories and Bulletin Boards

### TELEPHONE:

CIRCLE 1876, 1877 AND 1878

### MAIN OFFICE

250 West 54th Street  
NEW YORK, N. Y.

### BRANCH OFFICES

KANSAS CITY, MO., W. A. ANDREWS Co., 323 Reliance Building  
ST. PAUL, MINN., F. M. CADY, 615 Ryan Annex  
CHICAGO, ILL., J. D. DUFFY, 1119 Chamber of Commerce  
OKLAHOMA CITY, OKLA., HANSON BUILDING SPECIALTIES,  
c/o American Brick & Tile Co.  
NASHVILLE, TENN., JOHN W. McMURRAY, 409 Commercial  
Club Building  
NEW ORLEANS, LA., J. T. MANN & Co., 909 Union Street  
PITTSBURGH, PA., JAS. R. PITCAIRN, 345 Fourth Avenue

ST. LOUIS, MO., ST. LOUIS SALES Co., 1116 Chemical Building  
CLEVELAND, OHIO, R. L. QUEISSER Co., Schofield Building  
DETROIT, MICH., JOHN D. STEGE & Co., 319 Hammond  
Building  
COLUMBUS, OHIO, R. L. WATSON, 51 Columbia Building  
PHILADELPHIA, PA., F. J. WILSON Co., 1416 Land Title  
Building  
SAN FRANCISCO, CAL., WATERHOUSE-WILCOX Co., 8 Monadnock Building Arcade

### Products.

VAN KANNEL BUILDING DIRECTORIES and BULLETIN BOARDS for office and loft buildings, Floor Directories, Directories for Clubs, Social Organizations, In and Out Boards, Time Schedules for Universities and Schools, Department Directories for various kinds of business institutions, banks and public buildings, Church Membership Directories, Menu Directories for restaurants, Hospital Directories for doctors and nurses, Honor Roll Tablet Directories.

For Revolving Doors and Fire Exit Devices, see pages 588-89.

### General Description.

Van Kannel directories and bulletin boards are mechanically perfect, practical and simple in operation. They are sold outright and service maintained. They

are made up of removable strips of white letters on a black background, making a uniform arrangement, perfect in alignment and properly spaced.

In making changes, it is only necessary to remove the section frame by the use of a key, leaving all name strips in place, so that one is always working from the front, making it impossible for any alphabetical mistakes. This process of changing is the simplest construction on the market, and it is the only directory which permits changes to be made with one operation, and allows the directory board to be in full use during the time the changes are being made.

### Frame Designs.

Van Kannel frames are manufactured to meet every architectural requirement as to design and space in order to comply with the various ornamental treatments as desired.

Frames are made in bronze, steel and wood.

### Finish.

Bronze frames are finished to meet specified requirements. Steel frames are finished by sand blast process with baked enamel finish in any color to match requirements, and on account of this expensive finish, it needs no refinishing after installation.

### Sections.

The sections are made of cold rolled steel in the following standard sizes:  $7\frac{1}{2}$  by 22 ins.;  $7\frac{1}{2}$  by 26 ins. and  $7\frac{1}{2}$  by 32 ins. (special sizes when required).

The sections are fitted with glass, plain or beveled, as desired.

### Stock Designs.

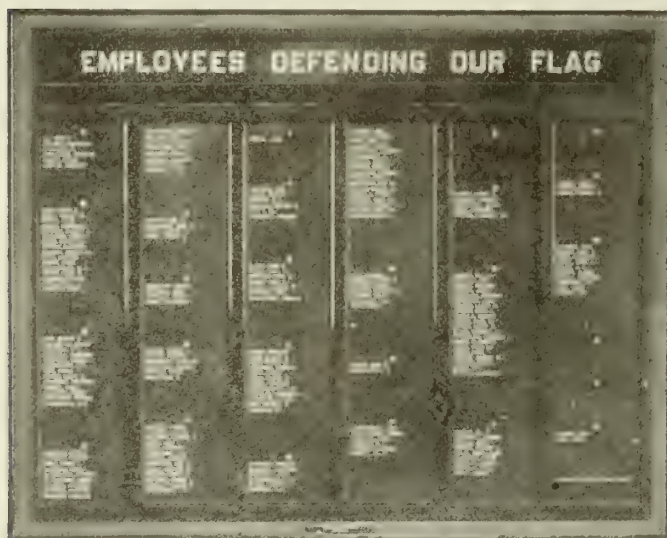
The company carries on hand several stock designs in plain oak, mahogany, steel and bronze, on which it can quote for practically immediate delivery.

### Co-operative Service.

This company employs experts in making up details, preparing data and providing suggestions in relation to the proper details and construction work regarding directories and bulletin boards. The drafting force is always at the service of customers.

### References.

Singer Building, New York, N. Y.  
Wall Exchange Building, New York, N. Y.  
Central Building, New York, N. Y.  
Union Arcade, Pittsburgh, Pa.  
Vinton Building, Detroit, Mich.  
Spitzer Building, Toledo, Ohio  
Union Trust Co., South Bend, Ind.  
American National Bank, San Diego, Cal.  
And many others.



VAN KANNEL BUILDING DIRECTORY

SECTIONS  $7\frac{1}{2}$  BY 26 INS.

No. of sections	2	3	4	5	6	7	8
Capacity No. 1*	80	140	200	260	320	380	440
Capacity No. 2*	50	90	130	170	210	240	280

SECTIONS  $7\frac{1}{2}$  BY 32 INS.

No. of sections	2	3	4	5	6	7	8
Capacity No. 1*	110	180	260	330	400	480	510
Capacity No. 2*	75	125	175	225	275	320	350

\*No. 1 Strip is  $\frac{3}{8}$  in. wide.\*No. 2 Strip is  $\frac{1}{4}$  in. wide.

Tables figure capacity. Alphabet space allowed in addition.



# AMERICAN MAILING DEVICE CORPORATION

Manufacturers of Non-clogging Mail Chutes and U. S. Parcels Post Chutes

**TELEPHONE:**

MURRAY HILL 6827

EXECUTIVE OFFICES  
103 Park Avenue  
NEW YORK, N. Y.

FACTORY  
Marcy Avenue and Walton Street  
BROOKLYN, N. Y.

**BRANCH OFFICES**

CHICAGO, ILL., 231 Insurance Exchange  
ST. LOUIS, MO., 16th and O'Fallon Streets  
ATLANTA, GA., Candler Building  
SAN FRANCISCO, CAL., 525 Market Street  
DENVER, COLO., 1534 Blake Street  
MINNEAPOLIS, MINN., Soo Line Building  
SEATTLE, WASH., 1103 1st Avenue

KANSAS CITY, MO., 323 Reliance Building

TACOMA, WASH., 1005 A Street  
SPOKANE, WASH., 164 South Madison Street  
LOS ANGELES, CAL., 750 Keller Street  
PORTLAND, ORE., 103 West Park Street  
WASHINGTON, D. C., Woodward Building  
BOSTON, MASS., 106 Equitable Building  
PITTSBURGH, PA., Ferguson Building

**Products.**

MAIL CHUTES and MAIL BOXES for United States  
Free Collection Service for all classes of buildings.

**Patents.**

Owners of United States Patents for its products.

**Authorization.**

Use of the company's products authorized by special  
Act of Congress under the Rules and Regulations of the  
Post Office Department.

**American Mailing System.**

The only successful non-clogging mail chute manu-  
factured.

**Construction.**

Made in one type only, of any required finish or  
color in solid bronze and planished steel.

**Installation.**

Equipment furnished and installed in any part of  
the world by this company.

**Boxes.**

Made from a large  
stock of standard designs  
and special designs of ar-  
chitects.

**Approvals.**

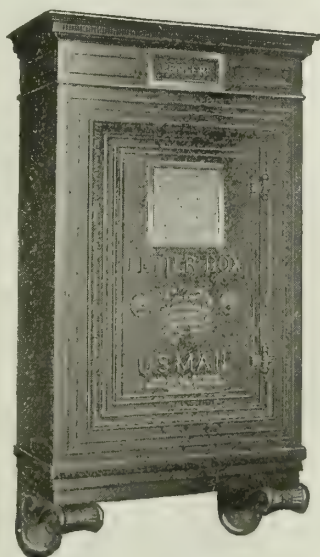
United States Post Of-  
fice Department, Treasury  
Department, and Building  
Data League.

**Prizes.**

Gold Medal—Panama-  
Pacific Exposition.

First Prize — North-  
west Building Material Ex-  
hibit, Minneapolis, Minn.

First Prize — Perma-  
nent Building Exhibit, Chi-  
cago, Ill.



NO. 421 LETTER BOX



NON-CLOGGING MAIL CHUTE

ESTABLISHED 1883

INCORPORATED 1909

## CUTLER MAIL CHUTE CO.

GENERAL OFFICES

Cutler Building

ROCHESTER, N. Y.

AGENCIES IN ALL PRINCIPAL CITIES

NEW YORK SHOP  
27 Thames StreetFACTORY  
Anderson Avenue  
ROCHESTER, N. Y.**Product and Service.**

The manufacture and installation of the "CUTLER MAILING SYSTEM."

**The Cutler Mail Chute.**

Mail chutes extending vertically, singly or in pairs, through the building and discharging into mail boxes in the ground story either for Government or private use.

When installed in connection with the U. S. Free Collection Service, this work is subject to the Regulations of the P. O. Department. Among the rules most affecting architects are the following:

The mail box must not be placed more than fifty (50) ft. from the main entrance of the building.

The mail chute must run through a public hall or premises that are freely accessible to the public and the P. O. authorities.

Every mail chute must be so constructed that its interior is quickly and easily accessible to authorized persons, but not to others.

It must not be run behind a partition or elevator screen.

All contracts covering mail chute installations must be upon the form prescribed by the P. O. Department with the Regulations printed upon and made part of the contract.

Copies of these Regulations will be furnished gladly on request.

**Mail Chute Types.**

The Cutler mail chute is made in two principal models:

**MODEL F**—In this model, the entire front is made in the form of panels of plate glass, set in mouldings of bronze or steel, depending upon the finish used. Any two of these panels are released by a person standing on the floor and turning the official key, and can then be removed and replaced without the use of tools or the exercise of mechanical skill. These panels are set between projecting flanges, which cover the side joint otherwise exposed, and prevent tampering with the chute. The design is simple, and in good architectural style, and the construction is sturdy and calculated to stand the rough handling to which a mail chute is apt to be subjected by Post Office employees. Panels and parts are so standardized that they are interchangeable and can be replaced quickly and easily in case of accident.

**MODEL C**—This model is designed for buildings of unusual size and in which large quantities of mail originate. It is made with its entire front in the form of doors hinged at one side and secured at the other by

special locking mechanism. This permits the chute to be opened, cleared and closed again in the least possible time. An interlocking device makes it practically impossible for the Post Office employee to leave the chute in anything but perfect closed condition.

Experience has proved that this model is less liable to accident and better adapted to "high duty" than any other type of mail chute construction.

Keyless mailing pockets may be opened and closed by the turn of a lever concealed inside, so that the use of the mail chute can be controlled by the Postmaster as required.

**Mail Boxes.**

Cutler stock mail boxes (see illustrations on next page) are entirely satisfactory and suitable for the average building. These boxes are furnished in a variety of finishes as described below.

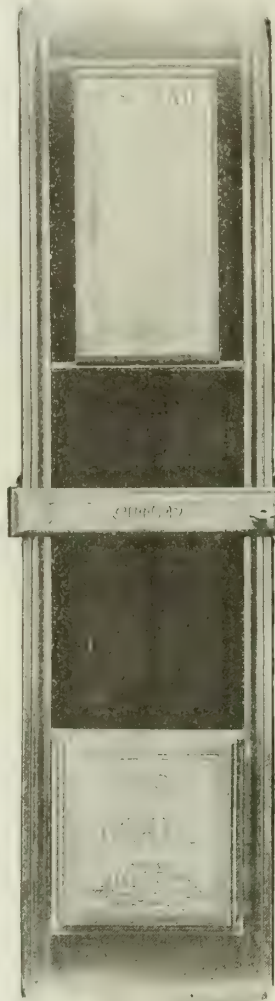
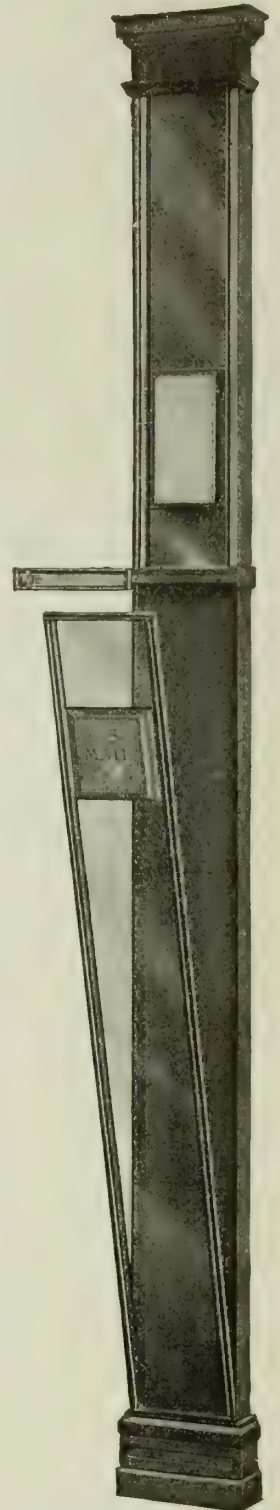
Cast bronze work of highest order is also supplied from special designs furnished by the architect or by this company and subject to his approval.

**Semi-special Work.**

In cases where the expense of executing a special design is prohibitory and the architectural treatment of the interior requires something better than the standard stock box, boxes of semi-special design are furnished by utilizing, wholly or in part, models and patterns from the extensive collection in the possession of this company. In this way, work can be produced at moderate cost, the expense of which, if designed specially, would be out of the question. Scale details and photographs of such work will be furnished gladly on receipt of necessary data as to the architectural style desired, the amount and character of space available, etc.

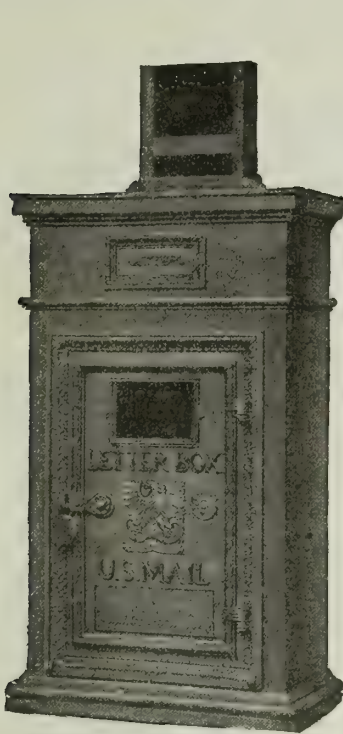
**Finishes.**

**STANDARD FINISH**—The steel mail chute channels finished in dull black enamel; the fittings (bases, caps, mouldings and mailing pockets) in bronze. The mail box, duplex bronze plated with mouldings (where the most wear comes)

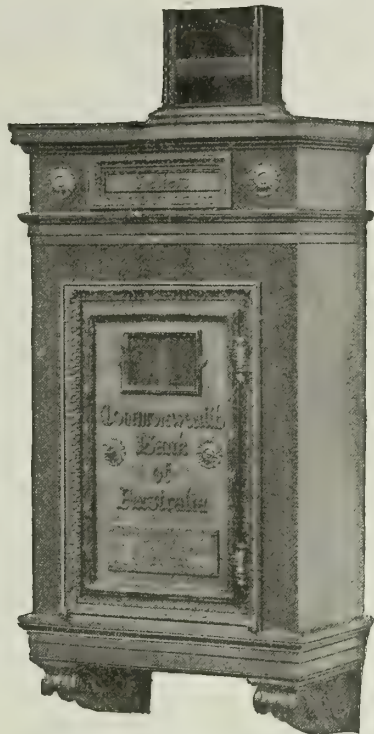
DETAIL AT MAILING  
POCKET

REMOVABLE PANEL





NO. 1165 MAIL BOX  
Electrobronze and bronze



NO. 2400 MAIL BOX  
Electrobronze and bronze



NO. 2110 MAIL BOX  
Black only

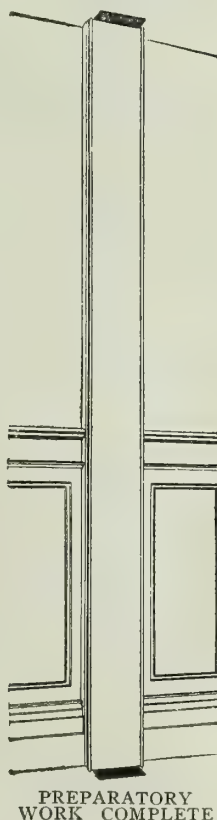
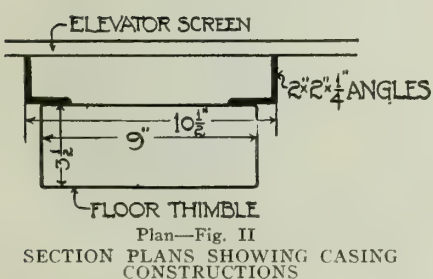
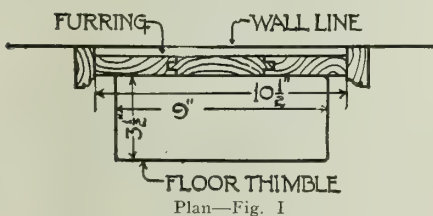
of bronze. Bronze surfaces are finished slightly oxidized or "statuary bronze" color and lacquered.

**BRONZE FINISH**—For those buildings where elegance as well as the highest mechanical excellence is required, the mail chute is made with all exposed surfaces of bronze; and where a bronze mail box is installed, this finish is usually used, sometimes either throughout the building or in the first story only, with standard or black finish in the upper stories.

#### Installation.

Entire work of installation is done by the manufacturers to secure best results and exact compliance with regulations of the P. O. Department, in respect of which the company is under bond; and much trouble and expense are avoided by consulting with regard to any special conditions in advance of determining location of apparatus and the exact form of specification.

**PREPARATORY WORK**—This



consists of finishing openings in floors, furnishing and erecting supports for mail chute and box. Openings in floors, especially in concrete and arch construction, should be provided for in general contract; rough openings 6 by 12 ins. are required. The general contract should also cover patching and repairing of plaster which is not included in mail chute contract. Full size detail drawings of various forms of preparatory work with steel angles (Plan Fig. II) or wood casing (Plan Fig. I) will be furnished on application, also specification forms for each type.

When the mail chute is to be located in front of an elevator screen, preparatory work must stand rigidly and be fastened only at floor and ceiling. In this position the casing, if wood, has side pieces and is in section like an I-beam; or, preferably, it is constructed of steel angles (Plan Fig. II). Space required to receive standard mail box under ordinary conditions is, for Design 1165, 36 by 21½ by 11¼ ins. over all.

#### Co-operation.

The designing and estimating department will furnish estimating blanks, specification forms, working details and other information which prospective users of Cutler mail chutes may desire, sending an expert for conference, or replying promptly to any inquiries by mail.

#### References.

The Cutler mail chute is and has been for thirty years the standard by which such work is judged. It is to be found in all high class office buildings, hotels and apartment houses in the principal cities of the United States and many foreign countries.

Notable installations, where most exacting conditions are perfectly met:

Woolworth Building, 55 stories, 6 chutes; the Equitable Building, 37 stories, 8 chutes; Metropolitan Tower, 41 stories, 2 chutes; Singer Tower, 49 stories, 2 chutes; Western Union, 27 stories, 4 chutes; Bankers Trust; City Investing Building; Fifth Avenue Building and many others in New York; Continental-Commercial Bank Building, Chicago; L. C. Smith Building, Seattle; Union Central Building, Cincinnati; Washington Trust, Los Angeles, and thousands more.

## ECO CLOCK CO.

Manufacturers of Electrical Watchman's Clocks

197 Congress Street  
BOSTON, MASS.

26 Cortlandt Street  
NEW YORK, N. Y.

### Products.

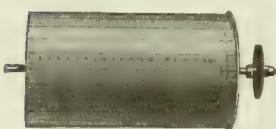
"BOSTON" and "ECO" ELECTRICAL WATCHMAN'S CLOCK SYSTEMS, with and without timepiece dials.

### Description.

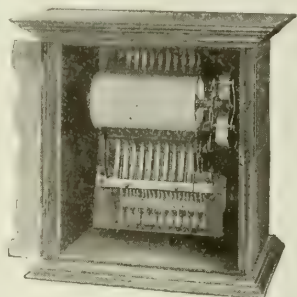
"BOSTON MAGNETO" TRI-RECORD RECORDER (RECTANGULAR PAPER DIAL)—Provides for registrations covering Saturday, Sunday and Sunday night without change of dial. Dial drum automatically shifts every 12 hours. Each day's or night's record in separate column. Made in 3 sizes, 20, 40 and 60 stations, respectively.

Every part of mechanism is visible, accessible, interchangeable and easily removed without disarrangement of mechanism. The absence of springs to restore needles after recording, is a valuable feature.

"BOSTON SIXTY-HOUR" RECORDER—Similar to "Boston Magneto Tri-record," but provides for holidays following Sunday, without change of dial. Made in 2 sizes, 20 and 35 stations, respectively.



"BOSTON" DIAL AND DRUM

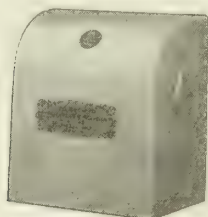


"BOSTON MAGNETO" RECORDER  
Standard case

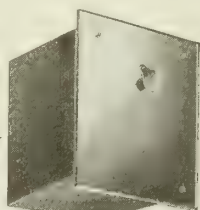
"ECO MAGNETO" (CIRCULAR DIAL)—Perforating needle is separate from armature and will not stick. The needle arm and armature are both restored to original positions by gravity.

### Operation.

"ECO" SYSTEM—Recorder is usually placed in office. Stations may be located at any place desired. Each station is connected with recorder by separate wire. Any number of watchmen can record on the same dial, with independent record for each.



Steel or Fiber Covers  
for General Use



Inset with Plain or  
Fancy Face Plates

STANDARD TYPE GENERATORS

MOTIVE FORCE—4-volt hand generator. Storage battery or 12-volt motor generator; single or in combination.

USUAL EQUIPMENT—Small hand generator at each station, surface or flush type. One full turn of the crank handle (which the watchman carries with him) generates sufficient current to perforate paper dial in space corresponding to number of station operated, and at exact time record is made.

### Advantages.

Can be installed by any careful electrician. Can not be tampered with without detection. Meets stringent requirements of all insurance companies. First cost is low. No current except at the actual moment of making record. No record can be made by short circuiting. Record dials are reduced to smallest size, consistent with accurate and easy reading.

### Finish.

Recorder cases and face plates furnished to match woodwork and hardware finish.

### Insurance.

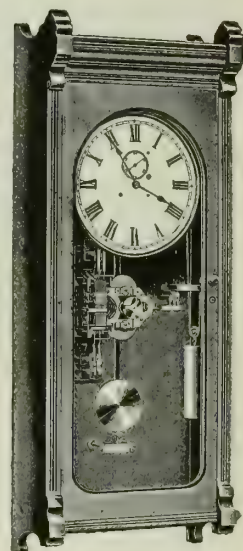
Approved by the National Fire Protection Association for use under the rules and requirements of the National Board of Fire Underwriters and by all Mutuals.

### Co-operation.

The Eco Clock Co. solicits difficult propositions which relate to a proper control of day or night watchmen.

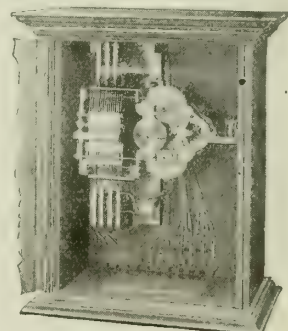
### Catalogue.

This company would be pleased to mail illustrated catalogue to any interested party, on request.



REGULATOR COMBINED  
WITH RECORDER

When desired, either "Boston" or "Eco" recorders combined with office regulator timepieces will be furnished



"ECO" MAGNETO RECORDER  
Open  
Standard case; 12- or 24-hour  
circular dial



# NEWMAN CLOCK COMPANY

ESTABLISHED 1872

## Manufacturers of Watchman's Clocks

178 Fulton Street  
NEW YORK, N. Y.

565 West Washington Boulevard  
CHICAGO, ILL.

507 Montgomery Street  
SAN FRANCISCO, CAL.

### ASSOCIATED COMPANIES

NEWMAN-MUNDERLOH CLOCK CO., LTD., 51 Victoria Square, MONTREAL, CANADA

NEWMAN CLOCK CO., LTD., 2 Whitechapel Road, LONDON, ENGLAND

NEW CIE. DES MONTRES DE CONTROLE, SOC. ANONYME, GENEVE, SUISSE

### Products and Services.

WATCHMAN'S PORTABLE CLOCKS for office buildings, hotels, hospitals, stores and factory plants.

Manufacturers of Watchman's Clocks for over forty years.

Our extensive experience in Watch Clock Installations is at the service of architects. On request, detail specifications of installations to meet requirements of any particular proposal will be furnished.

### Description.

Outfits complete consist of watch, leather pouch with carrying strap, key boxes or stations with marking keys attached, patrol box, seals and one year's supply of dials. Standard model key boxes furnished unless otherwise specified.

Regular sizes with capacities of 6, 9, 12, 16, 20, 25 and 35 stations.

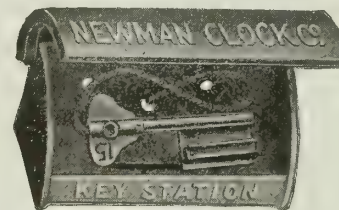
Larger sizes to meet requirements.

### Advantages.

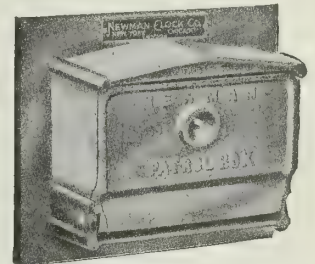
Provides an accurate check upon watchman. Inefficiency at once detected. Tampering impossible without detection. Carries highest rebate in insurance rates allowed for this class of device. Initial cost low. Maintenance slight. Eliminates wiring and electrical troubles.



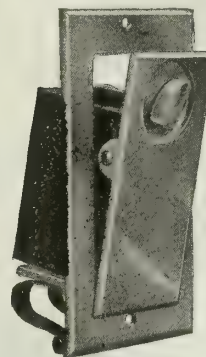
GRILLE MODEL



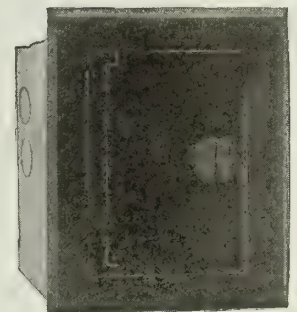
STANDARD MODEL BOX  
Lift cover, iron, with aluminum finish



PENN. R. R. MODEL BOX  
WITH BACK PLATE  
Iron, with bronzed finish

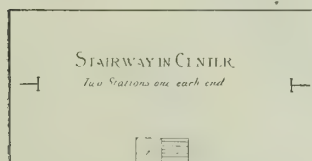
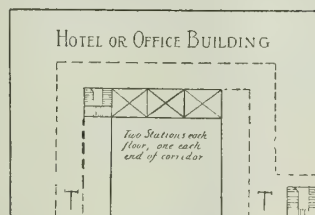
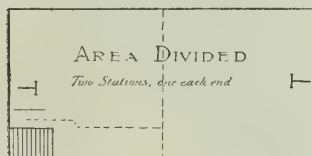
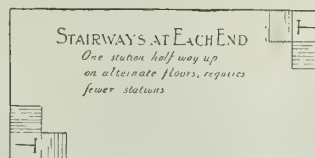
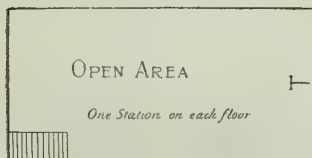


RITZ-CARLTON MODEL  
BOX, FLUSH TYPE



TEMPLE MODEL BOX,  
FLUSH TYPE

Key boxes finished to match hardware trimmings



Specify also one station each for office, boiler room, oil or paint room, rubbish or storage room. Usually one more for basement sufficient, if properly located.

TYPICAL FLOOR PLANS SHOWING LOCATIONS OF STATIONS

### Underwriters' Approval.

The Newman system is approved by the National Fire Protection Association for use under the rules and

requirements of the National Board of Fire Underwriters, and by all Mutuals. It reduces fire insurance rates.

### Specification.

To specify, write as follows:

Furnish .... Newman Grille Model Watchman's Clock[s] having a capacity of .... stations with .... key boxes .... model. Install at locations as marked on plans.

### Representative Installations.

Aeolian Hall, New York  
Architects Building, New York  
J. P. Morgan & Co., Bank Building, New York  
Ritz-Carlton Hotel, New York  
Underwriters' Building, New York  
Underwriters' Salvage Corps Building, New York  
Pennsylvania Terminal, New York  
Pan-American Union (Carnegie), Washington  
United States Naval Observatory, Washington  
Blackstone Hotel, Chicago  
La Salle Hotel, Chicago  
Underwriters' Laboratories, Chicago  
Pennsylvania State Capitol, Harrisburg  
Bank of Toronto, Toronto, Can.  
Bank of England, London, Eng.  
Utah State Capitol, Salt Lake City  
Oklahoma State Capitol, Oklahoma City  
Missouri State Capitol, Jefferson City

# THE E. HOWARD CLOCK CO.

NEW YORK OFFICE:  
67 MAIDEN LANE  
Telephone, 3148 John

373 Washington Street  
BOSTON, MASS.  
TELEPHONE, MAIN 643

CHICAGO OFFICE:  
31 NORTH STATE STREET  
Telephone Connection

## Products.

Makers of CLOCKS:

Tower Clocks; Magneto Watchman's Clocks; Electric Clock Systems for public buildings; Program Clocks for ringing bells at stated intervals; Post and Bracket Clocks; Astronomical Clocks for observatories; Westminster Chiming Clocks for private estates; Library, Church and Banking Room Clocks; Hall, School and Office Clocks, and specially designed clocks from architects' drawings.

## Tower Clocks.

**DESCRIPTION AND MATERIALS**—Howard clocks are made of the highest grade materials, the wheels of hard hammered brass with teeth accurately cut, and arbors and pinions of best open hearth steel. The escapements are the Graham dead beat or the Denison gravity. The frame and supports are of cast iron and bearings of bronze metal. The striking part is a repeater, making it impossible for the clock to strike wrong. A simple device is provided, so that the large hands on the tower can be easily and accurately set at the clock movement. The pendulum rod is of wood, or of iron compensated with zinc. Clocks may be made to strike the half and quarters of the hour, either on the same or on different bells from those on which the hours are struck.

**INSTALLATION**—This company will contract for these clocks delivered and put up, as it prefers to do the work itself, having trained men for that purpose.

**Caution**—The diameter of the dial should not be less than one-tenth of the height of its center from the ground.

**ILLUMINATED DIALS**—It is recommended that all dials for illumination over 36 ins. in diameter be made with skeleton iron frame. The advantages of such construction are:

(1) Should any one section of the glass become broken, it can be replaced at small cost, and any accident that would break a section would, of course, if a whole plate had been used, destroy the entire dial.

(2) When figures are painted on the glass or fas-

tened to it with cement, they are quite short lived, because storms and extremes of heat and cold soon

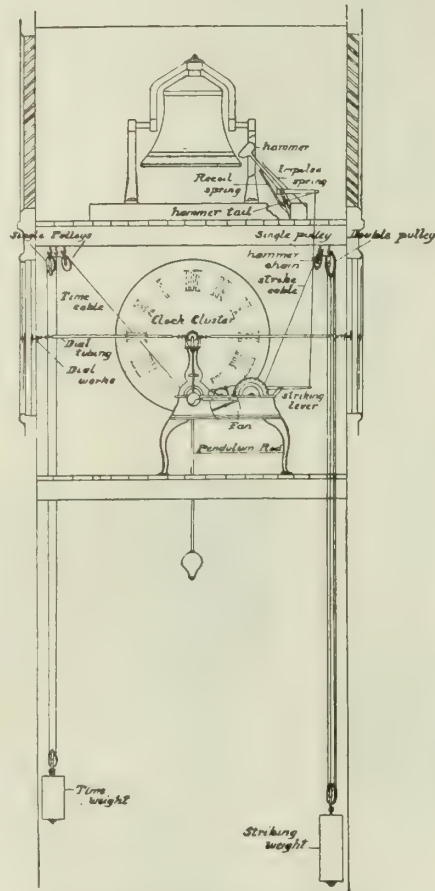
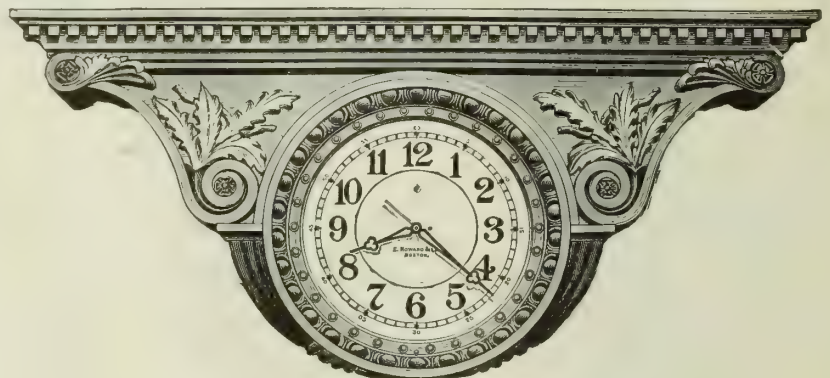


DIAGRAM SHOWING RECOMMENDED  
RELATIVE POSITION IN TOWER  
CLOCKS OF DIAL, CLOCK ME-  
CHANISM AND BELL



CUPOLA OF CITY HALL, PORTLAND, ME.  
CARRÈRE & HASTINGS, New York, Architects  
JOHN CALVIN STEVENS AND JOHN HOWARD STEVENS, Portland,  
Associate Architects



CLOCK NO. 141. FOR GALLERIES, BANK VAULTS, ETC.

Dial 24 ins.; length, 7 ft. 2 ins.; height 38 ins.

May be used as a hanging clock affixed to the ceiling, a ceiling beam or under a gallery railing, or may be reversed, to be set on a partition bank vault, or any other such structural feature



wear them off; and when they are fastened on by drilling holes in the glass, the glass is very materially weakened and will break much easier.

(3) On sectional dials when figures and hands need repainting, it is only necessary to remove one or more of the section glasses.

Stock patterns for illuminated dials advance in sizes by multiples of 6 ins., commencing at 3 ft. 6 ins. diameter.

**AUTOMATIC ILLUMINATION REGULATORS**—Automatic illumination regulators made in several sizes for governing gas jets or electric lights; time for lighting and extinguishing being made adjustable to conform to varying hours of darkness.

**PATENT SELF-OILING ESCAPE WHEEL**—Once filled with oil, it does not require re-oiling for 4 or 5 years; whereas, in the case of ordinary form of escape wheel, the oil dries up or becomes gummy unless wheel is frequently oiled, thereby causing a great increase in the friction, a change in the rating of the clock, and injury to the pallets by cutting.

**ACCURATE AND LONG LIVED**—Howard clocks do not vary more than 20 to 30 seconds in a month. A first class clock, properly made, will last 50 years with little or no expense. Lawrence Hall Tower, at Toronto, Canada, has a clock made by this company that has been running for 60 years and is still in excellent condition.

#### Gallery, Partition, Bank, Vault and Ceiling Clocks.

These can be furnished single or double faced. Cases are of oak, mahogany, walnut or other wood to match interior trim.

Dials may be of fine marble or onyx; of metal finish in gold, silver and bronze; of glass, or of carved wood, and are always in harmony with, and appropriate to, the design and surroundings. Figures on dials may be painted on or made in metal and attached. They may be finished in gold or oxidized silver, various bronzes or steel blue.

#### Cost.

A question blank has been prepared which, when properly filled out, will enable the company to give quickly and accurately the desired quotation.

#### Guarantee.

Howard clocks are warranted to be first class in every respect and free from all original defects, for 5 years.

#### Co-operative Service.

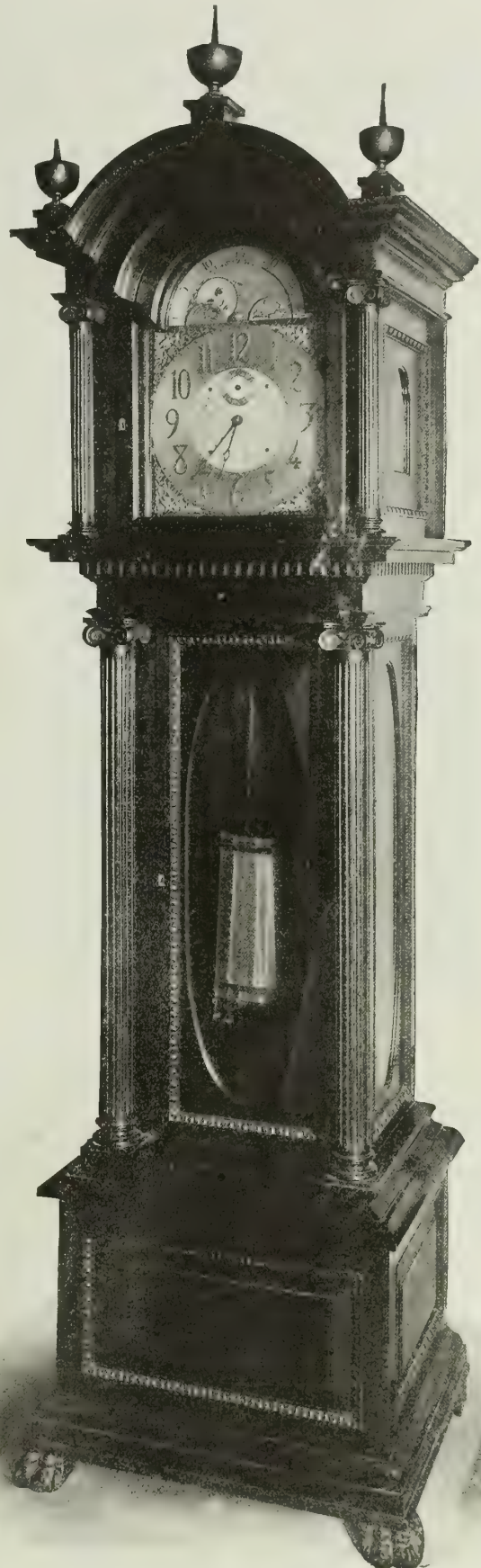
This company is ready at all times to conform to the ideas of the purchaser, and to submit special designs to meet requirements.

#### References.

Thousands of Howard clocks are in use all over the United States, in municipal, public and private buildings. Among others, are the following:

Library of Congress, Washington, D. C.  
 United States National Museum, Washington, D. C.  
 Smithsonian Institution, Washington, D. C.  
 Scottish Rites Temple, Washington, D. C.  
 Trinity Church, New York, N. Y.  
 St. Patrick's Cathedral, New York, N. Y.  
 J. P. Morgan & Co., New York, N. Y.  
 Bankers Trust Co., New York, N. Y.  
 Yale Club, New York, N. Y.  
 B. Altman & Co., New York, N. Y.  
 Metropolitan Life Insurance Co., New York, N. Y.  
 Sanitarium, Mt. McGregor, N. Y.  
 United States Custom House, Boston, Mass.  
 City Hall, Boston, Mass.  
 Wentworth Institute, Boston, Mass.  
 Technical High School, Toronto, Can.

Royal Victoria Hospital, Montreal, Can.  
 American College for Girls, Constantinople, Turkey  
 Hotel Statler, Detroit, Mich.  
 Henry Ford Hospital, Detroit, Mich.



MASTER CLOCK IN HOTEL McALPIN, NEW YORK

Electrically operates 62 clocks scattered through this large hotel. Beautiful hall clock case suggests a club or a fine residence

# SETH THOMAS CLOCK CO.

ESTABLISHED 1813

215 W. Randolph Street  
CHICAGO, ILL.

15 Maiden Lane  
NEW YORK, N. Y.

140 Geary Street  
SAN FRANCISCO, CAL.

TELEPHONE, CORTLANDT 8274

104 High Holborn  
LONDON, ENG.

FACTORIES  
THOMASTON, CONN.

## Products.

Manufacturers of TOWER CLOCKS of every description for public buildings, churches, factories, schools, private estates, etc.; ELECTRIC SECONDARY CLOCK SYSTEMS.

Self-winding Clocks; Marble Dial Clocks for banks, libraries, halls, etc.; Marine Chronometers and Ships' Bell Clocks for marine service and engine rooms.

House Clocks for every purpose; Regulators and Calendar Clocks for offices, hotels, stables, etc.; Side-walk Post and Bracket Clocks; Precision Clocks for observatories; Specially Designed Clocks.

## Tower Clocks.

These clocks are constructed upon the rules of the highest authorities in horology, and are made as timepieces only, or to strike the hours or half hours; also the quarters on two or three bells; and the Westminster Chime on four or five bells, or the "Angelus."

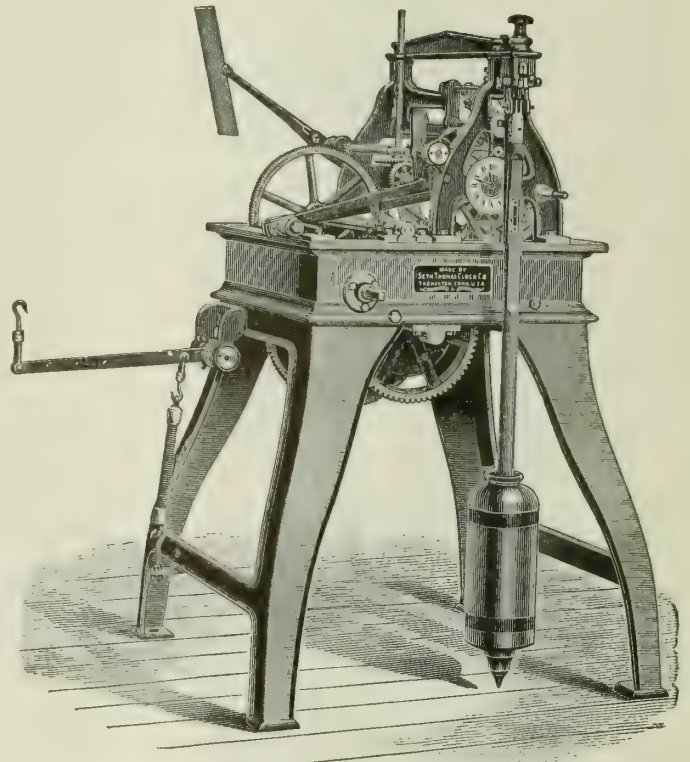
In the case of a time clock it is advisable that the movement be placed either opposite or below the dials. The best arrangement in the case of a striking movement is to place the movement *below* the bell where there is a minimum of vibration.

**DESCRIPTION**—The mechanism is held in place by a cast iron frame. The wheels are of bronze, pinions of steel (hardened) and gears machine cut. On the clock is a small dial to indicate the position of the hands on the outside dial(s); also, a seconds' dial for close regulation and comparison purposes; a safety catch to prevent the fall and breakage of the pendulum rod should the suspension spring break.

Our movements are fitted with either Graham's dead beat, the pendulum rod of mahogany, or Dennison's double three-legged gravity escapement, the pendulum of zinc and steel to insure accurate compensation.

**SILENCING DEVICES**—We can fit an automatic attachment which will silence and release the striking train for whatever hours desired; also, a hand switch to silence the clock for special occasions.

**DIALS**—To look well and show plainly, a dial should be 1 ft. in diameter for every 10 ft. of elevation, and be set out flush with or close to the line of building or tower.



TOWER CLOCK STRIKE MOVEMENT

**Wood**—The boards are tongued and grooved,  $\frac{1}{2}$  in. thick, in two layers, with grain crossed to prevent shrinkage; the surface is painted and smalted; the numerals and minute marks are of type metal (not wood) and, together with hands, are covered with the best of gold leaf or painted black.

**Iron**—These are of heavy galvanized iron with a wood backing  $1\frac{1}{2}$  ins. thick. The finish and numerals are the same as for wood dials.

**Skeleton Metal**—These may be varied in design and made of different metals. They are made with Arabic figures (minute dots omitted) or Roman numerals, placed not more than 2 or 3 ins. from the face of the wall, for a background is required to show to advantage. The color of the dials and hands should be considered in connection with the color of the wall, with a view of obtaining the contrast desired.

**Whole Plate**—These may be furnished with safety up to 4 ft. 6 ins. in diameter. The numerals and



minute marks are lettered on the surface in black or gold leaf of a durable finish.

**Sectional Dials**—The openings for this design should be made in the multiple of 6 ins. The numerals, diamonds and minute marks are made of iron or bronze; the frame rebated in the back to receive the glass and fastened together with brass clamps; the joints filled with lead, making the dials watertight when installed. The numerals, etc., are painted black and smalted or covered with gold leaf.

**Glass**—The glass is  $\frac{3}{8}$  in. thick, ground on both sides. For the sectional iron pattern the center light and outer segments are of the same thickness and quality throughout, which insures an even diffusion of the light.

**AUTOMATIC LIGHT SWITCH**—Our automatic light switch is controlled by the tower clock which will turn on and off the lights used to illuminate the dials, and is adjustable to suit the different seasons.

**SELF-WINDING ATTACHMENT**—Where the fall for the weights is limited, or where it is desired to have an automatic equipment, motors are furnished to wind the weights.

**CO-OPERATIVE SERVICE**—The Tower Clock Catalogue, which illustrates many styles, gives dimensions, weights, and shows plans for installing clocks with and without bells will be mailed on request. It gives many valuable suggestions which are of importance to the architect when drawing plans for a building in which a clock is to be installed.

We shall be pleased to enter into correspondence with any one, using our one hundred years' experience to assist the buyer to secure a clock which shall be suited for his purpose.

**ESTIMATES**—As each clock is made to order, it is impossible to issue a price list. It is, therefore, necessary for us to know whether it is a time or strike movement, the number and diameter of the dials and what style of dials is required.

**GUARANTEE**—Thomas tower clocks are guaranteed to be free from mechanical defects for 5 years, when fitted with Graham's escapement, to run within a variation of 30 seconds per month, or with Dennison's double three-legged gravity, 10 seconds per month, if properly cared for.

### Secondary Clock Systems.

**MASTER CLOCK**—There are many designs of the wall and hall clock cases. The circuit closers are of the single arm oscillating type, which gives the desired rubbing and self-cleaning effect without retarding the movement, thus leaving it with a free running train regardless of whether the secondaries are operated or

not. A tower clock can also be used as a master clock. All master clocks can be self-winding.

**SECONDARY MOVEMENTS**—The Thomas secondary is positively locked against disturbance or vibration, making it an impossibility for the hands to move except by the impulse sent out by the master clock or operated from the control board. It is not affected by temperature changes, nor does it require oiling.

The plates are of brass, nickelplated, with steel cut pinions. The magnets are silk wound and any residual magnetism is provided for by a fixed magnetic gap. The discharge from the magnet coils is cared for by a high resistance, non-inductive coil, shunt connected.

**SECONDARY CASES**—The wood cases are made to match the interior woodwork, either round or square. The dials for these designs range from 8 to 30 ins.

The cases open from the front so that the mechanism is easy of access.

**Special Designs**—A specialty is made of constructing cases from architects' designs.



DESIGN OF SECONDARY CLOCKS

### References.

The Seth Thomas tower clocks have received the highest premiums and awards at every exposition in this country and in Europe where we have competed. The many thousands throughout this country testify as to their reliability.

The largest clock in the world was made by us for Colgate & Co., Jersey City, N. J.

Four dials 24 ft. in diameter for the Bromo Seltzer Building, Baltimore, Md.

New York City Hall, N. Y.

Independence Hall, Philadelphia, Pa.

Nassau Hall, Princeton, N. J.

City Hall, Lowell, Mass.

Courthouse, Fort Worth, Tex.

Elgin Watch Factory, Elgin, Ill.

Great Northern R. R. Depot, Spokane, Wash.

Daniels & Fisher Building, Denver, Colo.

Maryland Casualty Co., Baltimore, Md.

# TIME-SYSTEMS COMPANY

## Manufacturers of Automatic Time Systems

### CHICAGO, ILL.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

#### Products and Services.

"HAHL" AUTOMATIC TIME SYSTEMS, including MASTER CLOCKS, SECONDARY CLOCKS, PROGRAM CLOCKS, TIME RECORDERS, TIME STAMPS, and TOWER CLOCKS.

"Hahl" Time Systems will be installed by this company, or shipped, with full directions, ready for installation by any local mechanic or electrician.

#### "Hahl" Automatic Time Systems.

The most essential feature of "Hahl" time systems is the fact that the media of operation—air and gravity—are, in relation to the system, constant and invariable. "Hahl" systems are not subject to eccentricities characteristic of electrically controlled devices; they are particularly preferable in this sense, when it is remembered that the slightest cessation from constant operation defeats the purposes of a time system.

#### Description of Systems.

Systems consist of the necessary number of secondary clocks (also, according to installation, of program clocks, time recorders, tower clocks and time stamps), located at desirable points throughout the building, and connected with a high grade master clock by means of small air conveying tubing. The clocks connected with the master clock are provided with small diaphragms. These diaphragms are alternately inflated by an impulse of air sent through the connecting tubing by a simple bellows and air release valve mechanism in the master clock, and are released by this mechanism at one minute intervals, motive power being furnished by weights. Through proper gearing each action moves the perfectly balanced hands of the dials exactly one minute, with unfailing certainty. The tubing being open to the atmosphere every other minute, any disturbance from expansion or contraction due to changes of temperature is positively and effectively eliminated.

**ADVANTAGES**—Because of their basic operating principle—air and gravity—the "Hahl" systems are positively the most accurate and dependable; they are the

most easily maintained at lowest cost and at no real operating expense.

"Hahl" systems are not disturbed by vibration, jarring or dust. They have no delicate or intricate mechanism to get out of order, to fuss with or to worry about. No auxiliary apparatus or electric current is required. The care required for the operation of the entire system is no more than that required for one ordinary clock; i. e., weekly winding of the master clock.

#### Master Clock.

A highest grade clock with self-contained power device to operate the secondary system. Has dead beat escapement, sixty-beat compensating pendulum and independent time train.

#### Secondary Clocks.

Movements rustproof, noiseless, positive in action, and not disturbed by vibration, jarring or dust. Hands perfectly balanced. Dials 4 ins. to 5 ft. in diameter.

#### Program Clocks.

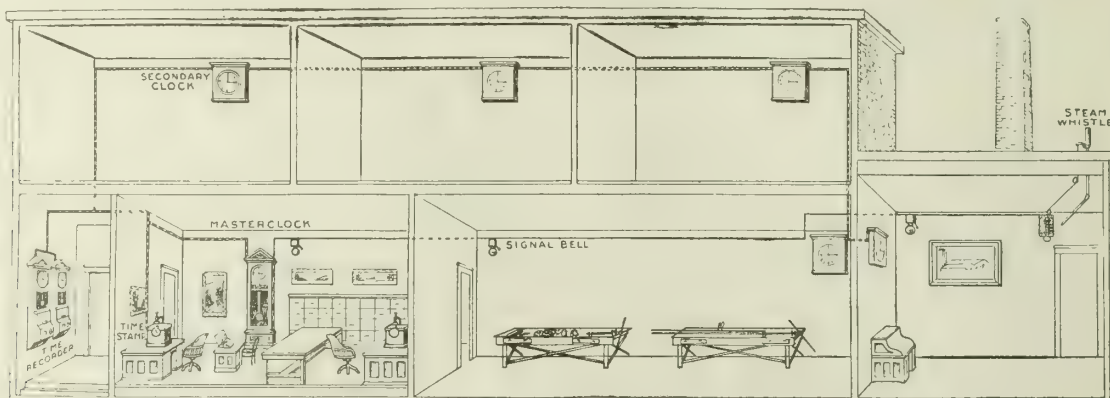
Program apparatus, gear driven from master clock, is arranged to make contacts for ringing bells at one minute intervals, on one or more programs. The apparatus is attached to main frame of master clock and located in the same housing. Automatic silencer eliminates signals during any given hour or day of the week. The program is easily set, and permits changes at any time when required.

#### Tower Clocks.

Eight-day or motor wound weight movements with "Hahl" automatic escapement synchronized by master clock. These movements are proof against vibration and weather conditions, and positive time keeping is assured by the control of the master clock, which preferably is located in the lower and more substantial part of the building.

#### Time Stamps.

Prints and records automatically, the year, month, day, hour, minute, A.M. and P.M. Movement is contained in stationary part of the stamp and is not disturbed by hard usage. Stamp is operated through same tubing as clocks.



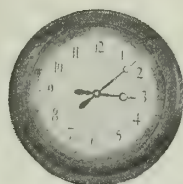
SECTIONAL PERSPECTIVE SHOWING SERVICE POSSIBILITIES OF "HAHL" AUTOMATIC TIME SYSTEMS





Master Clock Case, Style 1  
8' 5" high, 2' 1" wide, 1' 4" deep, 14" dial.

Quartered oak or birch mahogany



Secondary Clock, Style 06

Case...	18"	21 1/4"	24"	29"
Depth...	4 1/4"	4 1/4"	4 1/4"	4 7/8"
Dial...	12"	15"	18"	24"

Quartered oak or birch mahogany



Secondary Clock, Style 015  
Furnished for ceiling suspension or for mounting on coping. Also double faced.

High.....	22"	25"
Wide.....	50 1/2"	60"
Dial.....	15"	18"

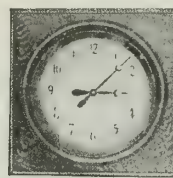
Oak or mahogany



Secondary Clock, Style 012

Case...	15"	19"	22"	29"
Depth...	1 1/2"	1 1/2"	1 1/2"	2"
Dial...	12"	15"	18"	24"

Recess 7" x 7" x 2 1/2" for movement  
Gunmetal



Secondary Clock, Style 01

Front...	15 1/2"	17 1/2"	20 1/2"	24"	29" Sq.
Depth...	4 1/4"	4 1/4"	4 1/4"	4 1/4"	6 1/2"
Dial...	10"	12"	15"	18"	24"

Quartered oak or birch mahogany



Secondary Clock, Style 03

Front.....	10 1/2"	13"	16 1/2"	25 1/2" Sq.
Dial.....	9"	12"	15"	24"

Recess 7" x 7" x 2 1/2" for flush  
White Italian marble



Secondary Clock, Style 016

Double faced; hardwood case, any finish.

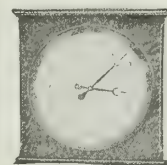
Base, 37"; height, 30"; circular part, 24"; dial, 18"; 12" and 15" dials in proportion.



Secondary Clock, Style 02

Case...	18"	20 1/4"	23 3/8"	29"
Depth...	4 1/4"	4 1/4"	4 1/4"	4 3/8"
Dial...	12"	15"	18"	24"

Spun brass; black copper sash and bezel



Secondary Clock, Style 05

Height.....	16"	17 1/2"	20 1/2"
Width.....	15 1/2"	17"	20"
Depth.....	4 1/2"	4 1/2"	4 1/2"
Dial.....	10"	12"	15"

Quartered oak or birch mahogany



Secondary Clock, Style 08

Dial, 5 1/2", 7 1/2", 10", 12", 15", 18". Bezel brush brass.  
Projects 1/2" from wall.

#### STANDARD CLOCK DESIGNS FOR TIME SYSTEMS

Special designs made to order

#### Time Recorder Synchronizers.

Is attached to any make of time recorder or cost keeping machine. An ingenious device, which synchronizes these machines pneumatically with master clock in a thoroughly dependable manner.

#### Piping.

Piping for clocks run same as for gas or water, 1/4-in. black wrought iron pipe for mains and 1/8-in. for branches. No return pipe. Flexible 1/4-in. brass tubing used in finished buildings, and may also be pulled through conduit, same as wire.

#### Information Required in Ordering.

In ordering or requesting estimates please supply the following information together with sketch of building layout or blue prints:

Size of building (area).....No. of floors.....  
Is building old or new?.....  
No. of clocks.....Time recorder?.....  
Time stamp?.....Program device?.....

NOTE—Are all bells to be rung simultaneously, or is more than one circuit required?

#### Co-operative Service.

On receipt of particulars this organization will gladly and promptly co-operate with users of this book in the careful study of time system problems. Full layout for installation and specifications will be supplied free of charge, and without obligating inquirer in any way.

#### Installations.

From a list of thousands of installations the following list of firms is given; for whom systems of from 10 to 200 clocks in capacity have been installed by this company:

#### References.

U. S. Supreme Court Building, Washington, D. C.  
Lee Rubber Co., Conshohocken, Pa.  
Union Theological Seminary, New York, N. Y.  
City Hospital, Blackwells Island, New York, N. Y.  
Habicht, Braun & Co., New York, N. Y.  
American Bank Note Co., New York, N. Y.  
Pawling School, Pawling, N. Y.  
Middletown State Hospital, Middletown, N. Y.  
Drum Hill High School, Peekskill, N. Y.  
Industrial Arts School, Mt. Vernon, N. Y.  
High School, Northampton, Pa.  
Kensington Trust Co., Philadelphia, Pa.  
Gilman Country School, Baltimore, Md.  
Rennert Hotel, Baltimore, Md.  
Postal Telegraph Co., Chicago, Ill.  
Chicago Telephone Co., Chicago, Ill.  
Sears, Roebuck & Co., Chicago, Ill.  
Simonds Mfg. Co., Chicago, Ill.  
W. C. Ritchie Co., Chicago, Ill.  
Chas. Emmerich & Co., Chicago, Ill.  
Western Bank Note & Engraving Co., Chicago, Ill.  
Sprague, Warner & Co., Chicago, Ill.  
Heath & Milligan Mfg. Co., Chicago, Ill.  
Mandel Brothers, Chicago, Ill.  
Marshall Field & Co., Chicago, Ill.  
Siegel, Cooper Co., Chicago, Ill.  
Herpolsheimer Co., Grand Rapids, Mich.  
Ohio National Bank, Columbus, Ohio  
Blackstone Hotel, Chicago, Ill.  
Maryland Hotel, St. Louis, Mo.  
People's Gas Building, Chicago, Ill.  
United States Post Office, Chicago, Ill.  
Cook County Court House, Chicago, Ill.  
Douglas County Court House, Omaha, Nebr.  
Wisconsin State Capitol, Madison, Wis.  
St. Luke's Hospital, Chicago, Ill.  
State Normal School, Milwaukee, Wis.  
State Normal School, De Kalb, Ill.  
U. S. Post Office, Atlanta, Ga.

ESTABLISHED 1884

INCORPORATED 1888

# THE STANDARD ELECTRIC TIME CO.

## SPRINGFIELD, MASS.

### SALES OFFICES AND SERVICE STATIONS

NEW YORK, N. Y., 50 Church Street  
 BOSTON, MASS., 261 Franklin Street  
 CHICAGO, ILL., 1363 Monadnock Building  
 KANSAS CITY, MO., 1513-A Grand Avenue

SAN FRANCISCO, CAL., 461 Market Street  
 LOS ANGELES, CAL., 706 Marsh-Strong Building  
 CLEVELAND, OHIO, Rockefeller Building  
 BIRMINGHAM, ALA., Brown-Marx Building

### Products.

The "STANDARD" ELECTRIC TIME SYSTEMS, which include Electric Self-winding Master Clocks or Regulators, Electric Secondary Clocks, Program Clocks, with Bells, Horns, Whistles, etc.

Tower Clocks, Street Clocks, Time Stamps, Employes' Time Registers, or Synchronizers for keeping other makes of clocks in perfect unison with our time systems.

### Service.

Each office has a force of electrical engineers and trained service men, whom architects are free to call upon for suggestions, diagrams, specifications, or estimates.

### Standard Electric Time System Master Clock.

The master clock, or regulator, is the source of time for the whole plant, or system. "Standard" master clocks are self-wound every minute, thus maintaining a steady drive from the main spring; fitted with dead beat escapement and platinum contacts throughout. Master clock should be preferably of 60-beat type, with mercurial compensating pendulum, for greatest accuracy.

### Secondary Clocks.

"Standard" centralized control permits secondary clocks to be located at the most advantageous point of observation, regardless of accessibility. They can be used for service that winding clocks will not adequately meet. Are not affected by temperature or vibration. Require no oiling and only infrequent cleaning.

### Finishes.

"Standard" cases for master clocks and secondaries are oak in three shades, light, medium and dark. Other finishes are supplied when desired to match the interior trim of the building.

Secondary clocks in metal cases, or with marble faces and with special hands, furnished in accordance with the architect's designs.

### Specifications.

Secondary clocks to be wired preferably in series; bells, gongs, etc., to be wired in multiple. Not over 20 clocks to be on one circuit. Size of wire to be not smaller than No. 16. On long lines use No. 14.

If bells are to be arranged for changing from one program circuit to another, a common return wire must be run back from

each bell to a connector board. Use a common return from all bells to battery.

Operating voltage to be from 16 to 24 volts. Storage battery should be used as source of current on all except the smallest installations, to be charged from either 110 D. C. or A. C. With the latter current use an electrolytic rectifier, transformer, panel board, etc., or hot bulb rectifier, except on the largest installations, when a motor generator should be used in place of rectifier and transformer.

Series secondary clocks to have 1 volt each for operation, up to 14 ins. Between 14 and 24 ins., 2 volts. Bells and gongs to be wound to high resistance for proper operation on the specified voltage. Allow also for line drop.

### References.

Bureau of Standards Building, Washington, D. C.  
 U. S. Senate Office Building, Washington, D. C.  
 Bureau of Printing and Engraving, and 11 other Public Buildings in Washington, D. C.  
 State Educational Building, Albany, N. Y.  
 Massachusetts Institute of Technology, Boston, Mass.  
 City Hall and Public Schools, Oakland, Cal.  
 Grover Cleveland High School and other Public Schools, St. Louis, Mo.  
 Hughes High School, and 20 other Public Schools, Cincinnati, Ohio  
 Twenty Public Schools, Bridgeport, Conn.  
 Harvard Medical School and Dormitories, Boston, Mass.  
 Hotel Astor, New York, N. Y.  
 Pierce Arrow Motor Car Co., Buffalo, N. Y.  
 Ford Motor Car Co., Detroit, Mich.  
 Underwood Typewriter Co., Hartford, Conn.  
 Cheney Bros. Silk Mills, South Manchester, Conn.  
 Fisk Rubber Co., Chicopee Falls, Mass.  
 U. S. Penitentiary, Atlanta, Ga.

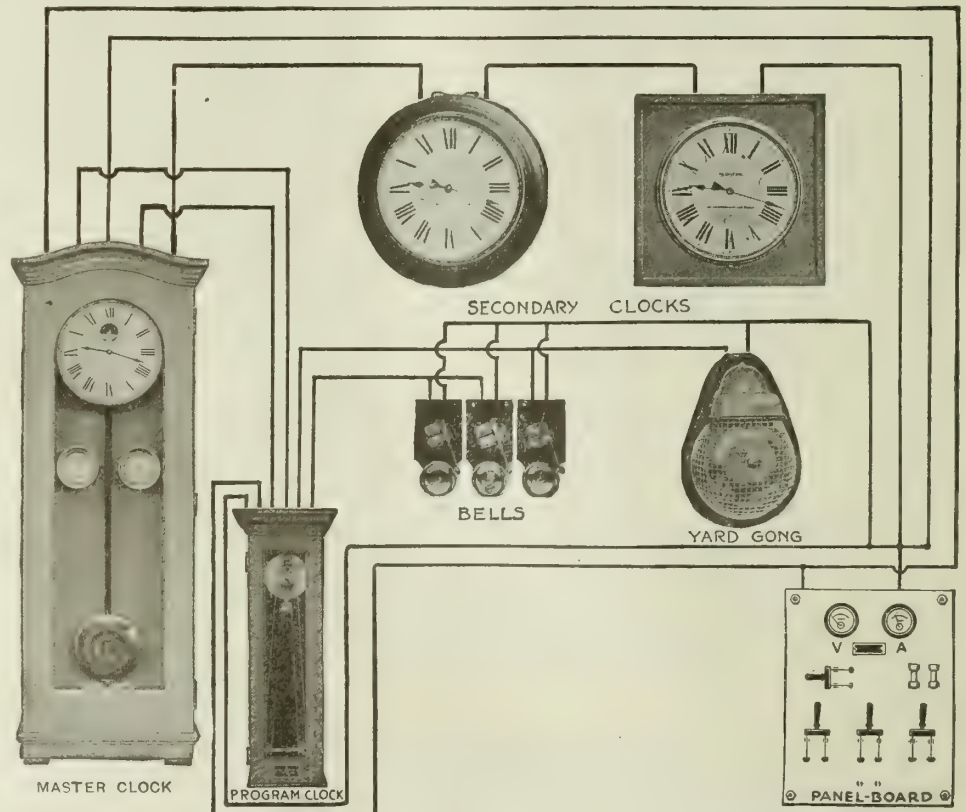


DIAGRAM SHOWING METHOD OF OPERATION AND DIFFERENT PARTS OF STANDARD ELECTRIC TIME CO.'S SYSTEM



# McSHANE BELL FOUNDRY CO.

ESTABLISHED 1856  
BY HENRY McSHANE

MAIN OFFICE AND FOUNDRY  
Harford Avenue and B. & O. R. R.  
BALTIMORE, MD.

INCORPORATED 1904

BRANCH OFFICES

CHICAGO, ILL., 154 West Randolph Street

SAN FRANCISCO, CAL., 461 Market Street

## Products.

Founders of CHURCH BELLS, CHIMES, PEAL and CHAPEL BELLS; FIRE ALARM, COURT HOUSE and TOWER CLOCK BELLS; also, WESTMINSTER CLOCK CHIMES, and SCHOOL-HOUSE BELLS.

## Specialties.

We specialize in the building of musical bells of the highest standard, chimes for churches and tower clocks.

## Description and Guarantee.

We make exclusively genuine bell-metal composition bells which are fully warranted and guaranteed to be satisfactory. We ship bells to all parts of the world and have cast more than 40,000 in a half century.

They can be installed by any first class carpenter or contractor, full instructions being furnished for the purpose.

## Suggestions for Construction of Bell-fries.

Best results are obtained when floor of bell deck is on a level with comb of roof of the building.

Place windows, which should be 12 to 16 ft. high, on a level with belfry floor and a ceiling just above top of windows. See that windows are as large and open as possible, and if louvers are used, see that they be pitched so as not to obstruct entirely the carrying of the tone.

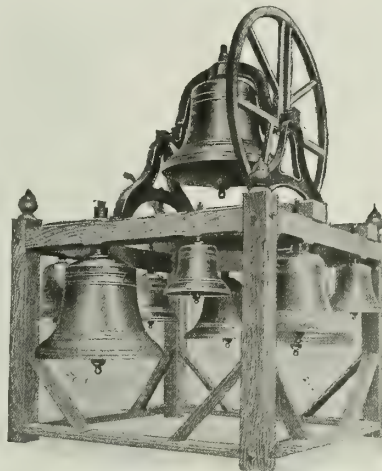
The average church bell measures from 3 to 5 ft. across the mouth. Make provisions for admission of bell.

## Facilities.

The most modern facilities and new inventions for tempering and tuning bells secure absolute accuracy.

## Co-operative Service.

Specifications and information supplied for memorials.



CHIME BELLS



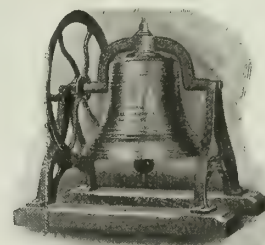
CHURCH BELLS



FIRE ALARM AND COURT HOUSE BELL



WESTMINSTER CLOCK CHIMES



CHAPEL AND SCHOOL BELL

## References.

A few churches recently supplied with chimes:  
St. Mark's Evangelical Lutheran Church, Van Wert, Ohio  
St. Paul's Protestant Episcopal Church, Chattanooga, Tenn.  
Church of the Saviour, Philadelphia, Pa.  
Taylor Street Presbyterian Church, Fort Worth, Tex.  
Westminster Presbyterian Church, Wilmington, Del.  
Ohio State University, Columbus, Ohio  
St. John's Protestant Episcopal Church, Tallahassee, Fla.  
First Methodist Episcopal Church, Fort Dodge, Iowa  
John B. Stetson University, De Land, Fla.  
Christ Protestant Episcopal Church, Glendale, Ohio  
First Baptist Church, Malden, Mass.  
First Methodist Episcopal Church, Hastings, Nebr.  
Zion Lutheran Church, Niagara Falls, N. Y.  
Church of the Good Shepherd, Rosemont, Pa.  
St. Giles' Presbyterian Church, Hamilton, Can.  
St. Luke's Methodist Episcopal Church, Dubuque, Iowa  
First Methodist Episcopal Church, St. Johns, Mich.



PEAL BELLS

# MENEELY BELL CO.

177 Broadway  
NEW YORK, N. Y.  
TELEPHONE, CORTLANDT 1749

22-26 River Street  
TROY, N. Y.  
TELEPHONE, TROY 525

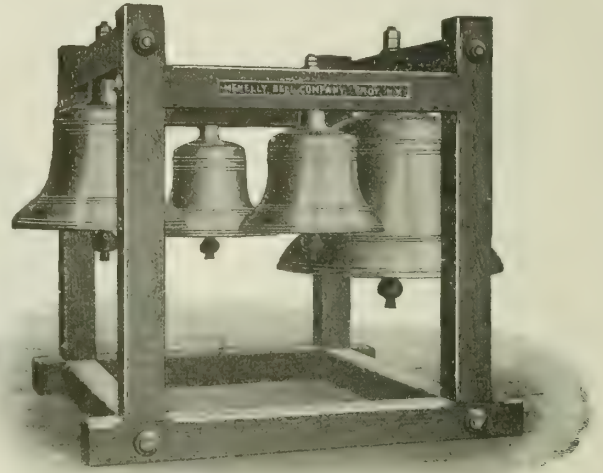
## Products.

Manufacturers of BELLS: CHURCH, CHIME, PEAL, ANGELUS, SCHOOL, TOWER CLOCK, WESTMINSTER, FIRE ALARM, FOG SIGNAL, SHIP, FARM, and other BELLS.

## Details of Church Bells.

WEIGHTS, TONES AND SIZES OF CHURCH BELLS

BELL			MOUNTINGS			
Weight, lbs.	Medium tone	Diameter, ins.	Size of frame outside		Diameter of wheel	
			ft.	ins.	ft.	ins.
400	D	27	3	5 x 3	5	4 4
450	C sharp	28	3	5 x 3	5	4 4
500	C	29	3	5 x 3	5	4 4
600	B	31	3	8 x 3	11	4 9
700	B	33	3	11 x 4	2	4 9
800	B flat	34	3	11 x 4	2	5 6
900	A	36	4	2 x 4	6	5 9
1000	A	37	4	2 x 4	6	5 9
1200	A flat	39	4	9 x 4	9	6 3
1500	G	42	4	10 x 4	10	6 6
1800	F sharp	45	5	5 x 5	7	7 0
2000	F	46	5	5 x 5	7	7 0
2500	E	50	5	5 x 5	9	7 6
3000	E flat	53	6	2 x 6	6	8 0
3500	D	56	6	2 x 6	6	8 6
4000	C sharp	58	6	6 x 6	9	8 6
4500	C	61	6	6 x 6	9	9 0
5000	C	63	7	0 x 7	0	9 0
6000	B	67	7	0 x 7	0	9 6
7000	B flat	69	7	6 x 8	5	9 6



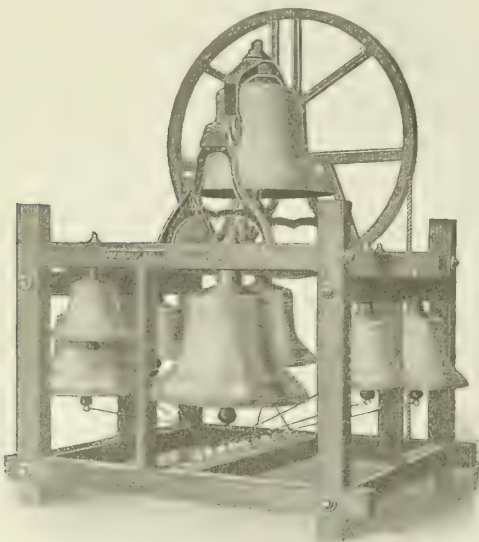
PEAL BELLS



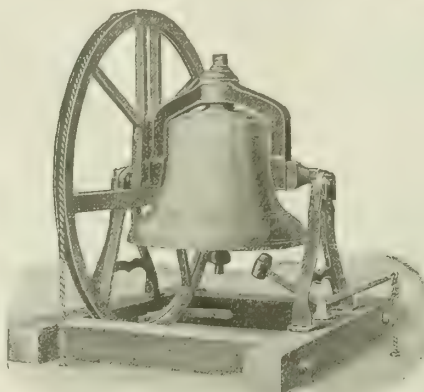
TOWER CLOCK BELL

## Illustrations.

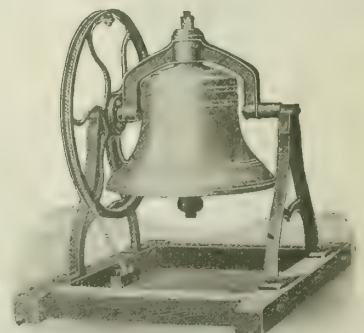
The accompanying illustrations show a few of the principal bells manufactured by this company.



CHIME BELLS



CHURCH BELL



SCHOOL BELL



## E. F. HODGSON CO.

### Manufacturers of Portable Houses

116 Washington Street  
BOSTON, MASS.

NEW YORK OFFICE: 6 East 39th Street

#### Product.

HODGSON PORTABLE HOUSES.

#### Description.

The Hodgson portable houses have been used in all climates for over 20 years, and have proved to be practical for many purposes throughout the year. The sides and roofs are of clear red cedar, the floors of rift hard pine. They are made in sections, each section being complete with doors and windows fitted with locks, etc. They are neatly finished inside and painted three coats outside. The sections are securely fastened together with wedge key bolts, there being no threads to rust, and they are quickly assembled by unskilled labor.

They are attractive in appearance, practical for the

purpose intended, and durable. They save much expense and annoyance of building.

Hodgson houses are used on the estates of the Ames, Hunnewells, Fricks, Rockefellers, McAlpins, Carnegies, Astors, Fennos, Lowells, Vanderbilts, Bancrofts, Gardners, Belmonts, Goulds, Cranes, Iselins, Forbeses, etc., being used for overflow houses, play houses, garden houses, chauffeurs' houses, servants' houses, garages, poultry houses, kennels, etc.

It is impossible in this space to give detail and the many uses the Hodgson portable houses have been put to.

We would be pleased to supply our catalogue, and when architects are planning a country estate they will find their clients will be interested in these houses for many different purposes.



HODGSON PORTABLE COTTAGE

Made in units of 6 ft. and either 10 ft. or 12 ft. wide. They have different styles of porches, screened rooms, sun parlors, ells, valley roofs, etc., so that it is possible to make up many arrangements of rooms, porches, etc., and to add to them at any time. They are used as summer cottages, week-end or overflow houses, chauffeurs' and servants' quarters, etc. Prices vary from \$150 for one room to \$1000 for several rooms.



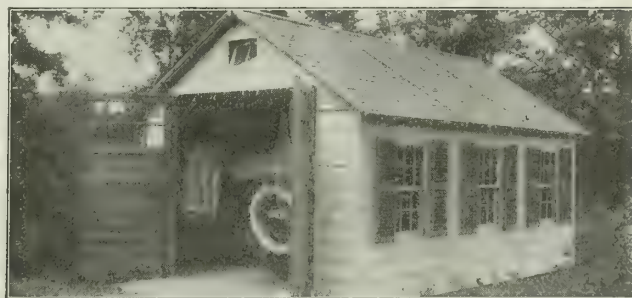
HODGSON PORTABLE CHURCH

Made on the unit system, and found to be very valuable in emergency cases and in trying out certain localities to determine whether it is wise to build permanently. It can easily be moved to new locations at little expense. Prices vary according to size: one to hold 100 to 150 people, costing \$1500 to \$2000; 500 to 600 people, about \$3000. We quote prices delivered and erected.



HODGSON PORTABLE CLUB HOUSE

Made in sizes from one small room for a few members, costing about \$150, to extensive buildings, with all necessary rooms to care for a large number of members, costing several thousand dollars. Used as permanent buildings; also as temporary buildings, perhaps after a fire or while a club house is being built.



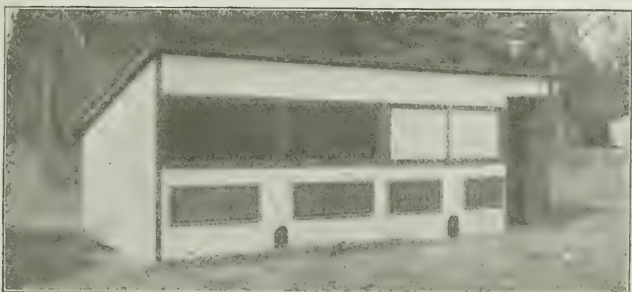
HODGSON PORTABLE GARAGE

Made in many sizes and styles and serve every purpose. The prices run from \$150 for a small car garage to \$1000 for a garage for 4 cars. These garages are used on many summer and country estates, and will save the purchaser much expense and bother in erecting a more elaborate building.



HODGSON PORTABLE KENNEL

Made in many sizes and styles



HODGSON PORTABLE POULTRY HOUSE

Made in many sizes and styles



# HITCHINGS & CO.

## Iron Frame Greenhouses and Equipment

GENERAL OFFICES AND FACTORY

ELIZABETH, N. J.

NEW YORK OFFICE, 1170 Broadway  
Telephone, 9083-9084 Madison Square

PHILADELPHIA OFFICE, Pennsylvania Building, 15th and  
Chestnut Streets

BOSTON OFFICE, John Hancock Building, 49 Federal Street

### Products.

GREENHOUSES for general purposes, for Palms, Orchids, Ferns, Roses; GRAPERIES, ORCHARD HOUSES, CONSERVATORIES, and SUN PARLORS.

HOT WATER and STEAM HEATING APPARATUS; VENTILATING and SASH OPERATING APPARATUS.

### Co-operative Service.

It is our desire to co-operate with the architect in every way possible, toward the building of a greenhouse that will be as practical from the *growing* standpoint as it will be attractive from the architectural standpoint.

We shall be glad to bring knowledge (gained by years of experience) of the exacting requirements of plant life, light values, and the other important considerations that enter into the building of a successful greenhouse, to bear on the architect's particular problem, and work with him toward the securing of the very best possible results.

We may be able to make suggestions that will increase the economy and practicability of the greenhouse without detracting from its attractiveness.

Plans and elevations will be gladly made if so desired.

We will furnish material direct, or do erecting.

### Quality.

All wooden portions are milled out of gulf cypress, which is first air-dried for months.

The roof bars of the curved eave houses are cut out of the cypress in the shape they are to take in the greenhouse; not *bent* into shape afterwards. They are rigidly strengthened by an inset strip of steel, preventing springing out of line and consequent glass breakage.

The sills, non-freezable gutters and roof bar brackets are all cast iron. Not only are the gutters cast iron, but *so are the end stops*. One is as essential to endurance as the other.

For the inside lead-off pipe from the gutter, copper is used.

The combined rafters and posts, and the purlins are steel.

We make all parts of our greenhouse. We are manufacturers—not assemblers.

### Heating.

The heating is generally done by cast iron pipes, located under the benches and connected with our cast iron sectional boiler.

Depth of cellar should always be such that the top of the boiler will be at least 2 ft. below the greenhouse floor level. It will therefore, vary with the size of the boiler used; but 8 ft. might be given as a good average depth.

### Benches and Tables.

Iron and cypress bench legs and angle cross bearers are galvanized iron, and bench side castings of cast iron. Sides, bottoms and bottom pieces are cypress. Tile bottom furnished if desired. The cypress portions can be easily removed and frame used over and over again.

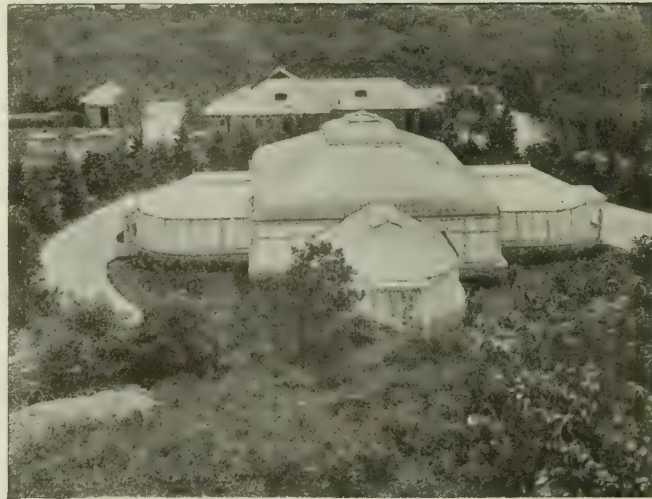
Tables are used in which to set plants grown in pots or tubs. There is practically no difference between benches and tables, except that tables have narrower sides of sufficient height only to confine covering of pebbles or gravel when used; tops are made of slate.

### References.

OWNER	LOCATION OF GREENHOUSE	ARCHITECT
W. G. Mather	Cleveland, Ohio	Chas. A. Platt
Chas. M. Schwab	Loretta, Pa.	Chas. W. Leavitt
H. H. Rogers	Tuxedo, N. Y.	Walker & Gillette
Stuart Duncan	Newport, R. I.	John Russell Pope
J. L. Severance	Cleveland, Ohio	M. H. Horvath
J. H. Harriman	New York, N. Y.	Herbert Lucas
Sterling Postley	Oyster Bay, L. I., N. Y.	Walker & Gillette

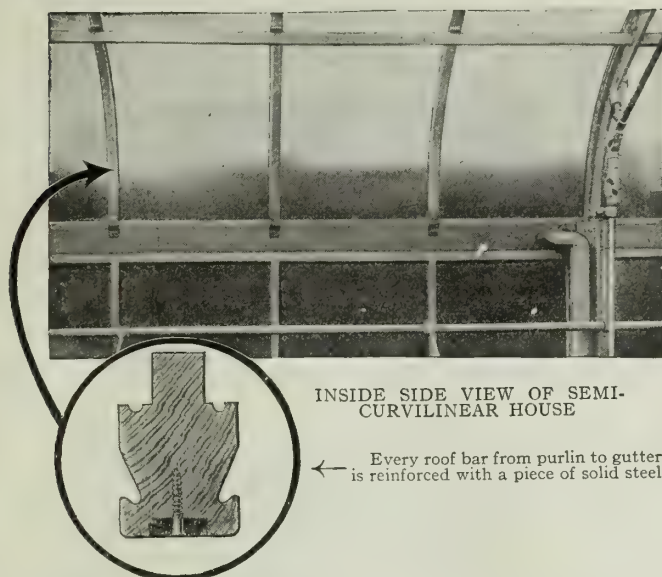


CURVED EAVE GREENHOUSE OF A. A. OLDS,  
HARTFORD, CONN.



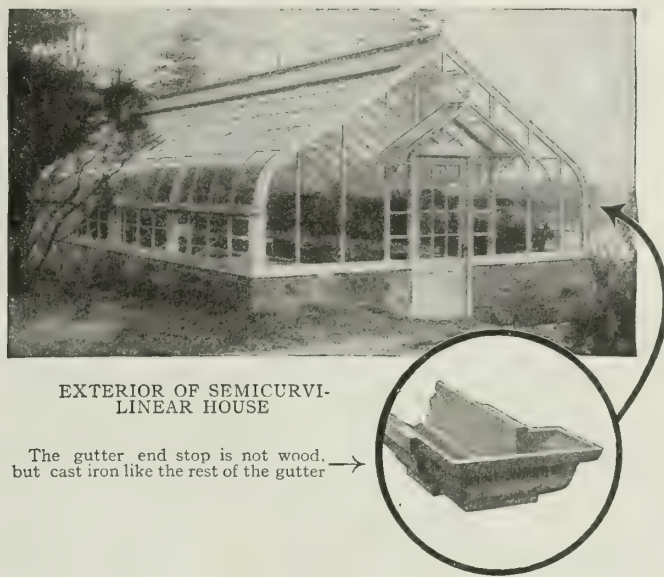
GROUP OF GREENHOUSES ERECTED FOR A. C. JAMES,  
NEWPORT, R. I.  
OLMSTEAD BROS., Architects





INSIDE SIDE VIEW OF SEMI-CURVILINEAR HOUSE

← Every roof bar from purlin to gutter is reinforced with a piece of solid steel



EXTERIOR OF SEMICURVILINEAR HOUSE

The gutter end stop is not wood, but cast iron like the rest of the gutter →

### Description of Constructions.

Fig. 1 below shows section of a curved eave house. In this house the gutter is combined with the cast iron sill. From the sill to the ridge, at intervals of 8 ft. 4 ins., extend the steel rafters which are all in one piece, being bent at the eave line while at white heat. The curve at the eave has a radius of 16 ins. Secured to the rafters and running parallel to the sill, are the steel purlins. The roof bars run from sill to ridge across purlins and between the rafters, and are spaced to receive glass 20 ins. wide. The rafters carry a cypress glazing cap. The side ventilation with this construction

is customarily secured through panels in the foundation wall.

Fig. 2 below shows section of a semicurvilinear house. This differs from the standard curved eave house in that the gutter is placed at the eave line; the roof's sweep being broadened to a 30-in. radius. This gives greater height above the side benches and makes it possible to grow the taller stemmed plants in them. A continuous row of ventilating sash is hinged to the under part of the gutter, giving abundance of air under perfect control.

The semicurvilinear house is our standard construction.

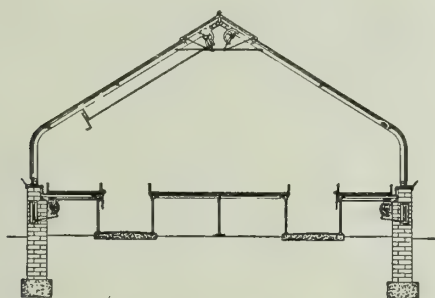


FIG. 1. SECTION OF CURVED EAVE HOUSE

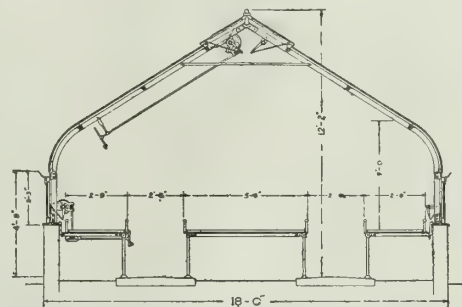


FIG. 2. SECTION OF SEMICURVILINEAR HOUSE



RUN OF REVOLVING SASH TYPE OF MILL VENTILATING APPARATUS

So called because of rocker motion conveyed to the arms and rods by a part revolution of sash. Most effective for short and medium length runs of sash



RUN OF SLIDING SHAFT TYPE OF MILL VENTILATING APPARATUS

Motion conveyed to sash by arms connected to rod moving horizontally Adapted to extra long runs. Send for catalogue of ventilating devices

# KING CONSTRUCTION COMPANY

Conservatories, Glass Construction and Sash Operators  
NORTH TONAWANDA, N. Y.

SALES OFFICES

NEW YORK, 1476 Broadway

BOSTON, 113 State Street

PHILADELPHIA, Harrison Building, 15th and Market Streets

## Products.

GREENHOUSES, CONSERVATORIES, PALM HOUSES, GLASS HOUSES, SUN PARLORS, FRUIT HOUSES, GRAP-  
ERIES and GREENHOUSE ACCESSORIES; KING CON-  
TINUOUS SASH OPERATORS.

HEATING PLANTS and VENTILATING APPARA-  
TUS.

## King Greenhouses.

King greenhouses are so constructed that they are extremely strong without the necessity of heavy shadow casting frames and supports. They also offer splendid architectural possibilities, and are easy to heat and operate.

**CHANNEL BAR TYPE**—This type of construction makes possible the more graceful sweeping lines so effective in greenhouse design. Suited for the more elaborate treatment for residences.

**IRON FRAME TYPE**—For curved and straight eaved conservatories, palm houses, etc., also for large vegetable houses.

**FOUNDATION WALLS**—Should be 8 ins. thick, brick or concrete construction, 30 ins. below and 30 ins. above the ground.

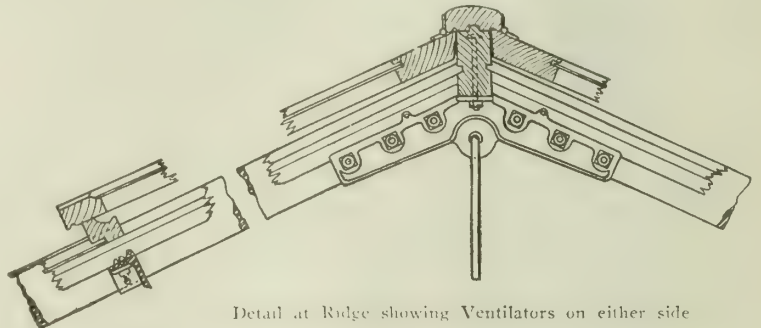
**GLAZING**—Glass should be double strength, "A" quality, laid in strictly pure putty, made of raw linseed oil and whiting; bedded in putty and fastened with wedge shaped zinc glazing nails, after which the surplus putty is removed and the joint between the glass and the framework is painted; forming a perfect bond with glass.

**PAINTING**—Should be with specially prepared white paint to resist moisture, put on in 3 coats.

**VENTILATION**—There should be two lines of roof ventilation in every greenhouse. In houses 25 ft. wide or wider, there should be a line of ventilation in each side as well.

**HEATING**—Should be done with 2-in. pipe coils. Hot water gravity circulation is most efficient. Boilers should have capacity double the amount of radiation installed in greenhouse.

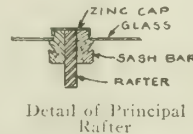
**Co-OPERATIVE SERVICE**—Plans and estimates will be furnished on receipt of particulars of requirements, without in any way obligating the inquirer.



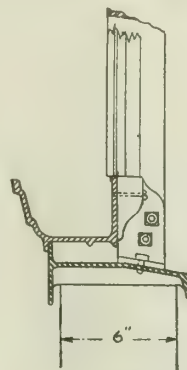
Detail at Ridge showing Ventilators on either side



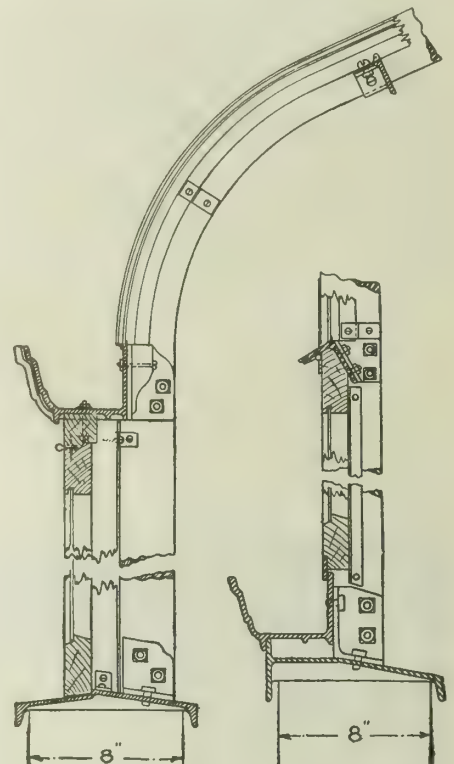
Detail of Sash Bar  
One-quarter full size



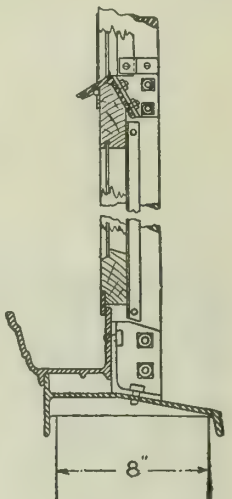
Detail of Principal  
Rafter



Detail of Side Wall  
Construction on 6-  
inch Concrete Wall



Gutter at Eave with  
Side Ventilators at  
Either Side



Details of Side  
Wall Construction.  
Gutters are Exposed  
to Interior Heat

CONSTRUCTION DETAILS OF KING GREENHOUSES



KING CHANNEL BAR GREENHOUSE  
Erected for J. P. Morgan, Glen Cove, Long Island, N. Y.



KING IRON FRAME GREENHOUSE  
Erected for F. H. Shelton, Media, Pa.



**King Continuous Sash Operators.**

The King sash operators are simple and direct in their operation, eliminating the need of roller bearings, machined surfaces and delicate parts which cause annoyance and add to the cost of the outfit.

All styles (as illustrated below) work on the principle of shaft rotation. This is the most simple and economical method. Where runs are so long that plain arm and lever gives too much torsion to shaft, a rack and pinion is used, thus greatly reducing leverage and, consequently, the torsion. One-in. pipe is used for runs of 100 ft. or less of pivoted sash and 1¼-in. pipe for all longer runs. In extreme cases of extraordinary weight of sash, 1¼-in. extra heavy or double extra heavy pipe is used.

**PATENT SPRING CONNECTOR**—This device (see illustration) prevents whole strain of operating machine from concentrating on any one sash, and thus greatly reduces liability of apparatus getting out of order.

**CO-OPERATIVE SERVICE AND ESTIMATES**—No sash operating problem has yet been presented to this organization that it was unable to solve satisfactorily. The devices shown cover a wide range of applications, but it should be remembered that the King systems include other patterns and that special pattern will be made when required.

As conditions are likely to vary in each case, the architect is urged to submit his problem entirely to the

Brass spring placed in connection between sash and operating device.

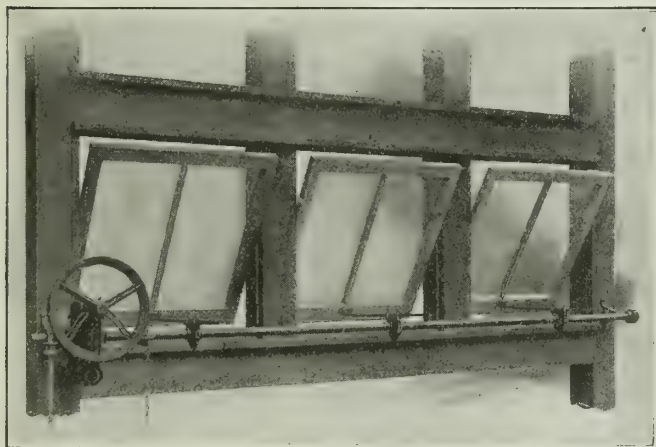
**FITTING WITH KING PATENTED BRASS SPRING CONNECTOR**

Should snow or ice accumulate under one or more sash, spring connector will allow these sash to remain open until obstruction disappears; spring will then automatically close sash

**KING RACK AND PINION**  
For opening heavy sash or long runs

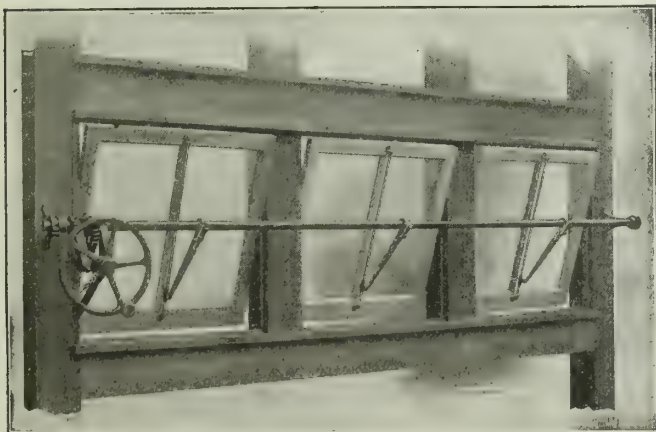
King Engineering Department. Upon receipt of drawings and full particulars, proper recommendation will be made and estimate submitted for materials or for system erected complete.

This company prefers to erect its systems complete, as this centers responsibilities and satisfactory results are absolutely assured.



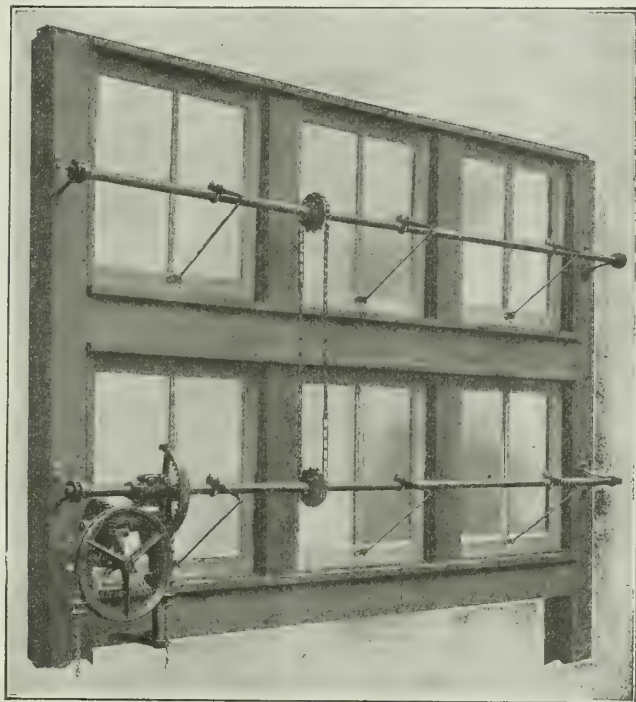
**STYLE 1. KING RACK AND PINION APPARATUS**

For heavy windows and long runs of sash hinged at top or bottom or horizontally pivoted. Will operate up to 400 ft.



**STYLE 2. KING CLOSE WORKING APPARATUS WITH SLIDING ARM FOR LOW DOWN SASH**

Does not project much into building. Will operate up to 50 ft.



**STYLE 3. KING WORM GEAR APPARATUS**

For short runs and light sash. Will operate up to 100 ft.

**References.**

The King continuous sash operators have been used by the following firms:

NAME AND LOCATION	QUANTITY
<b>VERTICALLY PIVOTED</b>	
America Radiator Co., Detroit, Mich., Titusville, Pa., Buffalo, N. Y.....	7000 ft.
Northern Pacific Railway Co., Calgary, Alta., Can.....	6000 "
Detroit Steel Products Co., Detroit, Mich.....	3500 "
<b>HORIZONTALLY PIVOTED</b>	
Bosch-Magneto Company, Springfield, Mass.....	3200 "
Otis Elevator Company, Buffalo, N. Y.....	1400 "
Big Four Car Shops, Indianapolis, Ind.....	12500 "
Carborundum Company, Niagara Falls, N. Y.....	2500 "
Pierce-Arrow Motor Car Co., Buffalo, N. Y.....	1200 "
Detroit Insulated Wire Co., Detroit, Mich.....	600 "
J. W. Clement Co., Buffalo, N. Y.....	1800 "
<b>RACK AND PINION, SPRING LEVER</b>	
J. W. Clement Co., Buffalo, N. Y.....	1800 "

# LORD & BURNHAM CO.

Greenhouse Designers and Manufacturers

FACTORIES

IRVINGTON, N. Y.

DESPLAINES, ILL.

ST. CATHARINES, CANADA

SALES OFFICES

NEW YORK, N. Y., 42nd Street Building  
BOSTON, MASS., Tremont Building  
CHICAGO, ILL., Rookery Building  
PHILADELPHIA, PA., Widener Building

ROCHESTER, N. Y., Granite Building  
CLEVELAND, OHIO, Swetland Building  
DETROIT, MICH., Penobscot Building  
MONTREAL, QUE., Transportation Building  
TORONTO, ONT., Royal Bank Building

## Products.

Manufacturers of SECTIONAL IRON FRAME GREENHOUSES, and GREENHOUSE EQUIPMENT, including Benches, Tables, Ventilating Apparatus, Hot Water and Steam Heating Systems, etc.

Conservatories, Sun Parlors, and Moving Picture Studios.

For Sash Operating Apparatus, see page 747; for Boilers, see pages 978-79.

## Quality and Facilities.

Back of our greenhouses, as built today, are our three-score years' experience as specializing greenhouse designers and manufacturers.

We thoroughly understand plant requirements and the best way to construct houses to meet them.

In three extensive factories, located conveniently near the business centers of the United States and Canada, are manufactured everything for the greenhouse except the glass. The fact that all the necessary materials are on hand, ready for immediate working up into houses, eliminates the delays and dissatisfaction that would attend the ordering of iron from one mill, wood from another, and waiting in turn for deliveries.

We will furnish materials and erect, or just furnish materials.

In order to co-operate closely with the architect, nine sales offices have been established, seven in the United States and two in Canada, at any one of which our greenhouse experts can be dealt with direct.

## Sectional Iron Frame Greenhouses.

GENERAL CONSTRUCTION—One section is formed by setting up two spans of rafters, 8 ft. 4 ins. apart, at either end of two lengths of cast iron sills. The cross framing between these two spans of rafters consists of the gutters at the eaves and purlins between the eaves and ridge. These latter are placed the right distance apart to carry the roof bars.

Another section may be added by setting up one more span of rafters 8 ft. 4 ins. further along, with cross framing, and so on until the required number of sections are had for the length of the house.

STRENGTH AND DURABILITY—The strength and durability of this construction is in its steel bar rafters, placed thin edge to the light and framed between with steel angles for purlins; and in the method of securing the rafters to the sills at the joints, where two sections of sills meet, and to the gutters in the same manner, so that the sections of sill and gutter on either side of each span of rafters and united to the rafters, as if they were part of them, making the entire iron frame of rafters, sills, gutters and purlins as one piece.

The combining of iron and wood makes an unusually strong construction. Years of experience have taught us that wooden sash bars are more durable and satisfactory for the purpose than any other materials, and prevent glass breakage that is bound to occur from expansion and contraction, if all metal glazing bars are used.

LIGHTNESS—While attaining durability, the light has been increased many fold, as each framework member is but a fraction of the size of its corresponding member in the wooden house and casts correspondingly less shade. Every unnecessary member is eliminated to admit all possible light.

ATTRACTIVENESS—Each construction member is prepared with an idea of good proportion, and general shapeliness of contours; the keynote being simplicity of lines.

The rafter caps and pilasters being larger than the glazing bars, each bay of 8 ft. 4 ins. is accented, giving an effect of broad spacing throughout the entire roof and sides, not obtainable where the glazing bars are of one size and no rafters are used.

QUICK ERECTION—Our greenhouse construction has been worked out to the end that the labor of erecting be reduced to a minimum. The entire frame is passed through a line of machines in the factory; where it is cut, shaped, punched, fitted and primed, ready for immediate erection.

When the materials are delivered, it is mainly a matter of bolting up the iron parts and fastening the screws.

## Styles of Greenhouse Sections.

CURVED EAVE HOUSE—The cast iron gutter is placed at the sill. The eave curve radius is 13 ins. The curved portion is reinforced with a cast iron clasp strip bolted to it on the inside. Side ventilation is obtained by panels in the masonry walls. See Fig. 1 on page following.

MODIFIED CURVED EAVE HOUSE—The gutter is at the bottom of the curved eave, and the ventilating sash are hinged directly to it. The radius of the eave curve is 2 ft., which increases the height of the curved portion over that of the curved eave house, giving greater headroom for the side bench plants. This we consider the most practical house built. See Fig. 2 on page following.

CURVILINEAR ROOF HOUSE—The roof of the curvilinear roof house is in a continuous curve from the ridge to the eave line. Gutter is at the eave. See Fig. 3 on page following.

STRAIGHT ROOF HOUSE—Roof is straight from ridge to eave. Gutter is at the eave. See Fig. 4 on page following.



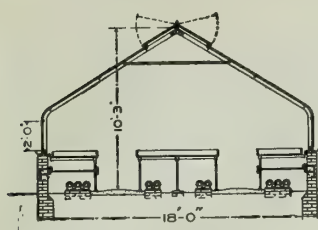


Fig. 1. Section A

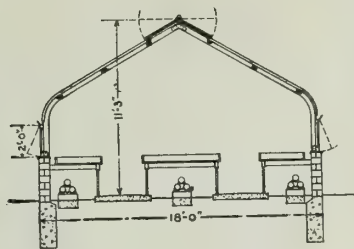


Fig. 2. Section B

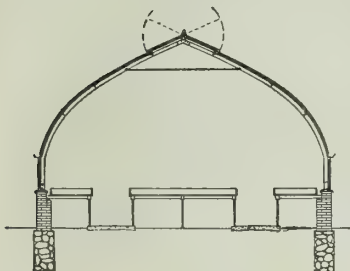


Fig. 3. Section C

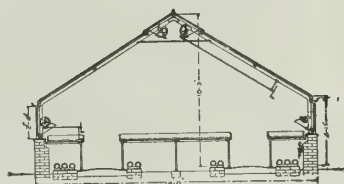
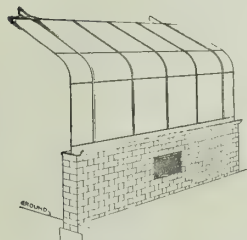
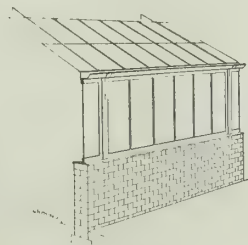


Fig. 4. Section D

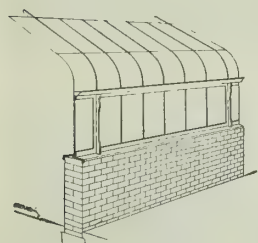
STYLES OF GREENHOUSE SECTIONS



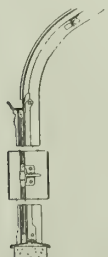
**SIDE CONSTRUCTION OF CURVED EAVE HOUSE**  
Gutter is made in combination with cast iron sill, which caps the wall



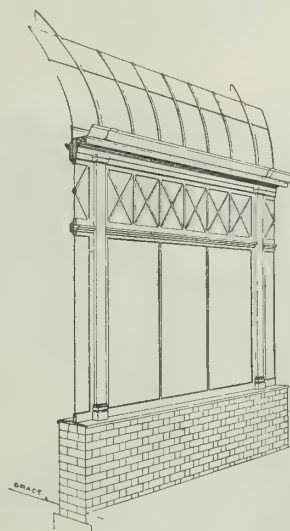
**SIDE CONSTRUCTION OF STRAIGHT EAVE HOUSE**  
Has cast iron gutter at eave. Ventilating sash hinged to the gutter



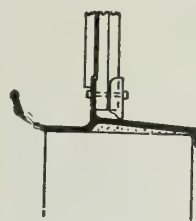
**SIDE CONSTRUCTION OF MODIFIED CURVED EAVE HOUSE**  
Gutter is raised to the eave line. Ventilating sash hinged to gutter, as in straight eave house



**SECTIONAL VIEW OF SIDE OF MODIFIED CURVED EAVE HOUSE**  
By broadening the roof's sweep, height of curved portion above gutter has been increased. Makes possible the growing of taller plants on side benches



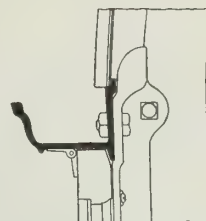
**SIDE CONSTRUCTION OF PALM HOUSE**  
Cast iron gutter placed at the eave. Masonry walls capped by cast iron sills and the rafter bolted to them



**COMBINATION SILL AND GUTTER**  
Combination that caps masonry walls on curved eave house



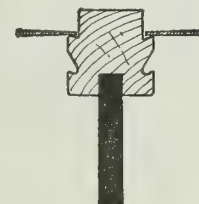
**CAST IRON SILL**  
Rafters secured to it by brackets. Cast with a rabbet which acts as a stop for side sash, and flanges overhanging the sides of the walls for weather protection



**CAST IRON GUTTER**  
Used in modified curved eave house. Cast in lengths of 8 ft. 4 ins. and in ample sizes. Side sash hinged to underside of gutter



**PURLIN**  
Angle steel purlin, secured to rafters by iron brackets and screwed to sash bars



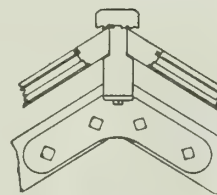
**RAFTER WITH CAP**  
Grooved to fit over rafter, forming insulation from both heat and cold, preserving perfect alignment between rafter and sash bars



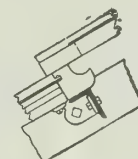
**ROOF BAR**  
These cypress bars are 1 1/8 by 1 3/8 ins. Drip groove on each side carries off condensation moisture



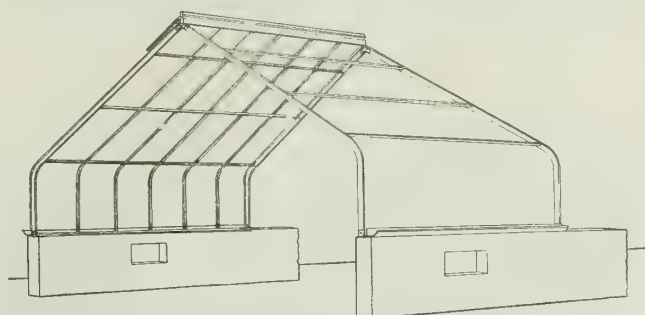
**BAR USED FOR GABLE AND PARTITION**



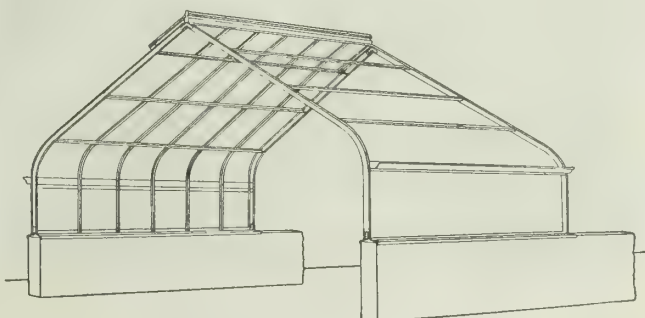
**RIDGE AND RIDGE BRACKET**  
Ridge is of cypress and in two pieces, tongued and grooved to fit. Lengths are joined by metal tongues. Milled to receive ventilating sash. Bolted to ridge brackets



**DRIP HEADER**  
Caps the purlin and forms seat for ventilating sash. Made with gutter which discharges sash condensation on roof. Roof bars fastened to it



**SECTION OF CURVED EAVE HOUSE**  
Showing all members that go to make one complete section of curved eave house. Right half shows only iron members, left half shows all members.



**MODIFIED CURVED EAVE HOUSE**  
Treated in same way as curved eave house in illustration above

### Heating.

Coils of 3½-in. (internal diameter) cast iron pipe, made up with calked joints, are generally located under the benches, where they do not take up any growing space, and are so arranged as to secure a free circulation of air around them. Their surfaces are so distributed as to give the desired temperature with sufficient control in each compartment to produce the best growing conditions.

"Burnham" boilers are used, with ample mains for carrying water to the coils.

The system is installed with sufficient grade to insure rapid circulation and even distribution. The coils are equipped with automatic air headers to prevent all air locks.

The cellar should be of a depth that will allow at least 2 ft. above top of boiler. The average cellar depth is 8 ft.

### Benches and Tables.

Three kinds of construction are employed in the regular stock benches and tables:

BENCHES—(1) Indestructible all cast iron; sides, bottoms and ends cast in separate pieces; legs, of pipe. (2) Galvanized iron frames with cypress bottoms and sides. (3) Galvanized iron frames with tile bottoms and cypress sides.

TABLES—(1) Indestructible all cast iron; sides, bottoms and ends cast in separate pieces; legs, of pipe. (2) Galvanized iron frames with ¾-in. planed slate bottoms. (3) Galvanized iron frames with cypress bottoms.

### How to Specify.

The following may serve as a suggestive guide in making specifications:

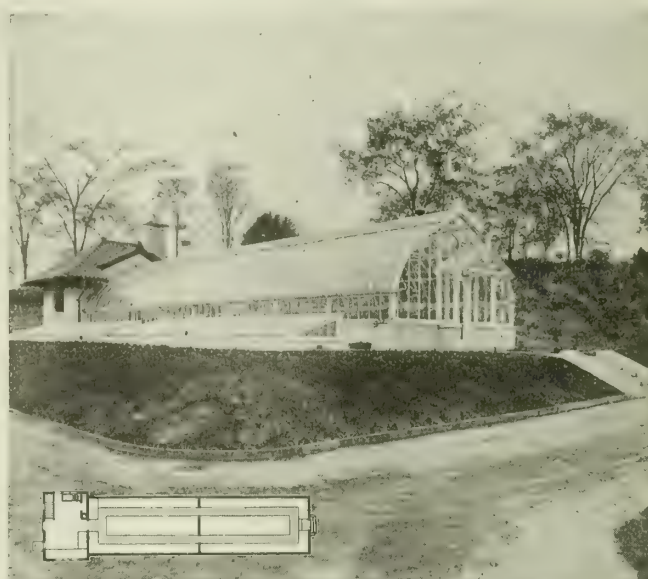
FRAME—The greenhouse to be built with a framework, consisting of cast iron sills capping the masonry walls, steel rafters and purlins, and non-freezable cast iron gutters. Rafters to be



ERECTED FOR I. D. LEVY, CEDARHURST, L. I.

BUCHMAN & FOX, Architects, New York, N. Y.

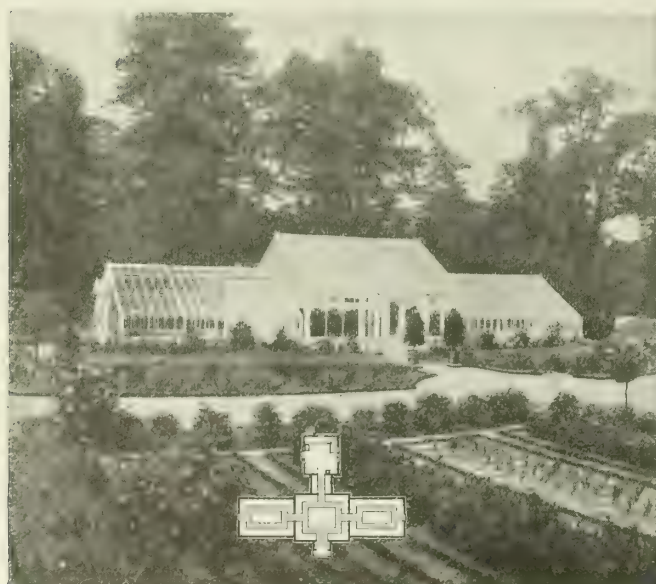
Two-compartment curved eave house with unique entrance treatment



ERECTED FOR ARNOLD SCHLAET, SAUGATUCK, CONN.

W. B. TUBBY, Architect, New York, N. Y.

Curvilinear house



ERECTED FOR M. KAHLE, BRIDGEHAMPTON, L. I.

Layout is a particularly practical one. Ferns, palms and other exotic plants are grown in central palm house. Side houses can be used for cut flowers or vegetables

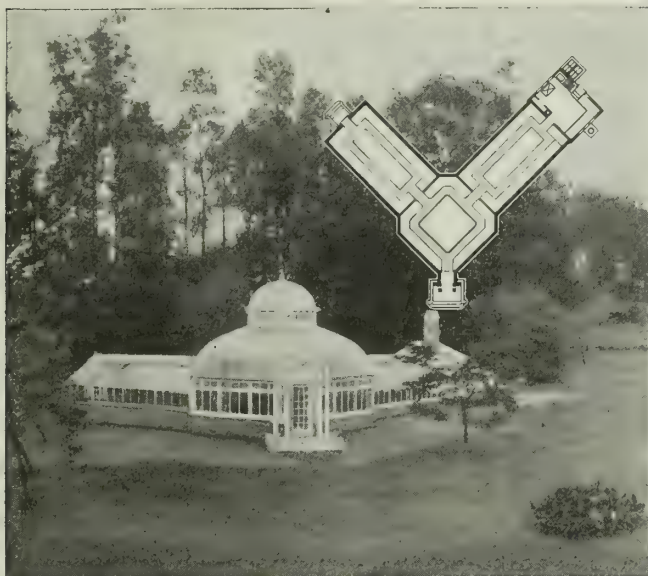


ERECTED FOR J. A. ALLISON, INDIANAPOLIS, IND.

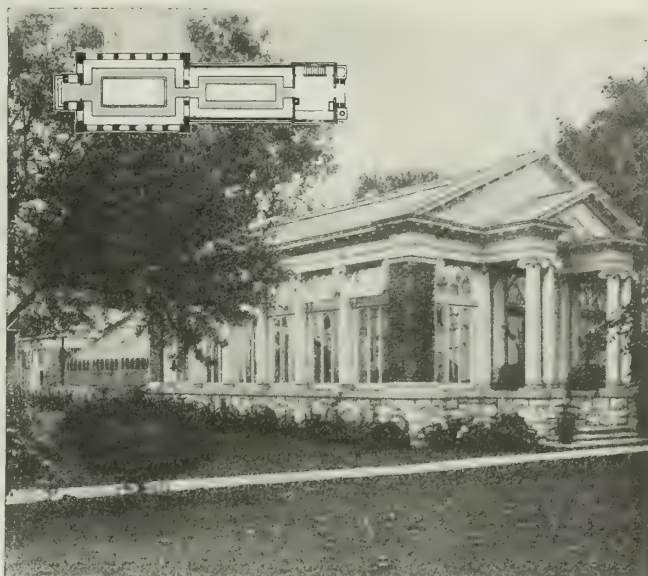
HERBERT L. BASS & Co., Architects, Indianapolis, Ind.

Part glimpse of range of 3 curved eave houses connected at end by glass passage





ERECTED FOR F. L. POTTS, BRYN MAWR, PA.  
Palm, rose and carnation houses



ERECTED FOR W. P. WORTH, COATESVILLE, PA.  
Classic palm house with adjoining general flower house



ERECTED FOR WM. J. DEGNON, JAMAICA, L. I., N. Y.  
By combining greenhouse with garage, same boiler can heat both



ERECTED FOR DUNLEAVY MILBANK, PORT CHESTER, N. Y.  
A compact modified curved eave house

spaced about 8 ft. 4 ins. centers. All sills and gutters to be cast in lengths of about 8 ft. 4 ins.

**WOOD CAPPING**—All wood used throughout to be of clear Gulf cypress, neatly milled and free from all defects. The structure to be furnished with the necessary ridge, mouldings, etc. All members to be properly moulded and secured to the steel frame with screws, lugs, etc.

**GABLES AND PARTITIONS**—The house to be furnished with .....glass gables and.....glass partitions. These to be constructed in a manner similar to the other parts of superstructure.

**VENTILATION**—A run of ventilating sash, constructed of cypress, to be placed on each side of ridge, hinged to same. A line of ventilating sash to be placed on each vertical side hinged to underside of gutter of modified curved eave house (Fig. 2) and in straight eave house (Fig. 4). Ventilation to be secured through panels in masonry walls in curved eave house (Fig. 1).

**PAINTING AND GLAZING**—All cast iron and steel work, entering into the superstructure, to receive 1 coat of red lead before shipment. All wood work, 1 coat of pure white lead and linseed oil. After the frame is erected, 1 coat of white paint. After glazing, a finishing coat of white.

**PLANT BEDS**—Plant beds, constructed with steel frames, cypress sides and bottoms, to be placed in each compartment, constructed and arranged in manner to best serve the various plants intended to be grown.

**HEAT**—Hot water system. Place a sufficient number of 3½-in. internal diameter cast iron pipes, so as to maintain desired temperature when the thermometer registers zero outside.

Connect heating system to a LORD & BURNHAM Co.'s cast iron boiler having sufficient capacity to maintain the temperatures specified.

**DIMENSIONS**—House to be .... ft. long by .... ft. wide.

### Co-operation.

A greenhouse or conservatory, to insure the complete satisfaction of its owner, combines architectural attractiveness with practicability for growing things.

Our architects' service department for securing just such practicability was organized in a spirit of hearty co-operation. The accumulated experience of over half a century spent in the building of glass enclosed structures, combined with an exact knowledge of the rather inelastic demands of plant life, is placed at the disposal of architects.

There are so many governing elements entering into the construction of greenhouses that it is believed satisfactory results can best be obtained through some such co-operation. We shall be glad to have architects make use of this service department with its embodiment of greenhouse experts.

### References.

Owners, location of greenhouses and architects:  
Miss Paula Uihlein, Milwaukee, Wis. George W. Perkins, Riverdale, N. Y., Robert M. Byers, Architect. Capt. J. R. DeLamar, Glen Cove, N. Y., C. P. H. Gilbert, Architect. Larz Anderson, Brookline, Mass., Fox & Gale, Architects. P. A. B. Widener Estate, Ogontz, Pa., Horace Trumbauer, Architect. Chas. S. Walton, St. Davids, Pa., D. Knickerbocker Boyd, Architect.



# WILLIAM H. LUTTON COMPANY

Designers and Builders of Modern Greenhouses

OFFICE AND WORKS  
JERSEY CITY, N. J.

WESTERN OFFICE, 710 Sykes Block, MINNEAPOLIS, MINN.

## Products.

GREENHOUSES and CONSERVATORIES, HEATING and VENTILATING INSTALLATIONS, BOILERS, etc.

Moving Picture Studios, Porch Enclosures, etc.

## Construction.

The Lutton type of greenhouse construction is the result of years of careful study and practical experience, and has been indorsed by architects and engineers throughout the country. This company specializes in the manufacture and erection of rustproof metal greenhouses, in which every piece of metal is heavily galvanized, except the cast iron sills and wall ventilating panels.

The interiors of these rustproof houses are usually finished with a special aluminum paint, producing a bright and very durable finish.

Standard iron frame greenhouses are also manufactured, of all types and sizes, for both private and commercial use.

## Iron Work.

**CAST IRON SILLS**—These cap the masonry foundation walls and are in lengths of about 8 ft. 3 ins., connected by wrought iron plates placed on under side of sills. (Sections Nos. 1 and 2.)

**GUTTERS**—Gutters are no longer considered necessary on curved eave houses, but our regulation cast iron gutters can be furnished when desired. (Section No. 2.)

**RAFTERS**—All intermediate and gable rafters are manufactured from structural steel and galvanized. They extend from sill to ridge in one continuous piece, bent at the eave line to the proper radius, secured at the ridge with iron brackets and firmly bolted to sills. (Section No. 4.)

**SASH BARS**—The V-section sash bar (Section No. 3), employed in the roof, sides and gables, is an important recent improvement that provides great strength, at the same time reducing the percentage of shade to a minimum. The compact arrangement of the cypress



ERECTED FOR J. B. SCHLOTTMAN, GROSSE POINT, MICH.  
MACCURE & SPAHR, Supervising Architects



ERECTED FOR RUFUS W. SCOTT, GERMANTOWN, PA.  
DUHRIE, OKIE & ZIEGLER, Supervising Architects



core and the galvanized V-section produce a bar which has a very neat and attractive appearance. The glass does not touch the metal, but is glazed against the wood, which acts as a cushion, practically eliminating any breakage due to expansion and contraction. Also note the groove on each side, designed to carry off the condensation.

### Woodwork.

All woodwork employed in the construction of Lutton greenhouses is manufactured from selected air dried red gulf cypress, smoothly milled and finished.

### Glass.

All glass is "A" quality, extra heavy, handmade. Glass 24 ins. by 24 ins. in size is usually employed except when otherwise instructed.

### Hardware.

All nails, screws and bolts entering into the construction are galvanized to prevent any accumulation of rust. All door furniture is of solid polished bronze.

### Wall Ventilating Panels.

All panels and frames are constructed of solid cast iron throughout, operated by worm and gear apparatus, located beneath the bench. The use of wall vents allows the fresh air to come in contact with the heating pipes, thus removing the chill before reaching the plants. (Sections Nos. 1 and 2.)

### Benches.

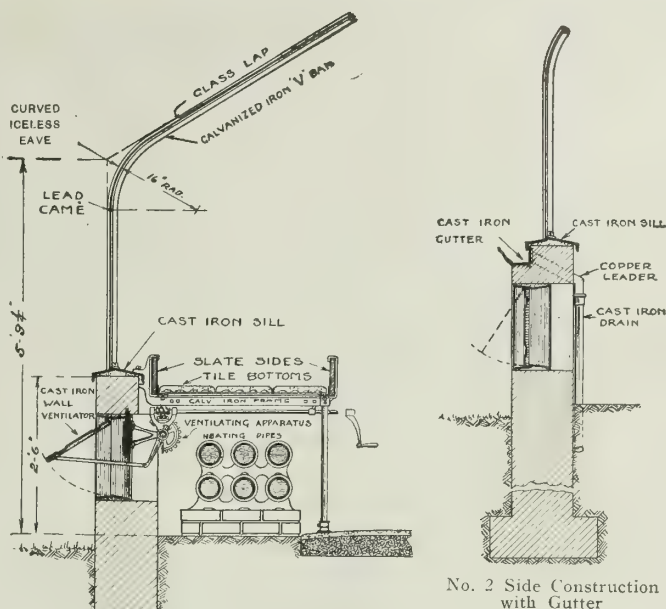
We manufacture several types of plant benches suitable for greenhouse work. The most popular style has the framework constructed of galvanized iron, with the bottoms of porous tiles and the sides of gray quarry slate 7 ins. high, sand rubbed on all edges and sides. This type of bench is everlasting. (Section No. 1.)

### Heating.

Where practical, a *hot water* system is always recommended, in preference to steam, one of our modern sectional cast iron boilers of sufficient size being installed to insure economy and ease of operation.

### Design and Preparation of Plans.

Every Lutton greenhouse is especially designed and adapted so as to best meet the particular requirements and prevailing conditions, which are different for every case. Special attention is paid to the proper exposure and arrangement of the growing compart-



No. 1 Side Construction without Gutter

No. 3 Section of Rustproof Metal "V" Bar

No. 4 Rafter and Rafter Bar Cap

### SOME LUTTON GREENHOUSE CONSTRUCTION DETAILS

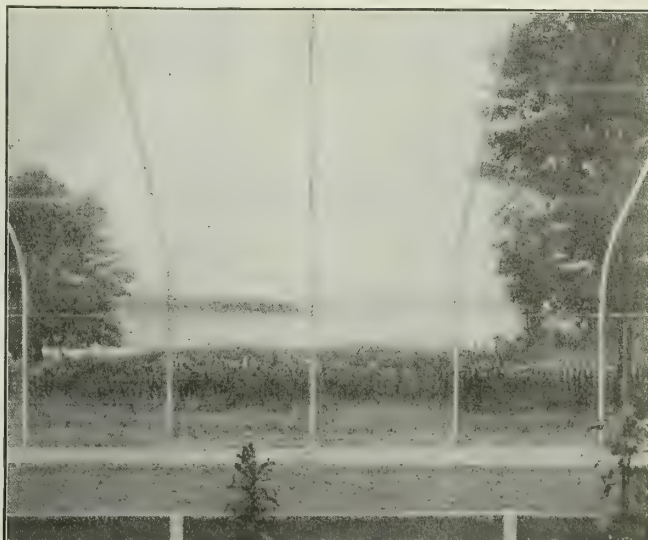
ments so that the maximum efficiency of the greenhouses will be secured.

Architects are invited to consult with our staff of experts, who will gladly co-operate with them in the preparation of plans, specifications and estimates.

Lutton greenhouses are to be found in all parts of the country. On request, architects or others will be advised of the one nearest to them and arrangements made for an inspection.



ERECTED FOR C. K. G. BILLINGS, LOCUST VALLEY, L. I.  
Guy Lowell, Supervising Architect



VIEW FROM INTERIOR OF A LUTTON V-BAR GREENHOUSE  
Note the absence of heavy shadow-casting members and the unobstructed vision

# PIERSON U-BAR CO.

Builders of Greenhouses

1 Madison Avenue  
NEW YORK, N. Y.

## Products and Services.

Manufacture, erection and equipment of U-BAR GREENHOUSES and CONSERVATORIES. The equipment consists of Ventilating Apparatus, Benches, Complete Heating Plant, etc.

Glass Enclosed Swimming Pools.

## Description.

In the U-Bar construction the wooden sash bar is incased with a galvanized steel U-shaped bar, the combined members being no larger than the smallest wooden sash bar used in other forms of construction.

Owing to their strength we are enabled to eliminate all the heavy iron rafters and many lateral supports, and to place the bars farther apart, permitting the use of glass 24 ins. wide. By bending the bars at the eave line and using curved glass at this point, all cumbersome gutters, plates, posts, and other shading members are eliminated, resulting in a structure of extreme lightness and of great strength.

## Advantages.

The steel covering of the wooden bars eliminates interior woodwork with its tendency to decay. The galvanizing of all steel members prevents rusting; the use of the wooden core-bar prevents injurious expansion and contraction of the structure and consequent glass breakage. All these features combine to produce a structure of wonderful durability and low cost of maintenance.

The extreme lightness of construction, the wide

glass, the absence of all heavy shading members, assure unusual productiveness.

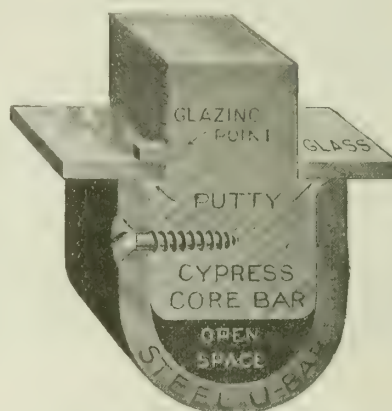
The curved eave line, the aluminum finish of the interior, and the absolute simplicity of the construction, produce a structure unmatched in attractiveness and adaptability.

## U-Bar Sizes.

The U-Bar is made in 3 sizes to meet roof conditions which vary with the span width.

## The Core-bar.

It is Red Gulf Cypress, free from sap and knots, and is milled from thoroughly air dried stock. All curved portions are cut from the solid block to prevent warping out of shape.



EXACT SIZE OF U-BAR USED FOR GENERAL PURPOSES



RANGE OF U-BAR HOUSES ERECTED FOR J. STEWART BLACKTON, OYSTER BAY, LONG ISLAND, N. Y.  
HOPPIN & KOEN, Architects, New York, N. Y.

RALPH W. WEINRICHTER, Landscape Architect, Rochester, N. Y.



Before incasing in the steel U-Bar, the core-bar is chemically treated. After incasing and before the glass is set it is painted with white lead and oil; after the glass is set the exposed portion of the core-bar is painted again, thus giving it a thorough protection against the weather. The open space below the core-bar insures a circulation of air as an additional protection against its decay.

### The Steel U-Bar.

It incases the lower part of the cypress core-bar, the latter being screwed to the U-Bar with screws placed alternately on either side at frequent intervals, thus securing the binding of the core-bar and U-Bar together.

To prevent all possibility of rusting, the steel U-Bar is heavily galvanized by the hot process.

### Glazing Method.

The glass is bedded and laid with lapped joints of about  $\frac{1}{4}$  in. directly upon the edges of the steel U-Bar, and is secured to the projecting core-bar with wedge shaped zinc glazing rails. The core-bar provides the best known medium for adhesion of the putty and fastening for the glass and makes possible the most satisfactory system of glazing.

### Aluminum Interior Finish.

After the glazing is done and the squeezed out putty is cut off from the inside and its exposed edges painted, the steel U-Bar is given a coat of aluminum paint, which makes a durable, bright, attractive finish to which neither dirt nor mildew adheres nor moisture affects, thus eliminating the expense and annoyance of frequent interior painting.

### Co-operation and Estimates.

In our years of experience in the greenhouse building business, a rather thorough knowledge of the exacting requirements of plant life and of how those requirements can be best met in a greenhouse has been gained.

We shall be heartily glad to bring that knowledge to bear on any problem, and to advise toward the making of a greenhouse that will be most practical for growing things.

There are so many elements, such as the amount of ventilation desirable for certain purposes, temperature to be maintained in houses devoted to certain plants, exposures, etc., that enter into greenhouse construction that it would really seem that the best results could only be obtained by some such co-operation.

We shall be glad to be of every possible service and will promptly estimate on plans that are submitted.

### How to Specify.

To specify as follows is to specify the U-Bar construction:

Each roof bar to be a wooden sash bar incased in a galvanized steel U-shaped bar. These bars to extend in one piece from the sills to the ridge; to be connected to the sills and ridge by brackets and to the other members by bolts. To be bent to a 16-in. radius at the eaves and spaced to receive 24-in. glass.

### References.

- Lamont DuPont, Wilmington, Del., Miss M. C. Coffin, Landscape Architect, New York, N. Y.
- H. C. Martin, Glen Cove, Long Island, N. Y., H. T. Lindeberg, Architect, New York, N. Y.
- Mrs. S. D. Riddle, Glen Riddle, Pa., Wilson, Eyre & McIlvaine, Architects, Philadelphia, Pa.
- E. F. Price, Portchester, N. Y., Peabody, Wilson & Brown, Architects, New York, N. Y.
- Mrs. E. R. Peirce, Wellesley Farms, Mass., Coolidge & Shattuck, Architects, Boston, Mass.
- Geo. J. Gould, Lakewood, N. J., Hoppin & Koen, Architects, New York, N. Y.
- E. C. Delafield, Riverdale, N. Y., Dwight J. Baum, Architect, New York, N. Y.
- John R. Lee, Elma, N. Y., Lansing, Bley & Lyman, Architects, Buffalo, N. Y.
- George Eastman, Rochester, N. Y., Claude Bragdon, Architect, Rochester, N. Y.
- Russell M. Bennett, Deephaven, Minn., Morell & Nichols, Architects, Minneapolis, Minn.
- Brooklyn Botanic Gardens, Brooklyn, N. Y., McKim, Mead & White, Architects, New York, N. Y.
- Swan Point Cemetery, Providence, R. I., Clarke & Howe, Architects, Providence, R. I.



THIS INSIDE LOOKING-OUT VIEW GIVES AN EXCELLENT IDEA OF THE SURPASSING LIGHTNESS OF THE U-BAR CONSTRUCTION

# JAMES MANUFACTURING COMPANY

## Sanitary Dairy Barn Equipment

FORT ATKINSON, WIS.

### DISTRIBUTERS

ELMIRA, N. Y., JAMES MANUFACTURING COMPANY  
BOSTON, MASS., P. R. ZIEGLER CO.

SAN FRANCISCO, CAL., DE LAVAL DAIRY SUPPLY CO.  
P. R. ZIEGLER CO.

### Products.

The JAMES LINE of SANITARY STEEL and WOOD COW STALLS; STEEL and WOOD STANCHIONS; SANITARY STEEL CALF PENS, BULL PENS, COW PENS and BOX STALLS; MANURE, FEED and MILK CAN CARRIERS; HARNESS CARRIERS; FEED TRUCKS; WATERING BUCKETS; WATERING CUPS; CONCRETE FILLED STEEL SUPPORTING COLUMNS; FIXTURES for Horse Barns; VENTILATORS for Dairy Barns, Factories, etc.; and miscellaneous BARN EQUIPMENT and SUPPLIES.

Cork Brick, Hog and Sheep Pens.

### Co-operative Barn Designing Service.

The James Co-operative Service Bureau is established as a "Clearing House" of ideas on barn building and equipment, especially dairy barns for dairy farmers and large country estates; the specific purpose being to furnish architects any information they may need relating to the practical end of dairy barn designing.

Dairy farmers are finding it profitable to install equipment of a permanent nature requiring a considerable investment; hence the necessity of securing the services of an experienced architect to design the barn with the assistance of dairy barn experts, making certain at the time the barn is built that all dimensions are correct to accommodate properly the modern equipment that will sooner or later be installed.

Many other items peculiar to the dairy business, varying according to the particular phase of the business being conducted, also enter into the problem.

The James Service Department is under the personal supervision of W. D. James, General Manager of the company, known among dairymen as a leading authority on dairy barns. Mr. James was born and raised on a dairy farm. Many years of practical experience as a dairyman have made him thoroughly familiar with every detail of the dairy business, from the cleaning of the barn to the handling of the profits. His personal contact with dairymen from all over the country at agricultural fairs and dairy shows and his visits to dairy farms have given him an intimate knowledge of the varied barn needs of dairy farmers in every section. For years architects building barns for dairy farmers throughout the United States have been submitting their floor plans to Mr. James for his criticism and suggestions, and many hundreds of barns of all kinds and sizes have been designed with his co-operation.

This, together with his experience as an inventor and manufacturer of dairy barn equipment, makes his advice and suggestions of great practical value.

Associated with him in this Service Department is a staff of competent draftsmen.

The James Service Bureau is, therefore, in a unique position to furnish complete information relating to the practical, every-day interior working conditions in the modern dairy barns.

Architects are cordially invited to avail themselves of any information in the company's possession. No

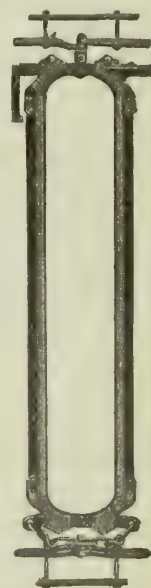
obligation of any nature is incurred by so doing, nor is any charge made for the service, the Service Bureau being established to aid in the improvement of dairy barns and to put the company in touch with prospective users of barn equipment, co-operating with the architect making the plans to the full extent of wide experience.

### James Cow Stalls and Stanchions.

The James line includes both steel and wood stalls and stanchions, to be used preferably with cement floors. Steel pipe,  $1\frac{5}{8}$  or  $1\frac{7}{8}$ -in. outside diameter, is used for framework and partitions. Mangers are of the best Apollo Bloom No. 20 galvanized sheets, and all couplings and fittings of the best malleable iron. Stalls and stanchions are furnished with a baked enamel finish.

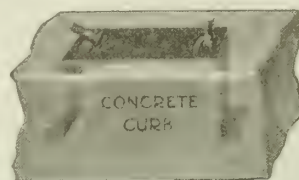
Stall 14-A comprises steel framework with the best malleable sanitary clamps; the 14-J stanchion, wood lined, with alignment device, double chain hanger, James anchor, and the James lock; the James sure-stop swinging post and lock open device; the James triple curve stall partition with its sure holding flange for cement floors; and the James sanitary self-cleaning manger with manger lifting springs, which makes it convenient to water cows in the manger bottom. All other James steel stalls are identical in construction, the only difference being that some of the special features are omitted.

Steel stanchions of high carbon steel tees are lined with best quality birch.



NO. TA15  
ALIGNMENT,  
DOUBLE  
CHAIN  
HANGING  
WOOD LINED  
STEEL  
STANCHION

Weight approximately 30 lbs. Stanchion adjustable in width of neck space. For other stanchions, see catalogue



JAMES STANCHION ANCHOR

Shows method of attaching stanchion to concrete curb; a bolt may be easily inserted or taken out. A similar anchor is used for the stall post

Carbon steel tees used in stanchions are  $1\frac{1}{4}$  by  $1\frac{1}{4}$  by  $3/16$  ins. Stanchion lock, lock open clip and hinge of best malleable iron, riveted to tees with  $1/4$ -in. rivets. All steel stall equipments are made up according to width of stalls, number in row, etc., to meet requirements of space and kind of cows.

**SPECIAL FEATURES**—The James stalls and stanchions are far more than mere cow ties; special patented features save time, feed, labor and money, sufficient to pay for the equipment with one year's use.



**Alignment Device**—Adjusts length of stall to fit the cow, aligning all cows evenly at the rear; the litter falls in gutter, keeping the stalls and cows clean.

**Sure-stop Swinging Post and Lock Open Clip**—Prevent cow putting her head in the wrong place—steer the cow right into the open stanchion. When stanchion is closed, sure-stop swings out of the cow's way, affording her maximum freedom.

**Double Chain Hanger**—Permits building the manger curb level, sufficiently high so the cow can not nose her feed out of the manger back under her feet; yet stanchion hangs low enough not to interfere with the cow's comfort when lying down. Chains being attached at sides, hinge is relieved of undue strains. Hinge is of unusually strong construction.

**Self-cleaning Manger**—Permits feeding cows according to their individual needs; does away with the labor required in keeping rigid mangers clean; prevents waste of feed and effects other savings. Manger has no bottom; a trough in the concrete floor serves this purpose. When the manger is raised the trough can be used for watering cows.

NOTE—Awarded Grand Prize (highest award possible) at Panama-Pacific International Exposition.

### Bull Pens, Carriers, Watering Buckets, Ventilators, etc.

Bull pens, calf pens, and cow pens are of steel pipe, with all clamps and fittings of best malleable iron, shipped in panels.

Lack of space prevents a statement of the other special features embodied in James stalls and stanchions, and in pens, ventilators, carriers, watering buckets, horse stable equipment, etc. Those interested are urged to send for free book, "The James Way."

### Prices.

Owing to conditions in materials markets, no prices are shown in connection with illustrations. Catalogue and price list sent on request.

### Installation.

Neither skilled nor experienced labor is needed for the erection of James equipment.

James stall posts and stanchions bolt to anchors set in the concrete curb, and James pens are erected by setting corner and gate posts in tubular anchors, bolting the pen panels to the posts, as shown on following page. Pens are shipped assembled in panels. Stalls are shipped assembled, knocked down for convenience in handling and erection; all fittings are properly attached at the factory.

The installation of James carriers, water buckets, etc., is equally simple. Complete instructions for installation with floor plans accompany every order.

If James equipment is to be used, a manger pattern and instruction sheet, and anchors—the only part of equipment required at time cement is laid—should be secured from this company before the cement floor is put in.

**ANCHORS**—Stocks of anchors are carried at various points throughout the country, so that, in emergency, delivery of same can be made quickly.

### Catalogue.

The James catalogue is a splendidly illustrated and carefully prepared book of 304 pages, size 7 by 10 ins., and bound in boards. This book, "The James Way,"

not only gives full information regarding James equipment, but also contains much information relating to the practical conditions necessary in the dairy barn.



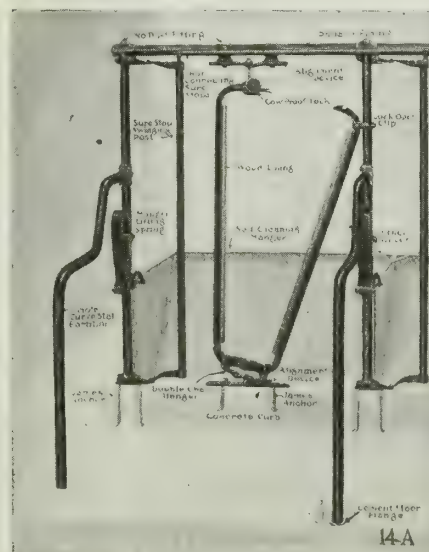
ALIGNMENT DEVICE

Showing alignment adjusted back for a short cow, and adjusted forward for a long cow. Has 7 adjustments, a total of 10½ ins. in all, providing for 7 sizes of cows



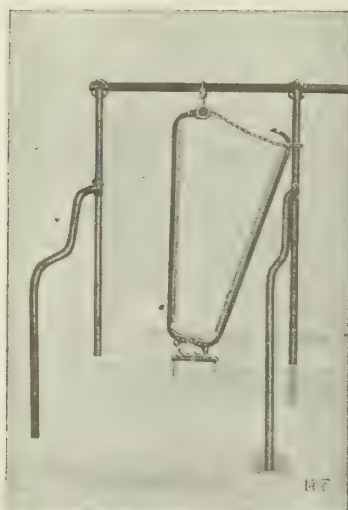
SANITARY FITTING

Edges overlap, preventing accumulation of dust



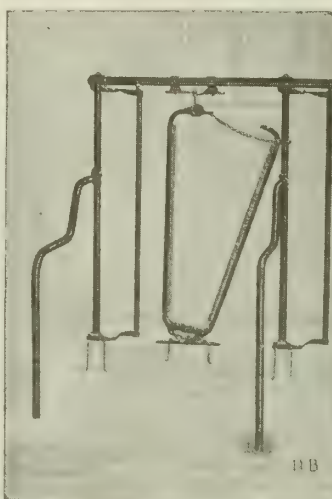
14-A STALL

Weight about 115 lbs. Stall partition and upright post for additional end required to finish row of stalls



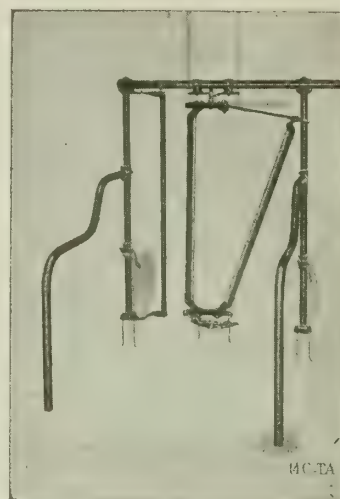
14-F STALL

Weight, about 63 lbs. Additional end required to finish row of stalls



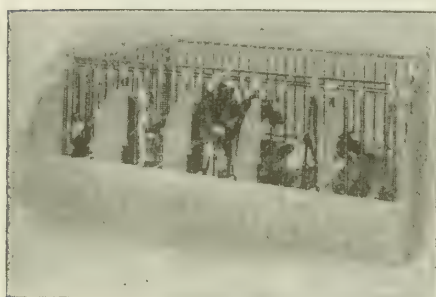
14-B STALL

Weight, about 82 lbs. Additional end required to finish row of stalls

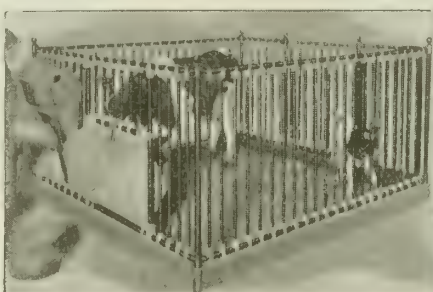


14-C-TA STALL

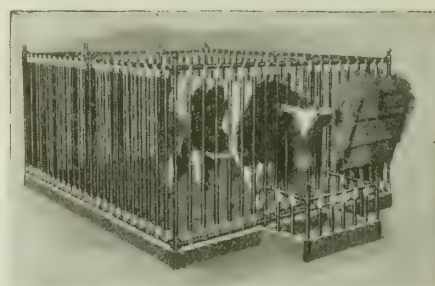
Weight, about 103 lbs. Additional end required to finish row of stalls



JAMES SANITARY STEEL CALF PEN



JAMES SANITARY STEEL COW PEN



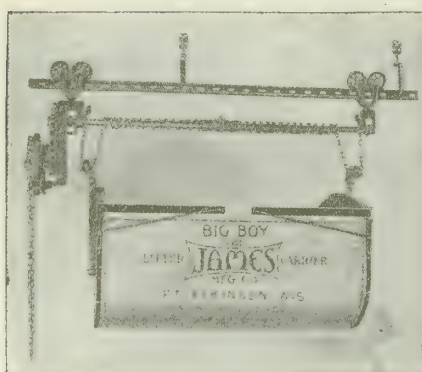
JAMES SANITARY STEEL BULL PEN



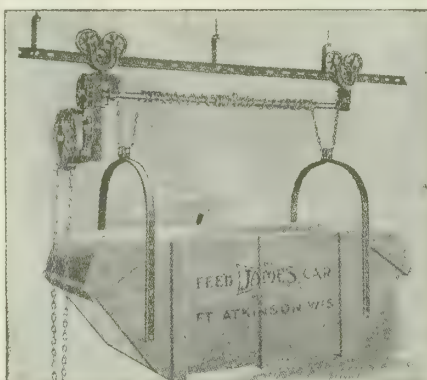
CORNER POST OF PEN, SET IN TUBULAR ANCHOR



INSTALLATION JAMES STEEL PENS AND STANCHIONS



JAMES "BIG BOY" LITTER CARRIER  
No. 2. Weight, 200 lbs. Capacity, 13 bushels



JAMES FEED CAR  
Weight, 250 lbs. Capacity, 16 bushels



JAMES FEED TRUCK  
16-bushel truck, weight, 200 lbs.  
25-bushel truck, weight, 265 lbs.

Note. Prices on harness carriers, pens, etc., quoted on application



**Carrier Track and Hangers.**

Track furnished with splice bars and bolts; hangers with nailing plates, including nails, or with extension bolts, either with nailing plates or ceiling plates.



**OUTSIDE SUPPORT FOR CARRIERS**  
Prices quoted on application



**FROM GUTTER TO FIELD WITH BUT ONE HANDLING**



**JAMES SWINGING STEEL CRANE**



**JAMES INDIVIDUAL WATERING CUPS**

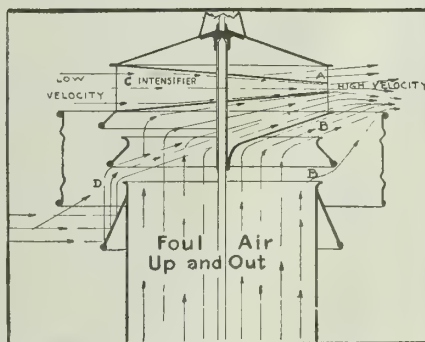
Complete with fittings for attaching to 1½-in. or 1⅞-in. O. D. piping. Galvanized supply tank, 10 by 24 by 14 ins., with cover, including ball float and valve. Prices on pipe fittings, double buckets, etc., quoted on application



**JAMES CUP NO. 3**  
For pressure systems

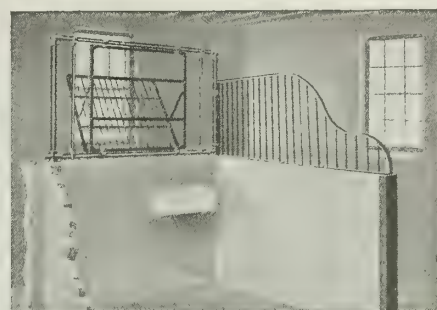


**JAMES CUP NO. 4**  
For gravity systems



**DIAGRAM OF JAMES VENTILATOR**

Top revolves on a hardened steel point, the vane keeping opening "C" always toward the wind. The tapering intensifier "speeds up" the wind, so that it leaves "A" at highest velocity. This creates suction in the vicinity of "A," exerting a powerful pull on the air in the flue



**JAMES HORSE STALL FIXTURES AND HARNESS CARRIERS**

Complete information on application

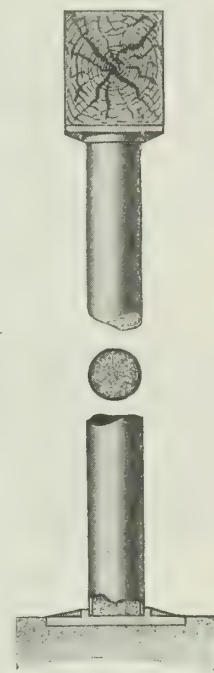


**JAMES REGULATING TANK**  
For gravity systems

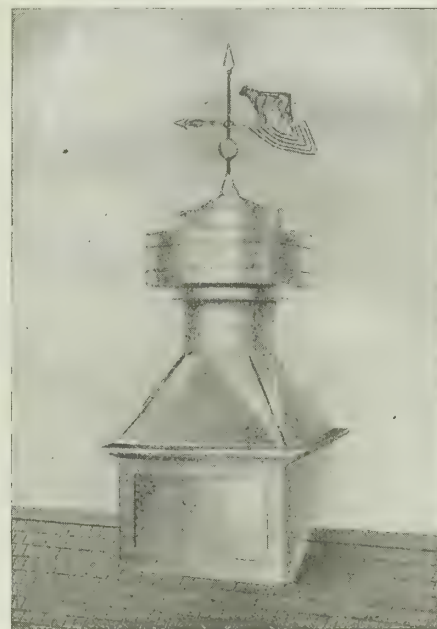
**James Composition Columns.**

Outer shell of high grade new steel, rolled especially to withstand high pressure, filled with red granite, torpedo washed sand and Portland cement.

Standard sizes, including cap and bases, made in the following diameters, 3½, 4½ and 5½ ins.; and in height, 7, 7½, 8 and 8½ ft.



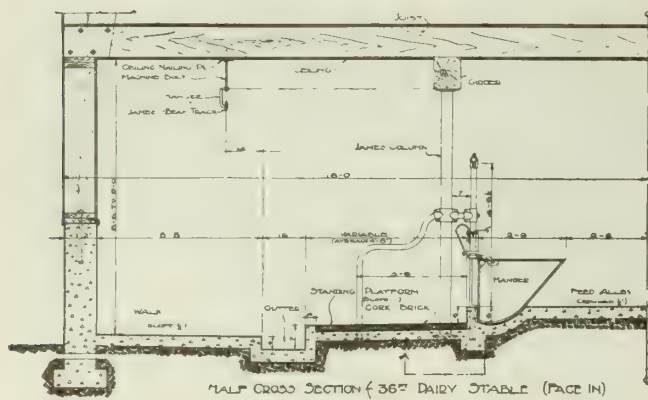
**JAMES COMPOSITION COLUMNS**



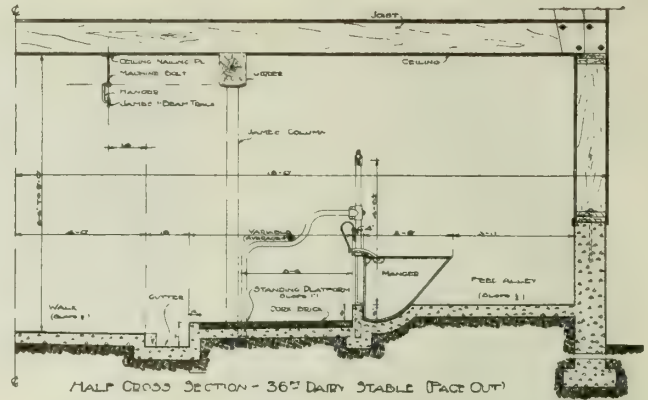
**VENTILATOR WITH REVOLVING HEAD**

24-in. diam. barrel, height 10 ft. 8 ins.; 30-in. diam. barrel, height 12 ft. 3 ins. Other types of ventilators for factories, etc.

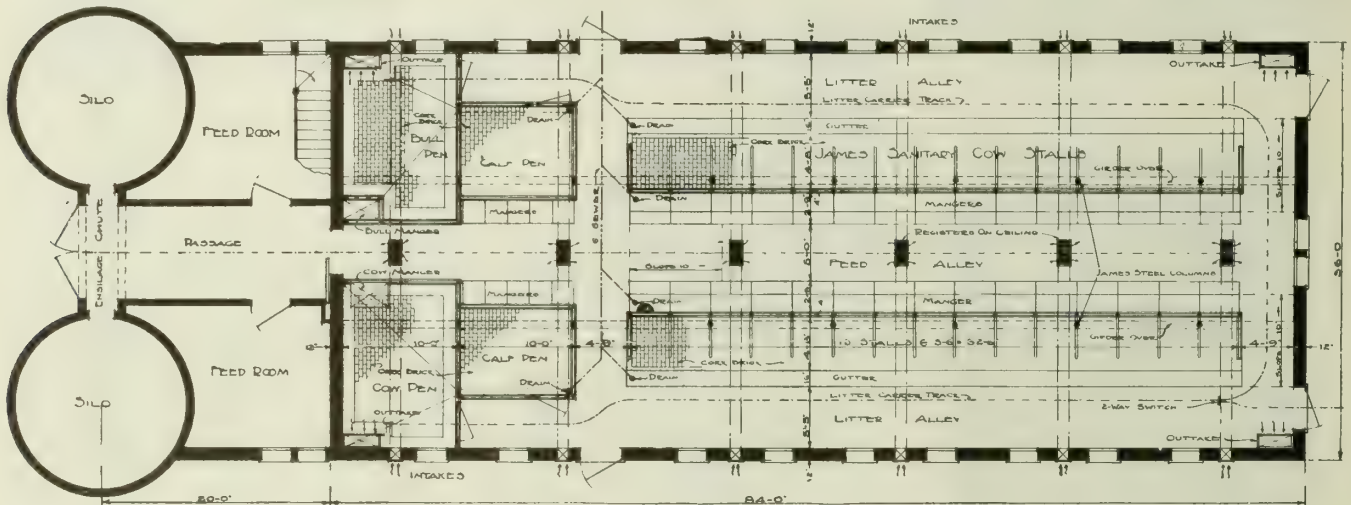
Full information and prices on application



CROSS SECTION OF TYPICAL DAIRY BARN, FACING COWS TO CENTER



SAME BARN ARRANGED TO FACE COWS TO THE WALL



### Partial List Important Installations.

#### PUBLIC AND RELIGIOUS INSTITUTIONS

Society of the Divine Word, Techny, Ill.  
 State Hospital, Peoria, Ill.  
 Notre Dame University, South Bend, Ind.  
 State Tuberculosis Hospital, Rockville, Ind.  
 Syracuse University, Syracuse, N. Y.  
 Home for Feeble Minded, Lapeer, Mich.  
 State Hospital, Morris Plains, N. J.  
 Jewish Protectory, Hawthorne, N. Y.  
 Women's Relief Corps Home, Oxford, N. Y.  
 Department of Charities and Correction, Cleveland, Ohio  
 State Hospital, Athens, Ohio  
 State Farm, Lassiter, Va.  
 McKane County Home, Smithport, Pa.  
 Hospital for Chronic Insane, Wauwatosa, Wis.  
 Wheelock Indian Academy, Millerton, Okla.  
 U. S. Indian School, Pipestone, Minn.  
 U. S. Experimental Farm, Beltsville, Md.  
 Indian School, White Earth, Minn.  
 Indian School, Flandreau, S. Dak.  
 Indian Agency, Crow Creek, S. Dak.  
 U. S. Experimental Farm, Corozal, Panama  
 Lower Brule Indian Agency, Chamberlain, S. Dak.  
 Kickapoo Indian School, Horton, Kans.  
 State Hospital, Norfolk, Nebr.  
 State Hospital, Yankton, S. Dak.  
 Panama-Pacific Exposition Dairy Barn, San Francisco, Cal.  
 Training School, Vineland, N. J.  
 State Hospital, Vineland, N. J.

#### INSTALLATIONS FOR WELL-KNOWN BUSINESS AND PROFESSIONAL MEN

L. S. Clough, Warren, Pa.  
 Coleman Du Pont (E. I. Du Pont de Nemours Powder Company), Wilmington, Del.  
 Robert Jennison, Birmingham, Ala.  
 Union Stock Yards, Chicago, Ill.  
 W. E. Flanders, Detroit, Mich.  
 John D. Rockefeller, Pocantico Hills, N. Y.  
 James J. Hill, Northcote, Minn.

C. C. Weber (Deer and Weber), Minneapolis, Minn.  
 Mayo Wood Farm, Rochester, Minn. (Drs. Mayo, owners)  
 Elbert Hubbard, East Aurora, N. Y.  
 Wm. R. Wood (Hotel Gotham), New York, N. Y.  
 James A. Gamble, Cincinnati, Ohio  
 E. L. Philipp, Governor of Wisconsin  
 F. K. Babson, Chicago, Ill.  
 H. W. Gossard, Chicago, Ill.  
 S. P. Stevens (Reid, Murdock & Co.), Chicago, Ill.  
 E. J. Tilden (Libbey, McNeil and Libbey), Chicago, Ill.  
 P. M. Sharples (Sharples Separator Co.), West Chester, Ill.  
 E. A. Stuart, President Pacific Coast Condensed Milk Co.  
 Horlick's Condensed Milk Co., Sherman, N. Y.  
 Borden's Condensed Milk Co., Wallkill, Edmeston and Earlville, N. Y.  
 E. N. Belding (Belding Silks), Rockville, Conn.  
 M. P. Moeller (Moeller Organ), Hagerstown, Md.  
 C. H. Jones, President Commonwealth Shoe Co., Boston, Mass.  
 Ed. C. Lasater, Falfurrias, Tex.  
 Maxwell Norman, Boston, Mass.  
 Geo. S. Baldwin, Appleton, Wis.  
 L. M. Bowers, Chairman Executive Committee Colorado Steel & Iron Co., Binghamton, N. Y.  
 Geo. C. Eastman, Rochester, N. Y.  
 Leroy B. Williams, Syracuse, N. Y.  
 August A. Busch, St. Louis, Mo.  
 Wm. J. Lemp, St. Louis, Mo.  
 E. A. Lemp, St. Louis, Mo.  
 Billy B. Van (Actor), George's Mills, N. H.  
 Gustave Pabst, Milwaukee, Wis.  
 Fred Pabst, Milwaukee, Wis.  
 Oliver Cabana (Liquid Veneer), Buffalo, N. Y.  
 Post Land Co. (Postum Cereal Co.), Battle Creek, Mich.  
 M. W. Wentworth (Battle Creek Sanitarium), Battle Creek, Mich.  
 Postal Farms (Griswold Hotel), Detroit, Mich.  
 Morton Plant, Bradford, Conn.  
 F. A. Sieberling (Goodyear Rubber Co.), Akron, Ohio  
 Ohio C. Barber, President Diamond Match Co., Barberton, Ohio  
 Col. F. O. Lowden, Oregon, Ill.  
 Fred Harvey, Kansas City, Mo.  
 Anaconda Copper Mining Co., Bozeman, Mont.



# THE LOUDEN MACHINERY COMPANY

## Barn and Garage Equipment

67 West Broadway  
FAIRFIELD, IOWA

### Products.

BARN and GARAGE EQUIPMENT as follows:

For every Barn—Barn Door Track and Hangers; Hay Forks, Slings and Carriers; Hoists; Cupolas, Ventilators; Floor Drains, Gutter Drains; Feed and Litter Carriers; Feed Tracks.

For Cow Barns—Steel Cow Stalls; Tubular Steel and Wood Lined Stanchions; Spring Balanced Manger Divisions; Steel Animal Pens; Automatic and Gravity Water Bowls; Window Ventilators; Milk Can Carriers; Cork Brick.

For Horse Barns—Complete Equipment for Stables.

For Garages—Garage Door Hangers, complete outfit for operating doors on interior; Garage Floor Drains and Ventilators.

Overhead Carrying Systems for garages, factories, warehouses, etc.

### Co-operative Service.

This company maintains a department of agricultural and architectural engineers, which is at the service of architects. Consultation and questions in regard to any special farm building problem is invited.

On receipt of details of requirements, the company will work out specifications, estimates and sketches.

The company's engineers are equipped to work out special arrangements for farm buildings as required for modern farming, and will give practical assistance as to proper light, ventilation and modern labor saving devices required for the handling of feed products and litter.

### Cow Stalls.

High carbon steel tubing,  $1\frac{5}{8}$  ins. outside diameter, is used for the framework of Louden sanitary cow stalls. Stall partitions made of the same material. Stalls fitted throughout with overlapping, dustproof connections of refined malleable iron, and may be fitted for cement or wood floor.

Stalls finished with heavy coat of enamel paint; can be galvanized at extra cost, and may be fitted with tubular steel or steel wood lined stanchions.



FIG. 812. COW STALLS WITH MANGER DIVISIONS  
 $1\frac{5}{8}$ -in. o.d. tubing used throughout

### Stanchions.

Louden cow stanchions may be hung in either wood or steel frame. Made in 2 styles, tubular steel and wood lined. Each is fitted with latch and hinge of the best malleable iron. Width of each stanchion is 7 ins. inside. Length, not including chain, 4 ft.

**SPECIAL FEATURES**—By means of Louden adjustable stanchion holders, stanchions may be adjusted forward or backward to align cows evenly on gutter.

Louden stanchions may be used either with or without built-up curb. Built-up curb should be used, however, on account of the fact that it allows curb to be built 10 or 12 ins. high, and still permits stanchion to swing near floor, giving the cow the utmost comfort and freedom, but not permitting her to nose feed out of her manger.



FIG. 861  
LOUDEN  
TUBULAR  
STEEL SWING-  
ING STANCHION

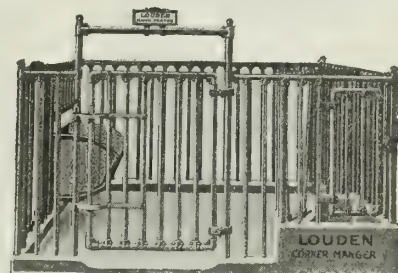


FIG. 1164. LOUDEN BULL PEN  
Top rails, corner posts and gate posts are of  $1\frac{7}{8}$ -in. o.d. steel tubing. Uprights are of  $1\frac{5}{8}$ -in. o.d. steel tubing and are set in cement. Pen is 5 ft. 2 ins. high

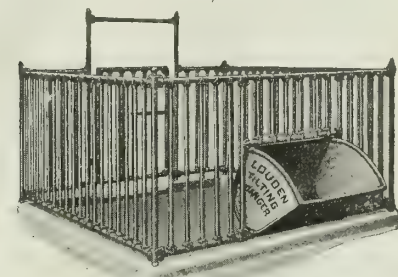


FIG. 996. LOUDEN COW PEN  
May be used on either cement or wood floor. Top rail, gate, frame, manger and corner posts are of  $1\frac{5}{8}$ -in. o.d. steel tubing. All fillers are of  $1\frac{1}{16}$ -in. o.d. pipe. May be furnished with or without tilting feed manger

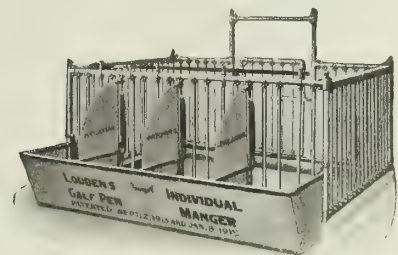
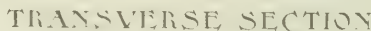


FIG. 1021. LOUDEN CALF PEN  
With individual spring balanced manger  
Top and lower rails and gate posts are of  $1\frac{5}{8}$ -in. o.d. steel tubing. Uprights are of  $1\frac{1}{16}$ -in. o.d. steel tubing. Pens may be furnished with or without individual mangers to raise and lower





LONGITUDINAL SECTION

### DETAILS OF LOUDEN NO. 812 COW STALL CONSTRUCTION



Plans and details of application of Loudon cow stalls.  
Other plans furnished if desired

### Spring Balanced Manger Divisions.

Louden spring balanced manger divisions are built of best No. 18-gage galvanized steel sheets, heavily reinforced with tee iron. Brace rod across top of each section adds rigidity, and prevents feed being nosed out of manger. They are fitted with coil springs, which make them easily raised and lowered. The attachment of the spring is such that they can be adjusted to help hold the division down when feeding, and thus prevent the cows from nosing them out of position. With the different sizes of springs and with the complete and convenient adjustment, any size or weight of manger division may be balanced to perfection. Can be furnished with any Louden stall.

## Carriers.

LITTER CARRIERS—Louden litter carriers may be had for either steel or rod track, or for combination steel and rod track; 4 styles. Solid steel track carriers are strongly recommended.

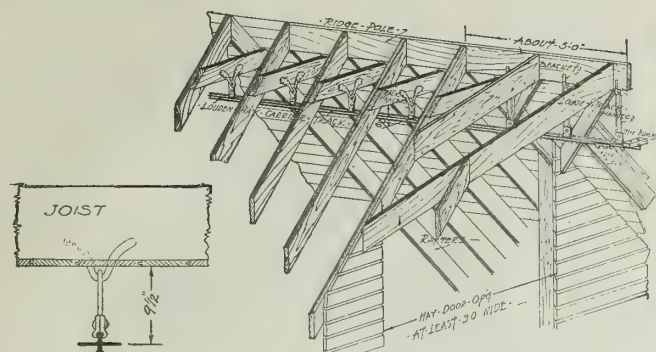
Steel track carriers are fitted with worm gear for raising and lowering, the most wonderful hoisting device to be obtained. It has an actual lifting power of

40 to 1. Worm gear is free from ratchets, brakes or clutches. Box remains stationary at any height, whether loaded or empty. The tub is made of No. 18-gage galvanized steel sheets, heavily reinforced with angle iron at ends, and is watertight. It is 48 ins. long, 24 ins. wide and 22 ins. deep.

**FEED CARRIERS**—Louden feed carriers are fitted with same gears as the Louden litter carriers. Box is made of wood, heavily reinforced. Size (double end carrier), 6 ft. long, 28 ins. wide, 20 ins. deep. Special side distributor carriers for feeding stock cattle in troughs or bunks are also manufactured.

**HAY CARRIERS, TRACKS, FORKS, SLINGS AND PULLEYS**—Louden hay carriers may be had in various designs for fork or sling use, and for either steel or wood track. Each carrier is compact, durable and simple in construction. The track wheels are thoroughly braced, and will not spread with the heaviest load. Every load will register properly, regardless of twisted ropes or swinging load. Power hoists to assist in haying are also made.





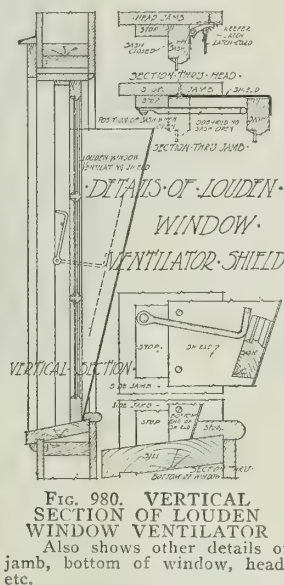
**DETAILS SHOWING APPLICATION OF LOUDEN TRACK HANGERS**  
For feed and litter carrier track, allow at least  $9\frac{1}{2}$  ins. to ceiling for switch mechanism

### The Window Ventilator.

The window ventilator is fitted with metal shields so arranged that the window may tilt inward when open, preventing cold air from striking the stock directly, and forcing it up toward the ceiling, from which point it is deflected to every part of the building. This is an inexpensive device, and one which adds much to the sanitary conditions in any dairy or farm barn. Shields and fixtures furnished only. Sash not furnished.

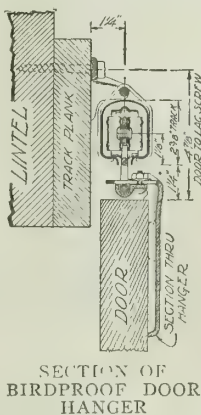


FIG. 987. LOUDEN WINDOW VENTILATOR



### Barn Door Tracks and Hangers.

Louden birdproof track completely encloses the trolleys, shutting out snow, sleet, rain and the troublesome English sparrow. The tube is made of a single No. 14-gage sheet of steel, pressed into shape. Track is amply strong for big heavy doors. Trolleys are roller bearing. Wheels travel on level tread. Strong, efficient, artistic. A track that is absolutely weather-proof in every way is also made. Write for complete details of this track.

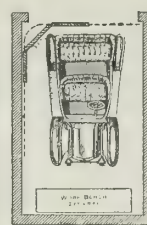


### Garage Door Hanger.

Door is hinged in 3 parts, and is supported by swiveled roller bearing trolleys. Track extends across door opening, inside and along the side of building, curved at corner. Door operates around curve and lies flat against inside wall when open. One section of door swings like an ordinary hinged door.

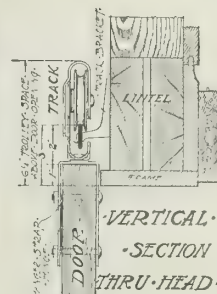


**LOUDEN GARAGE DOOR HANGER**  
Doors partially open  
Operates entirely on the interior of garage

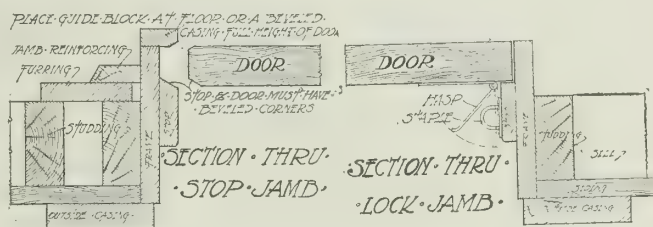


**PLAN VIEW OF GARAGE**

Note small amount of room doors require in going around corner



**INSTALLATION DETAILS OF LOUDEN GARAGE DOOR**



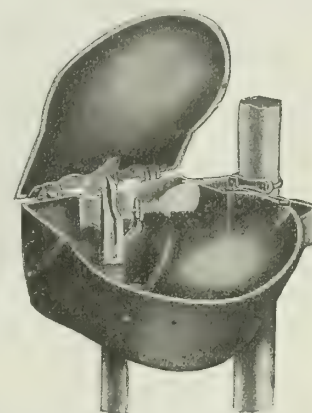
**CONSTRUCTION DETAILS OF LOUDEN GARAGE DOORS**

### Automatic and Gravity Water Bowls.

With the automatic bowl, the cow waters herself by raising the lid with her nose. Animal gets a fresh drink each time; no stale water stands in bowl.

The gravity bowl is supplied with governing tank, which keeps the water at a given height in the bowl by the action of a float valve.

Automatic bowls may be used for either stalls or pens. All pipe and pipe fittings are stock sizes, and may be secured from any plumber.



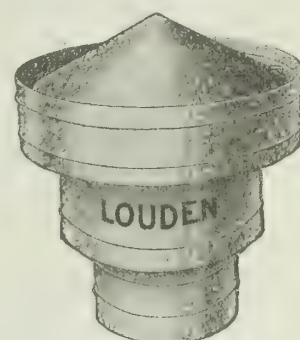
**LOUDEN AUTOMATIC WATER BOWL**

### Ventilators and Cupolas.

Louden ventilators are made in following sizes:

Diam. throat, ins.	Gage of metal	Cap. per hour, cu. ft.
12	24	36,500
18	24	82,000
24	22	145,900
30	22	231,000

A complete line of cupolas (not illustrated) can also be furnished; ventilating flue ranging from 20 to 36 ins.



**LOUDEN VENTILATOR**

### Installation.

Complete instructions for the installation of Louden equipment accompany each shipment.

Where Louden spring balance manger divisions are to be used, our templets for shaping mangers should be secured before the cement is put in, to assure that mangers or divisions will fit properly. Send for Standardized Manger Circular.

### Estimates and Catalogues.

Complete catalogues mailed on request. Itemized quotations and specifications cheerfully submitted.

# ALLEN PRESSURE SYSTEM CO., INC.

## Gasoline and Oil Storage and Distributing Systems

TELEPHONE:  
COLUMBUS 10077


16-24 West 61st Street  
NEW YORK, N. Y.

### BRANCH OFFICES

CHICAGO, H. K. ALLEN, 2007 Michigan Avenue

BOSTON, ALLEN PRESSURE SYSTEM CO., INC., 755 Boylston Street

### Products.

APSCO AIR PRESSURE, GASOLINE and OIL STORAGE, MEASURING and DISTRIBUTING SYSTEM; LIQUID DISTRIBUTING PANELS; STORAGE TANKS.  TRADE-MARK

### Official Approval.

The entire Apsco system has received the official approval of the National Board of Fire Underwriters and the Municipal authorities of New York City.

### The Apsco Air Pressure Gasoline and Oil Storage and Distributing System.

A system (Figs. 1 and 2) for transferring gasoline, oil or any liquid by means of *air* pressure from storage tanks to an automobile, vat or other receptacle; it consists, in its simplest form, of these parts; (1) Under-ground storage tank; (2) an auxiliary working tank; (3) a draw-off panel; (4) air pressure equipment; (5) necessary piping and air vents; (6) a fill box; (7) a gage box; (8) filter. The entire mechanism is designed by men having 15 years' experience in the distribution of liquids. No working parts to wear out; upkeep is practically negligible. Liquids discharged are accurately *measured* by an Apsco meter. System is operated entirely by *air* pressure (see Operation).

**ADAPTABILITY**—This system is invaluable in any garage, factory, cleaning establishment, gasoline distributing station or any place in which oils or volatile liquids are stored and handled—where economy, safety, speed and accuracy are important.

### Air Pressure.

Can be supplied from any outlet of an existing air system; quantity of air consumed is small, being used only when liquid is drawn off; when air pressure is higher than necessary, the reducing valve can be adjusted to regulate the same to suit required rate of delivery, height to which liquid is to be forced, etc.

### Draw-off Panel.

Furnished complete with unions for connecting to pipe lines, with meter, air pressure gage, air inlet valve, liquid control valve, vacuum valve, safety and reducing valves, air control valve, finger self-operating valve, hose, nozzle, vent line, etc. Hand pressure on finger valve sets the discharging apparatus in motion throughout the system—no other attention being required.

The panel is made of high grade materials and finished in emerald green enamel, with exception of the brass parts; size 16 by 24 ins. Draw-off panels and working tanks can be purchased for installation by local contractors.

**METER**—All liquid passing through the system is accurately measured by an Apsco meter, tested and sealed by the Bureau of Weights and Measures of New York City.

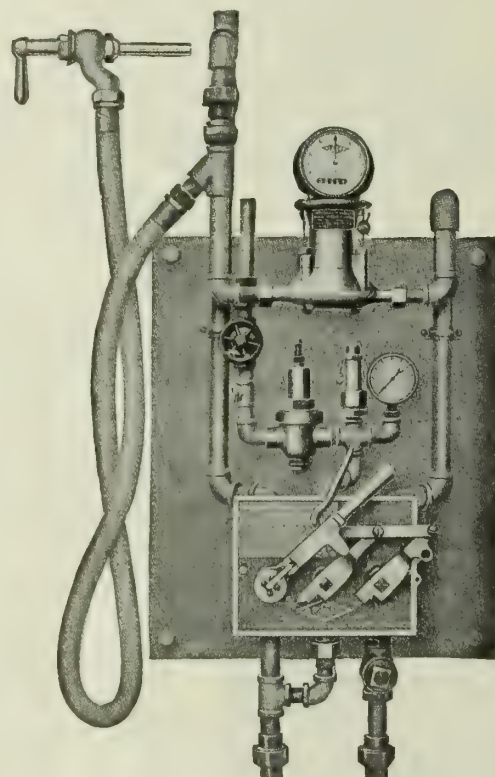


FIG. 1. DRAW-OFF PANEL

### Steel Storage Tank.

Of ordinary type, of any required size, equipped with gravity fill (from storage to working tank), vent, gage and gravity connections; it can be gaged or filled at any time, even when liquid is being drawn; such gravity fill is fitted with a trapped check valve which closes when air pressure is applied to working tank, and opens when air is released therefrom, permitting working tank to re-fill from storage tank the exact amount drawn off, so that the former always contains full capacity for each drawing operation; no liquid or air can be forced through the closed check valve back into storage tank (which is vented to atmosphere at all times).

### Steel Working Tank.

Specially made to withstand *air* pressure; equipped with fill, air and discharge connections at top. The discharge is controlled by a combination float and check valve; latter holds up liquid in discharge line, permitting immediate flow when next *air* pressure is applied, while float valve shuts off discharge line when liquid in working tank has reached a fixed low level. This tank is also vented to atmosphere at all times except when panel is in operation. Capacity, 60 gals.



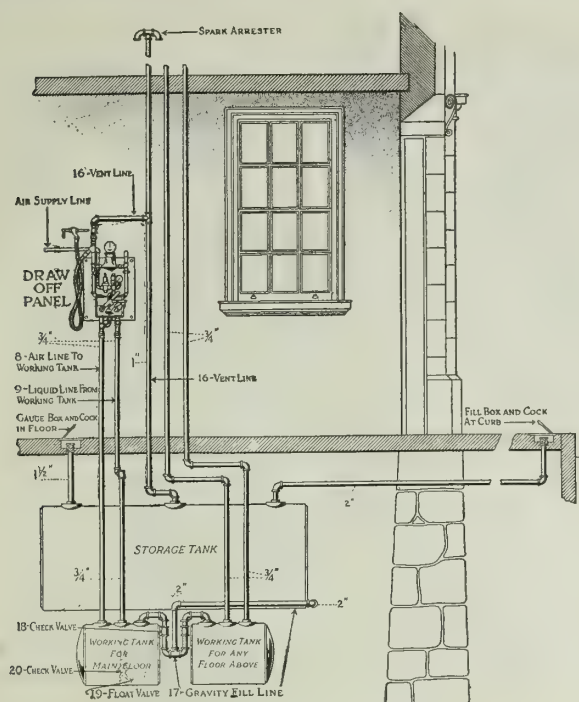


FIG. 2. MODEL OF INSTALLATION

### Operation of System.

The operator firmly grips the finger or self-opening valve, thereby closing vent line to atmosphere; moves handle to left as far as the stop—this opens air control and liquid control valves, permitting air to pass through air line to top of liquid in working tank, driving contents up through liquid line from bottom of working tank, through a filter, liquid control valve, meter, then discharging through hose and nozzle into automobile or any other receptacle.

When required quantity has been drawn, the handle is moved to right (holding on to it) as far as the stop, thus closing air control and liquid control valves—shutting off air and discharge of liquid; next, grip is released, permitting self-opening valve to open, allowing air to be released from working tank, same escaping through vent line to atmosphere; then working tank begins to re-fill from storage tank. No liquid can be discharged unless the grip is sustained.

### Advantageous Features of System.

(1) Safety against fire: gases can not collect within the system (they escape to atmosphere), eliminating possibility of ignition or explosion. (2) Flexibility: the system is adapted to all conditions—height, distance, speed of delivery, accuracy at all distances, etc. (3) No pumps, labor or other devices are used. (4) When operating handle is released from operator's grip, an automatic shut-off causes all discharge to immediately stop. (5) Automatic shut-off of discharge when liquid has reached a fixed low level.

### Contracts.

The ALLEN PRESSURE SYSTEM CO., INC., will be pleased to estimate on the complete installation, including all tanks and piping; it will sell panels and tanks separately, as desired.

### Specification Data.

GASOLINE AND OIL STORAGE AND DISTRIBUTING SYSTEM—Building to be equipped with the Apsco Air Pressure Gasoline (and Oil) Storage, Measuring and Distributing System as shown on drawings and herein specified, and as manufactured

and installed by the ALLEN PRESSURE SYSTEM CO., INC., 16-24 West 61st Street, New York, N. Y.

OFFICIAL APPROVAL—System shall be installed in strict accordance with the latest rules and requirements of the National Board of Fire Underwriters and all local ordinances.

(The following data relate to 3 tank-storage systems):

**STORAGE TANKS**—Furnish, set and pipe 3 steel storage tanks, capacity 550 gals. each, shell  $\frac{1}{4}$  in., heads  $\frac{1}{4}$  in., diameter 42 ins., length 92 ins., equipped with fill, gage, vent and outlet flanges—tanks to be painted with an approved protective coating.

**WORKING TANKS**—Furnish, set and pipe 5 steel working tanks, capacity 60 gals. each, shell  $\frac{1}{4}$  in., heads  $\frac{1}{4}$  in., diameter 24 ins., length 30 ins., equipped with one  $3\frac{1}{2}$ -in. and two 2-in. flanges, guaranteed to withstand 100 lbs. working pressure. Tanks to be painted with an approved protective coating.

**DRAW-OFF PANELS**—Furnish, set and pipe 5 draw-off panels complete with meter, filter, reducing valve, safety valve, air cut-off valve, operating valves, hose and nozzle; 1 on each floor secured to columns by iron straps and fitted with necessary pipe connections for air, release, and gasoline discharge.

**FILL PIPE**—Run 2-in. galvanized iron pipe from top of one storage tank to curb and there fitted with 2-in. brass fill cock set in 16 by 16-in. cast iron box with hinged cover and lock; fill cock to have No. 20 brass mesh at opening, also plug.

**VENT PIPE**—Run 1-in. galvanized iron pipe from top of 3 storage tanks to a point 10 ft. above roof, there capped with double gooseneck. Openings of which to be fitted with No. 20 brass wire mesh.

**GAGE PIPE**—Run  $1\frac{1}{2}$ -in. galvanized iron pipe from top of one storage tank to level of basement floor, terminating in brass stop cock with plug, set in 11 by 11-in. cast iron box with hinged cover and lock.

**GRAVITY FILL**—Run 2-in. galvanized pipe from heads of 3 storage tanks into a common header from which run branch lines, 1 to each working tank. Branch lines run to form a trap and fitted with 2-in. brass vertical check and cut-off valves before entering working tanks.

**DISCHARGE, AIR AND RELEASE LINES**—Run  $\frac{3}{4}$ -in. lines (2) from unions of each draw-off panel, 1-2-3-4-5th floors to top of working tanks. Connections to be made with release outlet at each draw-off panel to vent line.

**AIR FEED**—Run  $\frac{1}{2}$ -in. galvanized iron pipe from 1st to 5th floor with  $\frac{1}{2}$ -in. branches on each floor, connected to air inlet on each panel. This line to connect with air feed line of building.

### Multidistribution of Different Liquids.

Various liquids may be drawn at several points at same time and, under certain conditions, many liquids may be controlled by same panel and metered separately. Further particulars sent on request.

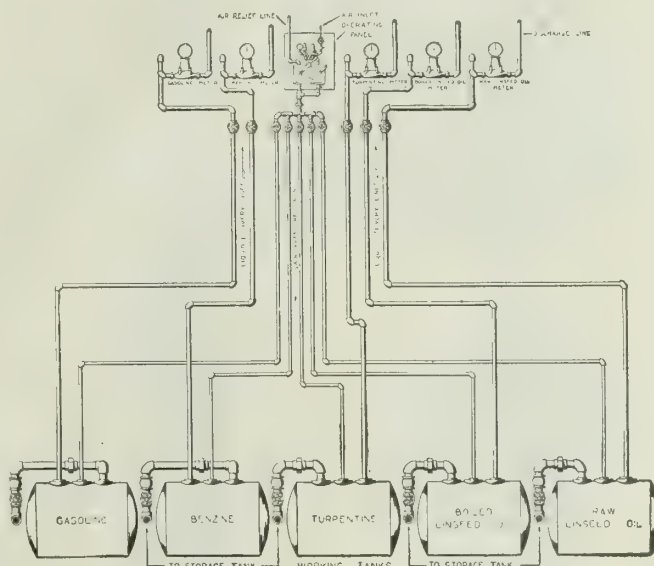


FIG. 3. DIAGRAM SHOWING MULTIDISTRIBUTION OF DIFFERENT LIQUIDS

## S. F. BOWSER &amp; CO., INC.

## Gasoline and Oil Storage Systems

## FORT WAYNE, IND.

CANADIAN PLANT, TORONTO, ONT.

DISTRICT AND SALES OFFICES

HARRISBURG, Telegraph Bldg.  
 ALBANY, 543-549 Broadway  
 DALLAS, 1911 Commerce St.  
 ATLANTA, Candler Bldg.  
 NEW YORK, 50 Church St.  
 CLEVELAND, 1904 Euclid Ave.  
 BUFFALO, 834 Main St.  
 TOLEDO, 242-244 Erie St.  
 BALTIMORE, Builders Exchange

SAN FRANCISCO, 612 Howard St.  
 CHICAGO, Fisher Bldg.  
 DENVER, Gas & Electric Bldg.  
 MEMPHIS, Exchange Bldg.  
 PHILADELPHIA, Abbott Bldg.  
 DETROIT, 1005 Woodward Ave.  
 KANSAS CITY, KANS., 312 Lathrop Bldg.  
 PITTSBURGH, 437 Oliver Bldg.

TORONTO, 66-68 Frazer Ave.  
 ST. LOUIS, Syndicate Trust Bldg.  
 WASHINGTON, Evans Bldg.  
 LOUISVILLE, Paul Jones Bldg.  
 BOSTON, Colonial Bldg.  
 CINCINNATI, 1210 Traction Bldg.  
 MINNEAPOLIS, 1104 Hennepin Ave.  
 MONTREAL, 1926 Mance St.  
 INDIANAPOLIS, 149 E. Market St.

In other cities see Telephone Directory

**Products.**

COMPLETE SYSTEMS for the STORAGE and CONTROL of OILS and GASOLINE in public and private garages, factories, mines, railroads, etc.

HAND and POWER DRIVEN GASOLINE PUMPS; OIL and GASOLINE STORAGE TANKS; SELF-REGISTERING PIPE LINE MEASURES.

Oil Filtering and Circulating Systems.

Dry Cleaners' Systems.

**Bowser Oil and Gasoline Storage Systems.**

Bowser systems are especially suitable for use in public or private garages.

The pump can be placed at any convenient point, and the tank buried in the ground outside or in the cellar, pit or oilhouse, as may be permitted by local and insurance regulations. The pump and tank may be any distance apart horizontally. Gasoline can be pumped directly into the reservoir of the automobile without being exposed to the air.

CUT 102 "CHIEF SENTRY"—A self-measuring, quick return gasoline pump of special type for curb installation, with maximum capacity of 5 gals. per stroke.

A rapid service outdoor pump, especially designed for heavy duty. It will pump any intermediate gallon, half-gallon or quart.

It will indicate the exact amount drawn.

It will record all liquid pumped up to 100,000 gals. and then repeat.

It will return the plunger to the bottom in  $3\frac{1}{2}$  turns of the handle.

It double locks; is absolutely waterproof; is a handsome, striking advertisement, day or night, and affords utmost efficiency in every way.

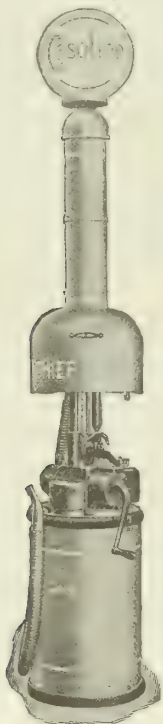
CUT 241 "RED SENTRY"—Self-measuring pump of special type for curb installation. Maximum capacity, 1 gal. per stroke and intermediate quantities of  $\frac{1}{2}$  gal., 1 qt. and 1 pt. Designed especially for gasoline, but adaptable for other oils. The brilliant red finish and electric light attachment make a striking advertisement day and night.

CUT 101 "RED CHIEF"—A self-measuring, quick return gasoline pump with a maximum capacity of 5 gals. per stroke. A convenient scale determines any intermediate quantity required.

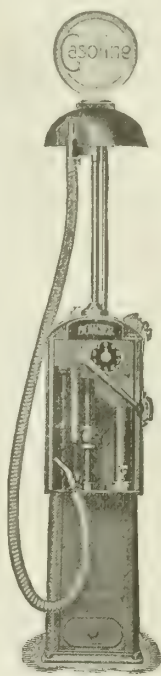
A quick return device returns plunger 4 times as fast as it is raised.

CUT 103—This indoor gasoline gallon pump is the latest invention for private garage use.

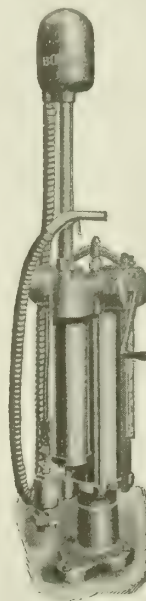
Fastest indoor gasoline gallon pump made. Pumps pint, quart, half-gallon or gallon. Compactly built. It locks, and also computes the price of small quantity sales. Measures, filters and records all gasoline pumped. Can be fitted with hose and portable muzzle for filling automobiles.



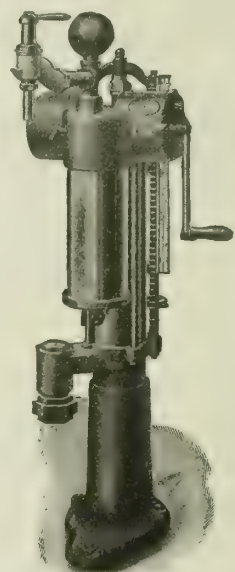
CUT 102



CUT 241



CUT 101



CUT 103

BOWSER PUMPS



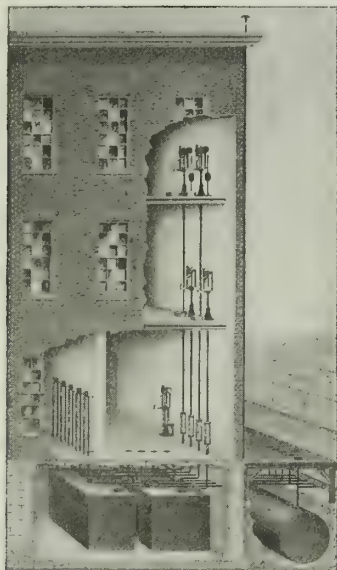
CUT 41—A standard, 4-measure, self-measuring pump with maximum capacity of 1 gal. per stroke and intermediate quantities of  $\frac{1}{2}$  gal., 1 qt. and 1 pt. Suitable for handling gasoline, kerosene and lubricating oils. Can be arranged in battery form.

CUT 44—Designed for garages where gasoline is required on several floors. This system gives gallon pump service wherever needed. Adaptable for both gasoline and lubricants.

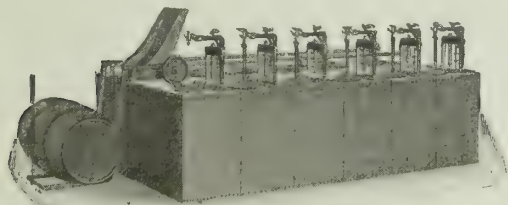
When used in connection with Bowser portable outfits, service is very complete and satisfactory.



CUT 41 FOUR-MEASURE PUMP



CUT 44 STORAGE SYSTEM FOR GARAGE

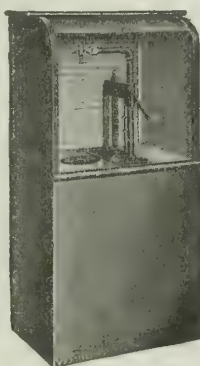


CUT 64 BATTERY FOR LUBRICATING OILS

CUT 64—Lubricating pump measures  $\frac{1}{2}$  pt., 1 pt. or 1 qt. It is dirtproof and can be fitted with lock and barrel emptying equipment.

One unit, or as many as is wanted, all in a solid, compact row.

CUT 52—All-metal lubricating cabinet for private garages. Pumps quarts, pints and half-pints. Closes like a roll-top desk and is fitted with lock.

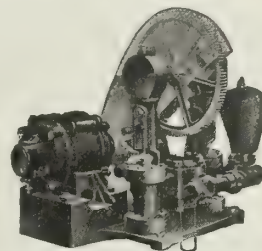


CUT 52 ROLL-TOP CABINET FOR LUBRICATING OIL

### Bowser Power Pumps for Large Public Garages.

A Bowser registering measure is connected by wiring with a special electric remote control equipment which automatically operates the pump.

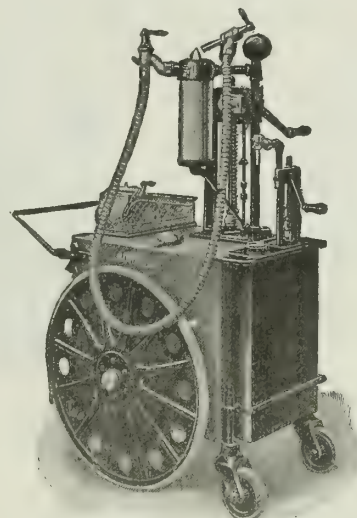
This system is so flexible that its use is practically unlimited. Briefly, it enables the operator to deliver the liquid from the place he keeps it to the spot where he needs it, in exact quantities he wants, without the use of labor, containers, trucks, etc., by simply turning a valve.



CUT 706 REMOTE CONTROL POWER PUMP

### Portable Storage Systems.

CUT 121 OUTFIT—A portable wheel tank for gasoline. Made for oils and other liquids. Maximum capacity, 1 gal. per stroke, and intermediate quantities of  $\frac{1}{2}$  gal., 1 qt. and 1 pt. Has automatic register and slip box used in recording sales. Wheels rubber tired.



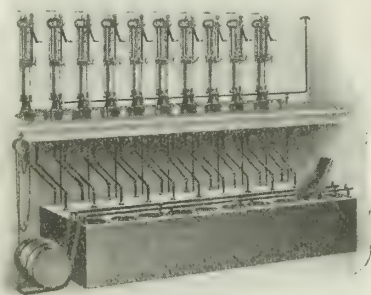
CUT 121 PORTABLE STORAGE SYSTEM

### Paint Oil Storage.

Bowser outfits are designed especially to place the paint room on a business basis.

CUT 115 OUTFIT—For handling paints, oils, varnishes, dryers, etc. Rectangular steel storage tanks are placed in basement; pumps on floor above in battery form; minimum amount of floor space required.

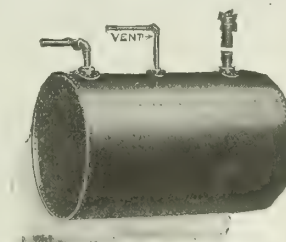
Tanks are equipped with barrel track and cradle for convenient filling from barrels or other containers. All work eliminated.



CUT 115 STORAGE OUTFIT

### Bowser Storage Tanks.

Nothing but first grade material and superior workmanship enters into the construction of Bowser storage tanks. Capacities of standard tanks, 1 bbl. to 25,000 gal.



CYLINDRICAL UNDERGROUND TANK  
Any capacity desired

ESTABLISHED 1865

INCORPORATED 1870

**GILBERT & BARKER MFG. CO.**

Gasoline and Oil Storage Systems

Gas and Oil Fired Furnaces

SPRINGFIELD, MASS.

**Products and Services.**

GASOLINE and OIL STORING and HANDLING EQUIPMENTS of all sizes, both MEASURING and NON-MEASURING, for the storage, pumping and distributing of oils of all kinds, and for hazardous liquids.

OIL FIRED and GAS FIRED FURNACES; PROCESS FOR BURNING FUEL OIL; etc.

Engineers and Contractors for HEAT TREATING and HARDENING PLANTS, and for OIL and GASOLINE STORAGE and HANDLING SYSTEMS.

**Gasoline Equipment.**

UNDERGROUND STORAGE TANKS—All underground storage tanks are made of the best open hearth soft steel, galvanized in the plate, by the hot process. All seams and flanges are welded by the oxy-acetylene process, making the tank practically one strong piece of metal.

After being tested under air pressure and known to be absolutely tight, tanks are coated with coal tar put on hot as an additional protection.

Tanks made in this way have been in the ground for over 30 years and show no signs of decay.

MEASURING PUMPS—For the public or private garage where gasoline is required by the gallon, half-gallon, quart or pint.

The quantity stops, which permit of measuring quantities less than 1 gal., are swung on a heavy threaded rod and can be sealed by the local sealer.

The pump is well built; cylinder made of seamless brass tubing; has brass valves, stuffing box and gland. All iron parts coming in contact with gasoline are galvanized. Pump is locked in handle by a strong, reliable lock.

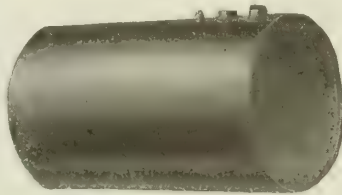
Can be fitted with one-way discharge, for filling cans, or two-way discharge which permits of hose connection.

Pump is nicely finished in red enamel, baked on.

SIDEWALK PUMP—In connection with an underground tank, the sidewalk pump makes an ideal outside filling arrangement.



TRADE-MARK



UNDERGROUND TANK  
STANDARD SIZES

Barrels	Gallons	Inside, Inches
1	65	30 x 22
2	120	30 x 40
3	170	36 x 39
4	220	36 x 51
5	285	36 x 65
6	345	36 x 79
8	460	42 x 77 1/2
10	550	42 x 93 1/2
12	650	46 x 92 1/2
15	800	46 x 115 1/2
20	1065	46 x 148



T-6  
GALLON PUMP

It pumps the gasoline from the tank, filters and measures it accurately, counts each gallon as delivered into the automobile tank, and registers all the gasoline pumped up to 100,000 gals.

The base of the housing is made of extra heavy gray iron, the doors of pressed steel, thoroughly protecting the working parts from the weather.

A length of specially constructed metal hose, fitted with a long spout, quick acting nozzle, is furnished.

Pump is fitted with tumbler lock and so arranged that either or both doors may be secured.

This sidewalk pump is handsomely finished in red enamel, baked on, and artistically lettered on each door. It is topped with a large electric-lighted globe, also lettered.

LONG DISTANCE PUMP—A well made long distance brass pump mounted on a galvanized iron base, especially adapted for the private garage. Has brass piston rod, stuffing box, gland and valve parts. Piston leather packing specially treated. It will deliver approximately 1 gallon for every four strokes. May be used to deliver into tank of automobile by attaching a hose to nozzle.

Finished in red enamel, baked on.

OFFICIAL APPROVAL—These products are included in the list of inspected mechanical appliances issued by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters.



T-8  
SIDEWALK  
PUMP



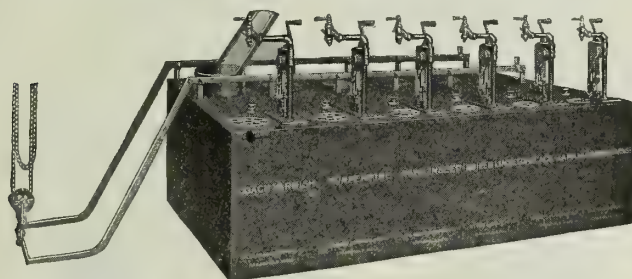
A GILBERT & BARKER LONG DISTANCE PUMP AND  
UNDERGROUND STORAGE TANK  
An ideal outfit for the private garage



### Outfits for Lubricating and Paint Oils.

The Gilbert & Barker self-measuring outfit handles light or heavy lubricating, non-lubricating, and paint oils. It measures accurate quarts, pints or half-pints directly into can or oiler without the use of measures. Can also be furnished in half-gallon and gallon capacities. Each measurement can be sealed by the local sealer of weights and measures.

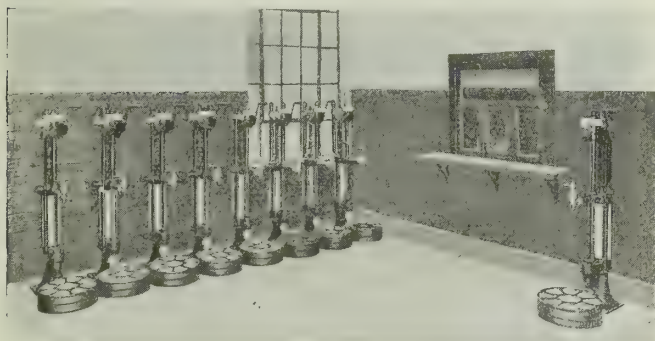
The pump is well built; cylinder made of seamless brass tubing; has brass valves, stuffing box and gland. Pump is locked in handle by a strong, reliable



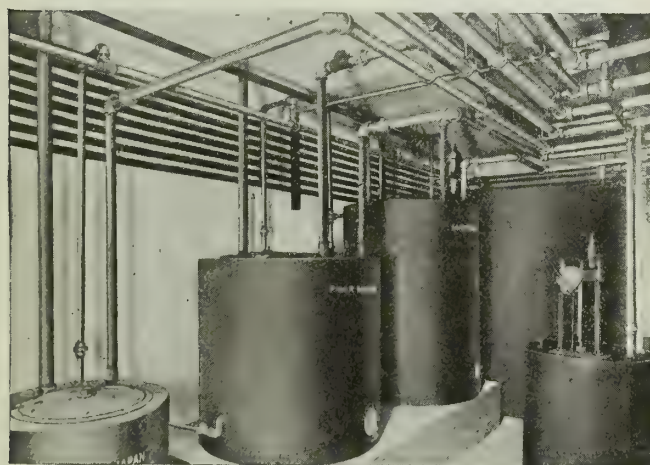
GILBERT & BARKER LUBRICATING OR PAINT OIL OUTFIT  
Arranged in a battery

lock. The discharge is fitted with a quick acting nozzle which prevents dripping. A discharge register counts each full stroke from 1 to 10 and then repeats.

It can be equipped with a meter, when so desired. Is neatly finished in green enamel, baked on.



A neat installation in a storeroom



Cellar tanks used with pumps shown above  
GILBERT & BARKER OIL OUTFIT

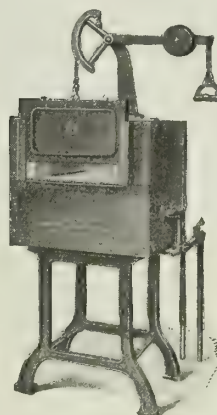
### Furnaces and Fuel Oil Burning Apparatus.

GILBERT & BARKER MFG. CO. are engineers and contractors for heat treating and hardening plants, and

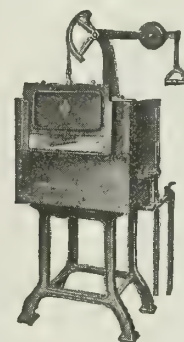
are experts on liquid and gaseous fuel problems. The services of the company's engineers are at the disposal of architects and contractors in an advisory capacity, to recommend and lay out complete plants, from storage tank to furnaces.

The furnaces are made of the best material throughout and are put together by skilled workmen. The present type of Gilbert & Barker furnace is the result of over 50 years of experience in the handling of liquid and gaseous fuels, and the design and construction of furnaces for all classes of heat treating work.

The furnaces consist of many different types, such as are used for the various classes of heat treating work. The heating chambers are just large enough to accommodate the work that is to be done, thus no unnecessary space is heated.



TYPE C



TYPE K

FURNACES, SEMI-MUFFLE  
TYPE C

No.	Heating chamber			Mouth		Floor space	
	Depth, ins.	Width, ins.	Height, ins.	Width, ins.	Height, ins.	R-L ins.	F-B ins.
C-2	10	8	5	8	5	29	18
C-4	12	10	6 1/2	10	6 1/2	31	22
C-6	15	12	6 1/2	12	6 1/2	33	26
C-7	18	12	6 1/2	12	6 1/2	33	28
C-8	24	12	6 1/2	12	6 1/2	33	36
C-10	24	15	6 1/2	15	6 1/2	38	36
C-12	24	18	7 1/2	18	7 1/2	48	38
C-15	36	24	12	24	12	57	51

TYPE K

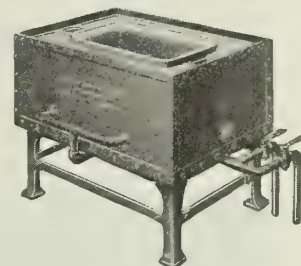
K-1	8	4	5	4	5	18	22
K-4	13	7	6 1/2	7	6 1/2	30	28
K-6	16	9	6 1/2	9	6 1/2	33	28
K-9	22	10	6 1/2	10	6 1/2	39	35

Other sizes to order.

### Pot Furnaces.

Pot furnaces, for lead hardening, oil tempering, salt bath, etc.

The engineers are ready at all times to give expert advice and assistance to concerns interested in this work.



TYPE F POT FURNACE

SIZES OF TYPE F

No.	Inside of pot			Floor space	
	Width, ins.	Depth, ins.	Height, ins.	Width, ins.	Depth, ins.
F-3	8	8	6	25	25
F-4	14	8	8	31	25
F-6	14	12	8	31	29
F-7	20	15	8	39	35
F-8	25	15	8	45	35
F-9	34	21	10	51	48

Other sizes to order.

# WAYNE OIL TANK & PUMP CO.

FORT WAYNE, IND.





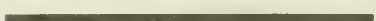
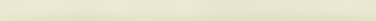
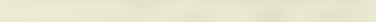
SALES OFFICES IN ALL PRINCIPAL CITIES

## Products.

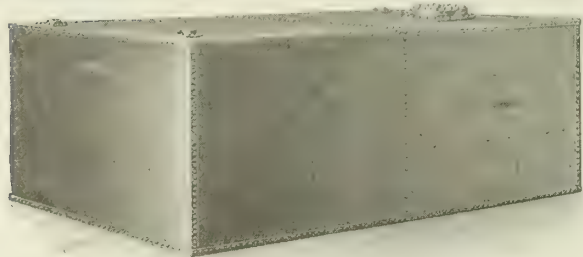
GASOLINE and OIL STORAGE and DISTRIBUTING SYSTEMS, PORTABLE and STATIONARY, for private and public garages, factories, mills, mines, railroads, oil houses, etc., including Tanks, Cabinets, Pumps, Filters, Recording Meters, Valves, Fill Pipes, Hose, Gauges, Nozzles, Splash Pans, Computers, Filler Boxes, Filling Devices, Combination Skid and Barrel Drainers.

## Tanks.

Tanks are made standard in Nos. 16-, 14- and 12-gauge galvanized steel, of one barrel (65 gals.) to 20 barrels (1100 gals.) capacities. Made to order, of larger capacity or heavier metal. Every principle of safety in the storage of oils and volatiles is embodied in them. The metal is all rolled before punching, which is accurately done by machine, and all seams lap riveted metal-to-metal. No filling of any kind is used. Tank seams made from Nos. 16-, 14- and 12-gauge metal

Gauge		Part of inch
No. 16		1/16
No. 14		5/64
No. 12		7/64
No. 10		9/64
No. 7		3/16
No. 3		1/4
No. 1		5/16

GAUGES OF METAL USED IN TANKS  
Illustration shows 1/2 actual thickness of metal



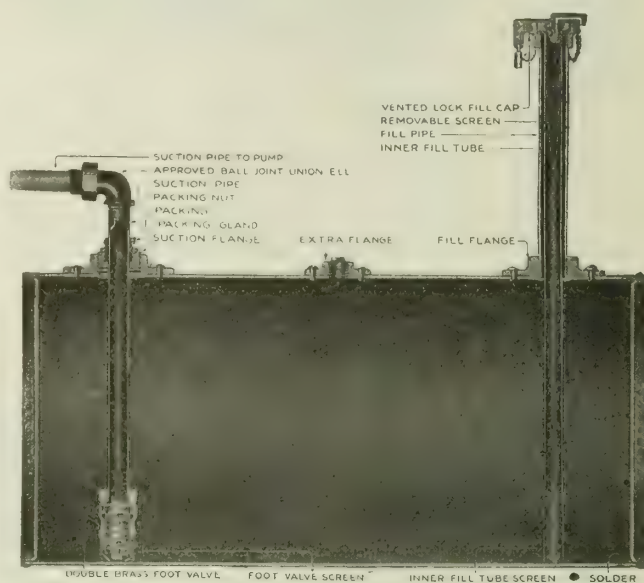
Rectangular Heavy Gauge Tank

are flushed with solder; heavier metal tanks are calked.

Has been designed to meet most exacting conditions of Board of Fire Underwriters.

## Equipment.

Standard equipment includes tank, gauge stick for tank, fill pipe complete, suction pipe for tank with union.



SECTIONAL VIEW SHOWING METHOD OF ARRANGEMENT AND CONSTRUCTION OF WAYNE LONG DISTANCE UNDERGROUND GASOLINE STORAGE TANKS

DIMENSIONS OF STANDARD TANKS

Capacity, bbls.	Capacity, gals.	Diameter, ins.	Length, ins.	Capacity, bbls.	Capacity, gals.	Diameter, ins.	Length, ins.
1	65	27	30	8	445	38	96
2	120	31	42	9	500	38	107
3	170	38	39	10	550	38	118
4	220	38	49	12	640	46	92
5	280	38	62	15	800	46	124
6	340	38	75	18	1000	46	145
7	400	38	87	20	1100	46	160



Cylindrical Heavy Gauge Tank

LARGE CAPACITY STORAGE TANKS MADE OF VARIOUS GAUGED BLACK STEEL



**Pumps.**

After the tank is located outside at the safest, handiest point for filling, and the most convenient point inside selected for pumping, this company will furnish measuring and metering pumps equal to the situation.

At the most convenient point for filling the automobile, the pump is held perfectly rigid by four heavy lag screws. Both pump and fill pipe cap lock.

Gasoline hose enables pumping direct from underground tank to car—an additional fire safeguard.

**Valves.**

The suction line is provided with a set of double brass valves, on which the accuracy of the measuring pump depends. Poppet and seat are carefully machined, then hand ground, and set in a heavy body of solid brass. Each works independently.

**Discharge Pipe.**

Discharge pipe terminates in a lever shut-off nozzle that makes it evaporation-proof. An automatic check valve in the discharge pipe furnishes double protection against fire and evaporation.



CUT 26. NON-MEASURING PUMP



CUT 32. 1-GAL. PUMP



CUT 278. 5-GAL. PUMP



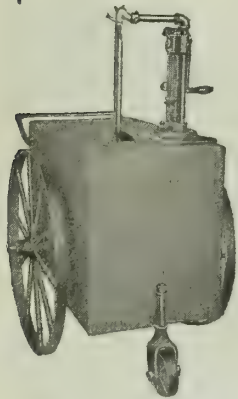
CUT 282. 1-GAL. PUMP



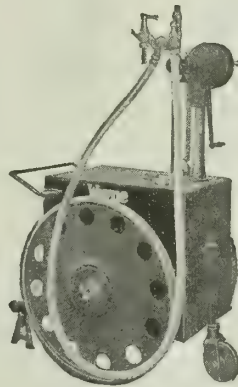
CUT 280. 1-GAL. CURB PUMP



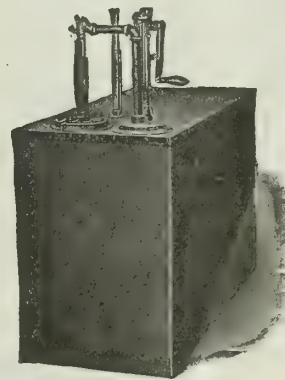
CUT 276. 5-GAL. CURB PUMP



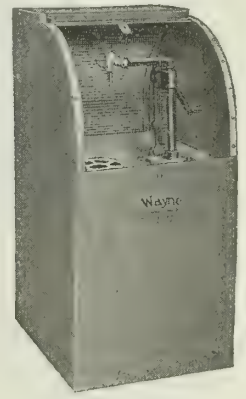
CUT 224. LUBRICATING OIL PORTABLE PUMP



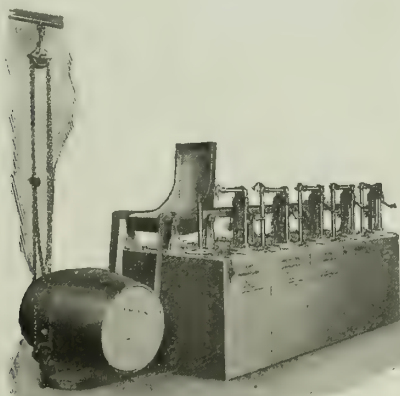
CUT 216. GASOLINE PORTABLE PUMP



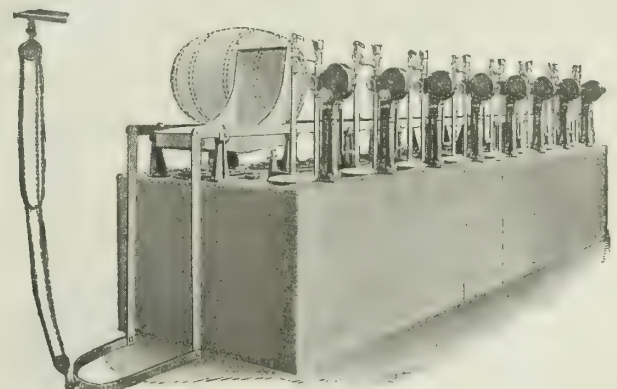
CUT 37. LUBRICATING OIL PUMP



CUT 24. LUBRICATING OIL PUMP



CUT 63. BATTERY OF TANKS FOR LUBRICATING OIL



CUT 70. BATTERY OF TANKS FOR PAINT OILS

ESTABLISHED 1896

INCORPORATED 1902

# CHICAGO STEEL TANK COMPANY

Builders of Gasoline and Oil Storage Equipment

733-737 South Halsted Street

CHICAGO, ILL.

## Products and Service.

STORAGE AND PUMPING SYSTEMS for Gasoline, Lubricating Oils, Paint Oils, Dryers, Turpentines, Varnishes. Complete equipment for public and private garages, factories, mills, railroads, oil houses. The company engineers and assumes contracts for complete installations.

## Underground Storage Tanks.

Tanks built in either riveted or welded type of construction, and in either galvanized or black steel. Table covers stock sizes of tanks in Nos. 14-, 12- or 10-gage and  $\frac{3}{16}$ -in. steel, from 60 to 2100 gals. capacity. Special sizes built to order.

**RIVETED TYPE**—Made from selected galvanized tank sheets throughout, best obtainable. They are flanged, closely riveted, thoroughly soldered, then tested with heavy air pressure, and guaranteed oiltight and watertight. Three coats of special rust resisting asphaltum applied.

**WELDED TYPE**—Welded under new process, and for those who prefer this type of construction, the best workmanship and a product unexcelled is offered. Tested with heavy air pressure, and painted with three coats of asphaltum.

## Filler Pipes.

On all standard complete equipment, tank provided with one underwriter's filler pipe vented (Fig. 103) having hinged cap, removable brass strainer, heavy brass lock and keys. Sometimes necessary or desirable to have flush cap fill arrangement, when Fig. 101 is included.

## Meters.

Entirely enclosed and foolproof meters, registering from 0 to 10,000 gals. and repeat, on the smaller pumps; and from 0 to 100,000 gals. and repeat, for larger systems. The company has spent years in perfecting a meter which can be relied upon at all times, and which will withstand continued hard usage and wear.



FIG. 105. STORAGE TANK

SIZES AND CAPACITIES

Bbbs.	Size, ins.	Cap., gals.
1	22 x 34	60
2	28 x 46	120
3	34 x 46	180
4	34 x 56	230
5	34 x 68	270
6	40 x 56	304
7	40 x 68	365
10	40 x 92	500
12	46 x 92	650
15	52 x 92	825
20	58 x 87	1,000
29	60 x 120	1,460
42	72 x 120	2,100

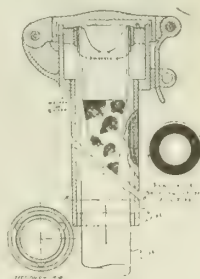


FIG. 103. DETAIL SHOWING FILLER PIPE



FIG. 101. FOR FLUSH CAP FILL

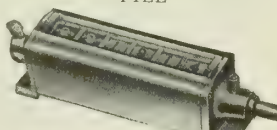


FIG. 102. METER

## Pumps for Inside Discharge.

For public and private garages, filling stations and factories. Discharge measured flow of oil with guaranteed accuracy. Tank can be buried at any desirable spot outside of building, the pump at most convenient point inside. Both Fig. 3 and Fig. 65 are long distance types, and are frequently installed 100 ft. or more from tank.

## Pumps for Outside Discharge.

For outside or sidewalk use. Heavily constructed, reinforced and absolutely weatherproof. Embodies all measuring, meter and filtering facilities included with the inside pumps. Either type equipped with large electric sign and globe as shown. The advertising as well as service features of this type of equipment are manifest.

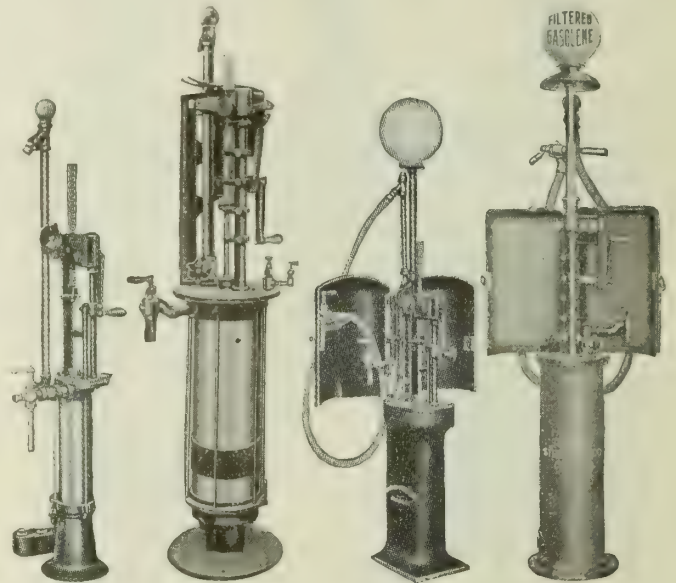


FIG. 3  
Pumps for Inside Discharge

FIG. 65

FIG. 75  
Pumps for Outside Discharge

FIG. 80

## DISCHARGE PUMPS

Fig. 3: Discharges accurately 1 full gal. to the stroke. Discharge capacity 10 gals. per min. Will also pump 1 qt. and  $\frac{1}{2}$  gal. to the stroke by setting predetermined stops. Pump equipped with one 0- to 15-gal. setback tally, 10,000-gal. and repeat foolproof meter, 1 overhead drain and drain valve with hose connection, 1 extra draw-off faucet for cans. Pump constructed from heavy rustproof materials, and furnished with durable lock. Neatly finished in red enamel and gold. Shipping weight 184 lbs.; height, 69 ins.; floor space required, 462 sq. ins.

Fig. 65: Recommended where rapid discharge is of paramount importance. Discharges 5 gals. to the stroke, with normal discharge capacity of 25 gals. per min. Will likewise pump 1, 2, 3 or 4 gals. to the stroke or any fraction thereof by setting predetermined stops. Equipped with one 0- to 50-gal. setback tally, one 100,000-gal. and repeat foolproof meter, water filter, overhead drain and drain valve with hose connection, 1 separate faucet for cans. Also necessary lock, keys and strainers. Automatic gear shift for quick return of rack bar. Neatly finished in red enamel and constructed from heavy rustproof materials throughout. Shipping weight, 310 lbs.; height, 92 ins.; floor space required, 462 sq. ins.

Fig. 75: Discharges 1 full gal. to the stroke. Discharge capacity 10 gals. per min. Equipped with 15-gal. setback tally, 10,000-gal. meter, overhead drain and drain valve, can faucet, filter, lock, keys and strainers, electric light and globe. Equipment entirely incased in heavy cast iron housing, beautifully finished in red enamel. Shipping weight 315 lbs.; height, 85 ins.; floor space required, 280 sq. ins.

Fig. 80: Discharges 5 gals. to the stroke. Normal discharge capacity 25 gals. per min. Equipment includes 50-gal. setback tally, 100,000-gal. meter, overhead drain and drain valve, extra draw-off faucet for cans, calibrated rack bar showing discharge in pints, automatic gear shift for quick return of rack bar, water filter, lock, keys and strainers. Electric light crown furnished as shown, and entire equipment incased in heavy cast iron housing. Shipping weight, 750 lbs.; height, 107 ins.; floor space required, 380 sq. ins.



# THE T. C. BEACH GARAGE EQUIPMENT CO., INC.

Manufacturers of Automobile Turntables and Automatic Air Outfits

50 Church Street  
NEW YORK, N. Y.

## Products.

"PERFECTION" BALL BEARING TURNTABLES and  
"IDEAL" ROLLER BEARING TURNTABLES for Motor  
Vehicles.

"IDEAL" COMPRESSED AIR OUTFITS.

## "Perfection" and "Ideal" Turntables.

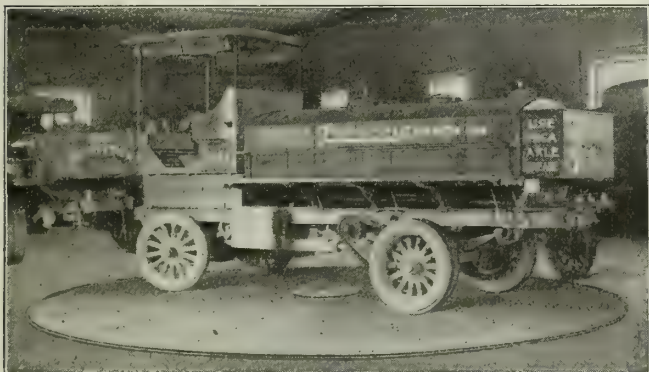
**CONSTRUCTION AND OPERATION**—In the mechanism of these turntables we use the two standard types of antifriction bearings.

The "Perfection" turntable operates on large chrome steel ball bearings, and is centrally supported. The arrangement of the mechanism and frame is such as to secure great sustaining power and the utmost ease of operation. This turntable exemplifies in every way the perfection of engineering skill, conjoined with many years' experience, applied to the purpose of turning the motor vehicles of the present day.

The "Ideal" turntable operates on large roller bearing wheels, which are located in proper position to insure the even distribution of the load, and are so mounted that they make certain the proper alignment of the turntable as a whole on the track base.

Both the "Perfection" and the "Ideal" have same steel frame of approved construction, and are furnished with tops either of heavy steel plate, reinforced concrete, or plank.

**INSTALLATION**—The installation has been so simplified that contractors, who follow the directions furnished, have no trouble in preparing the pit and foundation and in erecting the tables. Anchor bolts, etc., for the foundation are always supplied. A 3-in. channel curb, for edge of floor at pit, is furnished when desired.



TURNTABLE INSTALLED

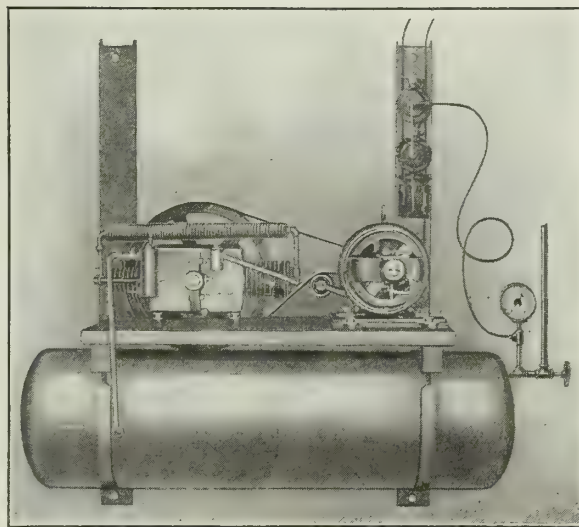
**DIAMETERS AND WHEEL BASES**—The regular diameters of the turntables and the maximum wheel base that each size will accommodate are as follows:

12 ft.	13 ft.	14 ft.	15 ft.	16 ft.
118 ins.	130 ins.	142 ins.	156 ins.	170 ins.

Heavy duty motor truck turntables are furnished of any diameter and any capacity desired.

## The "Ideal" Automatic Compressed Air Outfit.

This consists of platform sustaining brackets, 2-stage compressor, oil trap, safety valve, motor, endless vim belt, automatic belt tightener, seamless steel tank washed with block tin inside and out, 300-lb. pressure gauge, needle air valves and piping as shown—all assembled and mounted in the form most convenient and ready for installation. To install, it is necessary only to bolt the outfit to the wall and connect it with the electric current supply.



"IDEAL" AUTOMATIC COMPRESSED AIR OUTFIT

**GENERAL INFORMATION**—To produce high pressure air the 2-stage or compound air compressors are the most economical and efficient, and save a large percentage of the power that would be required for a single acting compressor of the same capacity.

## SPECIFICATION DATA OF THE THREE SIZES—

No. 300-2	
Cylinders,	3-and 1½ by 3-in. stroke
Capacity,	3 to 4 cu. ft. per minute
Power required,	½ to 1 h.p.
Tank size,	14 by 48 ins.
Wall space,	3 by 3½ ft.
Shipping weight,	450 lbs.
No. 401	
Cylinders,	4-and 2 by 4-in. stroke
Capacity,	7 to 10 cu. ft. per minute
Power required,	1½ to 2 h.p.
Tank size,	16 by 48 ins.
Wall space,	3½ by 4 ft.
Shipping weight,	600 lbs.
No. 802	
Cylinders, two each	4-and 2 by 4-in. stroke
Capacity,	14 to 20 cu. ft. per minute
Power required,	3 to 4 h.p.
Tank size,	20 by 60 ins.
Wall space,	4 by 5 ft.
Shipping weight,	1000 lbs.

## C. F. ERNST'S SONS

## Manufacturers of Combined Automobile Turntable and Wash Rack

61-87 Lathrop Street

BUFFALO, N. Y.

MILWAUKEE SALES OFFICE: W. F. MUELLER, Farwell Avenue and Brady Street

## Products.

The "ERNST" COMBINED AUTOMOBILE TURN-  
TABLE and WASH RACK; SPECIAL HEAVY AUTOMOBILE  
TRUCK TURNTABLE.

**Description.**

This apparatus is patented and made in two models, Nos. 1 and 2. Model No. 1 (Fig. 1) consists of a heavy cast iron drum (size of which is governed by diameter of table) with hardened steel resistance pin in center, surmounted by heavy cast iron top supported

by, and revolving on, large hardened steel balls, bearing in grooves cut in two heavy steel ball runs, set in each casting. Steel floor beams made secure by heavy cast iron clamping piece held in place by large Norway iron kingbolt and nut at center.

All bearings are protected from water and sand. No outer bearing or track to produce friction or cause table to turn hard.

Model No. 1 is made in three sizes, identical in construction, the sizes of parts simply increasing according to total size of turntable. Used as a wash rack.

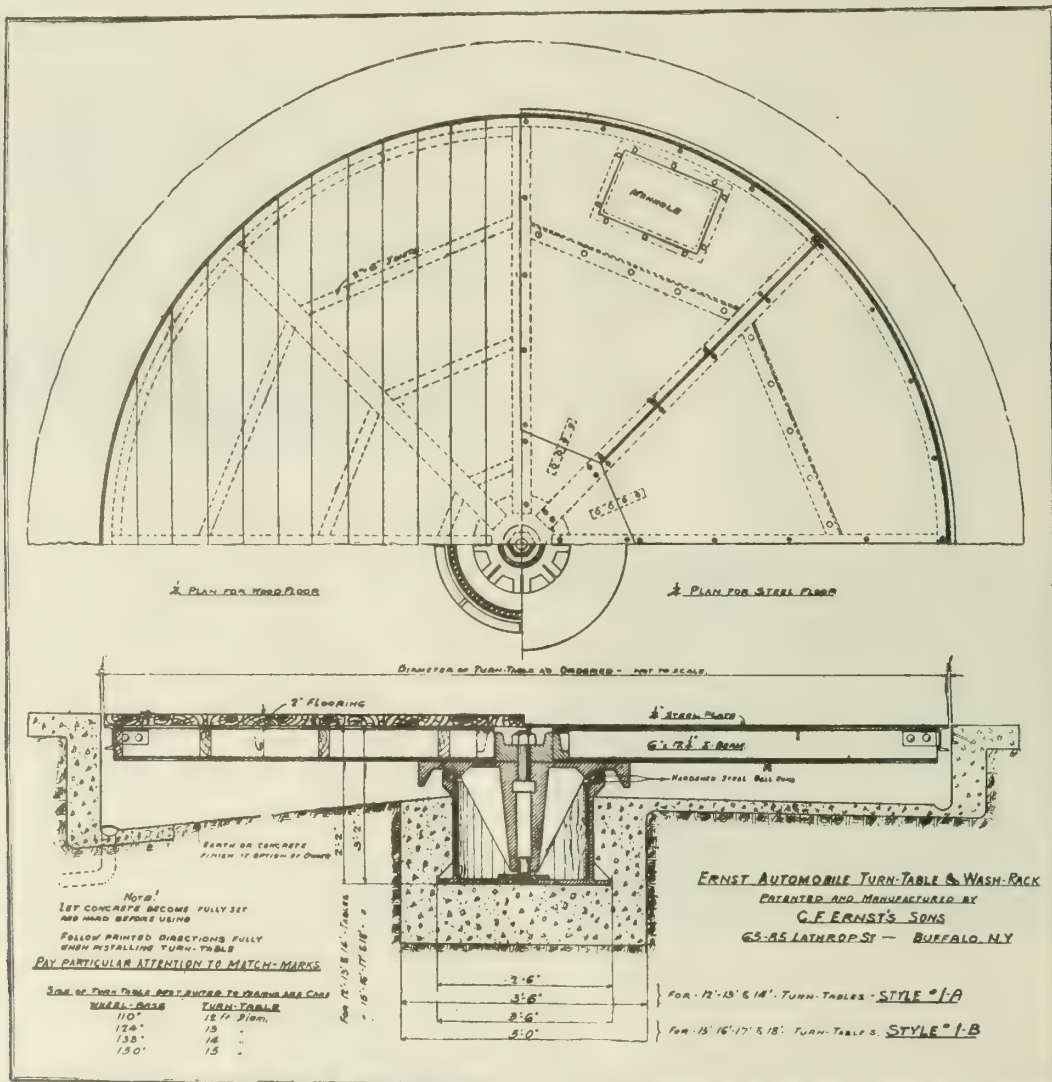


FIG. 1. DETAIL DRAWING OF "ERNST" TURNTABLE, MODELS NOS. 1-A, 1-B AND 1-C  
Note water gutter formed in concrete under outer edge of turntable, gutter to be connected with sewer

APPROXIMATE WEIGHT READY FOR WOOD TOP

12 ft.....2000 lbs., 13 ft.....2000 lbs., 14 ft.....2000 lbs., 15 ft.....3000 lbs., 16 ft.....3000 lbs.



**Turntable, Model No. 2.**

Made in three styles—2-A, 2-B and 2-C (Fig. 3). Designed for installation in upper floors of buildings, in ground floor where there is a basement, and in places where required depth for Model No. 1 can not be obtained. All styles are identical in construction. Used as a wash rack. Framing shown in illustration below is changeable to suit ideas of architect or owner.

**Special Heavy Turntable.**

A special turntable adapted for heavy automobile truck use is manufactured by this company and it will be glad to furnish detail drawings and quote prices on same, upon application.

**Guarantee.**

If the "Ernst" turntable, after being installed and used for sixty days, is not absolutely satisfactory, the company will pay cost of its removal and putting floor in good condition, purchaser to keep turntable until money is paid.

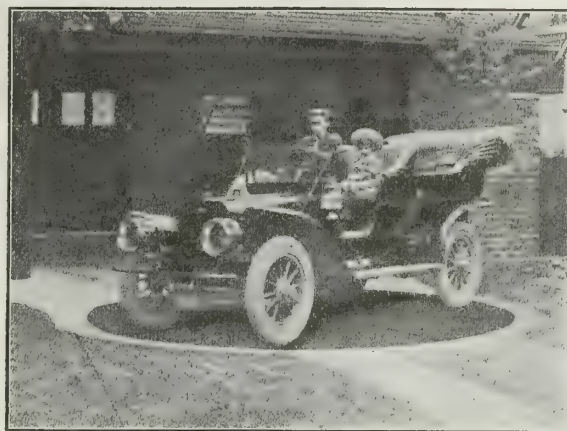
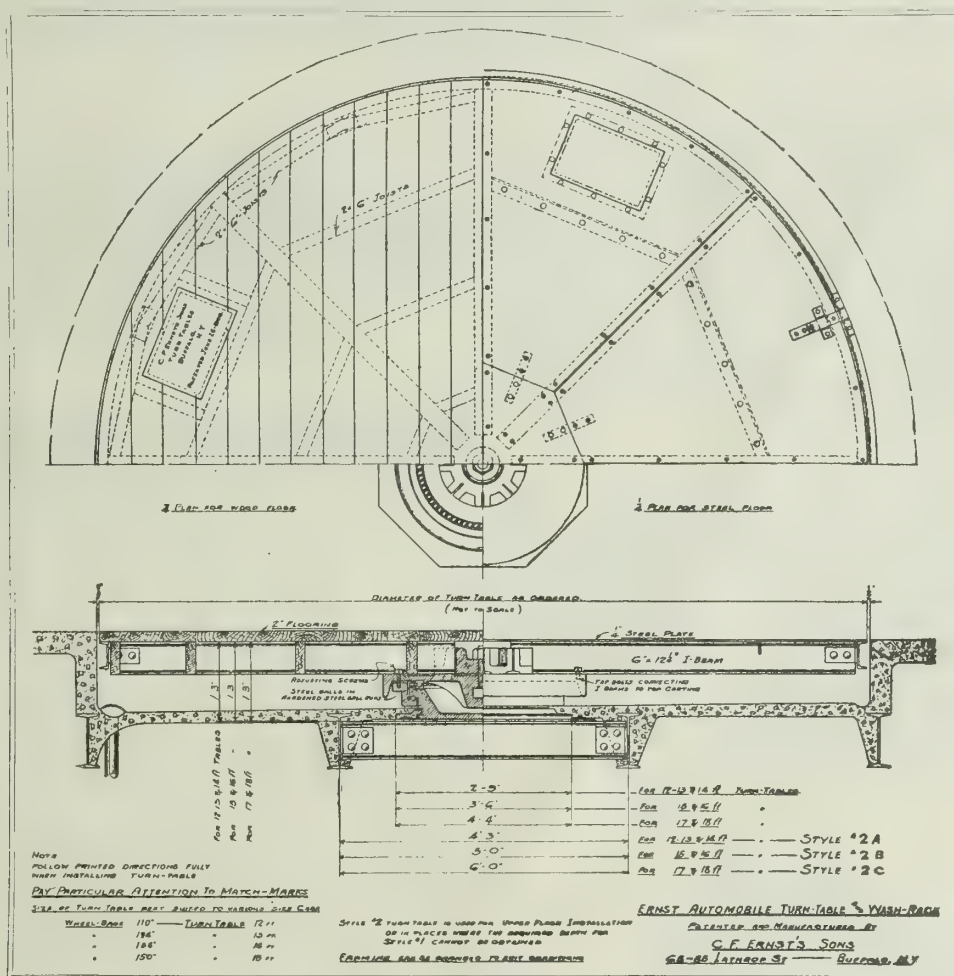


FIG. 2. "ERNST" TURNTABLE INSTALLED OUTSIDE 'GARAGE  
A satisfactory installation all the year round. Above turntable in use over eight years

**References.**

These turntables are in use in garages from Maine to California.

List of users sent on application.



# THE CANTON FOUNDRY & MACHINE CO.

Manufacturers of Serpentine Track Automobile Turntables

CANTON, OHIO

## REPRESENTATIVES

NEW YORK, N. Y., ZENAS R. TAYLOR, INC., 258 Broadway  
BOSTON, MASS., ZENAS R. TAYLOR, INC., 236 Old South  
Building  
PHILADELPHIA, PA., ROBT. B. LEDERLE, Witherspoon  
Building

PITTSBURGH, PA., GEO. C. WEBB, 207 Fulton Building  
DETROIT, MICH., GEO. T. WALLACE SALES Co., 400 Penobscot  
Building  
SAN FRANCISCO, CAL., C. J. JORGENSEN Co., 356 Market  
Street

## Products.

"UNIVERSAL" AUTOMOBILE TURN-  
TABLES for pleasure car and truck use.

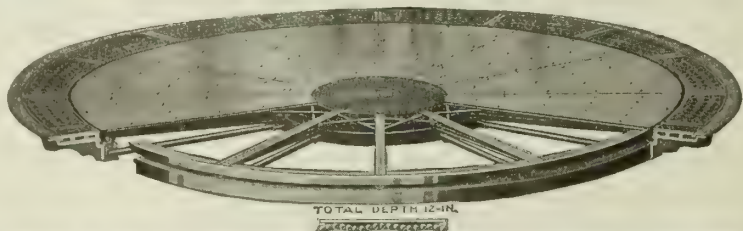
For Contractors' Iron Specialties, see  
page 270.

## "Universal" Automobile Turntables.

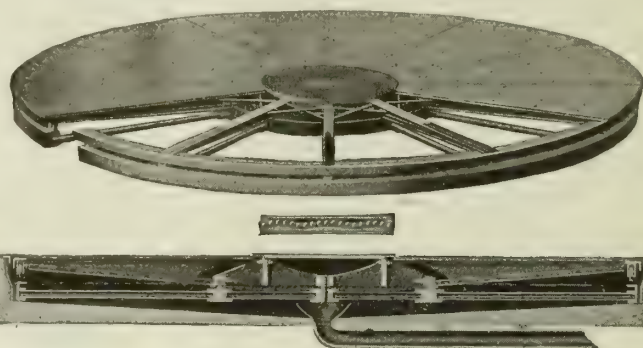
DESCRIPTION—Two styles, with and  
without washrack extension. Mechanically  
perfect in construction, and easy to turn.  
Weight of table and load it supports rest on  
2-in. ball bearings, that rest on the high  
points of serpentine, circular track, 6 ft. in  
diameter, reducing friction to a minimum.

Superstructure is of structural steel, built in truss  
form to give greatest possible strength; top of table  
made of  $\frac{3}{16}$ -in. steel plates. All parts made of iron and  
steel; simple in construction.

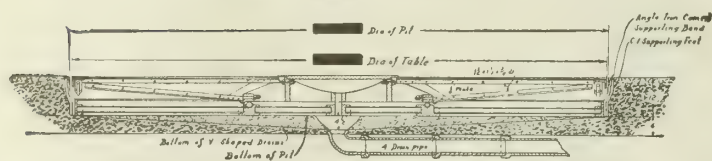
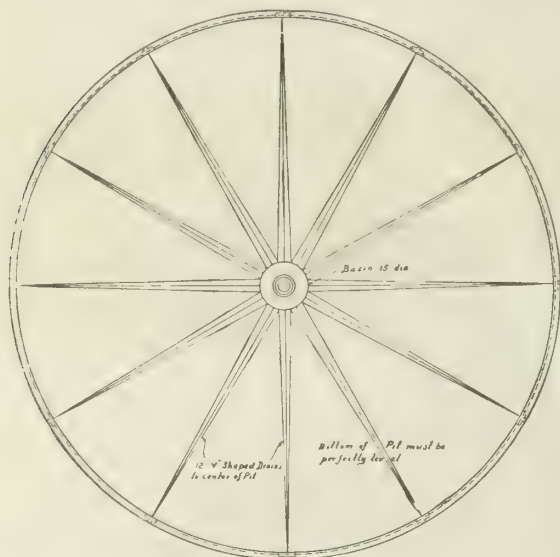
"Universals" may be placed on upper floors as  
well as on ground floors. Caster wheels at periphery  
of table are used only to prevent table from tilting.  
Heavy load does not substantially increase friction.



TOP AND SECTIONAL VIEW SHOWING DETAILS OF CONSTRUCTION OF THE  
"UNIVERSAL" WITH WASHRACK EXTENSION



TOP AND SECTIONAL VIEW, SHOWING DETAILS OF CONSTRUCTION  
OF THE "UNIVERSAL"



FOUNDATION PLAN FOR "UNIVERSAL" AUTOMOBILE TURNTABLE  
Patented December 27, 1904; June 29, 1909; October 4, 1910; January 2, 1912

SWEET'S CATALOGUE

FOR PLEASURE CARS					FOR TRUCKS	
Wheelbase, ins. ....	108	132	144	156	156	168
Diam., ft. ....	12	14	15	16	16	18
Supporting capacities, lbs. ....	8000	8000	8000	8000	10 tons	10 tons
Shipping weights, lbs. ....	4550	5300	5600	6000	8500	10,500

Angle iron supporting band for concrete floors comes fastened to outer circle  
of table.

ADVANTAGES—Removable ribbed steel plates on  
top, adjustable by means of truss bolts to take care of  
any wear; water drains to rim, then through grooves  
back to center of pit or outlet; can not tilt, always per-  
fectly poised; easily turned. Quickly and easily erected  
from knocked down shipment, by one man; always  
ready; but 12 ins. in depth.

SPECIFICATIONS—Blue print, complete speci-  
fications and directions for building pit and erect-  
ing table furnished with each order. Any careful  
mechanic can erect.

CATALOGUE—Send for catalogue "C-99."



ESTABLISHED 1866

# E. T. BARNUM IRON WORKS

## Steel Jail Cells and Jail Work

DETROIT, MICH.

### Products.

JAIL WORK, including STEEL JAIL CELLS; ENTRANCE DOORS; STEEL LINING for Jail Walls; WINDOW GUARDS and BUNKS for Jails, Lockups and Police Stations; PRISON BAR GRATINGS; JAIL BEDSTEADS; JAIL FENCING, PADDED CELLS and SANITARY EQUIPMENT.

For Wire and Iron Work, see pages 496-97.

### Descriptive.

Cells and cages for prisons, city and county jails, town and village lockups, portable convict wagons, padded cages and steel plate lining for rooms.

### Toolproof Material.

The Barnum laminated toolproof steel, composed of 5 alternate layers (3 layers of soft steel and 2 layers of 'crucible steel'), is proof against any saw, file or drill.

The Barnum steel cased bars are proof against cutting tools.

### Locking Devices.

Both sliding and swinging door lever locking devices of improved design, arranged to control any one or all doors in opening or closing. All operations are made from a lever box, thus permitting attendants to operate the doors without coming in contact with the prisoners.

Complete description will be furnished on request.

### Equipment.

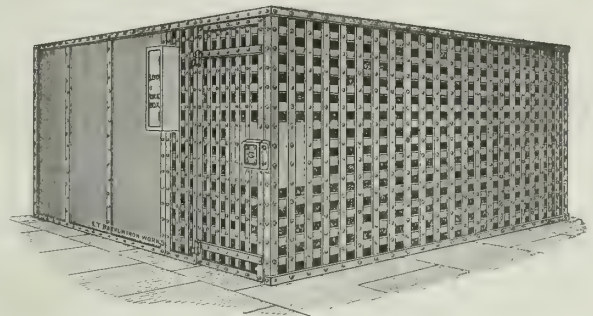
Equipment furnished complete, including entrance doors, window guards, steel lockers, bunks and beds, food openings and shelves, and other sanitary arrangements.

### Steel Lining.

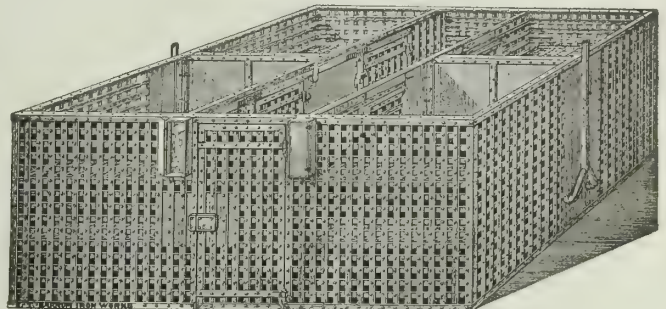
For use in insecure jail or lockup buildings, a specially constructed steel plate lining combined and reinforced with necessary angle and battens.

### Catalogues and Service.

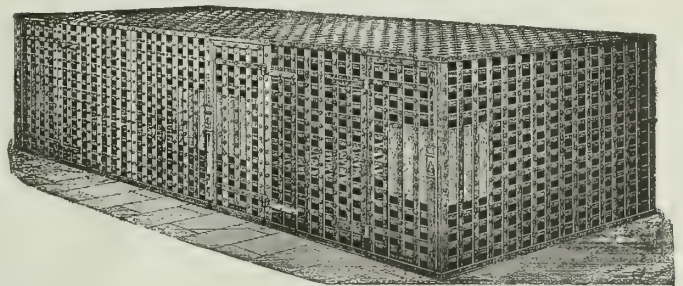
A fully illustrated catalogue, giving all necessary data, will be sent on request. Our engineering and drafting department will assist on jail problems; and when conditions warrant, a competent expert can be sent to go over matters in detail.



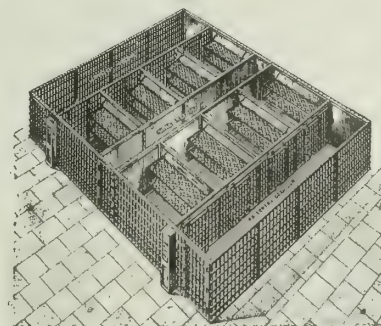
BARNUM NO. 14 TWO-CELL CAGE, WITH SIDE CORRIDOR



BARNUM NO. 6 FOUR-CELL AND CENTRAL CORRIDOR CAGE



BARNUM NO. 16 THREE-CELL LATTICE CAGE



BARNUM NO. 17 EIGHT-CELL AND THREE-CORRIDOR CAGE

ESTABLISHED 1856

**PAULY JAIL BUILDING COMPANY**

INCORPORATED

**ST. LOUIS, MO.**

GENERAL EASTERN OFFICE  
 NEW YORK, N. Y., Metropolitan Building, 23d Street  
 and 4th Avenue  
 Telephone: GRAMERCY 2583

**NEW YORK, N. Y.**

FACTORY AND MAIN OFFICE  
 ST. LOUIS, MO., 2215 to 2225 DeKalb  
 Street  
 Telephone: SIDNEY 246

**Products.**

Builders, exclusively, of CELLS for Jails, Prisons, Police Stations and Lockups; AUTOMATIC SLIDING DOOR and HAND PULL LOCKING DEVICES; PRISON PLUMBING FIXTURES; ROUND and FLAT INTERLOCKING BAR GRATING, for Window Guards, Corridors, Gratings, etc.

**Advantages.**

Perfect mechanism and durability.

**Specifications.**

Specifications covering our general and specific features are amplified and submitted with our layouts.

**Steel.**

Five-ply steel is used, referred to in specification as "toolproof," consisting of alternate layers of high carbon steel and iron. Round bars, alternate layers of hard steel encircling center core of tough iron. All layers thoroughly welded, and carbon steel layers hardened to resist action of cutting tools.

**Niches.**

PAULY JAIL BUILDING COMPANY is the originator and builder of the Niche system of cell plumbing.

**Corridor Gratings and Entrance Doors.**

"Toolproof" corridor gratings and "toolproof" corridor entrance doors for all prison corridors are advocated by this company.

**Bunks.**

Manufacturers of the most modern bunks for prisons and jails.

**Cell Door Locking Device.**

Cell doors operated by an automatic sliding door locking device, so that any one door or all doors in one row can be operated at same time on sliding principle. Doors suspended from above on steel hangers with antifriction bearings, consisting of hard steel balls set in hardened bushings, revolving on hardened spindles to insure the perfect distribution of weight of door. All of the locking device incased in steel plates outside of prisoners' corridor.

**Automatic Corridor Door Lock.**

Corridor entrance doors secured with automatic device arranged with series of hardened steel bolts to each door, placed on the inside of steel box, and released only by deadlock device, allowing door to be opened and closed automatically.

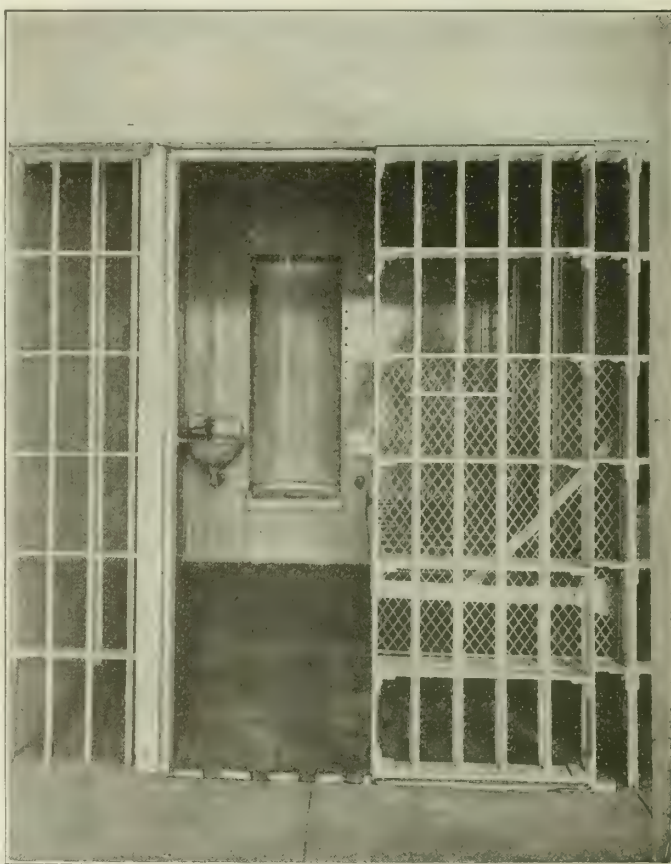
**Fittings, Special Work.**

Tables for corridors, ventilating stacks for utility corridors, consultation booths, screens, glass partitions and special devices for insane and condemned cells as required.

**References.**

The Pauly system has the endorsement of leading architects and specialists throughout the country.

Send for additional data, layouts, approximate costs, etc.



TYPICAL INTERIOR VIEW OF CELL  
 Showing Niche water closet with full enamel seat, also folding bunk



# THE VAN DORN IRON WORKS COMPANY

## Jail and Prison Builders

### CLEVELAND, OHIO

#### Products.

Manufacturers of VAN DORN STEEL JAIL and PRISON CELLS, WHITE DIAMOND BURGLARPROOF MATERIALS, PATENTED LOCKING DEVICE for Sliding Cell Doors, PATENTED INTERLOCKED and COUNTER-LOCKED GRATING CONSTRUCTION, CELL APPURTENANCES, etc.

For Steel Joist Hangers, Post Caps and Bases, see pages 254-55; for Metal Furniture, see page 1428.

#### Experience.

THE VAN DORN IRON WORKS COMPANY have been known as expert jail builders and manufacturers of steel jail and prison cell work for 36 years; during which time they have installed work of this character in some of the largest and most important penal institutions in the country.

Over 22,000 cells of their manufacture are in use in the United States, Canada, Mexico, Cuba, Hawaii and the Philippines.

#### Burglarproof Material.

The Van Dorn White Diamond Material (see illustration below) is manufactured by a special patented process and offered by no other company. By this process burglarproof work is made with an exterior coat of steel, "A," uniform in thickness and hardness, absolutely sawproof and fileproof, the core or center part being soft iron, "B." The hard steel on the exterior of the bar makes it impossible for the prisoner to mutilate it in any way, and every inch of the bar can be tested after erection.

#### Tests.

The Tombs Prison of New York City, containing 352 cells, is one of the finest pieces of workmanship in the jail-cell line ever produced, and the toolproof material of the Van Dorn product was tested by Hallsted & McNaugher, Engineers of New York, and not one bar was found defective in the least. The record is that not one bar has been cut, filed, sawed or drilled by prisoners.

In the Maryland State Penitentiary, Baltimore, which is claimed to be one of the finest and most complete penal institutions in the world, all of the cell work, window guards, doors and miscellaneous gratings are the product of this company. The same record stands for the Maryland Penitentiary as for the Tombs Prison, and also for the Allegheny County Jail, Pittsburgh, Pa., where 540 Van Dorn cells have been in use for the past nine years, the material tested by the Pittsburgh Testing Laboratory Co., with no defective or rejected bars, and not one having been cut, filed, sawed or drilled.

#### Co-operative Service.

Correspondence is invited with architects, engineers, etc., concerning steel cell equipment, and estimates, data and all information will be furnished to meet the existing conditions.

#### Catalogue.

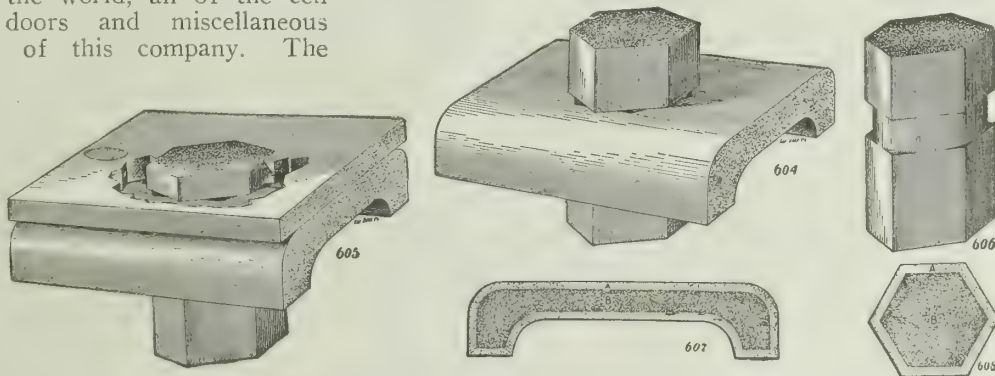
A catalogue, showing Steel Prison Construction, has just been issued, and architects, engineers, or any state, county or municipality, having under consideration the construction of penitentiaries, prisons, jails, police stations, lockups and calaboses, should write for one, which will be gladly sent free of charge.

#### Contracts.

THE VAN DORN IRON WORKS COMPANY has recently executed one of the most important prison cell contracts in the Hawaiian Islands, that for the Oahu Penitentiary, Honolulu, T. H., installing their latest improved Keyless Locking Device for sliding cell doors.

Among other recent contracts executed are the following:

LOCATION	NO. OF CELLS
New York City, Tombs Prison.....	352
Pittsburgh, Allegheny Co., County Jail.....	540
Baltimore, Md., State's Prison.....	970
Baltimore, Md., City Jails.....	300
Pittsburgh, Allegheny Co., Pa., Workhouse.....	480
Allentown, Lehigh Co., Pa.....	120
Boston, Mass., Deer Island Reformatory.....	360
New York City, Precinct Stations.....	188
Bridewell, Md., State's Reformatory.....	378
Wethersfield, Conn., State's Prison.....	187
Pittsburgh, Pa., Precinct Stations.....	200
Cleveland, Ohio.....	250
Hartford, Hartford Co., Conn.....	120
Harrisburg, Dauphin Co., Pa.....	140
Lincoln, Nebr., State's Prison.....	240
Salt Lake City, Utah, City Jail.....	35
Moundsville, W. Va., State's Prison.....	848
Bakersfield, Kern Co., Cal.....	92
Hackensack, Bergen Co., N. J.....	98
Comstock, N. Y., Great Meadows Prison.....	544
Fort Madison, Iowa, State's Prison.....	400
New York, Bronx Borough, N. Y.....	106
San Quentin, Cal., State's Prison.....	800
White Plains, N. Y., Westchester County Penitentiary and Workhouse.....	276



CONSTRUCTION OF THE HEAVY VAN DORN JAIL GRATING

No. 606—Elevation of vertical ready to insert in horizontal. No. 608—Section through vertical, showing size, style and distinction of exterior burglarproofing "A" and interior wrought core "B." No. 607—Section through horizontal. No. 604—Vertical and horizontal interlocked. No. 605—Double top and bottom counterlocking bars countersunk and riveted together between verticals















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